ក្រសួងអប់រំ យុវជន និងកីឡា
Ministry of Education, Youth and Sport

Digital Literacy Fundamental

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PREFACE

Cambodian has taken steps toward developing a digital-based economy in accordance with the ever-changing world in the digital era wherein society is rich in information and technological competitiveness, which influence on daily living, work and society. Likewise, Information and Communication Technology is playing a crucial role in responding to the above trend.

In this regard, the Ministry of Education, Youth and Sport has a vision of developing well-rounded human resources with knowledge, skills, especially strengthening ICT skills with a goal to promote creation, innovation, research and sustainable daily problem-solving skill. Strengthening 21st-century skills, science and technology education, digital education, and teacher education institution reform are fundamental priorities in Education sector.

Ministry of Education, Youth and Sport, together with KOICA, has developed nine textbooks for providing pre-service training to ICT-subject trainees at Teacher Education Institutions such as (1) Introduction to Computers, (2) Data Communication and Computer Network, (3) Educational Multimedia, (4) Artificial Intelligence Programming, (5) Database, (6) Python Programming, (7) Informatics Education, (8) Digital Literacy Foundation and (9) STEAM Education based on ICT. These training materials will contribute to the support and implementation of teacher education institution reform throughout strengthening the ICT knowledge and skills of trainers to provide the training to the trainees who will be teachers in the future.

The Ministry of Education, Youth and Sport would like to express a profound gratitude to all stakeholders who have contributed to the compilation and development of textbooks for RTTCs and other Teacher Edcuation Institutions for the benefit of teacher educators, pre-service teachers, learners, and the Cambodian people.

The Ministry of Education, Youth and Sport hopes that these textbooks will be essential learning tools to support the digital economy transformation and teacher educators, pre-service teachers, and learners at all levels for capacity development on technological skills to solve problems in daily life.

Phnom Penh, 07th August 2023

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PREFACE FOR DIGITAL LITERACY FOUNDATION

Day by day, the world is constantly evolving in all areas. in that, we observe that the field of digital technology has grown significantly and has played a necessary and important role in the lives of humanity. We can communicate with each other easily, quickly, and efficiently, even at the other end of the earth. We can get a lot of entertainment through modern electronic systems connected to the Internet. Complicated, time-consuming tasks are handled quickly, efficiently, and qualitatively. We can also gain a wealth of knowledge through learning in artificial classrooms without the need for face-to-face meetings between teachers and students. Most of the workforce is facilitated by artificial intelligence, which includes robots.

Dear all teachers and trainees! To adapt to the world's "4.0" technology era and to achieve the goal of digital education set by the Ministry of Education, Youth, and Sports, teachers and trainees must have knowledge of digital literacy in addition to the skills they already have. It does not require teachers and trainees to have a high level of knowledge in this field, but at least a basic level that can be used in the career path. This knowledge can help strengthen the quality, quantity, and speed up the work of teachers and trainees in large part.

What I have noticed is that all the documents related to the field of digital technology in our national language are not yet rich and lacking. Most of the documents are in foreign languages, which is why some scholars who do not have knowledge of foreign languages can't understand the contents of those documents.

According to UNESCO, **"Digital literacy"** refers to the ability to use digital technology and tools to find, use, manage, evaluate, create, and share information securely and accurately. The book **"Digital Literacy Foundation"** was written specifically for teachers and trainees interested in learning about digital literacy. The content of this book focuses on the basic knowledge that needs to be used in daily work. They are:

- Computer usage and maintenance knowledge.
- Computer administration software to prepare documents for teaching and managing students, presenting.
- Software for electronic communication and online file transfer.
- Distance learning software and creating artificial classrooms.
- Cloud storage services to store files online.
- Evaluate media content, and create content for media.
- Ethics and security in the use of digital technology.

Dear all teachers and trainees! Mistakes will inevitably occur in this book. Spelling, grammar, and technical vocabulary are often flawed. Pleas Forgive me. I appreciate any feedback from all of you. I sincerely hope that this book will be useful and will help develop the capacity of digital teachers for all teachers and trainees.

Author

Part 1 ICT Basic

Chapter 1 Computer Application for Administration

Part 2 Media and information literacy

Chapter 4 Digital Media and information Literacy

Chapter 5 Digital Literacy and Responsibility

Chapter 6 Content Creation for Media or Digital

Part 3 ICT Ethics

Chapter 7 ICT Ethics

Part 4 Computer Fundamental and Maintaining

Chapter 8 Computer Fundamental and Maintaining

CHAPTER 1

ICT for Education

Lesson 1

Using Computer in Basic

Introduction:

Using a computer is very important in the digital age. To improve your work, you need to know some basic computer applications. After completing this lesson, you will be able to:

- ➤ Learn the basics of computers
- ➤ Copy and move files
- ➤ Use computers to organize files and folders

In this lesson, you will learn the following:

I.   The Basics of Computers

II.   The Computer Operating System

III.   File Management

Lesson 1 Using Computer in Basic

I. Learning About Computers

1. What is Computer?

Computers are everywhere. During a typical day, you might use your phone to message a friend about meeting for lunch while listening to music as you walk to class. Although you might not realize it, you also use a computer to withdraw cash from an automated teller machine (ATM), change the temperature setting on a home thermostat, and turn on cruise control while driving a car.

Depending on your job, you probably use computers to take a diner's order at a restaurant, process a sale, or control a robot on a factory floor. Overall, computers assist you in most parts of your daily life. They play a central role in worldwide communications, entertainment, education, commerce, and other business activities. Computers have been around since the late 1940s when they were massive, special-purpose machines with names such as UNIVAC and ENIAC and were designed for use by the military and government. These early computers took hours to complete a calculation, occupied small buildings or entire city blocks, and cost millions of dollars. Today's smartphones have more processing power than a UNIVAC, cost less than any of its components, and fit in the palm of your hand. The future promises innovations such as wearable computers, using human thought as input, and computer-controlled micro-robots that treat and possibly cure cancer.

But what exactly is a computer? What does it do? Understanding what a computer is and how it works can help you to appreciate and use computers more effectively.

A **computer** is an electronic device that receives data (input), processes, stores data, and produces a result (output). Data is a collection of raw, unprocessed facts, including text, numbers, sound, images, and video. All basic computers have four functions: input, storage, processing, and output.

2. Personal Computer

In this lesson, we will focus on the most commonly used computers at home and in the office personal computers. Personal computers are those computers that one person commonly uses to assist with work and communication when needed. There are two types of personal computers: desktop computers and laptops.

- **Desktop Computer**: A personal computer for regular use at home or at the office in one place on the desktop. It cannot be used anywhere, because it is large, has separate parts and needs regular electricity.
- **Laptop**: You can take a small, lightweight personal computer with you. Laptops only need to be plugged in occasionally because they have a battery for their power supply. It would be best if you charged the battery fully.

2. 4 Main Part of Computers

A computer has four main components:

• System Unit

• Monitor

• Keyboard

• Mouse

System Unit: is the most important part of a computer. It is like the brain. It does all the tasks that we want the computer to do. It also controls all the other parts, like the Monitor, Keyboard, and Mouse. These parts must be connected to the System Unit to work. In the system Unit the most important components, such as the Motherboard, CPU, Hard Drive, RAM, and Graphic Card (GPU) are stored.

Monitor: A monitor looks like a TV screen. The CPU uses the monitor to show us information processing in the system unit. The front portion of the monitor is called the screen

or display. A monitor is connected to the system unit by VGA, HDMI, DVI cable via VGA, HDMI, or DVI port.

Keyboard: The keyboard is made of several small buttons called keys. Each key has a number, letter, or word written on it. Just as you use a pencil to write on paper, you can use a keyboard to write with a computer. You can also use the keyboard to control your computer. Also, the keyboard is connected to the system unit by a USB cable via a USB port.

Mouse: A mouse is used to point at items shown on the monitor to open, select a menu, or control something. The mouse usually has two or three buttons and a small wheel between the buttons. The mouse is connected to the system unit by a USB cable via a USB port.

3. Turning a Computer On and Off

To turn on your computer, make sure your computer is connected to a desktop computer. Laptops need to have enough battery power.

The desktop computer has a power button on the system tray. You need to press this button and wait a little bit for the computer to start up before you can use it.

On laptops, the turn-on is the same, but you have to find the power button on the computer. It can be located on the top left or right of the keyboard.

Contrary to the turn-on process, you cannot turn off the computer via the power button. If you do this, your computer will soon be prone to crashes or malfunctions. To shut down your computer correctly and safely, follow these steps:

➢ It is best if you make sure that all the programs running on your computer are closed. To know if an application is closed, you must observe the taskbar. If any program is running, please close it first.
➢ Drag the mouse pointer and click the Start button.
➢ Choose Shutdown

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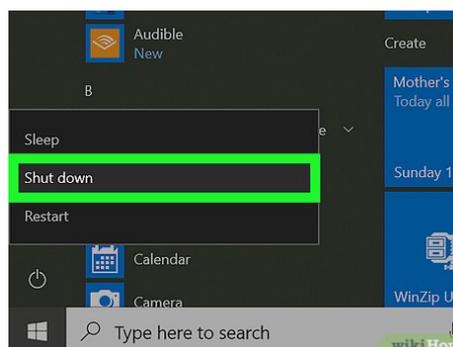
II. The Computer Operating System
1. Operating System User Interface

The four main components studied above are called hardware. Compatible computers depend on an operating system called software. Software is the operating system that controls the entire operation of a computer. It makes the computer hardware interconnected.

a. Desktop

The desktop of a computer (not to be confused with "desktop") is the first image you see on your computer screen (monitor) when the computer is turned on. It is the starting point to use the computer. Desks (icons and buttons) represent a computer's objects and functions. You can "touch" these items with the mouse to control them.

b. Icons and Buttons

Icons are thumbnails that represent objects or applications. When an icon is on the desktop or in a folder, it always has its name next to the image of that icon (filename or folder). Icons are objects in a computer that mark files, folders, or programs.

c. Using the Mouse

Buttons are located on the screen or window of a program with a specific function in the computer program, and we can use them by controlling the mouse to click on them.

The white arrow icon on the desktop is called a mouse pointer. It is used to control a computer to do something. It moves around the screen while you move the mouse on the table with your hand.

To click, hold down the left mouse button only once with your finger and release it immediately. You hover the mouse pointer over an icon or anywhere you want to control it to

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do something. You click on an icon with the mouse to select it, and hold it to control the icon. Clicking on a button will activate the function of that button.

To right-click, right-click on the mouse and release immediately. Normally, when you click the mouse, it will display a menu with various functions related to the location or object you clicked, and you can click the mouse to control any function.

To long press and drag is one of the many computer functions. Holding and dragging an object is like holding something on the desktop with your hand to move it. To do this, you must hover the mouse pointer over the object you want to select and then hold down the left mouse button (click on it as you hold it). You can then move the mouse without releasing the left mouse button. The object you clicked on will move to the same position as the mouse you moved (by moving your mouse). When you release the left mouse button, the object is dropped at the point where the mouse pointer stops.

When you want to do a task or change one of the objects in the computer, you must select it first so that the computer knows which object to work with. To select an object, click on it. To select more than one object, you must hold down the mouse where there are no objects or icons, then drag the desired objects across the screen. All objects will be selected when the mouse is released.

To double-click a mouse, immediately double-click the left mouse button and immediately release your hand from the left mouse button. Hovering the mouse over an object and double-clicking on it will activate the thing. If that is the case, it will open. If it is a text file, the computer will look for a program compatible with that text file and open it in that program. If it is a folder, the computer will open the folder in a window.

d. Window of Application
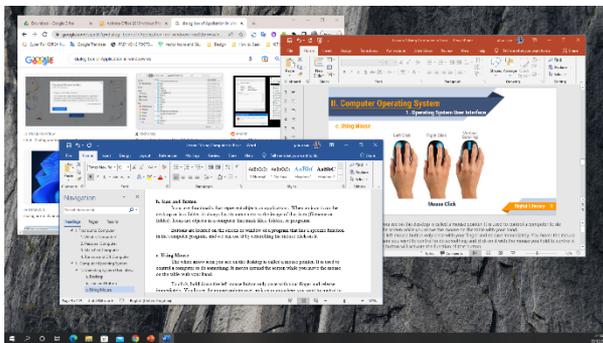
An application window is a box on the screen that displays the contents of an open folder or object, including some buttons or menus that can be used to control a function. We can open multiple windows on the desktop at the same time. The windows can be stacked on top of each other. Not all open windows are fully visible at once. The window can be resized or closed. If more than one window is open on your computer, one of those windows is the active window (the window we are working on), which is in front of the other windows with a full view of the screen. If you click on another window, the new window will reactivate and display its entire contents on the net. When you want to stop using a window, you can close it by simply hovering your mouse over it and pressing the left mouse button.

When we work with computers, sometimes, for convenience, we have to open multiple windows on the desktop for any programs that we need. For windows that we do not want to close but want to save for later use, we can minimize that window (Minimize). The window will no longer appear on the desktop and will be minimized, displaying only its name in the taskbar (bottom bar of the computer screen). We can open it again by clicking on the name in the toolbar. When we click on the name of the minimized application on the taskbar, it will open the maximized application (its original size on the desktop or full screen). All

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windows have buttons to maximize, minimize, or close (most are on the right side of Enabled, but these apps are minimized on this bar.

The following is a snapshot of the taskbar of the three different systems currently in use:

III. File Management

To work productively with a computer, you must know how to organize and find files. This lesson explains how to use Windows tools to manage files. You'll learn how to navigate the Windows file structure and change settings for viewing files. You'll also learn how to copy, move, delete, and rename files. To make sure you can find the files you need, you'll also create shortcuts and search for files. Finally, you'll identify file types, so you are prepared for what happens when you open a file.

1. Understanding How Windows Stores Files

A file is a collection of data stored together. A report document, a photo of your pet, a recording of your favorite band singing "Happy Birthday," and a video demonstrating how to bake a cake from scratch are all examples of data files. You store files in folders, containers for related files, and on drives, which are storage devices. You use folders to organize your files on a drive.

Drives contain certain types of disks, which are storage media, including removable media and hard disks. Removable media are disks you insert or attach to a computer, such as USB drives (also called flash drives and thumb drives) and digital video discs (DVDs). The term hard disk refers to a disk installed in the system unit that can economically store many gigabytes of data.

Before your computer can access a removable disk, you must insert the disk into a drive. A hard disk is housed inside the computer, so you don't need to insert a hard disk before a computer can access it. An external hard disk is in a removable drive that you can attach to your computer.

Windows names the drives on the computer by assigning each a drive letter. The hard drive containing the operating system is called drive C by default. The remaining drives can have any other letter from D to Z but are usually assigned in the order that the movements were installed on the computer. For example, the DVD drive might be drive D, and USB drives might be drive E, F, and G.

By convention, Windows includes a colon (:) after each drive letter. For example, your hard drive might be named Local Disk (C:). Windows stores thousands of files in many folders

on your computer's hard disk. These are system files that Windows needs to display the Start screen and desktop, access drives, and perform other operating system tasks. Windows organizes the folders and files in a structure or hierarchy called a file system to keep the system stable and find files quickly. At the top of the file, the system is the root directory, which is where Windows stores folders and essential files that it needs when you turn on the computer. These folders contain other folders, also called subfolders, in which you can store your files.
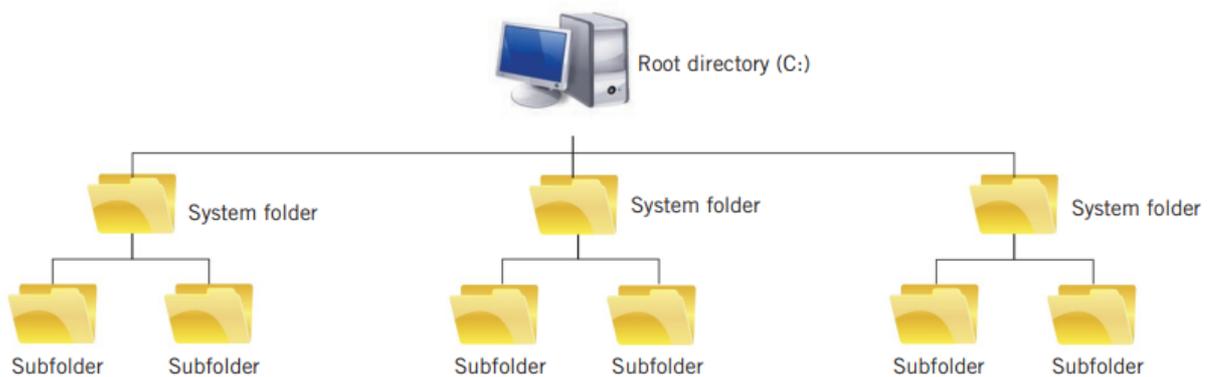
Although you can access almost any folder on your computer, including the root directory, you should store your documents, music, videos, and other files in subfolders, not in the root directory or other folders containing system files. Most operating systems, including Windows, limit your access to critical files and folders in the root directory so you cannot inadvertently corrupt the file system.

2. Using File Explorer

Most operating systems include a file management tool you use to organize your files. File Explorer displays the contents of your computer, using icons to represent drives, folders, and files. You use File Explorer to display files and folders, navigate the Windows file system, and perform other file management tasks.
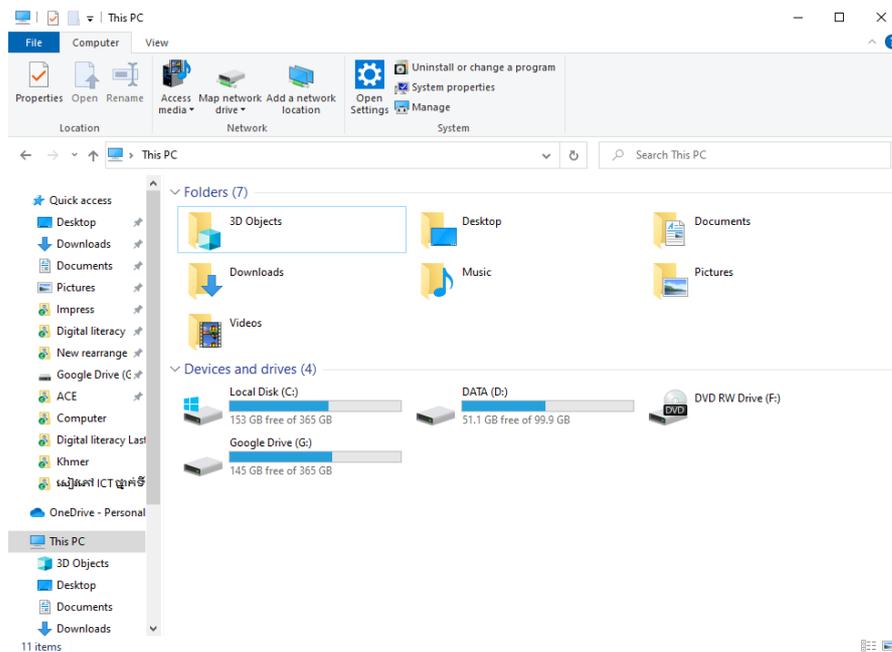
When you start File Explorer, it opens to show folders, devices, and drives on your computer, as in Figure ##. Windows provides four folders for your files: Documents, Music, Pictures, and Videos. The Desktop folder provides access to system resources such as the Recycle Bin, which you use later in this lesson when deleting files. The Downloads folder is for files you download or copy from the Internet and other networks. Devices and drives include the drives installed in your computer and any appliances or industries attached to your computer.

3. Managing Files

Managing files involves tasks that help you find files when you need them. These tasks include organizing the files into folders, deleting unnecessary files, and naming or renaming files so you can easily recognize their contents. To manage files, you group similar files in a folder, preferably a subfolder in one of the Windows default folders, such as Pictures for graphics and Documents for text files. You should divide the files into subfolders depending on the purpose or subject matter of the files and organize the subfolders from the top down. For example, a Courses folder might be a subfolder in the Documents folder. Within the Courses folder, there is a subfolder for each course you are taking, similar to the organization in the Figure below.
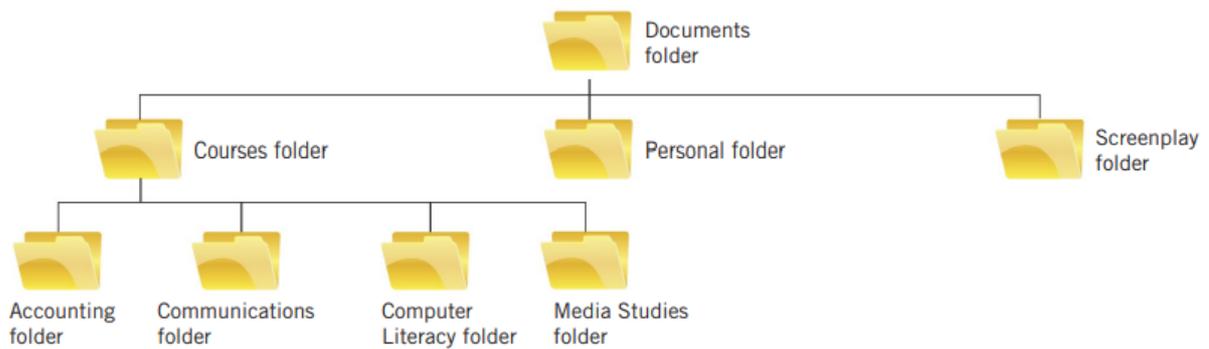
Windows only creates default folders on the hard drive, not removable media. If you are working with files on removable media, such as a USB drive, you can use folders stored in the root directory of the removable drive. For example, instead of using the Courses folder stored in the Documents folder on Local Disk (C:), you could use the Courses folder stored on Removable Disk (E:).

Do not store your files in the root directory of the hard disk, a folder containing system files (usually named Windows), or a folder containing software files (any folder in the Program Files or Program Files (x86) folder). Windows expects to find system files and the files for specific applications within certain folders. If you reorganize or change these folders, Windows can't locate these crucial files to start the applications stored in those folders.

4. Folders

The folder is an icon on a computer screen that can access a directory containing related files or documents. Before you organize files, you must create folders to have the files. You use File Explorer to create folders. (You use applications to create files.)

When you create a folder, you give it a name, preferably one that describes its contents. A folder name can have up to 255 characters. Any character is allowed, except / \ : *? " < > and . .
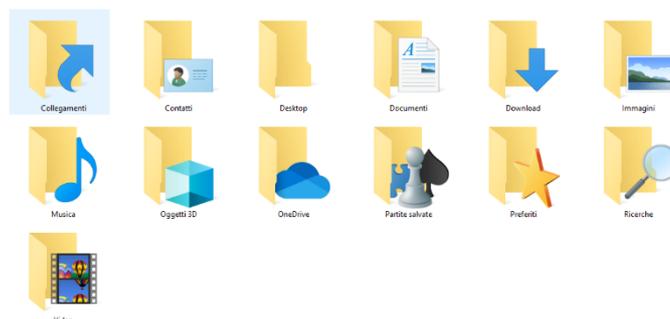
5. Copying and Moving Files and Folders

To organize files into folders, you can copy or move the files. Reproducing places a duplicate of a file in a new location that you specify, the destination folder. Moving removes a file from its current site and places it in the destination folder.

6. Deleting Files and Folders

You should periodically delete files and folders you no longer need to stay organized and reduce the clutter on your disks. You delete a file or folder in File Explorer by deleting its icon. When you delete a file from a hard disk, Windows removes the file from the folder but stores the file contents in the Recycle Bin. The Recycle Bin is an area on your hard disk that holds deleted files until you remove them permanently. When you delete a folder from the hard disk, it and all its files are stored in the Recycle Bin. Suppose you change your mind and want to retrieve a deleted file or folder? In that case, you can double-click the Recycle Bin icon on the desktop to display deleted files in File Explorer, right-click the file or folder you want to retrieve, and then click Restore on the shortcut menu. However, after you empty the Recycle Bin, you can no longer recover its files.

7. Renaming Files

Like folder names, filenames should reflect the contents of the file. The central part of a filename can have up to 255 characters, which is plenty of characters for a descriptive filename. You should be able to recognize the contents of a file by looking at the filename. You can use spaces and certain punctuation symbols in your filenames, but not the signs / \ : *? " < > or | because these characters have special meanings in Windows.

Keep the following guidelines in mind as you name files:

- ✓ **Use descriptive names**: Avoid names that might make sense now but could cause confusion later, such as MyFile or Info. Use filenames that are long enough to be meaningful but short enough to be read easily on the screen.
- ✓ Do not change the file extension: If you change the file extension when naming a file, Windows might not be able to find a program that can open it.
- ✓ Follow a pattern: If possible, use a consistent naming scheme that is clear to you. For example, if you store many assignments in the same folder, the first assignment file could be named Assignment01, the next Assignment02, and so on.

Be sure to give your files meaningful names that will help you remember their purpose and contents. The easiest way to rename a file is to use the Rename command on the file's shortcut menu. You can also use the Rename button in the Organize group on the Home tab.

8. Creating Shortcuts

In Windows, a shortcut is an icon or tile that provides a quick way to act, such as opening a folder or a file. You can create shortcuts in two places: on the Start screen and the desktop. If you often use a folder soon after you sign in to Windows, you can add or pin the folder to the Start screen, where it appears as a tile. Instead of displaying the desktop, starting File Explorer, and then navigating to the folder you want, you can click the folder's tile on the Start screen to immediately open the folder on the desktop.

You can pin folders on the hard disk to the Start screen but not on removable media such as a USB drive. Before pining the Backgrounds folder to the Start screen, copy it to the Pictures folder on your hard disk.

9. File Types

A computer can contain three categories: system files, application files, and data files. System files are those necessary for running the operating system. They usually are found in the root directory of a personal computer and the Windows folder of a Windows computer. On a Mac, system files are stored in the System folder. Linux computers keep system files in a folder named sys. An application file is part of an application, such as a word-processing application, and is necessary for running the software. These files are transferred to your computer when you install the application. A data file is one you create when working with an application, such as a document you write and format when working with Microsoft Word. Many system and application files are executable, meaning they can perform tasks automatically when you open them. In contrast, data files display data such as text or images or play a sound, music, or video.

Recall that a file extension identifies the file type. It also identifies the broader category to which the file belongs. The system file category has the fewest file types. System files often have attributes set so they cannot be edited or deleted because those files are critical to computer operation. (A file attribute is a file detail or setting that can be turned on or off.) System files come only as part of the operating system or software. Similarly, application files come only as part of the software. Do not move, edit, or delete system or application files unless a computer expert gives you specific instructions.

On the other hand, data files are designed for you to create, edit, and manage. You can learn valuable information about a file from the information listed in the Type column of File Explorer in the Details view or from its file extension. For example, suppose you have two files named Get Organized, as shown in Figure 3–17.
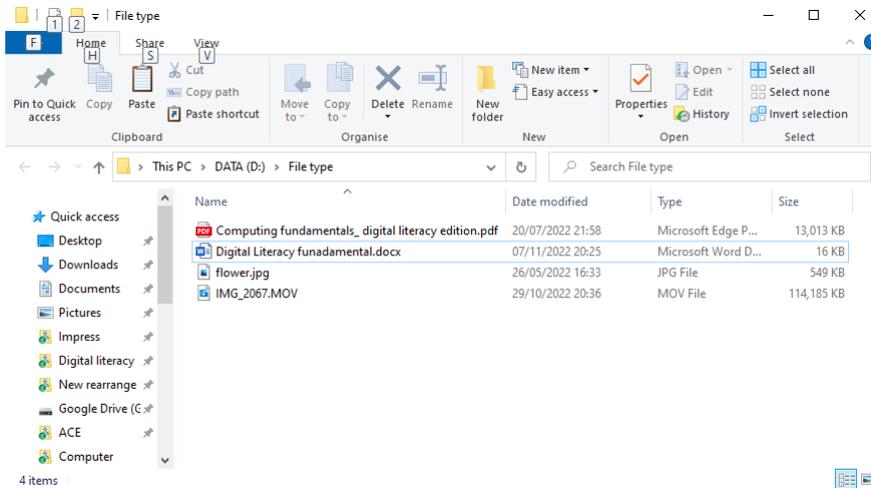
Note: Do not open the file by double-clicking it unless you receive an executable file (one with an extension such as .exe) from a trusted source. Doing so could trigger a virus or malware on your computer with harmful results.

File Explorer identifies one of the files as a Microsoft Word Document. This file type has a .docx extension. File Explorer identifies the other file as a PNG file, a graphics file. This file type has a .png attachment. Though the main parts of these filenames are identical, the file types distinguish them as different files. The file extension also helps Windows identify what application should open the file. For example, if you double-click a file named Class Notes.docx in File Explorer, Microsoft Word opens it so you can edit it. If the Type column in File Explorer includes the name of an application, that indicates the application is installed on your computer and is available for opening. (If something is wrong with the file—if you change the file extension, the application probably cannot open the file.) For some file types, especially media files such as graphics, audio, and video, Windows does not identify an application but lists the file extension in the Type column of File Explorer. These file types are not associated with a specific application, making it difficult to predict what happens when you double-click the files. Double-clicking a png file, for example, might open an application that only lets you view the picture or one that enables you to edit it. When you need to specify an application to open a file, you can right-click the file, point to Open with on the shortcut menu, and then click the name of the application you want to use. You should be able to recognize common file types and their file extensions, so you know which files to avoid (system and application files) and to

identify applications you can use to open files. Table 3–3 lists typical file types by category and specifies their file extensions and associated operating system or application.

CATEGORY	COMMON FILE EXTENSION	OPERATING SYSTEM OR APPLICATION
System files	.dll, .ocx, .sys	Windows
Application files	.bat, .com, .exe	Windows
	.app, .osx	Mac OS X
	.bin	Linux, Mac OS X, Windows
	.out, .run	Linux
Data files		
Media	.avi, .mov, .mp4	Video application
	.jpg, .png, .tif	Graphics application
	.mp3, .m4a, .wav	Sound application
Office documents	.doc, .docx	Microsoft Word
	.mdb, .accdb	Microsoft Access
	.ppt, .pptx	Microsoft PowerPoint
	.xls, .xlsx	Microsoft Excel
Simple text	.rtf, .txt	Text editor
Other	.htm, .html	Web browser
	.pdf	Portable document reader or editor
	.zip	File compression utility

📖 Summary

- A **computer** is an electronic device that receives data (input), processes data, stores data, and produces a result (output). Data is a collection of raw, unprocessed facts, including text, numbers, sound, images, and video. All basic computers consist of four functions: input, storage, processing, and output.
- There are two types of personal computers: desktop computers and laptops.
  - **Desktop Computer**: A personal computer for regular use at home or the office in one place on the desktop. It cannot be used anywhere, because it is large, has separate parts and needs regular electricity.
  - **Laptop**: A small, lightweight personal computer that you can take with you. Laptops do not need to be plugged in regularly because they use a battery for their power supply. You just need to fully charge the battery.
- A computer has four main components:
  - System Unit
  - Monitor
  - Keyboard
  - Mouse
- A file is a collection of data stored together.
- A folder is an icon on a computer screen that can be used to access a directory containing related files or documents.

👤 Questions

1. What is a computer?
2. What is IPOS of a computer? Please describe.
3. What is personal computer? How many types are there? Please describe.
4. What are the four main parts of a computer? Please describe.
5. Describe how to turn on/off a computer.
6. Describe how to copy and move files.

💡 Exercises

1. **Starting Up** with Windows and How to Use the mouse.

Turn on your computer by clicking the Open button on the system tray. When the desktop appears, each member of each group performs the following tasks:

- Observe on the desktop. Mark any object as an icon. Count the number of icons available on the desktop.
- Use the mouse and move it on the desktop. Click the mouse button on each icon to select it.
- Move one of the icons to the center of the screen by long-pressing and dragging it.
- Select more than one icon by holding down the mouse and dragging it across the desired icon location.
- Move all selected icons simultaneously by clicking on one of the selected icons and dragging them to the desired location (all icons will be moved).
- Reset all moved icons Back.

2. **Create folder**

A. Please create a folder name: "Lesson1 Using Computer in basic" in D drive by doing the following:

- Open File Explorer
- Navigate to where you want to create the new folder, and click New Folder.
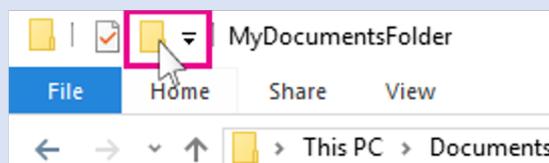
- Type the name of your folder, and press Enter.

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Intro to OpenOffice.org Khmer

Objectives:

- ❖ Learn about OpenOffice.org Khmer
- ❖ Install OpenOffice correctly
- ❖ Compare OpenOffice.org kmer to other Office applications

When you have finished this lesson, you will have learned the following:

I.   What is OpenOffice Khmer?
II.   OpenOffice Components
III.   Comparaing OpenOffice to MS Office
IV.   Installating OpenOffice

Lesson 2 Intro to OpenOffice.org Khmer
I. What is OpenOffice?
Khmer Office Software (OpenOffice.org) is suitable for your office work.

Khmer Office Software (OpenOffice.org) has the following advantages:

- No license fee: All users can use the full Khmer office software and distribute it for free.

- Open source: You can distribute, copy or edit this software.

- Cross Platform: This program can run on any system, such as Microsoft Windows, Linux, Linux, or macOS.

- Multilingual support: It has a multilingual user interface.
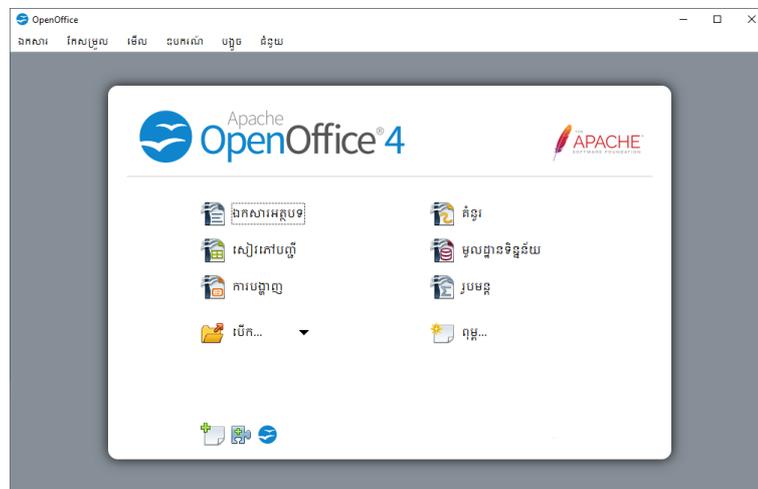
II. OpenOffice.org Component
The Khmer Office program includes components such as:

1. OpenOffice.org Writer
　　　　The writer is a program to create letters, books, reports, newspapers, advertisements, and many other documents. You can add graphics or design text to your needs. Manuscripts can export documents in various formats, such as HTML, XHTML, PDF, and Microsoft Word.
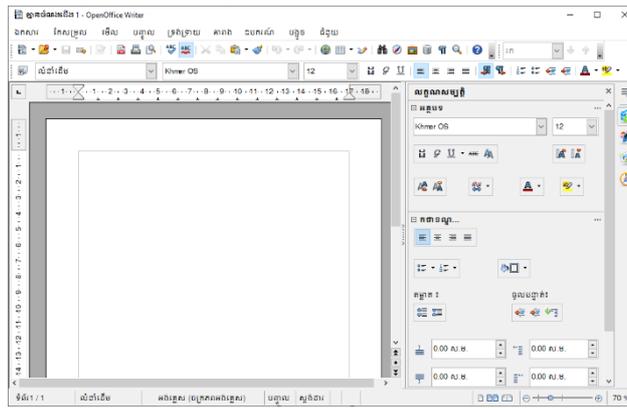
2. OpenOffice.org Calc

Calc is a program specializing in arithmetic and data analysis skills and creating charts for data. It also includes many formulas for financial work, statistics, mathematics, etc.
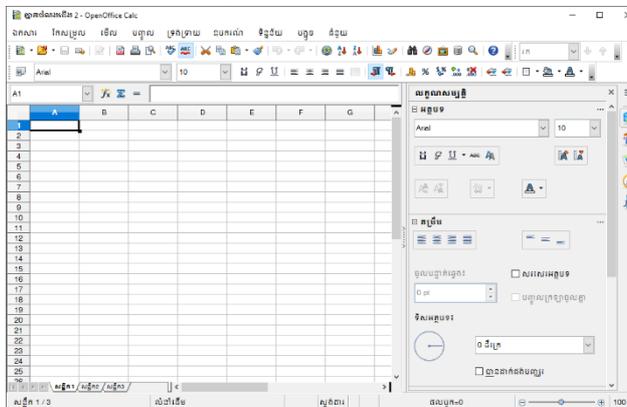
3. OpenOffice.org Impress

Impress offers a variety of presentation tools such as special effects, custom animations, transitions, slides and drawing tools, etc. In Slide Show, you can animate text or audio, images, and videos.

17
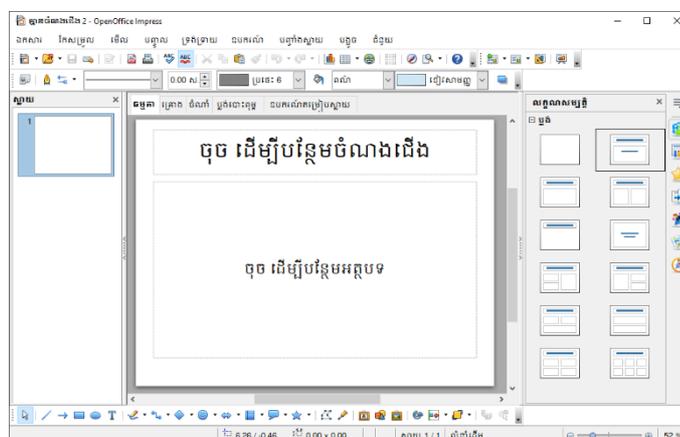
4. OpenOffice.org Draw

Draw is a program that contains vector drawing tools that can draw shapes of various formats, such as diagrams, 3D flow charts (3D), and calligraphy. It has a smart connection line to connect to your points. With Draw, you can create your photo gallery and add it to your gallery.
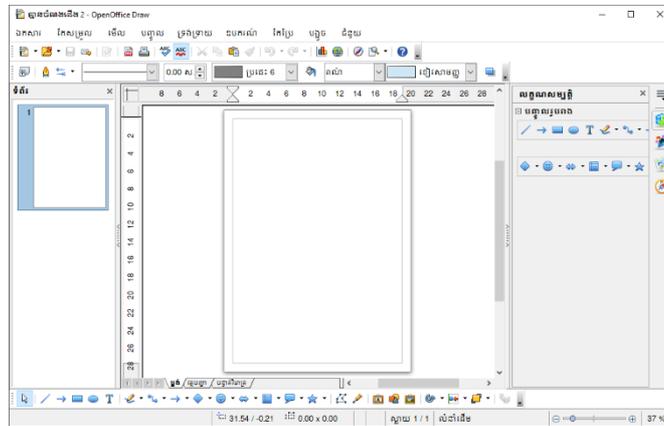
5. OpenOffice.org Base

Base is a program for managing data. With OpenOffice.org Base, you can create and edit tables, forms, questions, or reports.
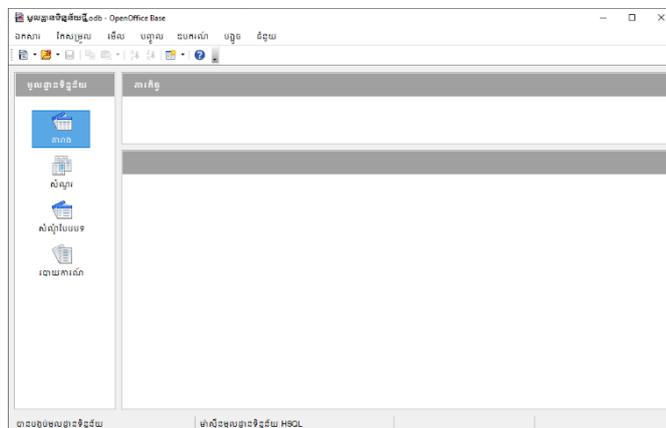
6. OpenOffice.org Math Editor

Math is a program for editing the formulas, fractions, or equations of the Khmer office program OpenOffice.org (Ooo). You can use this program to write complex equations, including special characters and symbols that are not in the standard font, and you can also use it to write mathematical formulas.

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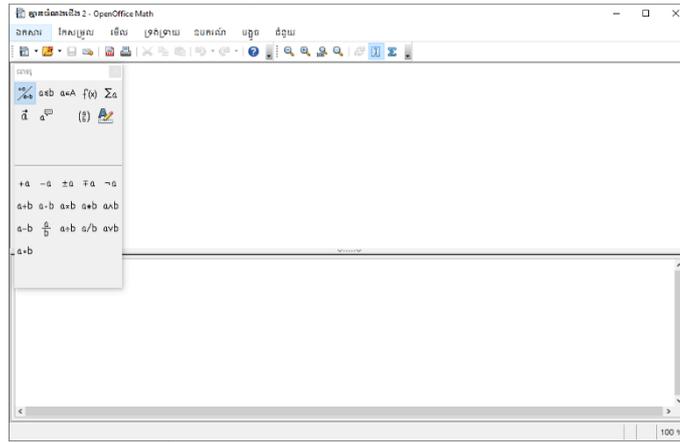
III. Comparation OpenOffice to Ms. Office

Khmer office software OpenOffice.org is very similar to Microsoft Office software. The following table compares the identical components of these two programs:

Function	OpenOffice.org	Microsoft Office
Word-processing	OpenOffice.org Writer	Microsoft Word
Spread sheet	OpenOffice.org Calc	Microsoft Excel
Presentation	OpenOffice.org Impress	Microsoft Power Point
Database	OpenOffice.org Base	Microsoft Access
Paint	OpenOffice.org Draw	None
Math	OpenOffice.org Math	Microsoft Equation

IV. OpenOffice.org Installation

Below you will find step-by-step instructions to download and install Apache OpenOffice 4. x versions on your system.

1. Review the System Requirements for Apache OpenOffice use.
Your computer needs these resources as a minimum to run Apache OpenOffice 4. x versions:

- ✓ Windows 7, Windows 8, Windows 10, Windows 11
- ✓ 256 Mbytes RAM (512 MB RAM recommended)
- ✓ At least 650 Mbytes available disk space for a default install (including a JRE) via download. After installing and deleting temporary installation files, Apache OpenOffice will use approximately 440 Mbytes of disk space
- ✓ 1024 x 768 or higher resolution with at least 256 colors

2. Download Apache OpenOffice

 ➢ Go to the OpenOffice website: https://www.openoffice.org/download/ or scan the QR code

 ➢ Select your operating system, language, and version

 ➢ Click the Download full installation button
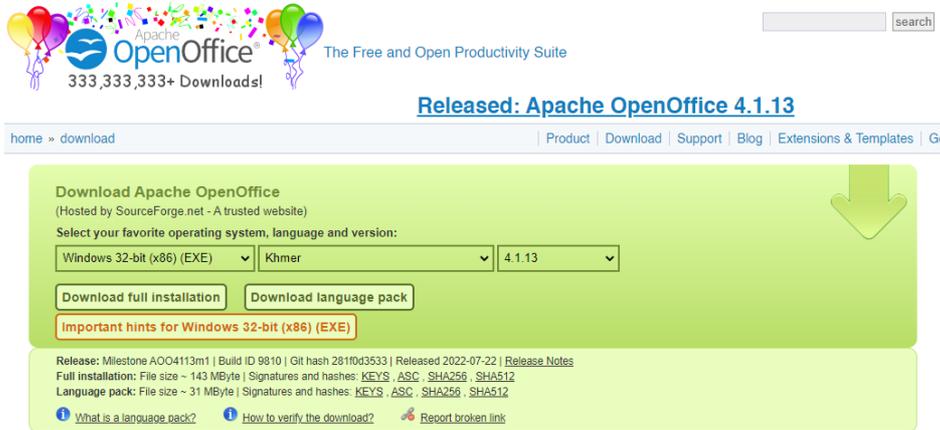
 ➢ Your file will be downloaded
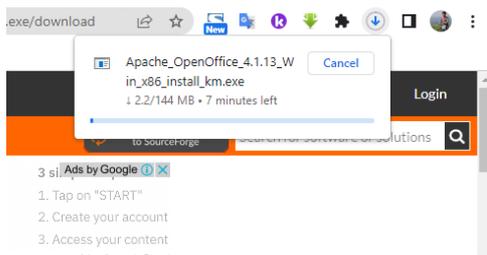
 ➢ Go to the Download folder in the file and explore

 ➢ Right-click on the Open office file

 ➢ Chose Run as Administrator
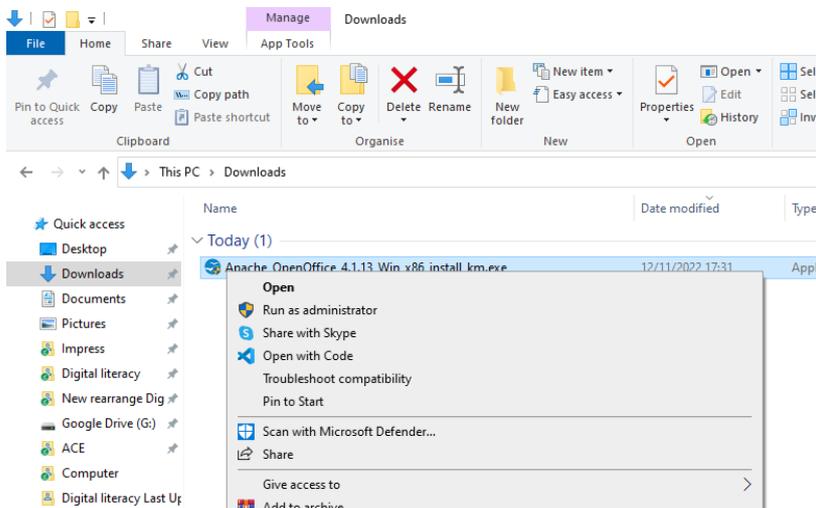
 ➢ When the message prompt appears, click the Yes button

➢ Click "Next"
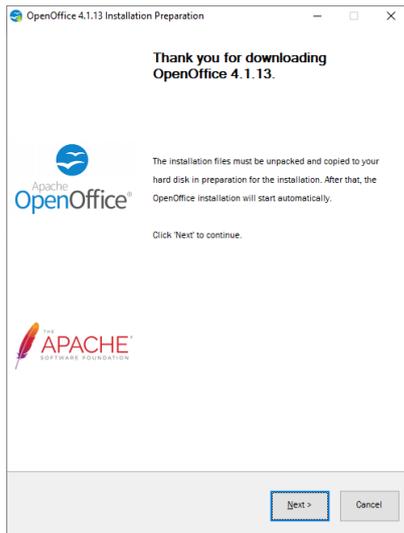
➢ Click "Unpack"
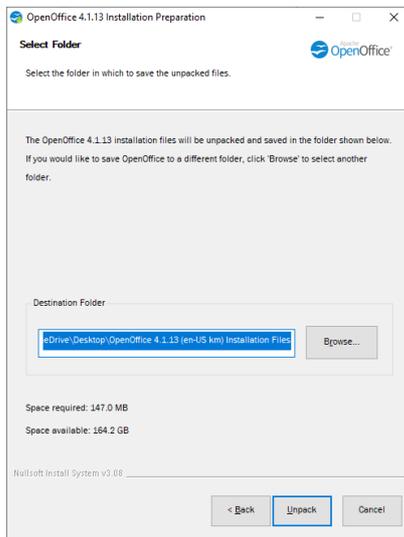
➢ When Unpack is successful, click the "Next" button
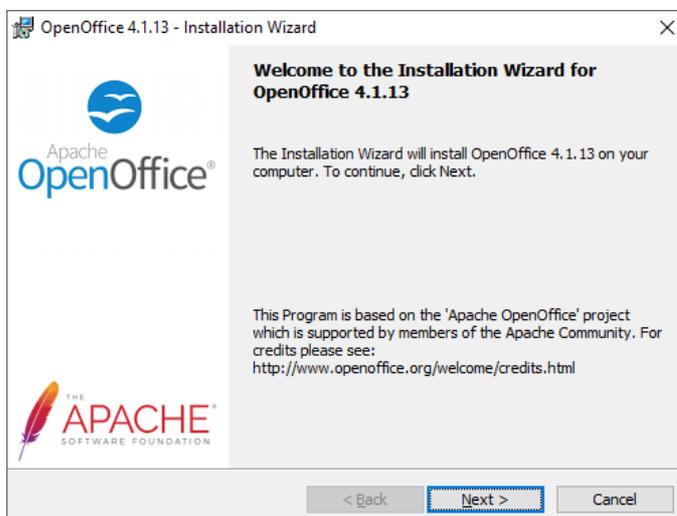
➢ Chose "Anyone who uses this computer (all users)"
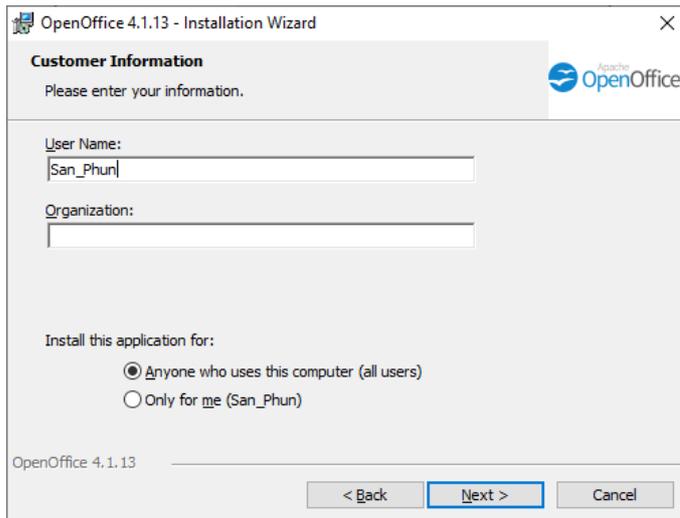
➢ Chose "Typical" and click "Next"
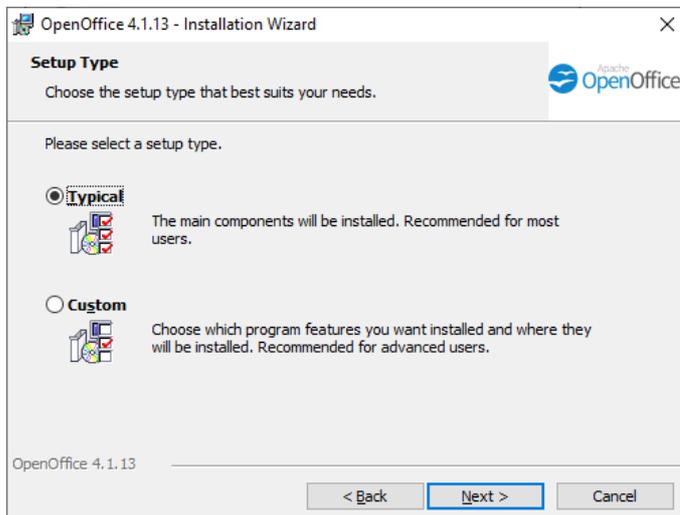
➢ Check "Create a start link on the desktop"
➢ Click the "Install" button
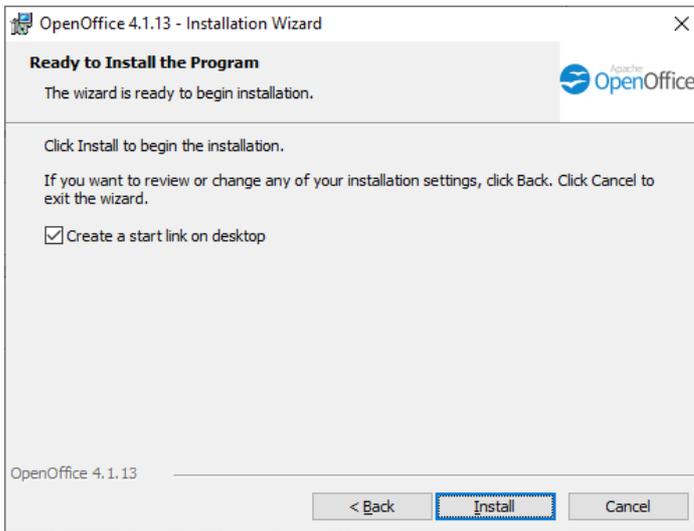
> ➢ Wait for the Installation process to finish
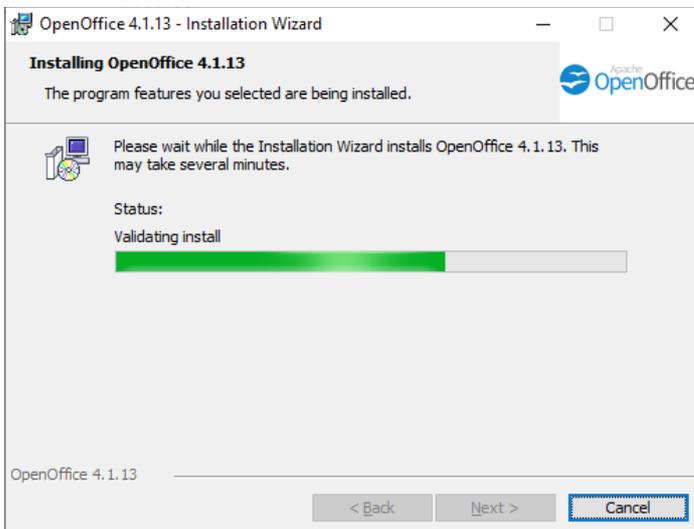
> ➢ When the Installation process is finished, click on the "Finish" button.
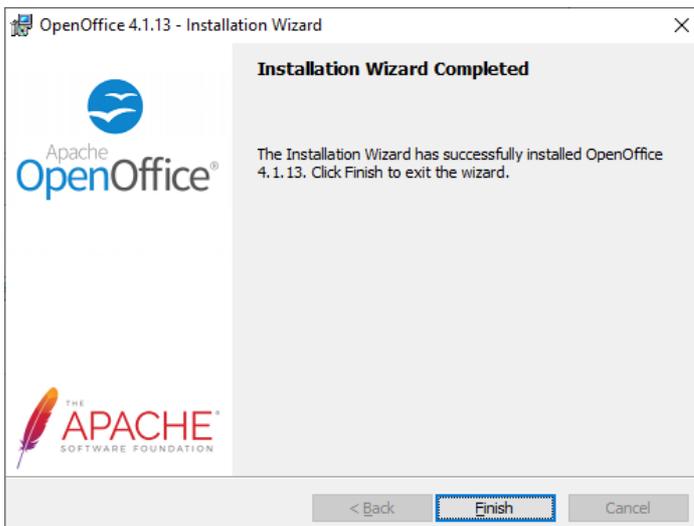
📖 Summary

- Khmer Office Software (OpenOffice.org) has the following advantages:
  - No license fee: All users have the right to use the full Khmer office software and distribute it for free.
  - Open source: You are free to distribute, copy or edit this software.
  - Cross Platform: This program can run on any system such as Microsoft Windows, Linux, or MacOS.
  - Multilingual support: It has a multilingual user interface.
- The Khmer Office program includes components such as:
  - OpenOffice Writer
  - OpenOffice Calc
  - OpenOffice Impress
  - OpenOffice Draw
  - OpenOffice Math
  - OpenOffice Base

Questions

1. What is OpenOffice.org Khmer?

2. What is the advantage of OpenOffice?

3. How many components of OpenOffice are there? Please describe each component.

4. Compare Open Office and MS Office

5. Describe how to download and install OpenOffice.

Lesson 3

Introduction to Open Office Writer

Introduction:

This chapter covers the basics of working with text in Writer. You will learn about Writer's menus, toolbars, and other topics covered in Lesson 1, Introducing Writer.

Objectives:

- ❖ A
- ❖ B
- ❖ C

When you have finished this lesson, you will have learned how to:

- ✓ Discover the Writer window
- ✓ Zoom in and out
- ✓ Find icons on the formatting bar
- ✓ Align paragraphs
- ✓ Move the cursor with the mouse
- ✓ Select text with the mouse
- ✓ Rename the font, font size, and bold italics, and underline one layer, etc.

Lesson 3 Introduction to Open Office Writer

I. Writer

Writer is an OpenOffice.org article editor. Currently, many different programs can be used to create text files of different types. Writer is an important program that can help you to create text documents as it allows you to create an exciting text file with images and various formatting settings.

With a writer, you can easily create text documents such as letters, brochures, schedules, certificates, price lists, questionnaires, exercise manuals, and lessons, etc. In addition, the manuscript also provides many other functions that allow you to create complex documents, such as writing projects, proposals, reports, and resumes, books, etc. These documents are multi-page, which may require page numbers, chapters, graphics, and tables of contents, etc.
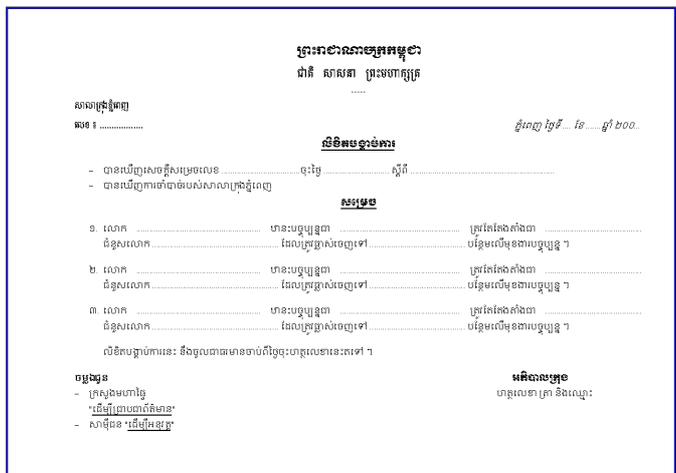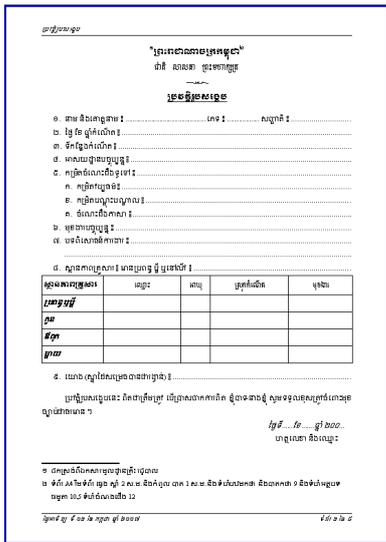
II. Opening a Writer Application

Like you start other programs, you can open the OpenOffice Start Center or the Writer component from the operating system menu. When OpenOffice was installed on your computer, a menu entry for each element was usually added to the system menu.
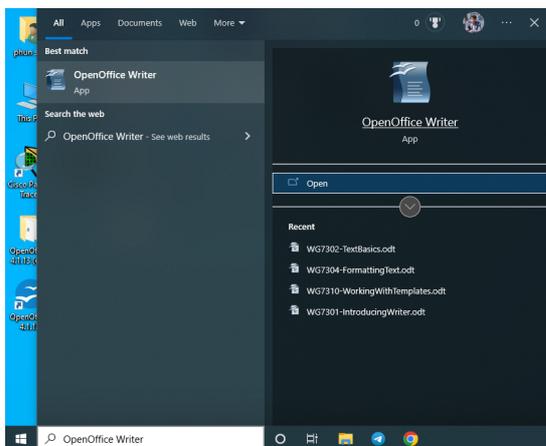
> ➢ Click Star menu
> ➢ Type Calc
> ➢ Chose Calc Icon

Note: When you open the first manuscript on the program's title bar, the word "untitled" means the file Opened does not have a title or has not been saved before.

III. Parts of the Main Writer Window

To efficiently use the program, you need to understand the user interface (User Interface) of the computer program. Usually, each program always has a point of Interface such as a title bar, menu bar, standard bar, format bar, and many more toolbars as indicated below:
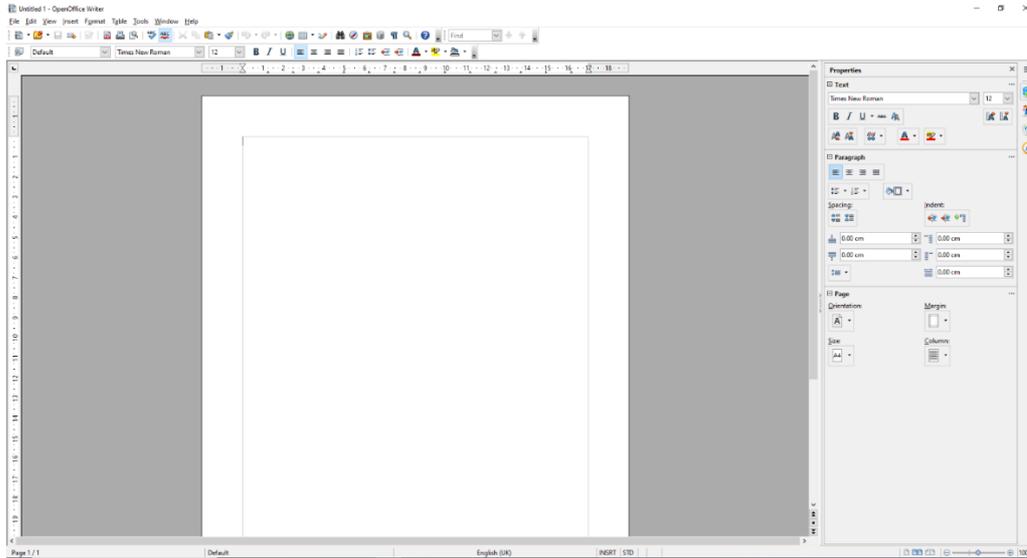
1. Title Bar

The Title bar is located at the top of the Writer window. It shows the file name of the current document. When the document still needs to be named, the document name will appear as Untitled X, where X is a number. Untitled documents are numbered in the order in which they are created.

2. Menu Bar

The Menu bar is located just below the Title bar in Windows and Linux and at the top of the screen in macOS. When you select one of the menus, a submenu drops down to show further options, including:

- Commands that directly cause an action, such as **Close** or **Save**, in the **File** menu.
- Commands that open dialogs. Three dots indicate the following command: **Find...** in the **Edit** menu.
- Commands that open further submenus. These are characterized by a right-pointing arrow following a command, such as **Toolbars** and **Zoom**, in the **View** menu. Moving the cursor onto one of these items causes its submenu to open.

3. Scroll bar

There are two scroll bars: a horizontal scroll bar and a vertical scroll bar. We use these to view and move around files.

4. Sidebar

The Sidebar usually is open by default on the right side of the Writer window, as shown in Figure 1. Select View > Sidebar on the Menu bar to display it if necessary. The Sidebar also has a **Hide/Show** icon, as shown in Figure 2. When the Sidebar is closed, it can be opened by clicking this icon, which will be on the far-right side of the window.

The Writer Sidebar contains four decks by default: *Properties*, *Styles and Formatting*, *Gallery*, and *Navigator*. Each deck can be opened by clicking its corresponding icon on the Tab bar to the right of the sidebar.

Each deck consists of a title bar and one or more content panels. A panel is like a combination of a toolbar and dialog. Toolbars and Sidebar panels share many functions. For example, the icons for making text bold or italic exist in both the Formatting toolbar in the main Writer window and the text panel of the Properties deck.

Some panels contain a **More Options** button, which opens a dialog with additional editing controls. When the dialog is open, the document is locked for other editing.

To adjust the width of the Sidebar, place the cursor on its left edge. When a double-headed arrow appears, click and drag to the right or left. When the *Properties* deck is open, you cannot make the Sidebar smaller than a certain width. When any other deck is open, the Sidebar can be collapsed to the width of its Tab bar.

To undock the Sidebar and make it floating, and to dock a floating Sidebar, use the drop-down list in the Sidebar Settings above the Tab bar. In the same list, you can use the **Customization** menu to choose which tabs you want to include in the Sidebar.
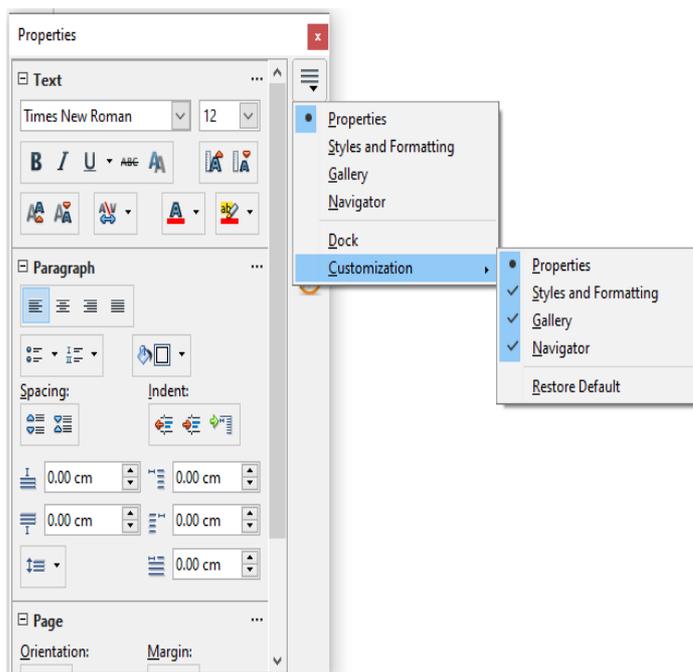
The decks contained in the Sidebar are described below:

Properties Deck: Contains tools for directly formatting content.

When *text* is selected, these panels appear:

– **Text**: Modify text properties such as the font name, size, color, weight, or character spacing.
– **Paragraph**: Modify a paragraph's alignment, background color, indent, and spacing, and toggle numbered or bulleted lists.

    −   **Page**: Contains tools for directly formatting the page style like Orientation, Margin, Size, and Column.
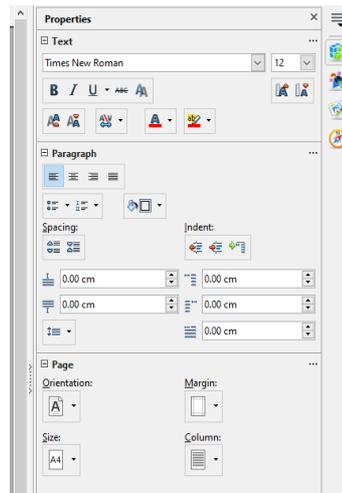
- **Caution**

    Be aware that by changing the options on the Page, you will change the page style in use, modifying not only the current page but all pages using the same page style in this document.

Gallery Deck: Shows images and diagrams included in the Gallery themes. The Gallery has two sections: the first lists the themes by name (Arrows, Bullets, Diagrams, and so on) and the second displays the images in the selected theme. For more information on using the Gallery to add images to a document, create new themes and add your own images.
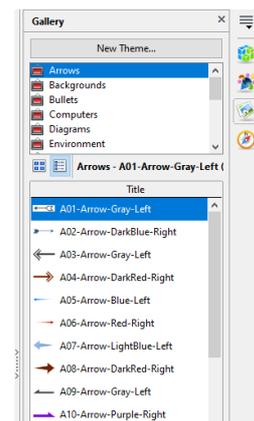
Navigator Deck: Browse the document and reorganize its content by selecting content categories, such as headings, tables, frames, images, etc.
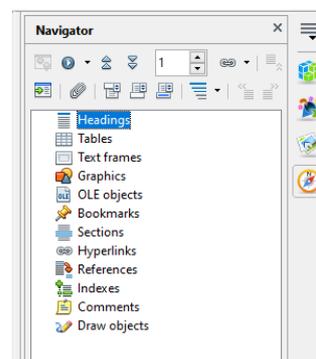
IV. Toolbars

Standard bar: Contains many icons such as Open, Save, Print, Copy, Paste, Brush, and Format, etc.

Formatting Bar: Contains various icons related to formatting text, paragraphs, and more.
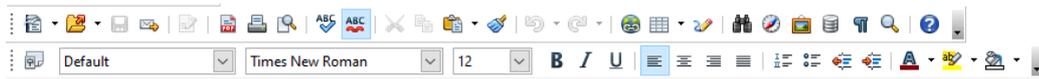
1. Displaying or Hiding Toolbars

To display or hide toolbars, go to **View > Toolbars** on the Menu bar, then click the toolbar's name in the drop-down list. An active toolbar shows a check mark beside its name. Note that toolbars created from tool palettes are not listed in the View menu.

To hide a toolbar, go to **View > Toolbars** on the Menu bar and deselect the toolbar, or right-click in a space between the icons on a toolbar and select **Close toolbar** in the context menu.
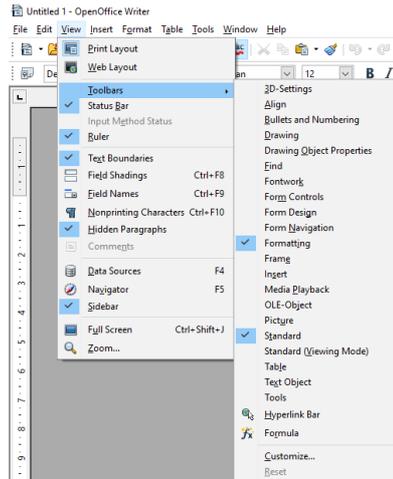
2. Moving Toolbars

Dotted handles indicate docked toolbars on the left end (Figure 10). They can be undocked and moved to a new docked position or left as a floating toolbar.

To undock a toolbar:

➢ Move the mouse pointer over the toolbar handle, the small vertical bar to the left of a docked toolbar, as shown in Figure 10.

➢ Your mouse pointer will be shown as a move pointer. Click the left mouse button and drag the toolbar to a new location.

➢ Release the mouse button.

To move a floating toolbar, click its title bar, drag it to a new floating location, or dock the toolbar at the top or bottom of the main window.

- **Note**
  You can also dock a floating toolbar by holding down the *Ctrl* key and double-clicking on the toolbar's title bar.

- **Tip**
  If the toolbar handle is not displayed, its position is locked. To unlock the toolbar, right-click it and then deselect the option **Lock Toolbar Position**.

3. Floating Toolbars

Writer includes several toolbars whose default settings correspond to the current position of the cursor or selection (when toolbars are made active). For example, when the cursor is in a table, the Table toolbar appears, and when the cursor is in a numbered or bulleted list, the Bullets and Numbering toolbar appears. You can reposition or dock these toolbars described in "**Error! Reference source not found.**" **Error! Reference source not found.**.
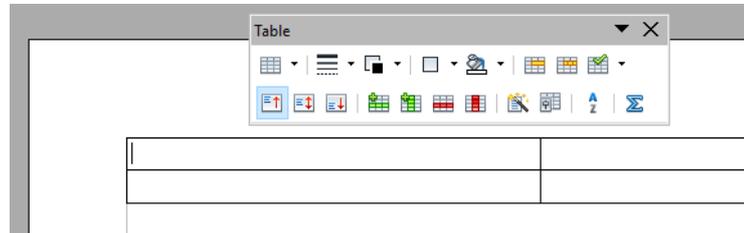
To position a toolbar, do any of the following:

- Right-click somewhere in the floating toolbar and click **Dock Toolbar** in the context menu. You can reposition the toolbar to a different docked position.
- Click **Dock All Toolbars** to dock all floating toolbars.
- Click **Close Toolbar** to close the selected toolbar.

4. Customizing Toolbars

You can customize toolbars in several ways, including choosing which icons are visible and locking the position of a docked toolbar. You can also add icons and create new toolbars, as described in Chapter 20, Customizing Writer. To access a toolbar's customization options, right-click anywhere on the toolbar to open a context menu.

To show or hide icons defined for the selected toolbar, click **Visible Buttons** on the context menu. Visible icons are indicated by an outline around the icon or by a check mark beside the icon (Figure 12), depending on your operating system. Select or deselect icons to hide or show them on the toolbar.
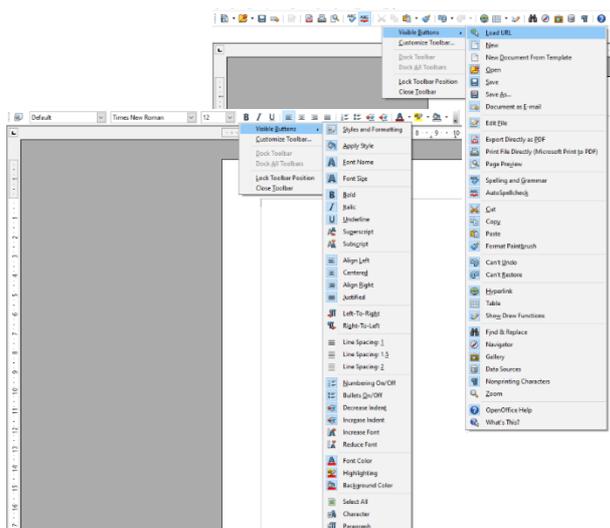
V. Rulers

The horizontal ruler across the top and the vertical ruler on the left of the workspace is shown by default. To enable or disable the ruler, choose **View > Rulers** on the Menu bar or **Tools > Options > OpenOffice Writer > View** and click on Ruler.
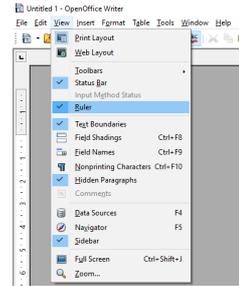
VII. Cursor

It is a small vertical black line that flashes, which is the starting point for the writer. You can move it with the mouse, click on the position you want to move to, or use the arrow keys.

VIII. Status Bar

The Writer Status bar is located at the bottom of the workspace. It provides information about the document and convenient ways to change some document features quickly. It can be hidden by deselecting it in the View menu.

- **Page Number: This shows** the sequence number of the current page, the total number of pages in the document, and the current page number (if different from the sequence number). For example, if you restarted page numbering at one on the third page, its page number is one, and its sequence number is 3.
- **Text Language:** Shows the language and localization used for spelling, hyphenation, and the thesaurus. It is based on the position of the cursor or the selected text.
- **View Layout:** Click the corresponding icon to change between single-page, multiple-page, and book layout views (Figure 9). You can edit the document from any perspective. Zoom settings interact with the selected view layout and the window width to determine how many pages are visible in the document window.
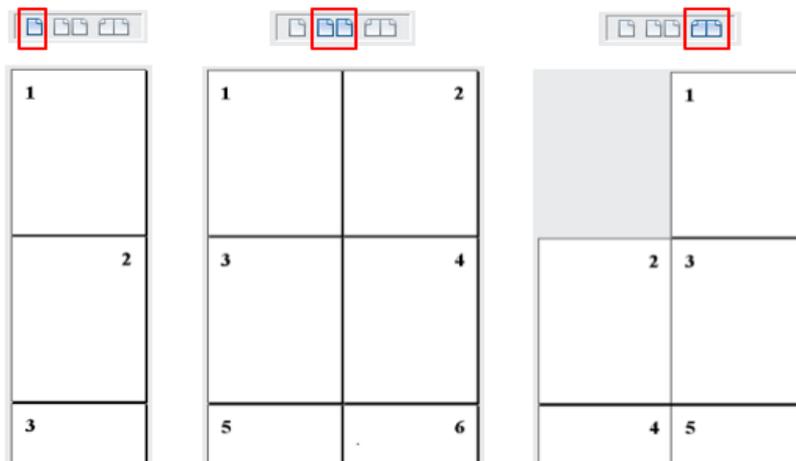
- **Zoom**: To change the view magnification, drag the Zoom slider, click the + and − signs, or right-click the zoom level percent to pop up a list of magnification values

from which to choose. Zoom interacts with the selected view layout to determine how many pages are visible in the document window.
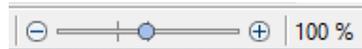
IX. Context (right-click) Menu

Context menus provide quick access to many menu functions. They are opened by right-clicking on a paragraph, graphic, or other object. When a context menu opens, the functions or options available will depend on the object that has been selected. This can be the easiest way to reach a function, especially if you are not sure where the function is located in the menus or toolbars.
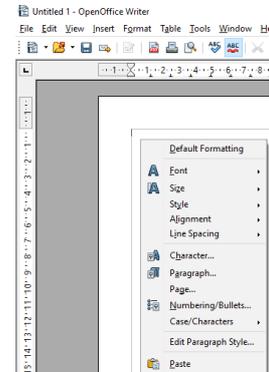
X. Dialogs

A dialog is a particular type of window. Its purpose is to inform you of something, request input from you, or both. It provides controls for you to specify how to act.

In most cases, you can interact only with the dialog (not the document itself) as long as it remains open. When you close the dialog (usually, clicking **OK** or a similar button saves your changes and closes the dialog. Clicking **Cancel** closes the dialog without saving any
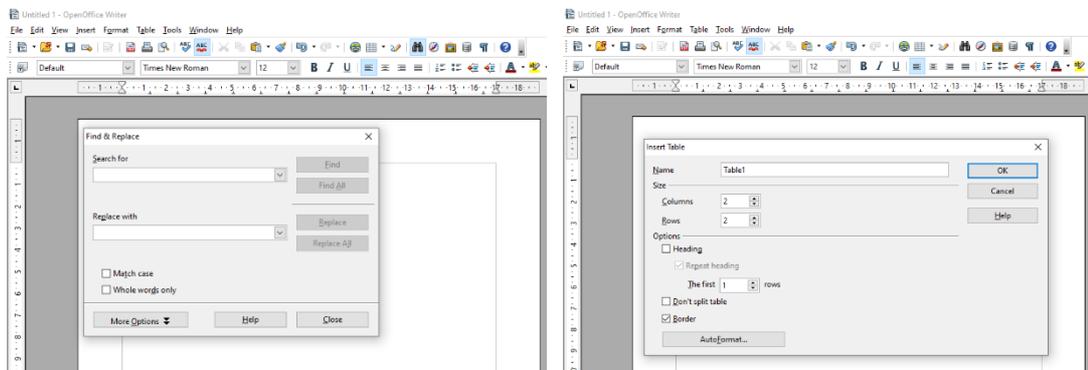
changes), you can work with the document again. Some dialogues can be left open as you work so you can switch back and forth between the dialog and your record. An example of this type is the Find & Replace and Insert Table dialog.

XI. Creating a New Document

You can create a new, blank document in Writer in several ways. If a document is already open in OpenOffice, the new document is made in a new window.

1. From the Operating System Menu

Like you start other programs, you can open the OpenOffice Start Center or the Writer component from the operating system menu. When OpenOffice was installed on your computer, a menu entry for each element was most likely added to the system menu. On macOS, the OpenOffice icon will be in the Applications folder.
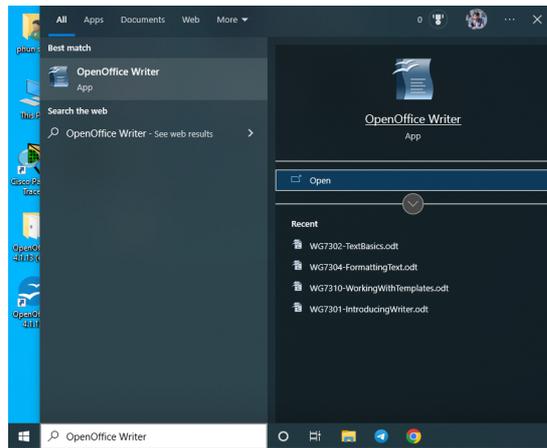
2. From the Start Center

When OpenOffice is open but no document is available, the Start Center (Figure 23) is shown. Click the **Text Document icon** to create a new text document.

3. From the Menu Bar, Toolbar, or Keyboard

When Writer is open, you can also start a new Writer document in one of these ways:

- Press the Ctrl+N keys, or

- Choose **File > New > Text Document** on the Menu bar, or

- Click the **New** icon on the Standard toolbar.

XII. Opening an Existing Document

You can open an existing document by following:

- Click the **Open** icon on the Standard toolbar.
- Or Click File -> Open
- Or Ctrl + O

And then, Open Dialog will appear. Navigate to the folder you want, select the file, then click **Open**. If a document is already open in OpenOffice, the second document opens in a new window.
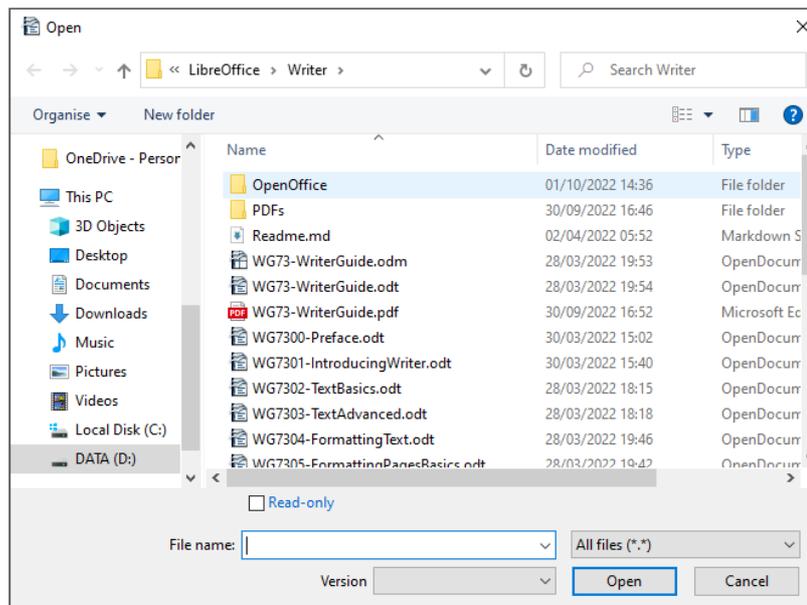
You can reduce the list of files in the Open dialog by selecting the type of file you are looking for. For example, if you choose Text documents as the file type, you will only see documents Writer can open. This method opens Word (.doc or .docx) files, other formats, and OpenDocument (.odt).
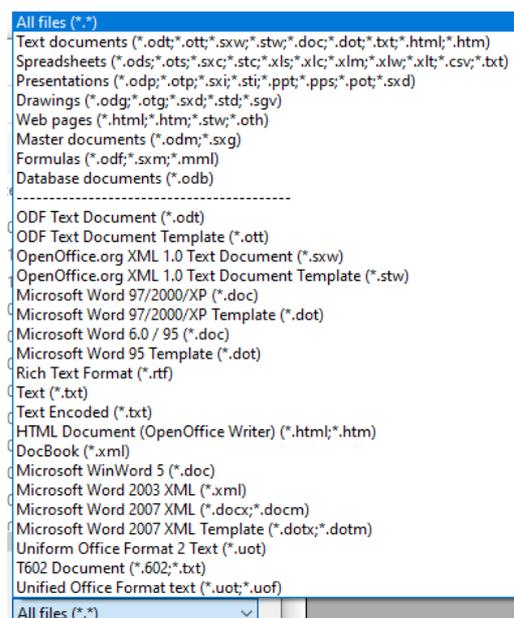
XIII. Saving a Document
You can save a document using any of the following commands:

- **Save**: use if you are keeping the document, its current filename, and location.
- **Save As**: use to create a new document, change the filename and file format, or save the file in a different location on your computer.

1. Save Commands
Do one of the following:

- Press *Ctrl+S*.
- Choose **File > Save** on the Menu bar.

- Click the **Save** icon 💾 on the Standard toolbar.

  If the file has not been saved previously, a Save As dialog appears after selecting one of the above options. Enter the file name, verify the file name type and location, and click **Save**.

  If a previously-saved file is being saved with the same file name, type, and location, nothing else must be done.

2. Save As ~~ea~~ Command

Use this command if you want to save the current version as a new document by changing the file name or type or by saving the file in a different location on your computer.

Choose **File > Save As**, or use *Ctrl+Shift+S* to open a Save As dialog where you can change the file name, type, or location and click Save.
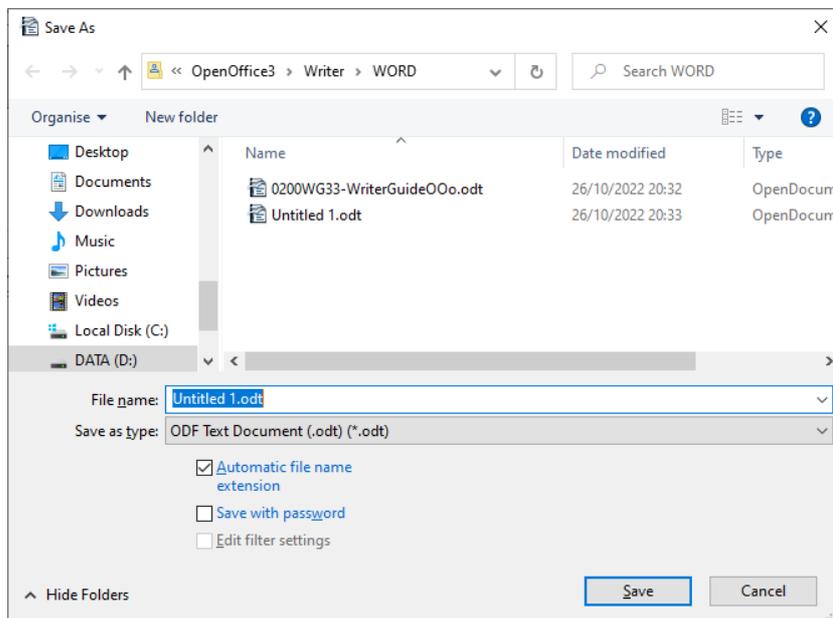
- ✓ **Save:** means to save what we entered after opening this old file. It does not display the Save As dialog, which requires a new name for this file, so the Save As dialog is not displayed when you select Save.

- ✓ **Save As**: means save by requiring us to assign a new name to the old one. The old file retains the same name and data format.

- **Note**
  OpenOffice uses the term "export" for some file operations involving a change of file type, such as PDF.

XIV. Undoing and Redoing Changes

To undo the most recent change in a document, press *Ctrl+Z,* choose **Edit > Undo** on the Menu bar, or click the **Undo** icon on the Standard toolbar. To get a list of all the changes that can be undone, click the small triangle to the right of the **Undo** icon on the Standard toolbar. You can select several sequential changes on the list and undo them simultaneously.
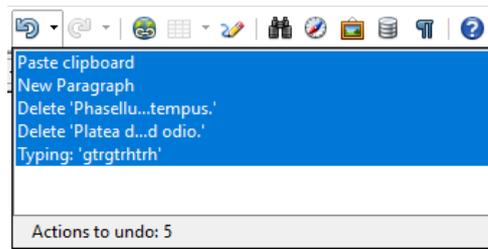
After changes have been undone, **Redo** becomes active. To redo a change, select **Edit > Redo**, press *Ctrl+Y* or click the **Redo** icon on the Standard toolbar. As with **Undo**, click the down arrow icon of the combination icon to get a list of the changes that can be restored.

XV. Closing a Document

If the document is open and you want to close that document, go to **File > Close** on the Menu bar or click the **X** on the Title bar. Depending on your operating system, the X may be located on either the right or left end of the Title bar.
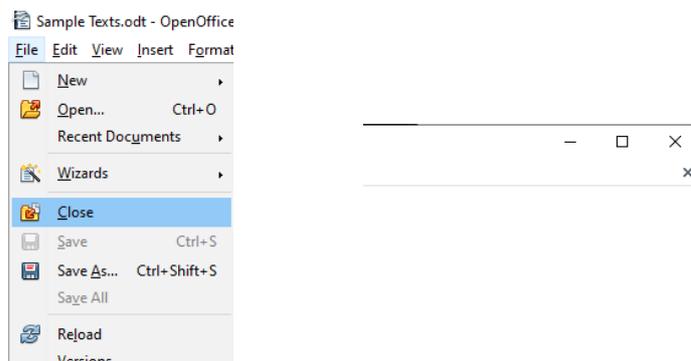
A message box is displayed if the document has not been saved since the last change. Choose whether to save or discard changes.
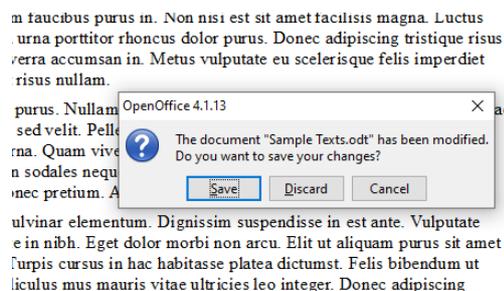
XVI. Closing OpenOffice.org

To close OpenOffice completely, click **File > Exit,** or close the last open document as described in "Closing a document" above.

If all the documents have been saved, the Writer closes immediately. A warning message appears if any documents have been modified but not saved. Follow the "Closing a document" procedure to save or discard your changes.

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📖 Summary

  Writer is an OpenOffice.org article editor. Currently, there are many different programs that can be used to create text files of different types. Writer is an important program that can help you to create text documents as it allows you to create an interesting text file with images and various formatting settings.

  With Writer you can easily create text documents such as letters, brochures, schedules, certificates, price lists, questionnaires, exercise manuals, lessons, etc. In addition, the manuscript also provides many other functions that allow you to create complex documents, such as writing projects, proposals, reports, resumes, books, etc. These documents are multi-page, which may require page numbers, chapters, graphics, and a table of contents.

? Questions

1. What is Writer?
2. What sidebar?
3. What is a tools bar?
4. Describe how to create a new document.
5. Describe the difference between save and save as.

💡 Exercises

1. Open the Writer program and save it in your Documents folder as: Lesson 1.

Lesson 4

Khmer Unicode

Objectives:

❖ Define the meaning of Khmer Unicode and Its Advantage

❖ Type Khmer Unicode correctly

❖ Use Khmer Unicode in daily life

When you have finished this lesson, you will have learned:

Lesson 4 Khmer Unicode

I. Definition

You already know that the writer program is a program that specializes in administrative matters such as writing letters, writing essays, etc. So, to make it easier to write Khmer text on the computer, you will learn how to type Khmer Unicode in this chapter. Before learning how to type Khmer Unicode, you need to understand Khmer Unicode first.

Unicode is a universal encoding scheme for typing and text that defines a consistent, multilingual encoding method that can exchange text data internationally and lay the foundation for universal software. Unicode is not just another font but a new international standard for the Khmer language and the Royal Government of Cambodia. Computers around the world will understand Khmer when using Khmer Unicode fonts. Older fonts will be forgotten in the next few years, and all text will be in Unicode. All Unicode fonts have the same encoding and meaning when an article is typed. The Unicode font can be converted to other Unicode fonts, and the text will remain in the correct format. For example, text typed in the KhmerOS System will be visible to other machines that do not have the KhmerOS System fonts but have Unicode.

What are the applicable Khmer codes?

- ✓ Khmer Unicode designs computer fonts (rounded corners, plain fonts ...)
- ✓ You can use Khmer Unicode to type Khmer text faster (spelling)
- ✓ Can display various information on websites that use Khmer Unicode
- ✓ You can find information online in Khmer through Google or Wikipedia (Khmer)
- ✓ Use Khmer Unicode to communicate in Khmer via email and chat
- ✓ Using Khmer Unicode allows you to sort Khmer letters alphabetically
- ✓ Using Khmer Unicode can check the spelling of Khmer words correctly

Khmer Unicode is being introduced in many government institutions, schools, NGOs, and private companies in Cambodia.

II. Differences Between Old and Unicode Fonts

If you have used the old Khmer fonts (Lemon, Battambang, ABC, etc.) before, you need a little time to get used to the new fonts (Unicode fonts). But this should only require two or three days. In a very short time, you will be able to type faster. The main point is that you can type in spelling ("type in spelling" is not correct), not from left to right, as you write by hand.

One of the most important differences between the old typing style and Unicode modes is that when using new fonts, there is a key on the keyboard to represent each vowel, including ្រ្ ្រ្ ្រ្ ្រ្ ្រ្ ្រ្ ្រ្ etc. In Unicode, you can type all at once, as in Khmer, meaning there is no need to type in parts. For example, if you wanted to type words with older fonts, you would have to type:

 េ + ស + �ីូ But with the new font, you have to type: ស + េីូ

In the example above, you will see that the keys are different, and you have to type the letters first and then type the vowels as you spell. (ស ...េីូ) ។

The most unusual thing about this new typing mode is that the leg is no longer embedded in the keyboard. So, to type a letter, you have to use two different keys: a key indicates that the next letter is the letter foot, and then the standard key for that letter. For example, to write the word " ក្ដី " you need to type: ក + ្ + ដ + ីូ

This is a way to increase typing speed because you do not have to remember all the literal feet on the keyboard. These are just some of the examples that introduce you to new ways of typing. We will now look at things in detail step by step, starting with understanding the Khmer characters.

III. Keyboard Layout and Unicode Typing

1. How to Use the Keyboard to Type Unicode

Typing Khmer Unicode differs from using old Khmer fonts. We must first change the keyboard's language before we can type Khmer Unicode. We can find out what language our keyboard uses by looking at the bottom right corner of your computer monitor screen.

If you see ENG, which is short for English, your computer uses an English keyboard, so all the keys you type will appear in English characters.

If you see ខ្មែរ, it means that your computer is using a Khmer keyboard, so all the keys you type will appear in Khmer characters.

2. How to Change the Keyboard to the Khmer Keyboard

- Control the mouse pointer, click on the ENG letter, and select ខ្មែរ. or

- Press Shift and Alt keys simultaneously: Each time you press them, the keyboard changes immediately. If the keyboard is currently in English (ENG), it will switch to Khmer (ខ្មែរ), and if it is currently in a Khmer keyboard setting, it will switch to English.

។

3. Learning the Keys
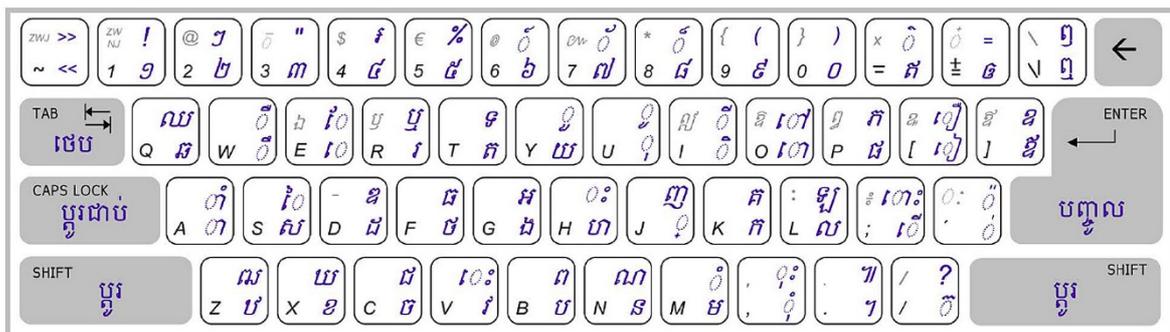
Take a look at the Khmer Unicode keyboard layout. Example: Key R
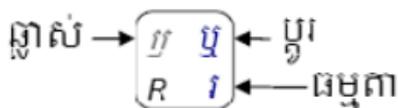
- The letters, vowels, and punctuation at the bottom of the key are typed simply by pressing the key. For example: To order a letter ិ, press R, the standard key.

- The letters, vowels, and signs in the upper right are typed by pressing the shift key with that key. Example: To order a letter ឫ, press the Shift key + R.

- Some letters that are not often used or some full vowels are placed in the upper left of the key and are greyed out by pressing the Alt Gr key. For example: To type a letter ឫ, press the Shift key (Al Gr) + R

IV. How to Type Khmer Unicode

To type text using Khmer Unicode, you must type in the order of spelling, not writing from left to right. And the computer will arrange the letters in the correct order.

ក. How to type consonants in combination with vowels

It is best if you type in ~~in~~ the order of spelling, such as លើើ

លើ + ើ   Is not ើ + លើ + �

All words must be in this order. The syllables must be typed according to a general rule.

Consonants + Subscript + Vowels + Signs

For the Khmer spelling, the consonants and vowels are used the same way, so the consonants in this document refer to either consonants or independent vowels.

Vowels are always typed behind the letter, even if written in front, behind, above, or below. The computer will place it in the correct position. Vowels with two parts, such as ៅ, are also typed after consonants. ៈ

ល + ិ -> លិ

គ + ែ -> គែ

ន + ៅ -> នៅ

ល + ើ -> លើ

If the syllable has any alphabetical foot, that foot is typed behind the main letter but in front (if any).

1. How to Type Consonant Subscript

You should also note that the alphabet is not available on the keyboard as in previous fonts (Lemon, ABC, or other fonts) because in Unicode the consonant subscript and the main

consonant are used with the same keys. To signal that the next letter is a consonant subscript, the J key (◌្) is typed before the main consonant ។

Example:

ច + ត + ្ + ត -> ចិត្ត

ស + ្ + រ + ◌ី -> ស្រី

ស + ្ + រ + ែ◌ -> ស្រែ

For a two-subscript syllable, you must type both subscripts in the order of the spelling, and a (◌្) sign must precede each subscript:

ស + ្ + ត + ្ + រ + ◌ី -> ស្ត្រី

Make sure you do not type the រ subscript before the other subscript. Adhere to the spelling sequence and do not type the consonant subscript behind the vowel.

2. Special Case for Consonants

There are some cases where some characters are represented by more than one shape depending on the different letters around them, in the case of the letter ប followed by ◌ា vowel. In previous fonts, it was necessary to have a unique character for this case, but in Unicode, you must type the normal key for the letter ប. When you type ◌ា, the computer will immediately change the shape of the letter ប.

ប + -> បា

The same goes for the letter ឈ. You do not have to worry about the appearance of letters or subscripts ◌្. If you type correctly, a correct letter will appear:

ទ + ា + ញ -> ទាញ

ស + ញ + ិ + ញ + ា -> សញ្ញា

ខ + ិ + ញ + ុំ -> ខ្ញុំ

ប + ញ + ិ + ច + េ + ញ -> បញ្ចេញ

Don't type ក + ា instead of ញ.

3. Special Case for Vowels

There are several vowels that, although present on the keyboard, represents two different characters (they have no direct characters in Unicode):

ាំ ុំ ុះ េាះ និង េាះ

You can type these vowels directly with the keyboard keys, but if you want to delete them, you have to press the backspace key (<-) twice ។

In contrast, there is a vowel with the following two parts (split vowel):

េី េឿ េៀ ោ និង ៅ

They are typed with a single key and erased by the backspace key.

Other vowels not on the keyboard require double typing. For example:

ក + ែ + ះ -> កែះ

4. Sign for Changing Consonant Sound

Sometimes a character is called a letter changer, which changes the vowel sounds accompanying a letter. These are two characters:

- A wavy line () changes the vowel sound that accompanies the voiceless consonant to the voiced consonant. It is used with a voiceless consonant that is not equivalent to any voice consonant. These are:

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ស ហ អ និង ប

-Mouse teeth (ö) are used to change the vowel sound that accompanies the voiced consonant to the voiceless consonant. It is used with a voiced consonant that is not equivalent to any voiceless consonant. These are:

ង ញ ម យ រ និង វ

The exception (ö) is also used with the letter ប to change its sound from ប to ប៉. Consonantal characters are usually typed after the letter and subscript but must be typed in front of the vowel. Components with a sign for change consonant sounds are in the following order:

Consonants + Subscript + Sign for change consonant sound + Vowels + Sign

For example:

យ + ̈ö + � + ក -> យ៉ាក

ប + ̈ö + ្range + ង + ប + ̈ö + ្range៖ -> ប៉ងប៉ោះ

ក + ្រ + ្ + ម + ហ + ̃ö + ្ + ន -> ក្រមហ៊ុន

ប + ̃ö + ្ + ត -> ប៊ុត

ស + ្ + រ + ̃ö + ្ + ប -> ស្រ៊ុប

ម + ្ + ហ + ̃ö + ្range + ត -> ម្ហ៊ែត

When a sign for a change consonant sound is followed by a vowel located above the consonant or by a vowel, the sign for a change consonant sound changes its position automatically under the main consonant. Also, it changes its shape to a vowel (ុ). And you do not have to type ុ. Here are some examples:

ស + ̃ö -> ស៊ី   ស + ̃ö + ̄ö -> ស៊ី

ប + ̈ö + ̄ö -> ប៊ី   ប + ន + ្ + ស + ̃ö + ̄ö -> បន្ស៊ី

If you type vowels ◌ុ instead of ◌̃ or ◌̈, you will not be able to type two vowels in a row:

ស + ◌ុ + ◌̄ -> សុ◌̄

There are three exceptions to the sign for change consonant sound, which does not change position even though the vowel is above the letter. The computer will set the correct order for the consonant you type.

- It will not change shape when the upper vowel is a ◌̊ because the combination of the ◌̊ vowel and the body changed to the lower vowel of the sign for a change consonant sound can be confused with a ◌ុ◌̊. The same goes for all vowels that are placed on a consonant. If not combined with the sign for change consonant sound characters, the sign for change consonant sound characters will remain on the same consonant.

  អ + ◌̃ + ◌̊ -> អ̊̃

- It will not change shape when the letter ប is used in conjunction with ◌̃ because the reader will not know whether the following form represents for ◌̃ or ◌̈ (so if it is pronounced as a vowel, it must be changed or if it is pronounced as a consonant, it should be replaced ប៉ instead of ប

  ប + ◌̃ + ◌̂ + ក -> ប̃̂ក

- When there is one consonant, and one subscript, one of them is ហ. Typing must always follow the dictionary of Choun Nath. This is probably because the other consonant in the syllable may be the voiced consonant. If the sign for change consonant sound characters is changed, it is unclear whether ◌̃ applies to ហ or another consonant.

  អ + ◌ុ + ហ + ◌̃ + ◌̂ + ◌ះ : -> អុ̃ហ̂ះ

5. Sign

There are three types of Signs in Khmer that form part of a syllable:

- rôbat (៌) ៖ rôbat is a Sanskrit loanword sign and has the same sound as putting the letter រ in front of the letter it is above. It is considered different from other signs. rôbat is usually typed after the consonant above and the vowel to be typed. A syllable with a rôbat (៌) cannot have a subscript or a vowel ~~to be~~ placed above a special consonant.

  When using rôbat (៌), the syllable must have this form ៖

  consonant + rôbat (៌) {+ vowel} {+sign}

  For example:

  ព + ណ + ៌ -> ពណ៌

  ស + គ + ៌ + ៈ -> សគ៌ៈ

  ក + ប + ៌ + ុ + រ -> កប៌ុរ

  ក + ា + ប + ៌ + ា + ស -> កាប៌ាស

  ស + ព + ៌ + េ + ជ + ុ + ញ -> សព៌េជុញ

- Other punctuation marks ទណ្ឌឃាត (៍), សំយោគសញ្ញា (៉) អស្ដា (៊) កាកបាទ (៎) វិរាម (៝) និង បន្តក់ (់) Is placed above the main letter ។ They are usually not used in combination with vowels. Still, in cases with vowels, they should be typed after the vowel and before the syllable after the syllable.។ When used with a vowel ុ (do not confuse it with a ៓ or ៉). We have the following formula ៖

  consonant + subscript + sign for change consonant sound + vowel + above sign + behind sign

  For example:

  ល + ក + ់ -> លក់

  ទ + ំ + ព + ៌ + រ —> ទំព៌រ

  ណ + ៎ + ៈ -> ណ៎ៈ

ន + ្ + ៉ + ៈ -> ន្ឌះ

A computer automatically executes two exceptions, but you should also note them because sometimes the upper vowel can be combined with a cross, such as ៈ

អ + ៏ + ៉ + ៈ -> អឺ៉ះ

- The combination of ៏ + ៉ is used for many words. Some previous fonts had such special characters. In Unicode, both characters are typed separately, but they can be combined correctly, as in the example below. ៈ

ព + ោ + ធ + ៏ + ៉ -> ពោធិ៉

Technical Note: This is just a technical note. To make it easier to read, we call it a ៉៏as vowel, but Unicode considers a ៉ as a sign, not a vowel. ។ Character ៀ៉ and ្៉ Are formed by a combination of vowels ៀ and ្ with the sign ៉ (សញ្ញា និគ្គហិត) Both Khmer vowels (ៀ៉ and ្) are available on the keyboard to adapt to Khmer culture, but the keyboard has created characters ៀ or ្ And then the characters ៉. The same goes for vowels ្ ៀ and ៀៈ They are automatically generated by the keyboard, but you have to understand that when we press one of these vowels, the keyboard must first create a vowel (្ ៀ or ៀ) and then a pair of small circles (ៈ).

- A pair of small circles ('s) and dots (:) are always placed after the last syllable. They can't be confused with two dots (and a) line (:)

ក + ៃ+ ៈ -> កៃះ

6. Punctuation (។ ៕ ៖ ៙ ៚, " ?)

The Khmer alphabet has punctuation marks such as the period (។). A period used to end an entire text or a chapter(៕), two dots (and a) line (៖), duplication sign (ៗ), cock's eye (៙), and a period used at the end of poetic or religious texts (៚).

In addition, some punctuation characters are borrowed from Latin letters, such as exclamation marks (!), periods (.), double quotations ("), and question marks (?). Dashes are used only for cross-sections. Punctuation in the Khmer language is usually separated from the words before and after by a space, except when used with an even duplication sign (ៗ). Latin punctuation marks are usually not separated by a word in front of them, except when used with double quotes (the words after the opening and before the closing double quotation marks are not spaces). In Khmer, space is also considered a punctuation mark used to pause speech, not to separate words. To type a space, press the SHIFT key and the spacebar at the same time.

7. Combination

In Unicode fonts, when the ា vowel follows a letter, it changes shape slightly to make it more beautiful. If ា vowel is deleted, the letter will be reverted to the original format. Users usually do not know how to combine this. They want the text to look pretty good. Please pay attention to this point ៖

ក + ា -> កា

You can see the variation of ក hair when combined with the vowel ា.

Another combination in the Khmer alphabet that also changes shape is between the round ិ and ុ.

វទ្ធុ   វិទ្ធុ

8. Zero-width Space (ZWSP)

Words in Khmer are typed consecutively and separated by a punctuation mark. Typewriters, Internet browsers, and other text-based programs need to know where to break each sentence into new lines. In Western languages that use spaces to separate words, this is certainly not a problem, but in Khmer, these programs do not know where to end a comment and a new line.

In most newspapers in Cambodia, line breaks are done manually. The writer has to calculate whether the next word can be put in a line together, then they will work on that line manually.

Web pages cannot be used this way because the page format depends on the browser window size on the user's computer and screen resolution.

The solution to this problem is to include invisible spaces between those words, which are just spaces for separating words from one word to another, and to let those programs know where to line up, so we cannot see the gap between the words.

This character is called an invisible space, the most frequently used character in the text (100 keystrokes have 16 hidden spaces), so we decided to put the most commonly used keystroke on the key. The easiest click is the spacebar. Each time you press the invisible space, you will insert a space bar. If you press the spacebar invisibly (without pressing any other key), the characters inserted into the text become an invisible space.

To type a space, you must press the SHIFT key combined with the spacebar.

Invisible space is used for:

- ✓ Separation between Khmer words (split words)
- ✓ Typed after each word

ខ្ញុំទៅសាលារៀន

Note: Do not type between សាលា and រៀន, because school is the same word for some of the following words: ទ្រង់ទ្រាយ ដំណើរការ ស្រាវជ្រាវ ការងារ ទាក់ទង ត្រឹមត្រូវ...

9. (Non-breakable Space)

In any language, there must be syllables, words, and phrases. The right combination of these components will form a paragraph of meaningful text. The important thing is to know how syllables, words, phrases, and sentences are different. But what makes it stand out? We hope you do this by studying Khmer Grammar. At this point, we would like to emphasize only the sentences.

A sentence is a combination of words that is meaningful enough to be heard and ends with a punctuation mark, such as (.?....). In the same way, in Western languages, there is an ending with a punctuation mark. Still, the difference is that there is no gap between the words and the punctuation mark, thus making it easier for the typist to type without a single punctuation mark. Which one alone comes to a new line? In particular, in the Khmer language, by the grammar rules in writing between sentences, each sentence must be separated by a punctuation mark, and spaces must separate the words that follow the punctuation. This makes it somewhat tricky for the typist because when the punctuation mark is at the end of the paragraph, the spacebar causes the punctuation mark to fall on the new line alone, thus causing the text to lose its beauty. To avoid this problem in the computer system, we have created a unique key called interconnect. Spacing keys combine the Alt (Gr) key and the Space key.

Formula: **Word + Alternate Key + Invisible Space Key + Punctuation**

Adding a space between a word and a punctuation mark means that you can only see the space between the word and the punctuation mark normally, but embed a feature that helps keep the word and the punctuation stick together. The words that follow it cannot sign alone. This space can also be used with characters other than punctuation, and it retains its original character—spaces but no lines in the line.

📖 Summary

- Unicode is a universal encoding scheme for typing and text that defines a consistent, multilingual encoding method that can exchange text data internationally and lay the foundation for universal software.
- To type text using Khmer Unicode, you are required to type in the order of spelling, not the order of writing from left to right. The computer will arrange the letters in the correct order.
- Zero-width space is used to separate words.

Questions

1. What is Writer?
2. What is a sidebar?
3. What is a tools bar?
4. Describe how to create a new document.
5. Describe the difference between save and save as.

⌨ Exercises

Please write the text below:

ក. រៀនវាយព្យញ្ជនៈផ្សំជាមួយស្រៈនិស្ស័យដូចខាងក្រោម

កា កិ គី កុ គូរ គូ គើ បើ តុ ទូ តូ រៀន ខៀន ចៀសរវាង ជេរ ថែទាំ គោ ទៅ ដំបៅ យុំ កំពង់ ចេះ កោះ គិត កុំ សុះ សៅ កោសិកា សរសេរ សរសេ ឡើង ទាមទារ លុ:ណា ទី: ជិ: គ្រឺ: រិ:

ខ. រៀនវាយព្យញ្ជនៈផ្សំជាមួយជើងព្យញ្ជនៈ និង ស្រៈនិស្ស័យ ដូចខាងក្រោម

ច្បាប់ ទ្រព្យ ទ្រឹង ពង្រាត់ ព្រើង ព្រមច្រៀង ផ្លុផ្លង ផ្លៀងផ្លាត់ ផ្លូវ ផ្ថែ ផ្ថែ ផ្ថែផ្ថាំ ឆ្នាំផ្លង ធុនទ្រាន់ ប្រាក់ ប្រាប់ បោកប្រាស់ ច្រោះព្រាំ ជ្រកកាន ឈ្លើយ ផ្លុ:ផ្លាយ ភ្លឺស្វាង ថ្មាំ ថ្មី ថ្មល់ ច្ចុំថ្មើង ថ្នាក់ថ្នម ថ្លើម ច្ចេញ សិទ្ធិ ស្ទិទ្ធស្វាល សន្និសីទ សន្និបាត សន្ឋាន សម្បុរ ត្បូង ក្នុងក្នាង សម្ថុវំក្រុក សម្ម៉ៈ សម្បូវស្បេក សម្បុងសត្រុង សំក្តិសិទ្ធិ សង្ឋឺម វឌ្ឍន: បឋ្មា ក្បេមក្បាន្ត បញ្ញាចារមី បាយក្រៀម បុគ្គលិក ផ្លុងផ្លង ពន្លឺត ពានឋ្ន ឈ្ចេត លម្ម៉ើយ ទឋ្ឌីកម្ម ទ្រឹស្ថិ ពន្លួញ ឈ្ណើយចុ: បុគ្គលបញ្ញត្តិ បុព្ទេនិវាសានុស្សតិញ្ញាណ អ្ន: បាដិហារ្យ តិរិយ ទ្បុវិក្ស មហាស្វាវ ព្រឹទ្ធាចារ្យ អាស៊ីវិស អាសិពិស

គ. រៀនវាយព្យញ្ជនៈផ្សំជាមួយព្យាង្គតម្រួតជើង

អង្រ្តង ចង្រ្កាន សង្រ្គោះ សង្រ្គាម សង្រ្កប បង្រ្កប តន្រ្តី តន្រ្តី មន្រ្តី កញ្រ្ជោង កញ្រ្ជោង កន្រ្ទុំ បញ្រ្ចោស មេកន្រ្ថាញ កន្រ្ថែ សង្រ្កាជ សង្រ្ឋានគ្រោះ រាស្រ្ត

ឃ.រៀនវាយព្យញ្ជនៈផ្សំជាមួយ វណ្ណយុត្ត

ព័ត៌មាន ពណ៌ា លោមព័ណ៌ សាប៊ុ ប៊ីចេង ជាតិសាសន៍ យុត្តិធម៌ ប៉ុនប៉ង ប៉ុឋ្ឋាន ប៉ុន្ថែ ប៉ុណ្ណោ: ប៉ុណ្ណា ស៊ី នំប៉័ង បាយ៉ន ប៊ី នីមួយៗ ចា: ណ៉ា ហ៊ុ: ចំក្ថច៌ន យុវវ៉ិយ លម៉ើ រប៊ីករប៉ែង រប៊ីករប៉ុក បាយម៉ាន បិណ្ឌបាតប្បូថ្មិយ បុកល៉ុក អាត្ម៉ន ម៉្ឋៈ ចម្ថ៉ា ម្ថិតៗ សិទ្ធាចំ វាមកិរ្ឋិ

ង. រៀនវាយព្យញ្ជនៈផ្សំជាមួយ ស្រៈពេញតួ

ឪពុក ឧឡ្ឹក ឧម៉ាល់ ឧបសគ្គ ឧបសម្ប័ទ ឯកឧត្តម តទ្ទិពល តង្ឌ តណ្ឌៀ តណ្ឌសីុន ឱជារស ឰដ៏ដវហារ៍ ឲ្យ ឱ្យ ឮសាន ចទ្ទិបាទ តន្រ្ទប្រស្ស ឧត្ថាម ឧទាហរណ៍ ឧបករណ៍ ឧស្ឋើ

Lesson 5

Apache OpenOffice™

Text and Paragraph Formatting

Objectives:

- ❖ Using Writer to format text
- ❖ Formatting a paragraph
- ❖ Creating a letter

When you have finshed this lesson, you will have learned how to:

I.   Select Text
II. Copy, Cut, and Paste
III. Insert Special Characters
IV. Format Characters
V.   Format a Paragraph

Lesson 5 Text and Paragraph Formatting

I. Selecting Text

You can swipe the mouse cursor over text or use multiple clicks to select a word (double-click), sentence (triple-click), or paragraph (quadruple-click).

You can also click on the text, press *F8* to enter *Extending selection* mode, and then use the arrow keys on your keyboard to select a contiguous text block. Press *F8* again after you have finished selecting the block of text.

In addition, you can select non-contiguous items and vertical blocks of text. One way to change the selection mode is to use the icon on the Status bar (see Figure 1). When you right-click the icon, a context menu displays the available options: Standard selection, Extending selection (*F8*), Adding selection (*Shift+F8*), and Block selection (*Ctrl+Shift+F8*). Left-clicking cycles through these selections.

1. Selecting Non-consecutive Items

To select non-consecutive items (Figure 2) using the mouse in *Standard selection* mode:

- ➢ Select the first piece of text.
- ➢ Hold down the *Ctrl* key and use the mouse to select the next part of the text.
- ➢ Repeat as often as needed.

To select non-consecutive items using the keyboard in *Adding selection* mode:

- ➢ Select the first piece of text. For more information about keyboard selection of text, see the topic "Navigating and Selecting with the Keyboard" in the OpenOffice Help (*F1*).
- ➢ Press *Shift+F8* to enable *Adding selection* mode.
- ➢ Use the arrow keys to move to the start of the next piece of text to be selected. Hold down the *Shift* key and select the next piece of text.
- ➢ Repeat as often as required.

Now you can work with the selected text (copy, delete, change the style, and so on). After finishing your work with the selected text, press *Esc* to exit *Adding selection* mode.
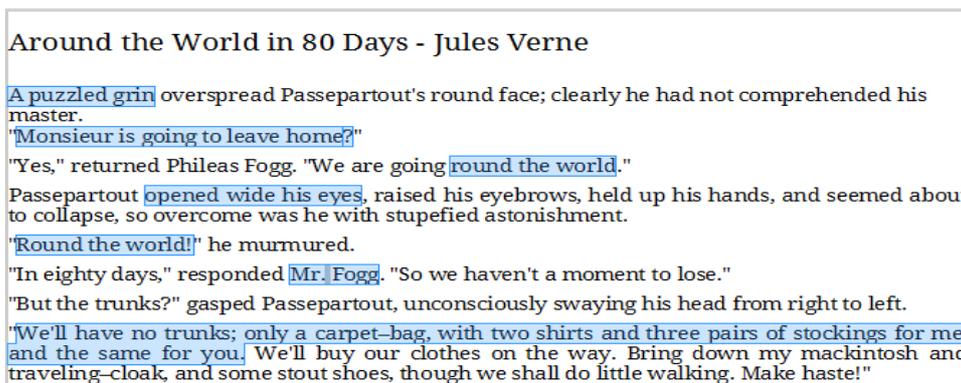
2. Selecting a Vertical Block of Text

You can select a vertical block of text that spans through multiple rows using Writer's *Block selection* mode. Use **Edit > Selection Mode > Block Area**, or press *Alt+Shift+F8*, or click the **Selection** icon in the status bar and select **Block selection** in the list. Now you can highlight the selection using a mouse or keyboard, as shown in Figure 3.

> When Mary Lennox was sent to Misselthwaite Manor to live with her uncle everybody said she was the most disagreeable-looking child ever seen. It was true, too. She had a little thin face and a little thin body, thin light hair and a sour expression. Her hair was yellow, and her face was yellow because she had been born in India and had always been ill in one way or another. Her father had held a position under the English Government and had always been busy and ill himself, and her mother had been a great beauty who cared only to go to parties and amuse herself with gay people. She had not wanted a little girl at all, and when Mary was born she handed her over to the care of an Ayah, who was made to understand that if she wished to please the Mem Sahib she must keep the child out of sight as much as possible.
>
> ***Excerpt from The Secret Garden by Frances Hodgson Burnett***

II. Copying, Cutting, and Pasting Text

You can copy or move text within or between documents by dragging or using menu selections, icons, or keyboard shortcuts. You can copy text from other sources, such as web pages, and paste it into a Writer document.

1. Copying

✓ Select text, and click the Copy icon 📋 on the standard bar. And insert the cursor at the paste-in point and click on the Paste icon 📋 to paste.

✓ Select text, and hold down the *Ctrl* key while dragging. The text retains the formatting it had before pulling.

✓ Use Ctrl + C to Copy and Ctrl + V to paste

2. Cutting

✓ Select text, and click the Cut icon ✂️📋 on the standard bar. And insert the cursor at the paste-in point and click on the Paste icon 📋 to paste

✓ use Ctrl + X to cut Ctrl + V to paste.

When you paste text, the result depends on the source of the text and how you paste it. If you click the **Paste** button, the pasted text keeps its original formatting (such as bold or italics). Text pasted from websites and other sources may be placed automatically into frames or tables as part of the format when you paste.

To make the pasted text inherit the paragraph style at the insertion point:

✓ Choose **Edit > Paste Special**, or

✓ Click the arrow on the combination **Paste** button, or

✓ Press *Ctrl+Shift+V*

✓ Then select **Unformatted text** in the resulting menu.

You can also p*ress Ctrl+Alt+Shift+V*, which pastes unformatted text directly.

The choices on the Paste Special menu vary depending on the text's origin and formatting (or another object) to be pasted. Figure 4 shows an example with text on the clipboard.
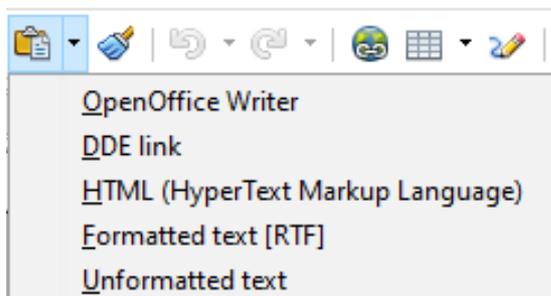
III. Inserting Special Characters

A unique character is one not found on a basic English keyboard. For example, © ¾ æ ç Ł ñ ö ø ¢ are all special characters.

To insert one or more special characters, place the cursor in the position where you want the characters to appear. Then do the following:

- Click **Insert > Special Character** to open the Special Characters dialog (Figure 8). Double-click the characters (from any font or mixture of fonts) you wish to insert in order. They appear in the document as you select them. The selected characters are added to the Recent Characters list on the lower left of the dialogue.
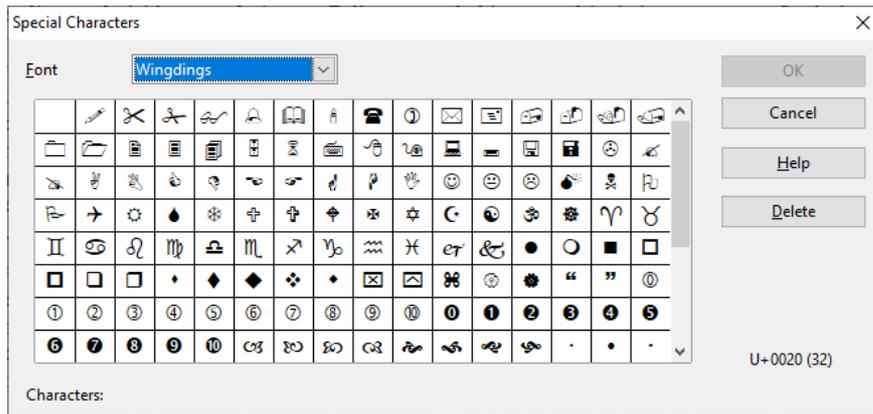
- **Tips**

  To view details of a character, single-click it. Details are shown on the right, along with its numerical code.

  To insert a character and leave the dialogue open, double-click the character. To insert a character and close the dialogue, click it and then click the **Insert** button.

Different fonts include different special characters. If you are still looking for a particular special character you want, try changing the *Font* selection.

IV. Formatting Characters
1. Change Font Name

Generally, a document can have multiple font name types. These fonts include Khmer OS Muol, Khmer OS, Khmer OS Moul Pali and Khmer OS Moul Pali, and many others. In the body of the administrative letter, they usually use the usual Khmer OS System or Khmer OS Battambang, and the national motto is usually in the Khmer font. OS Moul or Khmer OS Moul Light Other fonts depend on the user's design.

Available Khmer Unicode Font Styles:

Khmer OS	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Battambang	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Bokor	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Content	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Fasthand	ម៉ូតអក្សរយូនីកូដខ្មែរ

Khmer OS Freehand	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Metal Chrieng	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Muol	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Muol Light	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Pali	ម៉ូតអក្សរយូនីកូដខ្មែរ
Khmer OS Siemreap	ម៉ូតអក្សរយូនីកូដខ្មែរ

Method:

  ➢ Select text
  ➢ Drag the mouse to the font name on the Formatting toolbar or the font name box on the sidebar
  ➢ Choose your font name.

2. Change Font Size

By default, the most commonly used font size with Khmer Unicode is 12. You can also resize the font as small or large as you like. When writing an administrative letter, it is common to use an 11 or 12 font size for the body of the letter.

Method:

  ➢ Select text
  ➢ Drag the mouse to the font size box on the Formatting toolbar or the font size box on the sidebar
  ➢ Choose your font size.
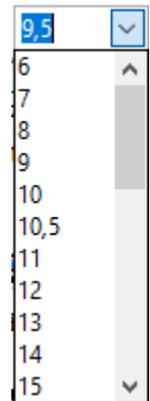
3. Bold, Italic, and Underline
Method:

  ➢ Select text
  ➢ Drag the mouse to the Bold **B**, Italic *I* , and Underlined U icons on the Formatting toolbar on the sidebar

B=Bold   *I*= Italic ,   U=Underline

Note: To remove bold, italic, or underscore text, select the text and click the bold italic icon again.

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4. Change Font Color
- ➢ Select text
- ➢ Drag the mouse to the font color icon 🅰 on the Formatting toolbar or the font size box on the sidebar
- ➢ Choose color

V. Formatting Paragraph

1. Text Alignment

A paragraph is a text you type, starting with the characters you typed until you press the Enter key. So, pressing the Enter key means that the line breaks into a new paragraph. By default, when you type text, the left-aligned paragraph is set. You can customize the paragraph alignment via the icons on the Formatting Bar.

Method:

- ➢ Position the cursor where the paragraph you want to align
- ➢ Select the Alignment icon on the Formatting bar
  - • Align left ≡ (Ctrl+L)
  - • Center alignment ≡ (Ctrl+E)
  - • Align right ≡ (Ctrl+R)
  - • Align justified ≡ (Ctrl+J)

2. Bullet

Method:

- ➢ Position the cursor where you want to insert a bullet in the paragraph
- ➢ Click bullet on/off (Shift+F12)

> • Align left ≡ (Ctrl+L)
> • Center alignment ≡ (Ctrl+E)
> • Align right ≡ (Ctrl+R)
> • Align justified ≡ (Ctrl+J)

To choose more types of Bullets.

- ➢ Click format menu
- ➢ Choose bullet and numbering
- ➢ Choose bullets tab
- ➢ Choose bullet type
- ➢ Click OK button
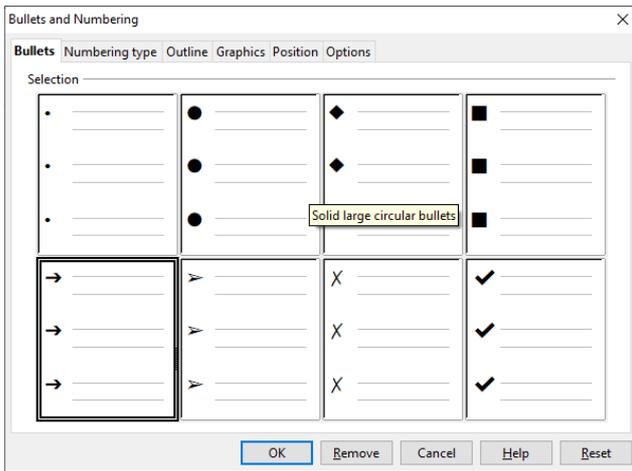
3. Numbering

Method:

- ➢ Position the cursor where you want to insert the numbering in the paragraph
- ➢ Click numbering on/off (F12)

To choose more types of numbering:

- ➢ Click format menu
- ➢ Choose bullet and numbering
- ➢ Choose numbering tab
- ➢ Choose numbering type
- ➢ Click OK button

1. Prey Veng
2. Svay Reing
3. Kompung Cham
4. Takoe
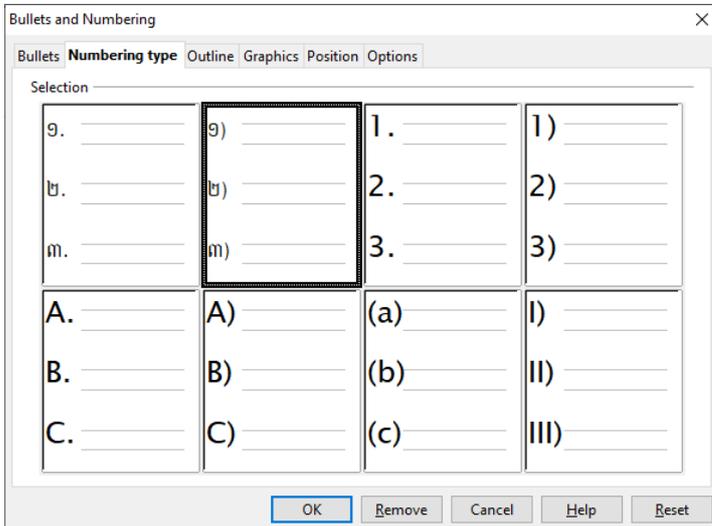
4. Paragraph Indentation

Paragraph indentation is the movement of text in or out of the text border to the first line or all text of a paragraph, left or right. The following will explain how to use the three triangle icons on a horizontal line to indent a paragraph.

Method:

➢ Hold down the mouse pointer to any triangle icon on the line.
➢ Drag in or out at the distance you want. You will then see different indentation changes for the three types of triangles.

Example: Set the following paragraph indentation:

➢ The left triangle above the entrance distance of 1.5 cm.
➢ Pull the bottom left triangle to a distance of 1 cm.
➢ Pull the right triangle to a distance of 2 cm.
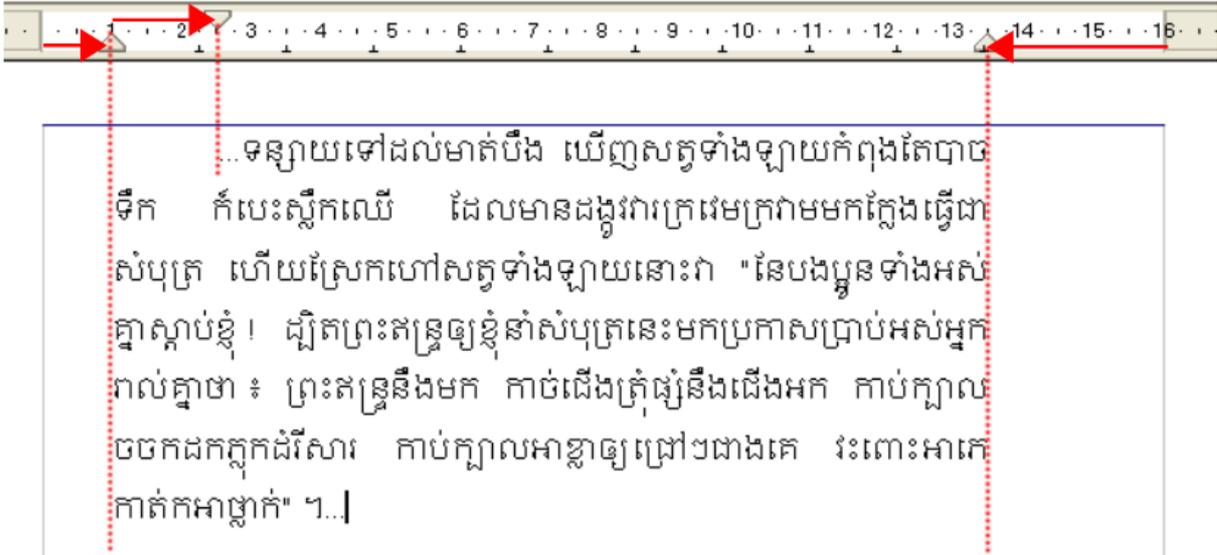
But using a triangle icon, you need to know the exact value entered in the paragraph. So you can do the following.

For example, you have the following three paragraphs inserted. You want to indent the second paragraph line where the left paragraph (before the text) is 1 cm. And the notable paragraph (after the text) is 2.5 cm.

➢ Position the cursor in the paragraph that you want to format. E.g., second paragraph.

➢ Enter the value of 1.00 cm. In the box before the text (same as using the lower left triangle on the line)
➢ Enter the value of 2.50 cm. In the box after the text (same as using the right triangle on the line)
➢ The first line: indicates a paragraph to the first line (same as using the upper left triangle)
➢ Click OK button

> Cambodia, country on the Indochinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.
> For 2,000 years Cambodia's civilization absorbed influences from India and China and, in turn, transferred them to other Southeast Asian civilizations. From the Hindu-Buddhist kingdoms of Funan and Chenla (1st–8th century) through the classical age of the Angkor period (9th–15th century), it held sway over territories that are now part of Thailand, Vietnam, and Laos.
> Cambodia began the process of recovery under the Vietnam-backed regime of the People's Republic of Kampuchea (1979–89), and in the 1990s it regained political autonomy, reestablished a constitutional government, and subsequently instituted free elections. The Cambodian economy has steadily improved, and the country seems to be living by the words of the Cambodian proverb, "Fear not the future, weep not for the past."

5. Spacing Between Paragraphs

Generally, a document can have multiple paragraphs. By default, each paragraph is contiguous, with no gaps at all. Therefore, to determine the spacing between each paragraph, you need to do the following:

➢ Place the cursor in the paragraph where you want to set the spacing. E.g., place the cursor in the second paragraph
➢ Choose Menu Format
➢ Choose Paragraph
➢ Select the Inline and Spacing tabs. In the space above the paragraph and below the paragraph
➢ **Above Paragraph**: Sets the space value between the paragraph you hover the cursor over and the above paragraph on it.
➢ **Below Paragraph**: Sets the amount of space between the paragraph where you hover the cursor over and the bottom paragraph.
➢ Click the OK button

> Cambodia, country on the Indochinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.
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Or you can use the icon on the sidebar.
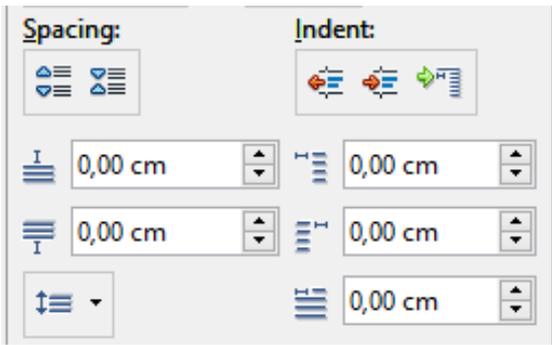
6. Spacing Between Lines in a Paragraph

For example, you want to set the spacing between "1.5 lines" in the paragraph where you place the cursor.

How to apply

- ➢ Place the cursor in the paragraph where you want to set the line spacing
- ➢ Choose Menu Format -> Paragraph
- ➢ Select the Inline and Spacing tabs. Set the line spacing as in the box below:
- ➢ Select line spacing
- ➢ Click the OK button

Cambodia, country on the Indochinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.

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Cambodia began the process of recovery under the Vietnam-backed regime of the People's Republic of Kampuchea (1979–89), and in the 1990s it regained political autonomy, reestablished a constitutional government, and subsequently instituted free elections. The Cambodian economy has steadily improved, and the country seems to be living by the words of the Cambodian proverb, "Fear not the future, weep not for the past."

7. Positioning Tab Stops on Horizontal Lines

The tab stop is set on the horizontal line and positions the cursor when you press the tab key. This tab stop is handy, allowing you to align the text evenly to the left, right, center, or decimal point. To set tab stops, follow these steps:

- ➢ The tab stop types are:

Align left

Align right

Center alignment

Align the decimals
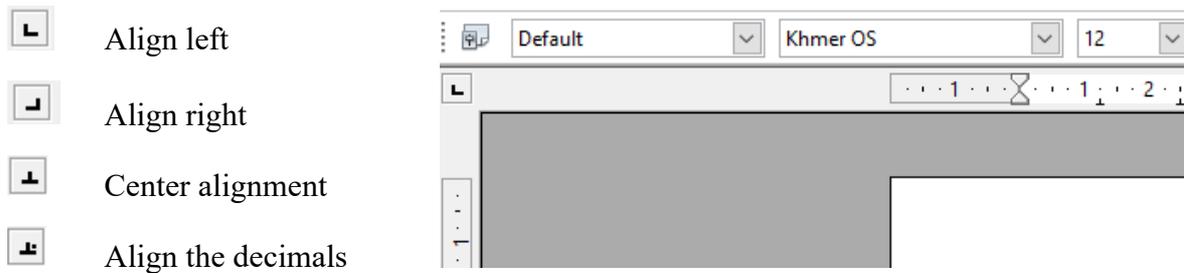
➢ Control the mouse pointer, click anywhere on the line
Example: 1. Select the Left Tab Stop icon -> then click on positions 3 and 5 on the
horizontal line.
2. Select the Center Tab Stop icon -> and then right-click on position 12
on the horizontal line.
➢ Press the Tab key to move the cursor to the defined tab position
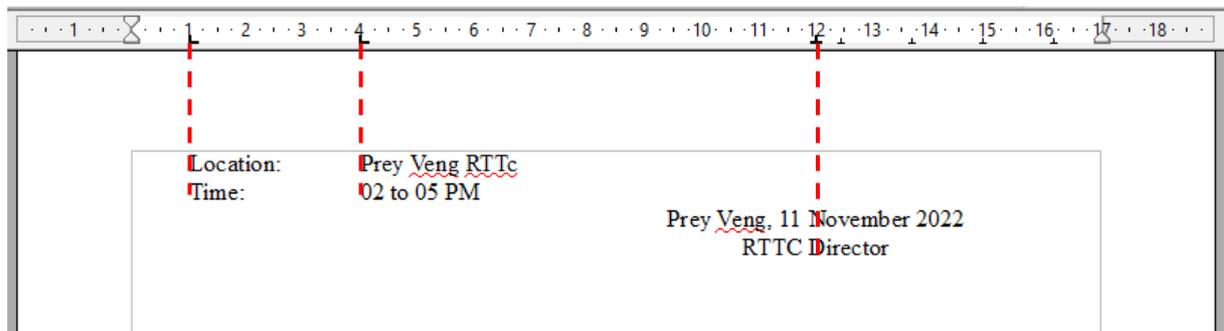
VI. Default Formatting

For formatted text, you can make it the default format. For example, if you have the text "ជាតិ សាសនា ព្រះមហាក្សត្រ "in the following format, and you want to make it the default format, you can do as follows:

➢ Insert formatted text
➢ Select the text you want to set as the default format
➢ Choose Menu Format -> Default Format
➢ Or press Ctrl + M
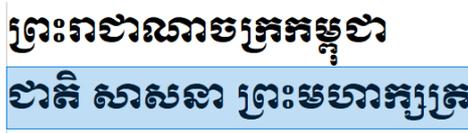
VII. Copy Text Format (Painting Format)

In writing, you can copy one text format to paste into another text without formatting, with no re-texting.

How to apply:

➢ Place the cursor in a paragraph or any formatted word.
➢ Click the Formatting Brush icon 🖌 on the Standard bar.

➢ Left-click on an unformatted text by holding down the mouse.

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា **ព្រះមហាក្សត្រ**

📖 Summary

- You can swipe the mouse cursor over text or use multiple clicks to select a word (double-click), sentence (triple-click), or paragraph (quadruple-click).
- You can also click on the text, press F8 to enter Extending selection mode, and then use the arrow keys on your keyboard to select a contiguous text block. Press F8 again after you have finished selecting the block of text.
- In addition, you can select non-contiguous items and vertical blocks of text. One way to change the selection mode is to use the icon on the Status bar When you right-click the icon, a context menu displays the available options: Standard selection, extending selection (F8), Adding selection (Shift+F8), and Block selection (Ctrl+Shift+F8). Left-clicking cycles through these selections.

🙋 Questions

1. How many text selection types are there? Describe them.
2. Describe the icon functions you have learned about in the Formatting Bar.
3. What do you need to know to format an article? Describe how to format the text, giving examples you want to illustrate.
4. Describe how to make bullets and numbers. Find examples to illustrate bullets and numbers.

🔧 Exercises

1. Open the Writer application.

2. Create an invitation in the following format.

3. Save this file as "Invitation."

4. Close the application.

<div align="center">

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

</div>

សាលា.....................
លេខ ៖.............

<div align="center">

លិខិតអញ្ជើញ

</div>

ខ្ញុំបាទ/នាងខ្ញុំជា.. មានកិត្តិយសសូមគោរពអញ្ជើញ
លោក........................... ហាន:ជា... ដើម្បីចូលរួមប្រជុំពិភាក្សាការងារ
តាមរបៀបវារៈដូចខាងក្រោម ៖

- របៀបវារៈអង្គប្រជុំ ៖
    1. ....
    2. ....
    3. ....
    4. ....

- កាលបរិច្ឆេទប្រជុំ ៖ នៅថ្ងៃទី .... ខែ .... ឆ្នាំ ២០..... វេលាម៉ោង..

- ទីកន្លែងប្រជុំ ៖ នៅឯ...

សូមលោក/លោកស្រីមេត្តាអញ្ជើញចូលរួមប្រជុំដោយមេត្រី ។

ធ្វើនៅ............... ថ្ងៃទី..... ខែ........ ឆ្នាំ ២០.....
ប្រធាន
ហត្ថលេខា និងឈ្មោះ៖

Lesson 6

Table

Writer provides a function for you to create data tables to manage your various tasks related to tables. Tables consisting of rows and columns form cells that allow you to enter numeric or alphanumeric data for any task. We can structure information into tables, such as study schedules. At the end of this lesson you will able to:

- ✓ Learning how to create a table
- ✓ Creating a table
- ✓ Using a table to organize data

When you have finished this lesson, you will have learned:

I. How to Create a Table
II. Table Formating

Lesson 6 Table

I. Creating a Table

To create a table, you need technical skills related to tables, such as how to insert tables, edit tables, insert rows/delete columns, rows/columns, select a table, and format the table.

Before creating a table, you need to know the number of rows and rows of data tables you want to create. You then need to place the cursor at any location on the sheet where you want to create the table.

Method:

- ➢ Choose Table menu
- ➢ Choose Insert
- ➢ Choose Table (Ctrl + F12)
  - • Columns: To determine the number of columns of the table to be created. E.g., 3
  - • Row: To determine the number of rows of the table to be created. E.g., 2
- ➢ Click the OK button
- ➢ You will then see a table created as follows:

1. Moving the Cursor in a Table

You can use the mouse or keyboard to move the cursor to any cell in the table.

- • Apply via mouse:
  - ➢ Control the mouse pointer by clicking on any cell you want to move.
- • Apply via keyboard:
  - ➢ Place the cursor in a cell and press the Tab key: to move the cursor to the right one cell at a time
- ✓ Press the Shift + Tab key: to move the cursor from right to left one cell at a time
- ✓ Press the down arrow key (↓): to move the cursor down one cell at a time
- ✓ Press the up arrow key (↓) (not up arrow): to move the cursor up one cell at a time
- ✓ Press Enter: to indent text in a cell

2. Inserting Text in a Table

You can enter text in a table using the keyboard.

- ➢ Place the cursor in any cell where you want to insert text. Enter the text you want using the keyboard. E.g., please enter the following text:

Name	Sex	Age
SAN PHUN	Male	27
SAM AT SIV HONG	Female	26

3. Adding Columns

You can edit the inserted table, such as adding a new column, deleting a column, adding a row, deleting a row, inserting a cell, deleting a cell, inserting a cell, splitting cells, splitting tables, and so on.

Example: You want to add two columns after the last column of the following legend:

Method:

➢ Place the cursor in any column where the new column will be next to or in front of the column where you place the cursor
➢ Choose Table Menu
➢ Choose Insert
➢ Choose Columns
➢ Enter the number of columns you want
➢ Select the location where you want to display the new column, e.g. After
➢ Click the OK button
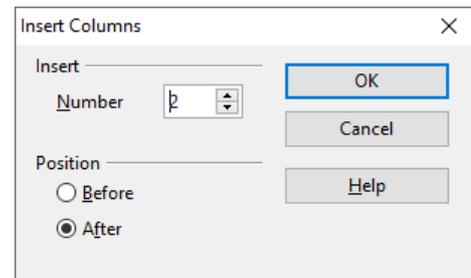
Name	Sex	Age		
SAN PHUN	Male	27		
SAM AT SIV HONG	Female	26		

4. Adding Row

When you want to add a new row to the table you entered, you can do the following:

➢ Place the cursor in the row where the new row will be next or previous
➢ Choose Table Menu -> Insert -> Rows.
➢ Enter the number of rows you want
➢ Select the location to display the new row
➢ Click the OK button
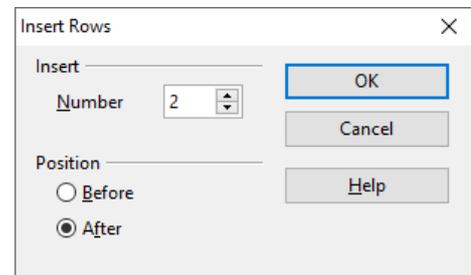
Then two new rows will appear, as shown below:

Name	Sex	Age		
SAN PHUN	Male	27		
SAM AT SIV HONG	Female	26		

5. Deleting Columns and Rows

To delete a column in a table, follow these steps:

➢ Place the cursor in the column where you want to delete the column

Name	Sex	Age	Address	Phone
SAN PHUN	Male	27	Prey Veng	0987654321
SAM AT SIV HONG	Female	26	Prey Veng	0123456789

➢ Choose Table Menu
➢ Choose Delete
➢ Choose Columns
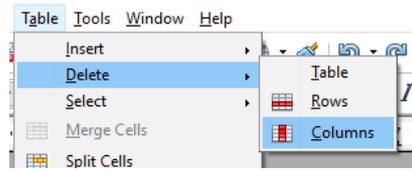
To delete a row in a table, follow these steps:

➢ Position the cursor in the row where you want to delete the row
➢ Choose Table Menu
➢ Choose Delete
➢ Choose Rows
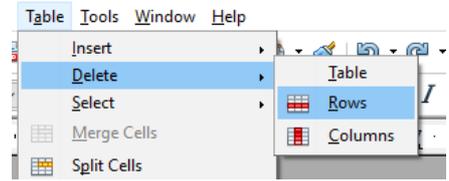
6. Deleting a Table
To delete a table, follow these steps:

➢ Position the cursor in the column or row where you want to delete the table
➢ Choose Table Menu
➢ Choose Delete
➢ Choose Table
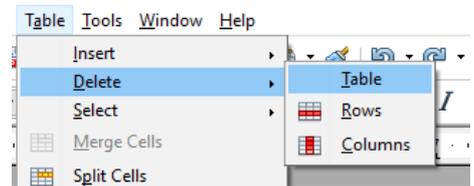
II. Table Formatting
1. Selecting Tables, Rows, Columns
        Table selection is helpful for formatting text, inserting cells, and copying text or formulas in cells. There are many selections, such as table selection, row selection, column selection, and cell selection. This section will explain to you all the selections in the table.

Cell Selection:

➢ Place the cursor in the cell you want to select
➢ Choose Table Menu
➢ Choose Select
➢ Choose Cells

Name	Sex	Age
SAN PHUN	Male	27
SAM AT SIV HONG	Female	26

Row Selection:

➢ Place the cursor in any cell of the row that you want to select
➢ Choose Table Menu
➢ Choose Select
➢ Choose Rows

Name	Sex	Age
SAN PHUN	Male	27
SAM AT SIV HONG	Female	26

Column Selection:

➢ Place the cursor in any cell of the column you want to select
➢ Choose Table Menu
➢ Choose Select
➢ Choose Columns

Name	Sex	Age
SAN PHUN	Male	27
SAM AT SIV HONG	Female	26

2. Changing Width and Row Height of a Column

You can zoom in or out on any column width and row height in the table.

➢ Drag the mouse pointer to the right vertical line of the column you are zooming in or out on.

Name	Sex	Age	⟷ ⇔Address	
SAN PHUN	Male	27		
SAM AT SIV HONG	Female	26		

➢ Hold down the mouse button (left) and drag it to the size you want.

Note: Changing the row height is the same as changing the column width; change the column to the row.

3. Merging Cells

In a table, you can merge multiple cells into a single cell. This means you want two or more of the selected cells to be one. You can merge cells only if you select more than one.

How to ~~apply to~~ merge two selected cells into a single cell:

➢ Select the cells that you want to merge (more than one). E.g., as follows:

Name	Sex	Age		
SAN PHUN	Male	27		
SAM AT SIV HONG	Female	26		

➢ Choose Table Menu
➢ Choose Merge Cells

Name	Sex	Age		
SAN PHUN	Male	27		
SAM AT SIV HONG	Female	26		

4. Split Cell

Splitting a cell means splitting one cell into multiple cells. So when splitting cells, you do not need to select two or more cells. You place the cursor in the cell you want to split. Then follow the steps below:

Horizontal Cell Split:

➢ Place the cursor in the cell you want to split
➢ Choose Table Menu
➢ Choose Split Cells
➢ Select the number of cells to be divided by the partition. Do you want to split this cell into two or more cells by the number you set?
➢ Select Horizontal Orientation
➢ Click the OK button
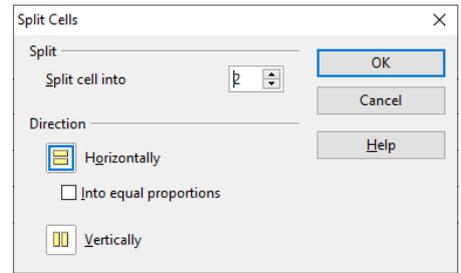
Vertical Cell Split:

The same as in with the horizontal cell split, but this one is chosen vertically in direction.
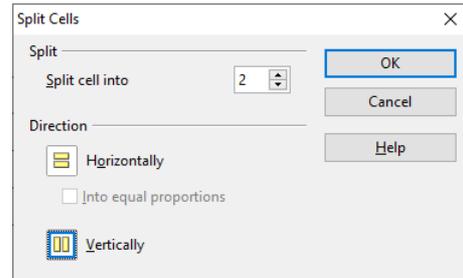
5. Aligning Text in Cells

In the cell, you can align the text in two ways: horizontally or vertically.

Align Text Horizontally:

➢ Select the cell that contains the text you want to align
➢ Drag the mouse pointer, click the alignment icon on the format bar

Align Text Vertically:

➢ Select the cell that contains the text you want to align
➢ Right click the selected cell
➢ Choose Select Cell
➢ Choose Center.

You will then see the text in the selected cell aligned to the center of the column, as shown in the image below:
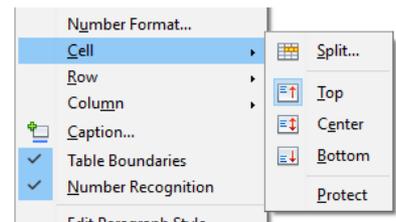
Name	Sex	Score	
		Math	Khmer Literature

6. Cell Background Color

In the table, you can color the area of the cell to make the table you created look interesting.

Method:

➢ Select the cell ~~for~~ which you want to color ~~it~~
➢ Choose Table Menu
➢ Choose Table Properties
➢ Select Background tab
➢ Choose your favorite color
➢ Click the OK button

Note: To remove the color you applied to any cell, you need to:

➢ Select the cell in which you set the background color.
➢ In the Background tab, select No Fill.
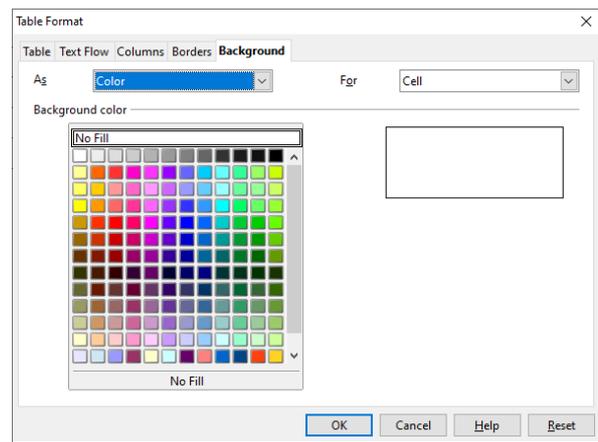
7. Discovering Table Bars

In Writer, the program provides a bar that can define various table characteristics, called the table bar. After you have inserted a table, a table bar will appear when you place the cursor at any position in the table. For users to set different attributes for this created table:
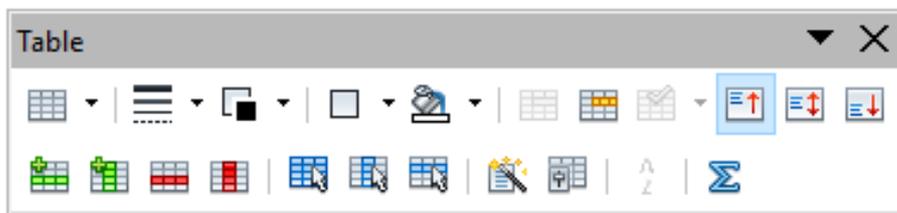
1) Table
2) Line style
3) Line color
4) Border
5) Background color
6) Merge cell
7) Spit cell
8) Top aligns
9) Center aligns
10) Bottom aligns
11) Insert row
12) Insert column
13) Table properties
14) SUM

8. Table Border

By default, when inserting a table for the first time, you may notice that the table has a single normal frame. In case you want the table to display different frame types, you need to do the following:

Method:

➢ Select the cell for which you want to define the frame type.
➢ Choose Table Menu
➢ Choose Table Properties
➢ Select the Frames tab
➢ Choose a line style
➢ Drag mouse click (click mouse and drag?) on line layout by default or user-defined
➢ Click the OK button
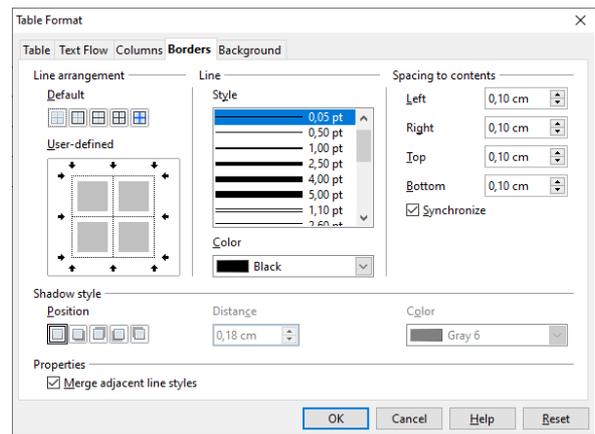
📖 Summary

Before creating a table, you need to know the number of rows and the rows of data tables you want to create. You then need to place the cursor at any location on the sheet where you want to create the table.

Method:

➢ Choose Table menu
➢ Choose Insert
➢ Choose Table (Ctrl + F12)
   • Columns: To determine the number of columns of the table to be created. E.g., 3
   • Row: To determine the number of rows of the table to be created. E.g., 2

👩‍🦰❓ Questions

1. Explain the table.

2. What tasks can you use the table for?

3. Can you calculate the numerical values in the spreadsheet program?

4. Create a chart about student score management.

Exercises

Create a text file in the following format:

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

──────

វិទ្យាល័យ ....

ថ្នាក់ទី : ....

គ្រូទទួលបន្ទុក : ....

បញ្ជីឈ្មោះសិស្ស

លេខរៀង	ឈ្មោះអញ្ញ		ភេទ	ថ្ងៃ ខែ ឆ្នាំកំណើត
	នាមត្រកូល	នាមខ្លួន		
១				
២				
៣				
៤				
៥				
សម្គាល់៖				

ថ្ងៃទី .... ខែ .... ឆ្នាំ ២០0..

ហត្ថលេខា និងឈ្មោះគ្រូទទួលបន្ទុក

Lesson 7

Apache OpenOffice™

Picture and Drawing Object

In most text documents, the observer sees images inserted to enhance the text or explain something. One, like the textbook you are reading, you see pictures inserted to explain something. Images in a computer can be scanned through a scanner, inserted through a removable storage device, or from memory. You are downloading from the Internet. Etc. At the end of this lesson you will be able to:

✓ Learn the method to add a picture and drawing an object in a document
✓ Adding a picture and formatting it
✓ Using a picture to enhance the text or explain something

When you have finished this lesson, you will have learned how to:

I.   Create a Document Using a Picture
II. Insert a Special Character
III. Draw an Object

Lesson 7 Picture and Drawing Object

I. Creating a Document with a Picture

1. Insert Picture

Some pictures are included in the text to enhance or explain. You must have those images on your computer to insert images into a text.

Method:

- Position the cursor where you want to insert the image or any position in that paragraph.
- Choose Insert menu
- Choose Image
- Choose From File
- Select an image location.
- Choose your favorite image.
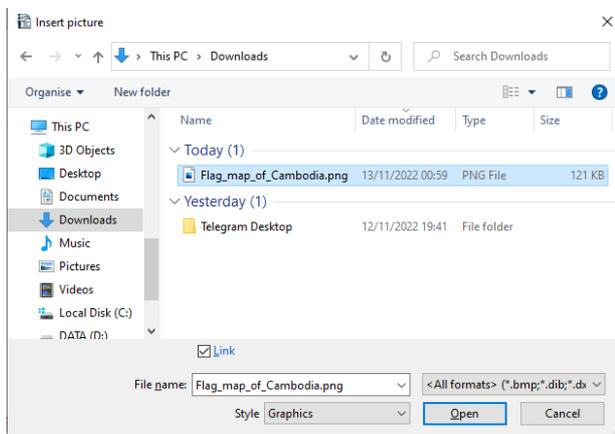
- Click Open button
- You will then see the selected image inserted at the top position of the selected paragraph.
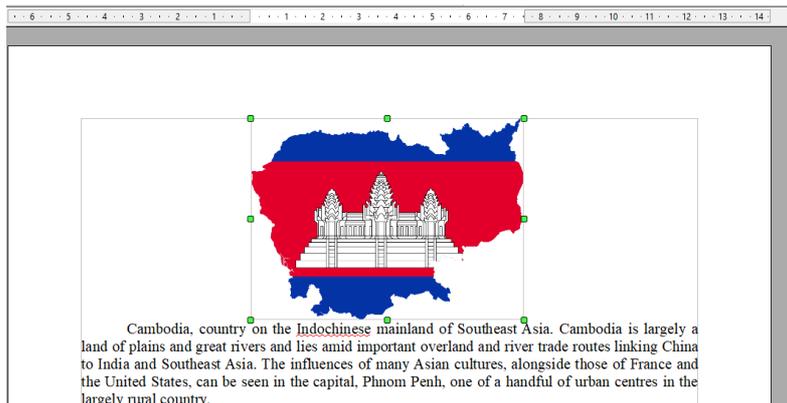
2. Change Picture Size

After you insert the image into the text, you can resize it to your liking.

Method:

> ➢ Select an image by clicking on the image
> ➢ Move the mouse pointer over any of the four corners of the image until a double-pointed arrow (↔) is displayed.
> ➢ Hold down the mouse and drag it to the size you want.
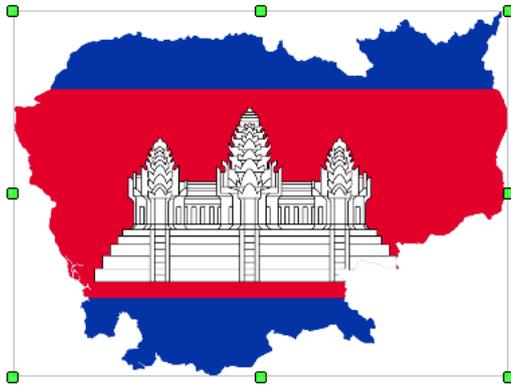
Note: To resize the image to the default width and height ratio, hold down the Shift key while you start. Download this image.

3. Learn About the Picture Bar

When you click on the image you entered, you see an image bar appear. This bar lets you set various features for the picture, such as setting filters, adjusting brightness, making transparency, setting colors, and adjusting to gray, white/black. Flip the image horizontally or vertically.
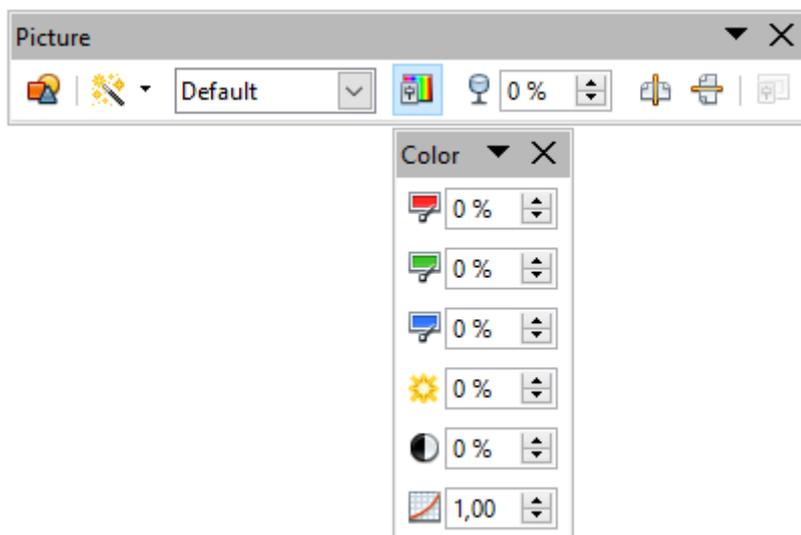
4. Aligning Images to Pages

For images you have already inserted, you can align them to the left or right of the page or the center of the page without dragging them with the mouse. Aligning with the mouse pulls to the center or leftmost position of the page, you will not be sure that the image

you are carrying will be in the center or leftmost of the page. Therefore, to be accurate in aligning or moving the image to the center or left of the page, you need to do the following:

➢ Right-click the image you want to align.
➢ Choose Alignment
➢ Choose Left or Center or Right
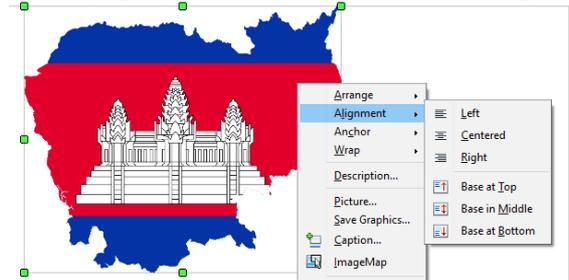
5. Wrapping Text Around an Image

After you insert an image into the text, you can make the text around the image or the image above or below the text or the text separated. Out of the picture and wrap the best text with the image.

For example, you want to best wrap the text with the image you entered above.

Method:

➢ Select image
➢ Choose Menu Format
➢ Choose Image
➢ Select the wrap tab
➢ Choose the type of wrap you prefer, E.g., Optimal
➢ Click the OK button

Or ....
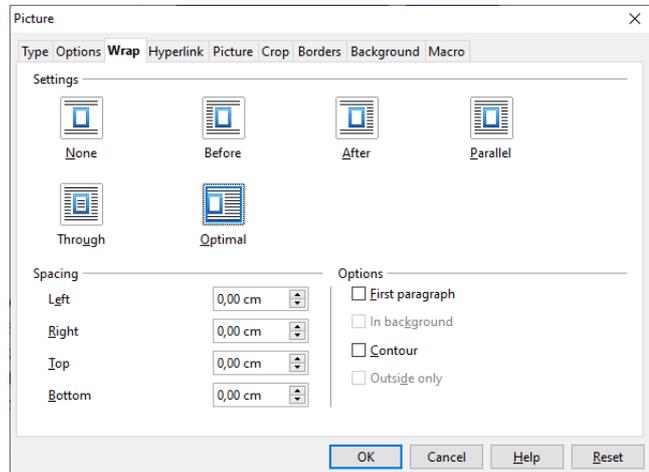
➢ Right-click on the image -> select wrap
➢ Choose your preferred wrap type
➢ No wrap: Text separated from images
➢ Page wrap: Text around the image
➢ Optimal page wrap: text on either side of the image
➢ Wrap Through: Image above text
➢ In the background: the picture below the text
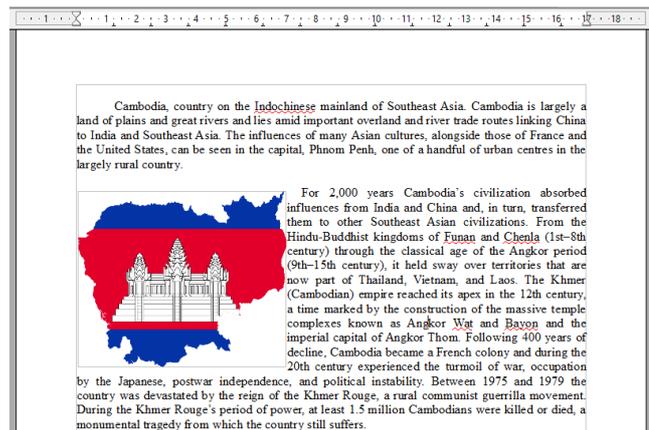
6. Setting Spacing from Image to Text

After wrapping the best text for the image, you observe the text and the image next to each other. Therefore, to determine the gap between the image and the text, you need to do the following:

➢ Select image
➢ Choose Menu Format -> Image

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> ➢ Select the wrap tab
> ➢ In the gap, enter the value of the desired spacing
> ➢ E.g., Straight right insert 0.50 cm.
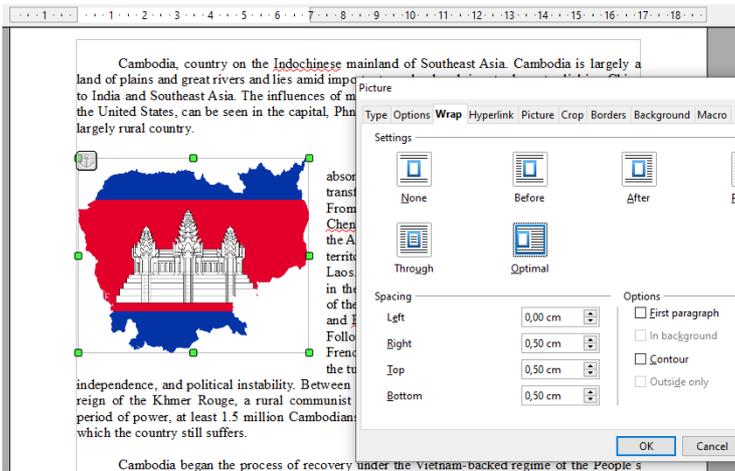
7. Adding Captions to Images

In most textbooks, captions are added to the image to explain or identify the image type or to refer to the image. Image number caption period.

Method:

> ➢ Select image
> ➢ Choose Insert menu -> Title
> ➢ Enter an image title in the Title box
> ➢ Select None in the Category box
> ➢ Click the OK button
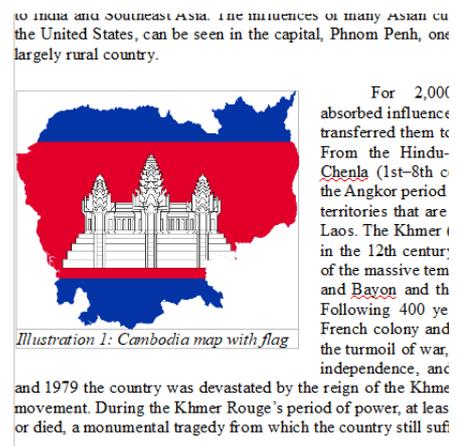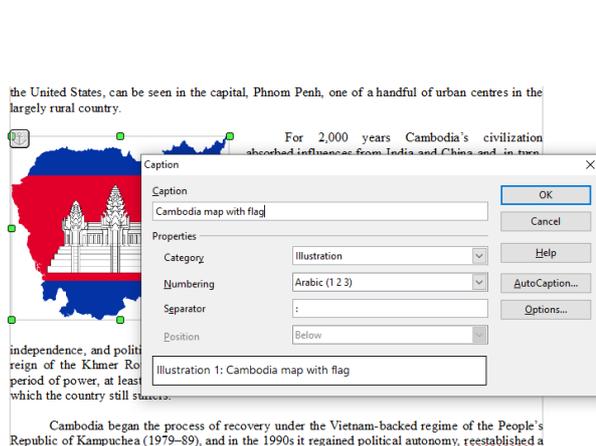
II. Insert Special Characters

Special characters are various symbols that characterize a character. This means that you can format it just like a character. The Leaf application provides a function for you to enter this special character. Entering special characters means you can enter as many special characters as you need at once.

How to enter a special character:

➢ Choose Insert menu -> Special Characters
➢ Select a font name in the Fonts dialog to change the Special Characters

You can control the mouse pointer to select your favorite characters if you want to insert multiple special characters at once. It would be best if you often looked at the bottom of the special character box at the character:✎ ✎ ✎ 📖 ✍ ✍ ✍ which is the output location of the special character you Selected. You can delete it by clicking the delete button and re-selecting it.

III. Drawing an Object

You can use the icons on the drawing bar to draw different drawing objects on your text.

How to draw a drawing object:

➢ Control the mouse pointer to select any drawing object on the drawing bar.
➢ Click your favorite drawing object. E.g., a Smiling face
➢ Hold down the mouse pointer at the point where you want to start drawing.
➢ Then drag to another location according to the size you want.

1. Properties of Drawing Objects

Below is a bar to define object properties, such as line style, arrow style, line width, color line, and style line/fill. Etc.
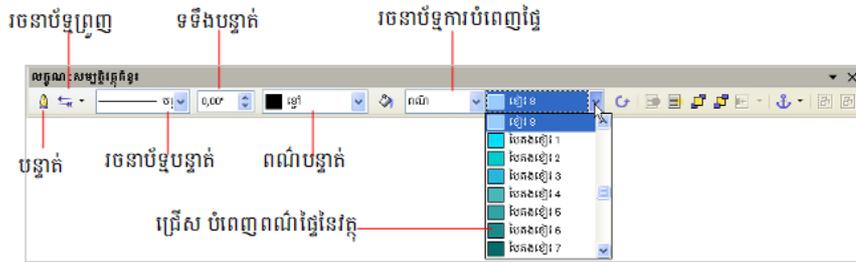
How to apply to fill a drawing object:

> ➢ Select the drawing object that you drew.
> ➢ Control the mouse pointer, and select any properties that you want to place.
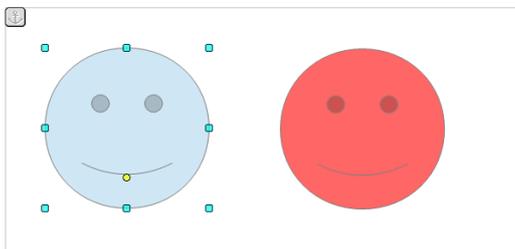
2. Drawing Bar

On the drawing bar, there are many drawing objects that you can choose to meet your work needs. There is a down arrow to the right of some drawing objects on the drawing bar. You see many other drawing objects when you click the mouse on this arrow.
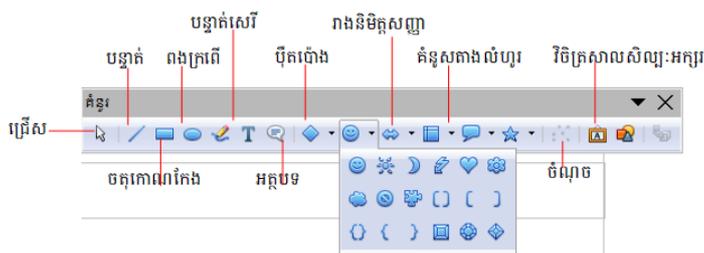
C. Insert text to drawing Object

How to apply:

> ➢ Draw an object.
> ➢ Double-click the drawing object -> Enter the desired text.
>   Or ...
> ➢ Select the drawing object for which you want to insert text.
> ➢ Press the Enter key

📖 Summary

- In most text documents, the observer sees images inserted to enhance the text or explain something. For example, in the textbook you are reading, you see pictures inserted to explain something. Images in a computer can be scanned through a scanner, inserted through a removable storage device, or from memory, ones you've downloaded from the Internet, etc.

❓ Questions

1. Describe how to insert an image into a text file and define text wrapping around the image.
2. Describe how to draw an object into a text file.

💡 Exercises

1. Please create the file text below:

   1. Wrap: Optimal wrap
   2. Spacing: 0.20 cm

Cambodia[1], country on the Indochinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.

For 2,000 years Cambodia's civilization absorbed influences from India and China and, in turn, transferred them to other Southeast Asian civilizations. From the Hindu-Buddhist kingdoms of Funan and Chenla (1st–8th century) through the classical age of the Angkor period (9th–15th century), it held sway over territories that are now part of Thailand, Vietnam, and Laos.

Cambodia began the process of recovery under the Vietnam-backed regime of the People's Republic of Kampuchea (1979–89), and in the 1990s it regained political autonomy, reestablished a constitutional government, and subsequently instituted free elections. The Cambodian economy has steadily improved, and the country seems to be living by the words of the Cambodian proverb, "Fear not the future, weep not for the past."

2. Draw diagram
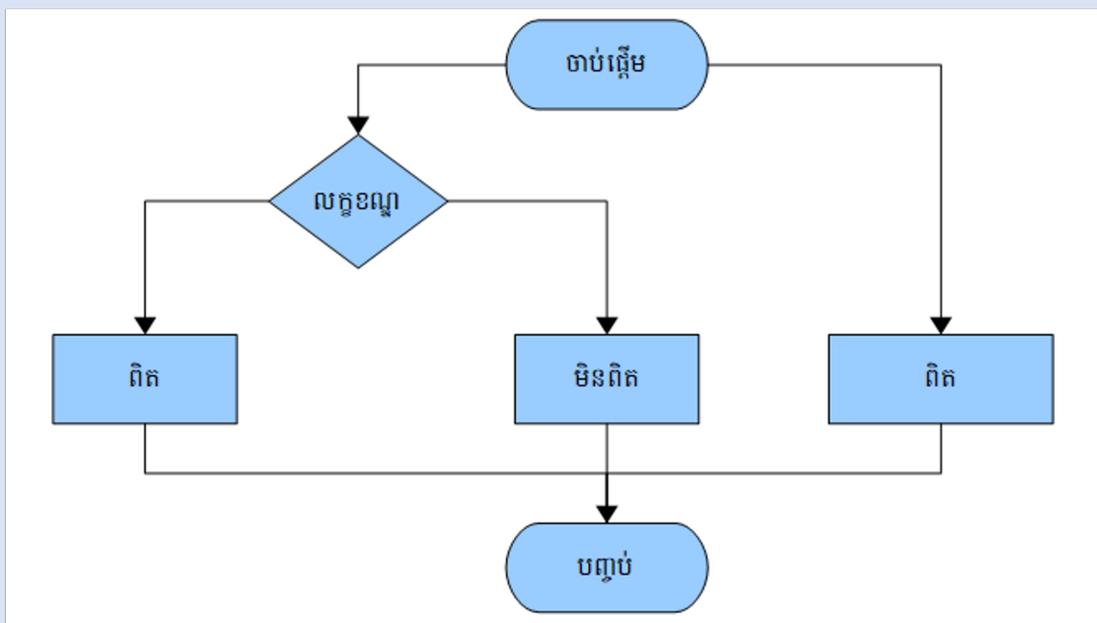
Lesson 8

Page Layout and Printing

Objective:

- ✓ Learn how to format page layout
- ✓ Define footer, header and coloum
- ✓ Printing file correctly

When you have finished this lesson, you will have learned:

Lesson 8 Page Layout and Printing

I. Page Formatting

1. Page Margin

Page formatting includes paper formatting, page orientation, and page margins. You can set it in the following ways:

Margins: The margins are the blank spaces that line a document's top, bottom, left, and right sides. They are important because they help make a document look neat and professional.

Set Margins: this means setting your worksheet's page margins in the writer program.

Method:

- ➢ Choose Format Menu
- ➢ Choose Page
- ➢ Choose Page Tab
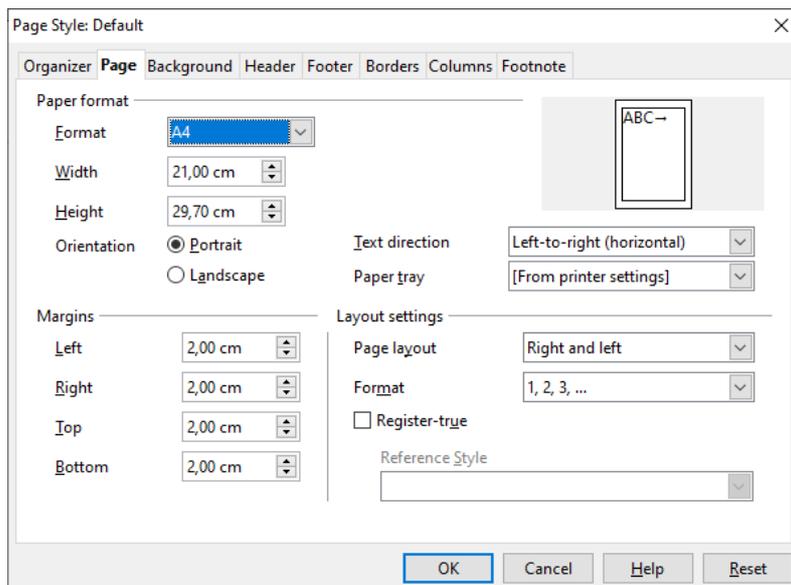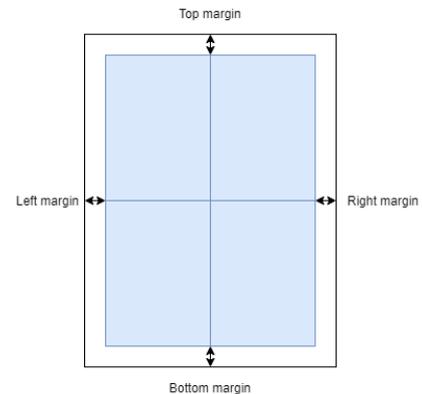
- ➢ On the margin section, insert the margin value
- ➢ Click OK button

2. Page Size

Set Page Size: This means setting the page size in the writer program, such as A3, A4, A5, Letter, and Legal. Etc.

Method:

- ➢ Choose Format menu
- ➢ Choose Page Tab
- ➢ Choose Page size on the format box

➢ Click OK button
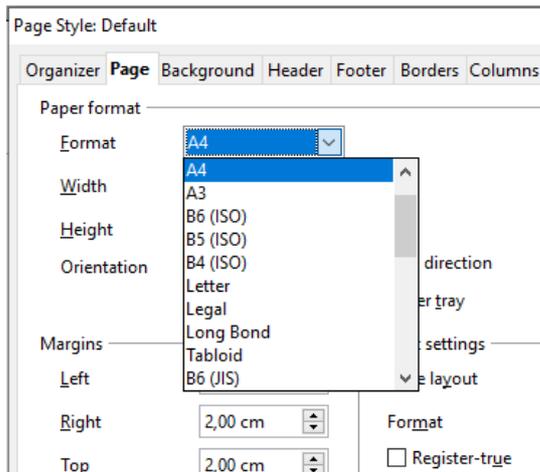
3. Page Orientation

Page orientation is the direction of the page. Two types of orientation are:

- Portrait
- Landscape

Method:

➢ Choose Format menu
➢ Choose Page Tab
➢ Choose Orientation
➢ Click OK Button
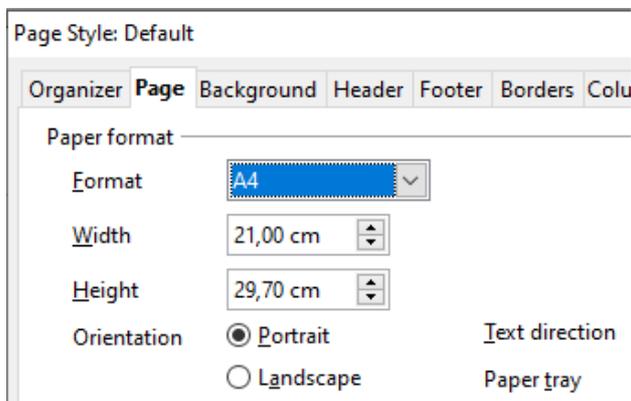
II. Columns

In this section, you will learn more about some of the methods involved in inserting column layouts and using page styles, such as inserting a New page, column layout, header/footer and formatting, and so on.

1. Add a New Page

You can add one or more new pages in the document when your article is more than one Page. The new page will be under the current page where the cursor is.

Method:

➢ Place the cursor at the end of the document
➢ Choose Insert menu
➢ Manual Break
➢ Select Page Break in type
➢ Click the OK button
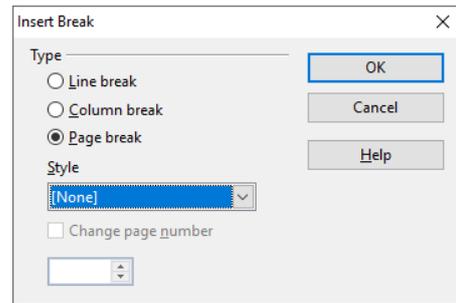
Or

➢ Place the cursor at the end of the document
➢ Press the shortcut key Ctrl + Enter

Note: In the Separation dialog, you see three options:

• Line break: Move the cursor into a new line in the same paragraph (or press Shift + Enter)
• Column break: to move the cursor into a new column Or you can press the shortcut keys Ctrl + Shift + Enter

2. Insert Column

If you read an article in a newspaper or magazine, you will see that the article is written in a column layout. The manuscript also provides a function that allows you to insert layouts, format, and delete columns.

Method:

➢ Position the cursor where you want to insert the column
➢ Choose Insert menu -> section
➢ Select the Columns tab
➢ Select the number of columns you want to insert
➢ Uncheck Distribute content evenly across all columns: When checked, the text you typed will pass into the second column. Automatically when you finish a row in the first column. If unchecked, the text you typed will only appear in the first column unless you break the column. The text in the second column
➢ Press the Insert button
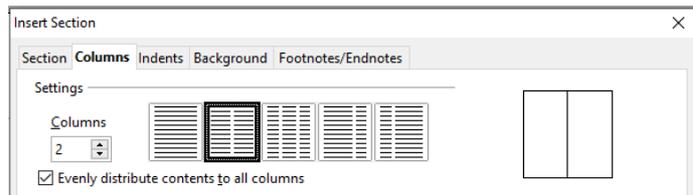
You will then see a two-column layout as shown below:
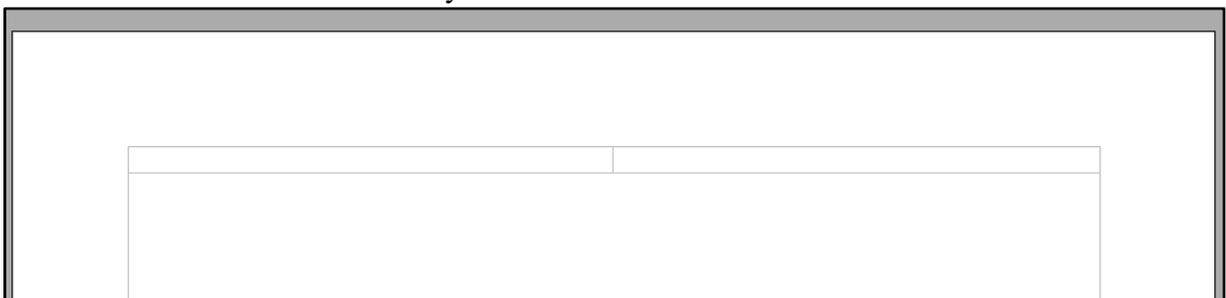
3. Inserting Text in the First Column Layout:

➢ Move the cursor to the first column layout and type the following text:

Location	Land
Cambodia, country on the Indo-Chinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.	Cambodia, about one-third the size of France and somewhat larger than the U.S. state of Missouri, is bordered to the west and north-west by Thailand, to the north-east by Laos, to the east and south-east by Vietnam, and to the south-west by the Gulf of Thailand. The country's maximum extent is about 280 miles (450 km) from north to south and 360 miles (580 km) from east to west.

     The two columns above are contiguous, making the typed text look contiguous. As if you needed to divide the columns. So, to make the two columns a little bit apart, you need to edit the column in the following way:

Example: You want to set the distance between the two columns to 0.50 cm.

➢ Place cursor in any column
➢ Choose Menu Format -> Columns
➢ Spacing: Enter the value you want. E.g., 0.50 cm.
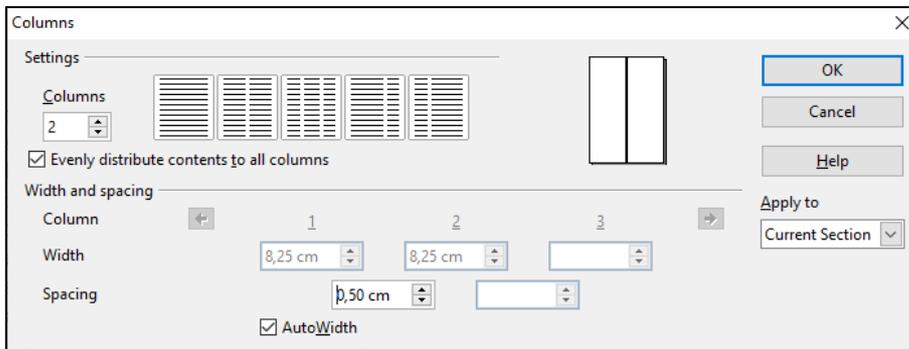
➢ Click OK button

You will see two columns have a spacing of 0.50 CM:

| Location	Land
Cambodia, country on the Indo-Chinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.	Cambodia, about one-third the size of France and somewhat larger than the U.S. state of Missouri, is bordered to the west and north-west by Thailand, to the north-east by Laos, to the east and south-east by Vietnam, and to the south-west by the Gulf of Thailand. The country's maximum extent is about 280 miles (450 km) from north to south and 360 miles (580 km) from east to west.

4. Separator Line Between Columns:

To place a line between two columns, do the following:

➢ Place cursor in any column
➢ Choose Menu Format -> Columns
➢ At the Separator line: Select the type of line you want to divide between the two columns
➢ Click the OK button
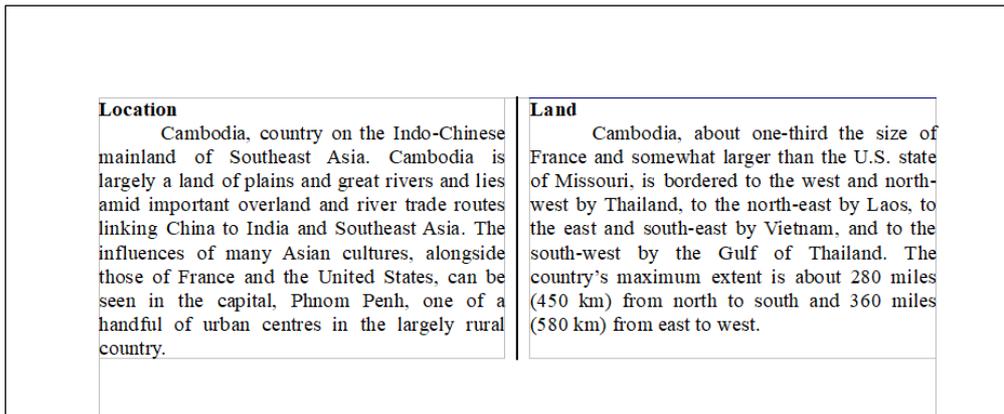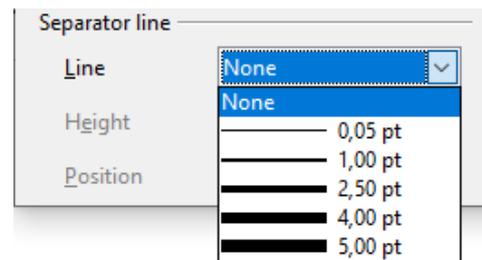
5. Deleting a Column Layout:

To delete a column layout or normalize text, do the following:

➢ Place cursor in a column layout
➢ Choose Menu Format -> Sections
➢ Select the volume you want to delete
➢ Click the Remove button
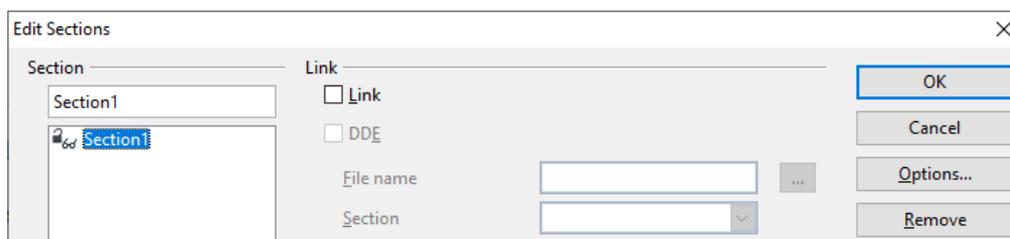
➢ Click Remove Button

III. Header and Footer

The header is the part of the header used to write the text so that it appears on every page. The footer is part of the footer for writing text to appear on every page below.

1. Insert Header

Method:

➢ Choose Insert menu -> Header -> Default (default is page style)
➢ Please include the following header text:

Lesson 1 Cambodia Geography

Location

    Cambodia, country on the Indo-Chinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside those of France and the United States, can be seen in the capital, Phnom Penh, one of a handful of urban centres in the largely rural country.

Land

    Cambodia, about ⟨ France and somewhat large of Missouri, is bordered to west by Thailand, to the n⟨ the east and south-east by south-west by the Gulf country's maximum extent (450 km) from north to s (580 km) from east to west.

2. Insert Footer

➢ Choose Insert menu -> Footer -> Default (default is page style)
➢ Enter the text you want.

By: SAN PHUN
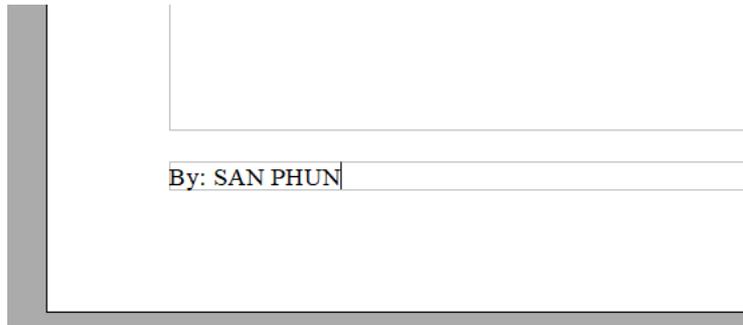
3. Header and Footer Formatting

    Header or footer formatting includes framing, background color, spacing, height setting, and more.

Example: You want to place a line under the header or footer text or color the background:

➢ Choose Format Menu -> Page
➢ Select the header tab

Page Style: Default   ✕

Organizer Page Background **Header** Footer Borders Columns Footnote Text Grid

Header
☑ Header on

☑ Same content left/right

Left margin   0,00 cm   ⏶⏷

Right margin   0,00 cm   ⏶⏷

Spacing   0,50 cm   ⏶⏷
☐ Use dynamic spacing

Height   0,10 cm   ⏶⏷
☑ AutoFit height

More...

OK   Cancel   Help   Reset
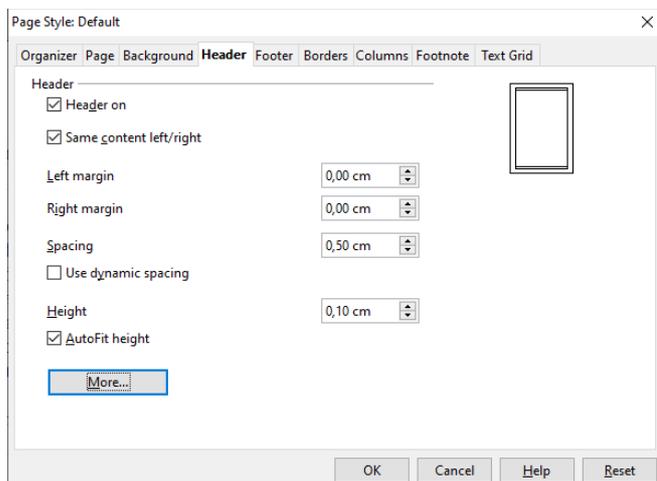
➢ Click More… Button
➢ Choose a line style

Border / Background   ✕

Borders Background

Line arrangement ───── Line ───── Spacing to contents ─────
Default   Style   Left   0,00 cm
▢ ▣ ▢ ▣ ▢   Right   0,00 cm
User-defined   0,05 pt
                                 0,50 pt   Top   0,00 cm
                                 1,00 pt
                                 2,50 pt   Bottom   0,00 cm
                                 4,00 pt   ☑ Synchronize
                                 5,00 pt
                                 1,10 pt
                                 2,60 pt
                          Color
                          ▇ Black

Shadow style ─────
Position   Distance   Color
▣ ▢ ▢ ▢ ▢   0,18 cm   ▇ Gray 6

                              OK   Cancel   Help   Reset
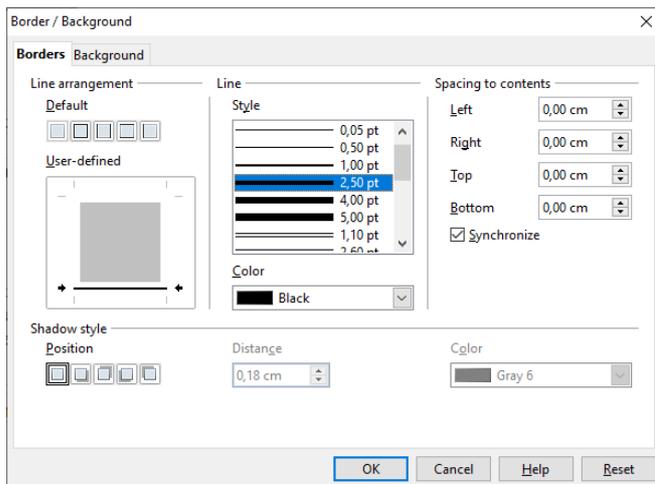
➢ Select the location where you want to place the frame. To place a line under the header text, control the mouse pointer, and click below at the user-defined
➢ Click the OK button

Lesson 1 Cambodia Geography

Location
    Cambodia, country on the Indo-Chinese mainland of Southeast Asia. Cambodia is largely a land of plains and great rivers and lies amid important overland and river trade routes linking China to India and Southeast Asia. The influences of many Asian cultures, alongside

Land
    Cambodia, about one-third the size of France and somewhat larger than the U.S. state of Missouri, is bordered to the west and north-west by Thailand, to the north-east by Laos, to the east and south-east by Vietnam, and to the south-west by the Gulf of Thailand. The

4. Insert Page Number

To include page numbers and page numbers in the footer, do the following:

➢ Position the cursor in the footer or header where you want the page number to appear
➢ Choose Insert menu -> Fields -> Page Numbers.

By: SAN PHUN   Page 1

➢ Position the cursor where you want to enter the number of pages
➢ Choose Insert menu -> Fields -> Number of pages.

By: SAN PHUN   Page 1 of 3

IV. Footnote

When you insert a footnote into a word or phrase, you need to make an explanatory note of that footnote at the location. The selector is at the end of the footnote or the end of the document. Footnotes will appear in lowercase (power). This is useful when you want to explain a word or phrase in Your article to readers.

How to apply a footnote:

➢ Position the cursor where you want to place the footnote.
➢ Choose Insert -> Footnotes / Endnotes ...
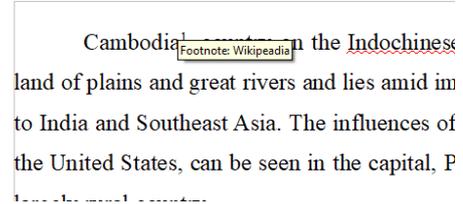
On Numbering section

- Automatic: For inserting footnotes in automatic sequence.
- Characters: Enter a footnote or click the ... button to select various symbols as footnotes.

On type section:

- Footnotes: When you select it, the footnote description will appear at the end of the footnote page.
- Endnotes: An annotation of footnotes will appear at the end of your document.
➢ Click the OK button
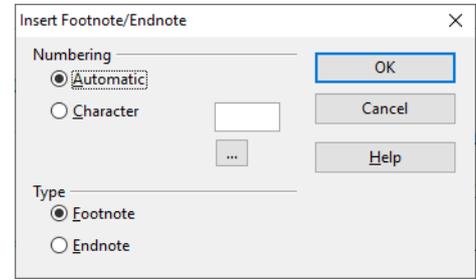
Insert footnote annotation

1   Read more in: www.wikipedia .com

1. Formatting Footnotes into Khmer Numbers

You can not use font conversion to convert to Khmer numerals. Therefore, to make this entered footnote a Khmer number, you need to do the following:

➢ Choose Tools Menu
➢ Choose Footnotes/Endnote
➢ Select the footnote or endnote tab according to your settings when you enter the footnote.
➢ Drag the mouse pointer, right-click the numbering box
➢ Select the Native Numbering
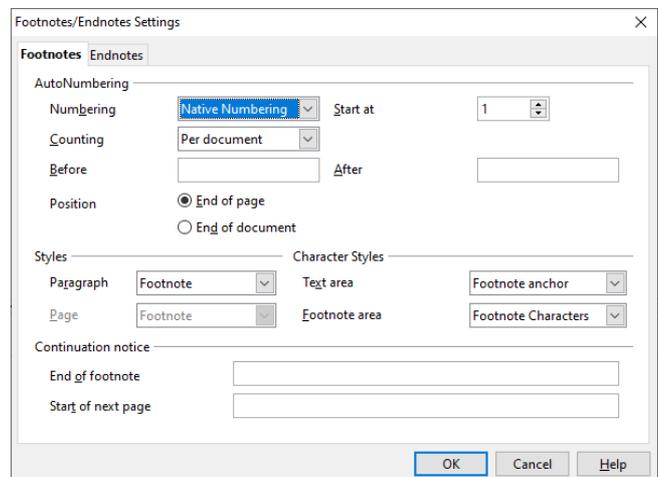
9 Read more in: www.wikipedia .com

V. Defining Tab Stops by Filling in Characters

You've already learned how to set tab stops using the tab stop icon on horizontal lines. . But the tab stop setting with the tab stop symbol on the line does not automatically fill in the characters or dashes. Therefore, to define a tab stop with a character fill, you need to follow the steps below.

Example: Set tab stops as shown below:

Chapter1...1

Lesson1 2

How to apply: Step 1

- ➢ Position the cursor where you want to set the tab stop.
- ➢ Choose Menu Format
- ➢ Choose Paragraph
- ➢ Select a tab
- ➢ Set the tab stop value at the position: 16.00 cm.
- ➢ Select type: Right
- ➢ Select the sign or character you want to fill in, such as:
- ➢ Note: Do not fill in characters
- ➢ ......: When you press the tab key, it will display this sign.
- ➢ Click New button
- ➢ Click the OK button
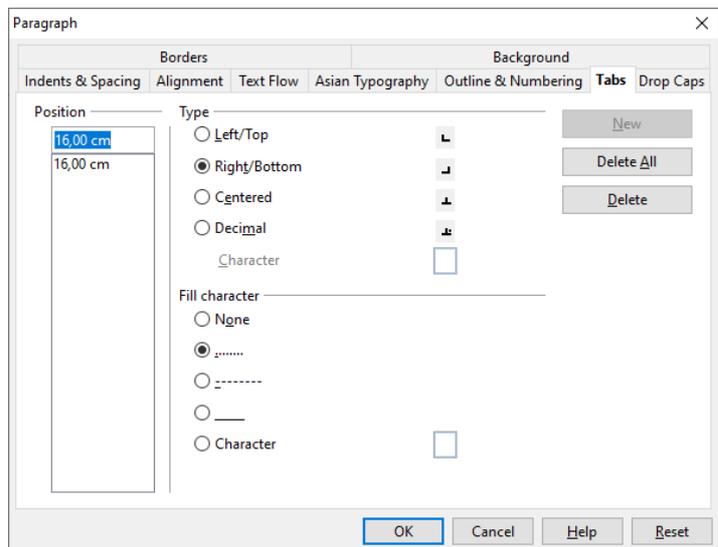
Step 2:

Enter the word "Chapter 1" and press the Tab key. Then you will see the cursor move to the 16 cm position along with filling in the characters with dashes (.......).\
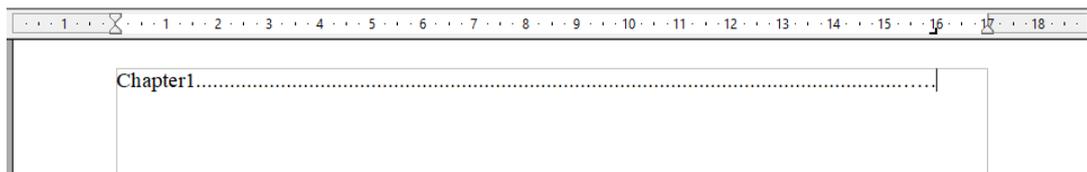
VI. Printing

1. Print Preview

Generally, before printing a document, you should look at the page to know what format the document you are going to print is. To preview this page, follow these steps:

- ➢ Choose File -> Page Preview
- ➢ Or click the page preview icon on the standard bar
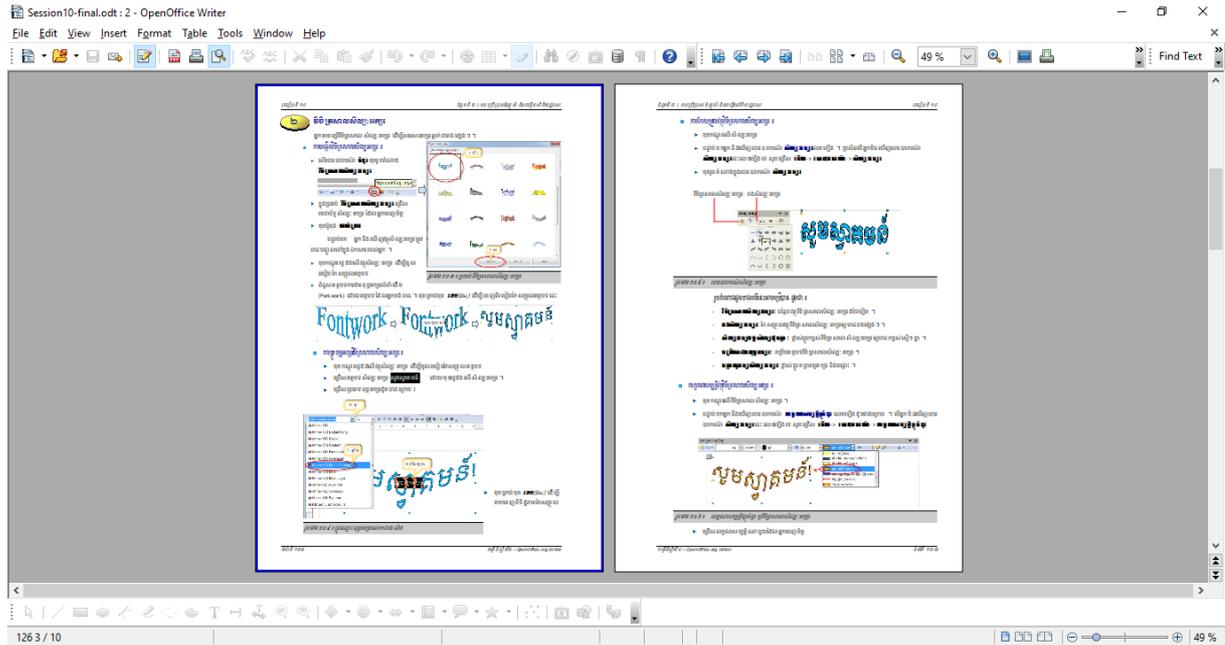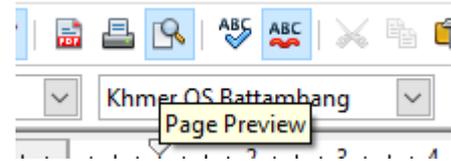
- ➢ Use the arrow keys or the arrow icon on the preview bar to move from page to page.

Note: You can not edit your file while on the preview page. To print your document, click the Print File icon 🖶 to set print options.

2. Print Settings

Before printing a document, make sure that the document you created is correct or organized. To avoid misprints, you should preview the page.

How to apply:

- ➢ Choose File menu -> Print or press the shortcut keys Ctrl + P
- ➢ Select a printer name in the Printers dialog box.
- ➢ Define print queues for copies and ranges
- ➢ All pages: Print the entire document All pages
- ➢ Pages: Print by page defined in the Page dialog
  Example: 1-5: Print pages 1 to 5. 7;11-15: Print pages 7 and pages 11 to 15
- ➢ Click the OK button

Print   ✕

210 mm (A4)

General OpenOffice Writer Page Layout Options

Printer

AnyDesk Printer
EPSON2BB72C (L6290 Series)
Fax
Microsoft Print to PDF

⊞ Details   Properties...

Range and copies

◉ All pages   Number of copies 1 ▲▼
○ Pages 1-10
○ Selection   ☑ Collate
☐ Print in reverse page order

Print

Comments None (document only) ▼

297 mm

1 / 10 ◄ ►

Help   **Print**   Cancel
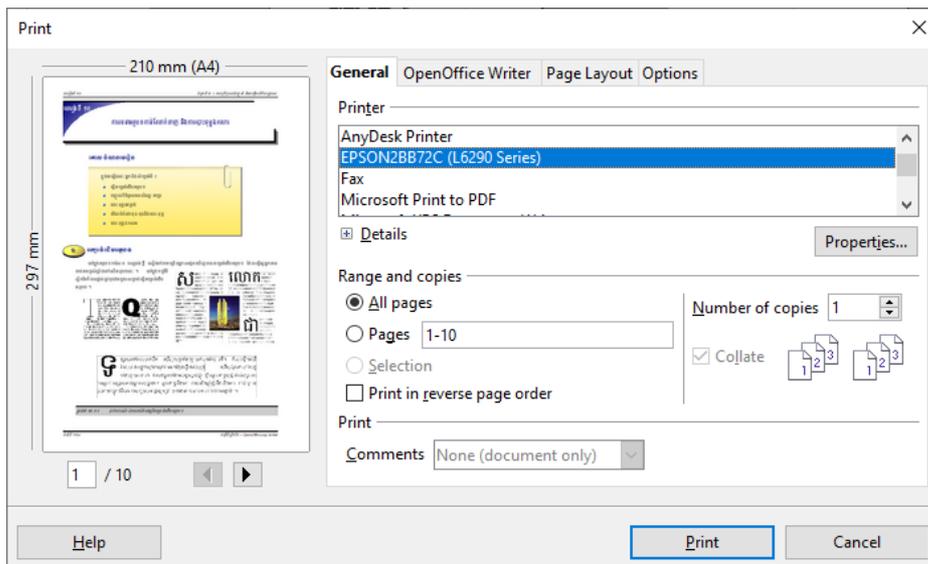
📖 Summary

- Page formatting includes paper formatting, page orientation, and page margins. You can set it in the following ways:
- Margins: margins are the blank spaces that line the top, bottom, and left and right sides of a document. They are important because they help make a document look neat and professional.
- Set margins: means setting the page margins of your worksheet in the writer program.
- The header is the part of the header that is used to write the text so that it appears on every top of the page. The footer is part of the footer for writing text to appear on every page below.

❓ Questions

1. Describe how to set margins.
2. Describe how apply columns.
3. What are the benefits of inserting a header or footer?
4. Explain how to convert page numbers to Khmer numbers.

Exercises

A. Please write text below:

1. Create a letter that contains indentation, paragraphs, pictures, and tab stops on horizontal lines.

2. Set tab stops to create a text file as follows:

Note: Margin: 2 cm all side

🔌 Exercises

B. Create file in below format:

1. Margin: 2 cm all sides

2. Paper size: A4

កំណត់ហេតុប្រគល់ និងទទួលសម្ភារៈសិក្សា

ក្រសួងអប់រំ យុវជន និងកីឡា	ព្រះរាជាណាចក្រ កម្ពុជា
វិទ្យាល័យ	ជាតិ សាសនា ព្រះមហាក្សត្រ
លេខ ៖	៩៩៩⊞๑๑๑๒

កំណត់ហេតុប្រគល់ និងទទួលសម្ភារៈសិក្សា

កម្មវត្ថុ ៖	នៅ .... ឆ្នាំ ....
....	ខែ............. ថ្ងៃទី.......... ព្រលាម៉ោង.............. និង.............. នាទី

	យើងជា ....
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	....
	អ្នកដំណឹយការ នាយឹកា

កំណត់សម្គាល់៖

• កំណត់ហេតុនេះត្រូវបាន ....
  ....
• ....

ទំព័រទី ១ នៃ ១
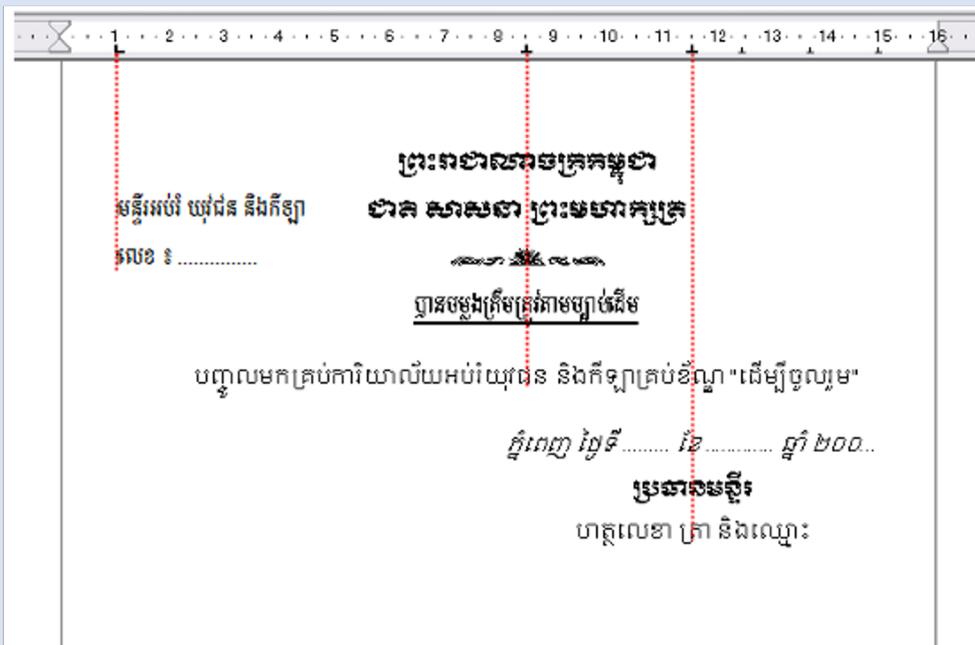
Lesson 9

Introduction to OpenOffice Calc

In this lesson you will learn about how to create inventory in your class by using Apache OpenOffice Calc which is related to the following calculation:

- ✓ Use Apache OpenOffice Calc for creating inventory and calculation.
- ✓ Format the Calc spreadsheet to make it more interesting and use calculating addition such as (+) Sum, (-) Minus, (*) Multiply, and (/) Dividing.

In this lesson you will learn the following:

I.   The Open Office Calc Application
II. Calc Interface
III. Inserting and Editing Data
IV. Data Type
V.   Operator

Lesson 9 Introduction to OpenOffice Calc

I. What is Apache OpenOffice Calc

Apache Open Office Calc is a spreadsheet program that facilitates calculations and tasks related to tables, such as lists. Income, expenses, payroll, staff, student scores, billing, and graphic design, etc. Arithmetic software is not used to type a simple text like a spreadsheet program but to analyze complex numbers and manage data.
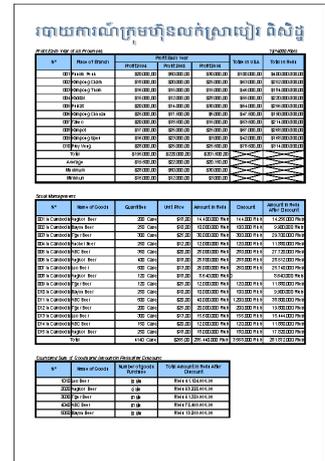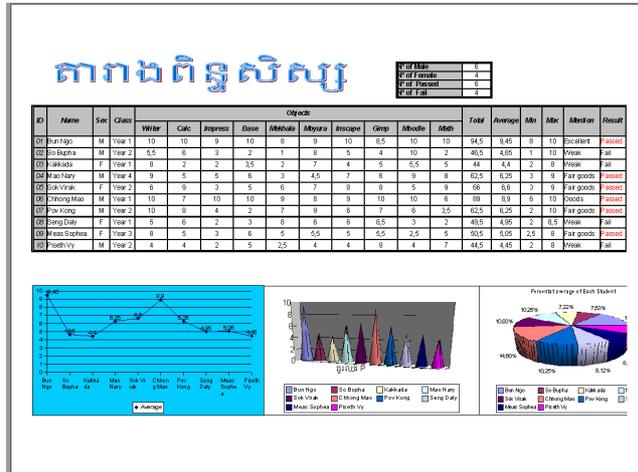
II. Starting Apache OpenOffice Calc

To start using Apache OpenOffice Calc, follow some steps below:

➢ Click on the **Start** button

➢ Type Calc

➢ Select **OpenOffice.org Calc**
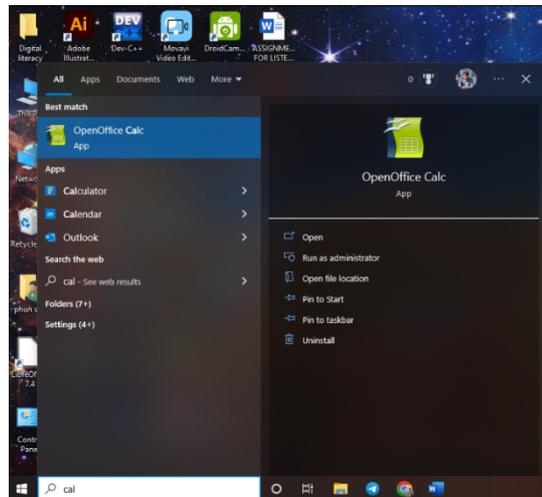
III. Discover the Calc Window

To easily use Calc software, you need to know the main components of the program as follows:
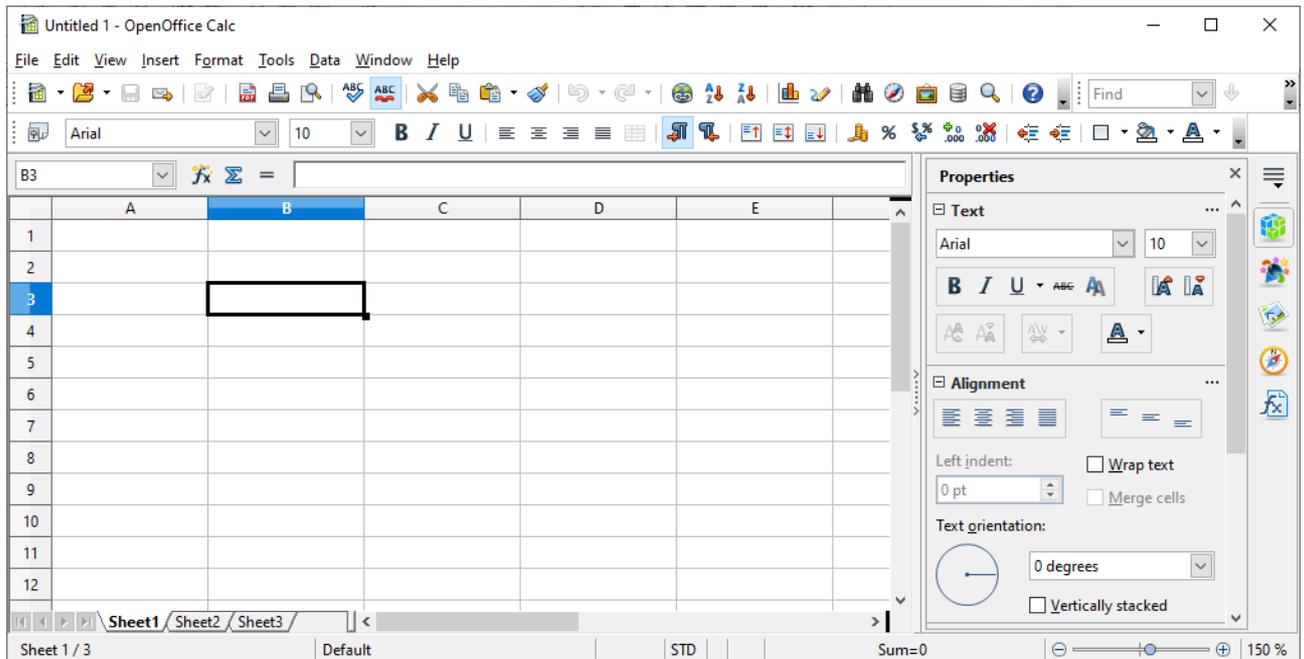
IV. Discover Column, Row, Cell, and Cell Range

In each tab of the arithmetic program, you see rows, columns, cells, and cell ranges that you need to understand to manage tasks in tab sheets easily.

- **Row** is a horizontal row with a representative number at the end of the row from 1 to 65536.

- **Column** is a vertical row with letters at the head of columns A to IV (256)

- **Cells** are intersected between rows and columns, forming cells.

- **Cell range** is a set of cells you select from two or more cells.
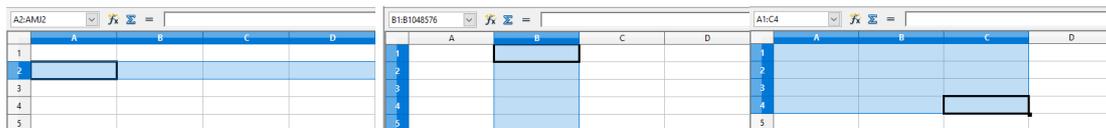
V. Cell Address

The cell **address** combines a column header name and a row number name (A1). It is not the combination of row number and column name (1A).

To view cell addresses and data in the cell, you need to move the mouse pointer to click on a cell, and it will display the cell address where the cell pointer (boldest cell) is located. In the name box, display the data contained in that cell in the input range of the formula bar.

- **Name Box:** A box to display the name of the cell address where the cell cursor is located and can move the cell cursor to the cell position. Whichever one you want to search for, enter the cell address identifier in the name box and press the enter key.
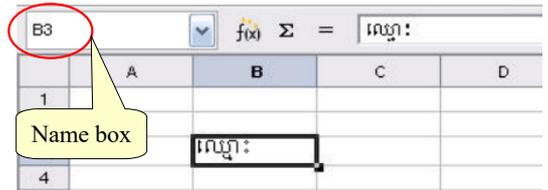
- **Function Box:** A place to display data or formulas that you have entered in a cell.
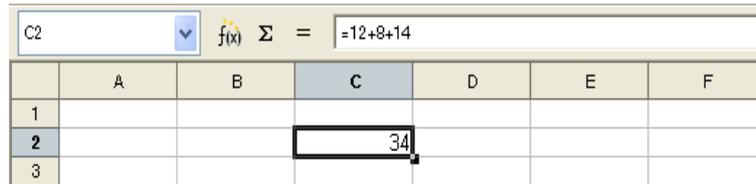
VI. Move Cell Address

There are two ways to move the cell address:

1. Moving by Using the Mouse:

➢ Control the mouse pointer to locate the cell you want to move. The cell cursor will then move to the cell of your choice.

2. Moving by Using Arrow Keys

➢ **Use Arrow Keys:** to move the cell cursor left, right, up, and down one cell at a time.

➢ **Press the Enter Key:** to move the cell cursor down one cell at a time

➢ **Press the Tab Key:** to move the cell cursor one cell at a time.

VII. Insert and Editing Data

1. Insert Data

To enter data, select the cell location in which you want to enter the data and click enter data through the board. After entering the data, you can:

➢ Press the **Tab Key**: to move the cell cursor one cell at a time.

➢ Press the **Enter Key**: to move the cell cursor down one cell at a time.

Example: Enter data in the following table:

	A	B	C	D	E	
1	ឈ្មោះ	អក្សរសាស្ត្រ	គណិតវិទ្យា	ពិន្ទុសរុប	មធ្យមភាគ	
2	ចន្ទ លីដា	30	70			
3	អ៊ឹម ការម្យ	70	20			
4	ឡូន សំអុល	85	49			
5	សែន ហុកលី	80	70			

The data you enter in the number is on the right side of the cell. The text input is on the left side of the cell.

2. Editing Data

For data that you have already entered, you can edit it by doing the following:

- Move the cell cursor to any cell you want to edit.

- Double-click the cell you want to edit or press the F2 key. Or drag the mouse pointer, click on the input line of the formula bar, and edit.

- You can edit all the data in a cell by moving the cell cursor to that cell and inserting a new one.

- After editing the data, you can not use the arrow keys to move the cell cursor. You need to press the Tab key or Enter) to move the cell pointer.

VIII. Deleting Data

To delete data entered in a cell, you need to apply the following:

➢ Select the cell that contains the data you want to delete.

➢ Then press the Delete key.

Then a content deletion box will appear as shown on the right:
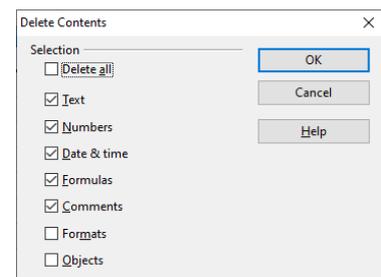
➢ Select which type of option you want to delete

- **Delete all: Delete all data types and formatting in the selected cell.**

- **Text:** Delete only data types as letters

- **Number:** Delete only the data type as a number

- **Formula:** Delete only any numeric value from the formula calculation

- **Comment:** Delete only comments in the cell

- **Format:** Delete only cell format and data format

- **Object:** Delete only object word art that you have selected

➢ **Click Ok**

IX. Cell Data Types

You can identify the data types entered in the cells below:

- **Text:** any character-type data will be aligned to the left of the cell.

- **Number**

- **Date**

- **Time**   All of this data will be aligned to the right of the cell

- **Formula**

X. Changing Column Width and Row Height

You can change the column width or row height to suit the font size of the data you enter in the cell by following these steps:

1. Changing Column Width:

➢ Move the mouse pointer over the vertical line to the right of the column heading that you want to resize until the mouse pointer appears as a forward arrow. ↔
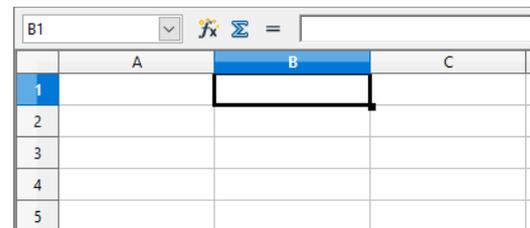
➢ Hold down the mouse and drag it left or right to the desired size.

2. Changing Row Height

➢ Move the mouse pointer over the horizontal column below the heading of the row you want to resize until the double-faced arrow is displayed ↕

➢ Hold down the left mouse button and drag the mouse up or down to the desired size.
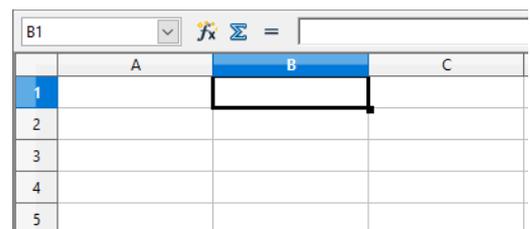
XI. Insert the New Column and Row

In Calc, you can add rows or columns anywhere in the sheet. Sometimes you skip a name or something in the list. You do not need to delete everything and retype it. You add a row or column at the location you skipped.

1. Insert a New Column

To insert a new column, follow these steps:

> ➢ Place the cell cursor at the location of the column you want to insert

> ➢ Choose Insert menu → Columns

Or …
> ➢ Right-click the column heading at the location you want to insert.
> ➢ Select Insert Columns
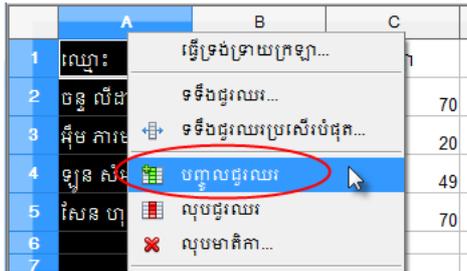
2. Insert New Row

To insert a new row, follow these steps:

> ➢ Place the cell cursor at the location of the row you want to insert
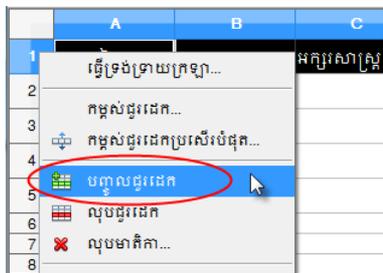
> ➢ Choose Insert menu → Row

XII. Operator

Calculations in OpenOffice Calc are more accurate and precise than manual calculations. In this lesson, we will give you some calculations using mathematical operations such as Sum (+) Minus (-), Multiply (*), Divide (/), and so on.

All calculations in arithmetic applications must always start with an equal sign (=).

1. Calculation Numbers

Have you ever used a calculator? Calculating using real numbers in the Calc program is the same as using a calculator. Add an equal sign (=) in front of that calculation. Ex: =9+6+5

(+): =number + number+…+number⤸	(*): =number * number*…*number⤸
(-): =number – number-…-number⤸	(/): =number / number/…/number⤸

Example: Calculate using a real number by taking 10 plus 20. What is the result? In cell A1 enter = 10 + 20 ⤸

How to apply:

- ➢ Select cell A1 to write a formula
- ➢ Enter equal sign (=)
- ➢ Enter 10 + 20 and press Enter key
- ➢ It will then display the results you calculated
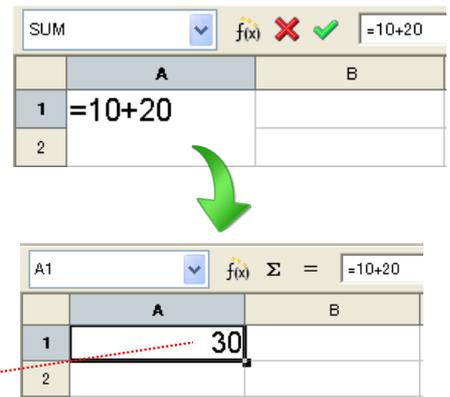
2. Calculation by Using the Cell Address

Example: Calculate the total score using the cell address containing the numeric value to be calculated as follows:

How to apply:

- ➢ Select cell E3
- ➢ Enter =C3+D3
- ➢ Enter key

📖 Summary

- Apache Open Office Calc is a spreadsheet program that facilitates calculations and tasks related to tables, such as lists. Income, expenses, payroll, staff, student scores, billing, and graphic design, etc. Arithmetic software is not used for typing simple text like a spreadsheet program. Rather, it is used for analyzing complex numbers and managing data

- Row Is a horizontal row with a representative number at the end of the row from 1 to 65536.

- Column is a vertical row with letters at the head of columns A to IV (256)

- Cells are intersected between rows and columns, forming cells.

- Cell range is a set of cells you select from two or more cells.

- The cell address combines a column header name and a row number name (A1). It is not a combination of row number and column name (1A)

- All calculations in arithmetic applications must always start with an equal sign (=).

❓ Questions

1. What is OpenOffice Writer?

2. What is a cell address? How do we move the cell address to cell Z2500?

3. How many columns and rows are there in the OpenOffice Writer?

4. What do you need to do to calculate an operation? Give examples.

5. Which operator priority is applied first to calculate an operator?

6. Create a table on student score management for Khmer language computer programs (manuscripts, arithmetic, exhibitions, internet, and email). What field names (table headers) do you need to create? And which field do you need to create to do the calculation?

💡 Exercises

The classroom has desks, chairs, books, various objects, and computer equipment. Sometimes monitoring everything in a classroom is difficult. What are some ways you can keep those inventories in your classroom? One way is to use a computer to create a classroom inventory.

1. Create an inventory of furniture and fixtures in your classroom. See the example below:

	A	B	C	D	E	F
1	បញ្ជីសារពើភណ្ឌថ្នាក់ទី ៦ ក					
2						
3	ប្រភេទ	ឈ្មោះ	សេចក្ដីពិពណ៌នា ឬ លេខសម្គាល់	ចំនួន	ឯកភាគតម្លៃ	តម្លៃសរុប
4	សៀវភៅ	សិក្សាសង្គម	១២៤៥៥០០	៤០	៤ ០០០ ៛	១៦០ ០០០ ៛
5	សៀវភៅ	គណិតវិទ្យា	៤៥០១៥៥៨	៤០	៣ ៥០០ ៛	១៤០ ០០០ ៛
6	សម្ភារៈ	ទូសៀវភៅ	មាន ១០ ថត	០១	២០ ០០០ ៛	២០ ០០០ ៛
7	សម្ភារៈ	តុគ្រូ	តុសម្រាប់គ្រូ	០១	២៥ ០០០ ៛	២៥ ០០០ ៛
8	សម្ភារៈ	តុសិស្ស	តុសម្រាប់សិស្ស	៤០	១៥ ០០០ ៛	៦០០ ០០០ ៛
9	សម្ភារៈ	កៅអី	កៅអីសម្រាប់គ្រូ និងសិស្ស	៤១	១២ ០០០ ៛	៤៩២ ០០០ ៛
10	សម្ភារៈ	ដីស	ដីសមួយប្រអប់	០១	១ ៥០០ ៛	១ ៥០០ ៛
11	សម្ភារៈ	ខ្មៅដៃ	ខ្មៅដៃមានជ័រលុប	០៥	៥០០ ៛	២ ៥០០ ៛
12					សរុប	១៤៤១ ០០០ ៛

2. If working with a partner, discuss the following questions with them. Writing or sketching your ideas on paper is helpful.

• What furniture, equipment, books, and objects do you have in your classroom? How can you organize similar objects into groups?

• How much is each item worth?

• What information can help you identify each specific object type? Do your electronics have an ID number?

3. Save this file as "Class 6A Inventory" in your folder.
4. Close the application.

Lesson 10

Formatting Row, Column, Text, and Formula

In this lesson you will learn how to create a document related to the student score management table and be able to use Calc software.

- ✓ Know the basic cell format
- ✓ Manage data in cell
- ✓ Know the basic functions

You will learn more about the following:

Lesson 10 Formatting Row, Column, Text, and Formula

I. Selecting Cells by Using Mouse

To format a cell or data in a cell, you must first select that cell. Using the mouse is a quick way to select cells by pressing the mouse pointer, or whichever way you want.

1. Selecting Multiple Cells

To select multiple cells in a row, do the following:

➢ Hold down the mouse pointer to the location of the cell you want to start, select and hold (ed start from cell A2)

➢ Drag the mouse to the next cell to the point you want to stop selecting (e.g., stop at cell F2)

Example: Select a cell in the following table:

2. Select Multiple Cells Separately

To select multiple cells separately, you need to do the following:

➢ Control the mouse pointer, click on the cell you want to start selecting

➢ Hold down the **(Ctrl)** Key

➢ Control the mouse pointer and click on the location of the cells you want to add

➢ Release the Ctrl key.

Example: Try to select a numeric value of points less than 50 in the table.

4. Selecting All Cells

If you want to select an entire sheet, you have to control the mouse pointer first. Then click on the top left corner of the sheet (header name Column A and above the row header name 1), or click Ctrl + A

5. Selecting Columns

To select columns, follow as below:

  ➢ Select the mouse pointer on the head of columns (e.g., column C)

 If you want to select multiple columns, left-click on the column heading you want to start selecting and drag left or right according to the number of columns you want, and then release the left mouse button.

6. Select Rows

  To select a row, you need to:

  ➢ Control the mouse pointer

  ➢ Click on the header row you want to select (e.g., column 2)

  ➢ Or... press the shortcut key:

  Shift + Space

 If you want to select multiple rows, click the heading of the row you want to start, select and hold, and then drag up or down. Below is the number of rows you want to select.

7. Select Sheet

  If you are already working on one worksheet, you can switch to working on another worksheet by following these steps:

  ➢ Control the mouse pointer, click on any tab you want to select (e.g., Sheet w)

II. Resizing All Columns Evenly

In the previous lesson, you learned how to resize columns or rows, but for this lesson, we will teach you how to resize all columns to the same size.

How to apply a change in the width of all columns equally:

- Select the entire sheet or press the shortcut key Ctrl + A

- Resize any column. All columns will resize to the one you changed.
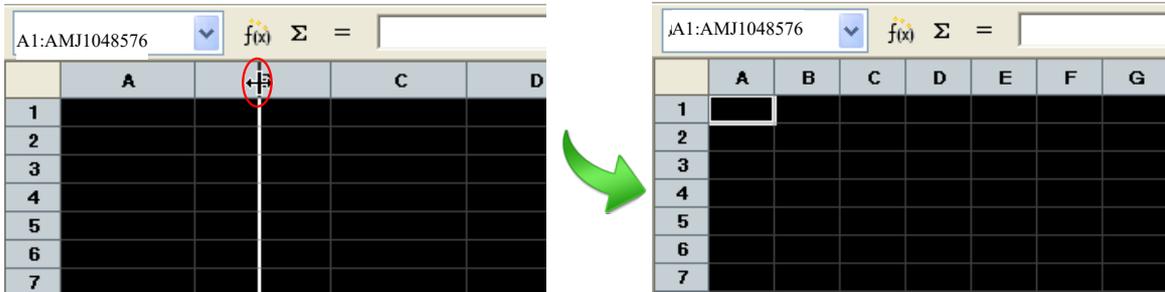
Resolving all rows equally applies to resizing columns. You need to select all the rows and resize any rows, and all the rows will resize accordingly.

III. Insert More Columns and More Rows

You can insert multiple endings or slides at once.

1. Insert More Columns

To insert multiple columns at once, follow these steps:

➢ Select the cell in the column location that you want to insert.

➢ Choose Insert Menu → **Columns.**

Or... you can insert a new column as follows:

➢ Select the column where you want to insert the new column

➢ Right-click the selected column heading → Select Insert Columns

Example: Enter the following physics and chemistry scores and subtract the result from the old total and mean scores, and you will Recalculate it later.

2. Insert Multiple Rows

To insert multiple rows at once, follow these steps:

➢ Select the cell in the location of the rows that you want to insert. (e.g., Cell A4:A5)

➢ Choose Insert Menu → **rows**

Example   Insert a new data record in the newly inserted row. Re-number and add a new record in the new row.

	A	B	C	D	E	F	G	H
1	តារាងពិន្ទុសិស្ស							
2	លេខរៀង	ឈ្មោះ	អក្សរសាស្ត្រ	គណិតវិទ្យា	រូបវិទ្យា	គីមីវិទ្យា	ពិន្ទុសរុប	មធ្យមភាគ
3	1	ចន្ទ លីដា	30	70	50	80		
4	2	សេង ដាលី	93	85	95	50		
5	3	ទូច ស្រីនិត	85	89	65	81		
6	4	អ៊ីម ភារម្យ	70	20	80	90		
7	5	ឡូន សំអុល	85	49	60	30		
8	6	សែន ហុកលី	80	70	75	85		

IV. Deleting Columns and Rows

1. Deleting Columns

If you want to delete a column, you need to do the following:

➢ Select columns that you want to delete

➢ Chose to Edit menu → Delete

2. Delete Rows

If   you want to delete a column, you need to do the following:

➢ Select the number of rows that you want to delete

➢ Chose Edit menu → **Delete**

V. Auto Numbering

To enter automatic numbering, you need to do the following:

➢ Enter the numeric value that you want to start. E.g., Type 1 in cell A3)

➢ Select cell A3 (take the mouse pointer, and click on cell A3)

➢ Hold the mouse pointer until the plus sign (+) is displayed.

➢ Hold down the mouse and drag the mouse to another location until you get the desired end value.
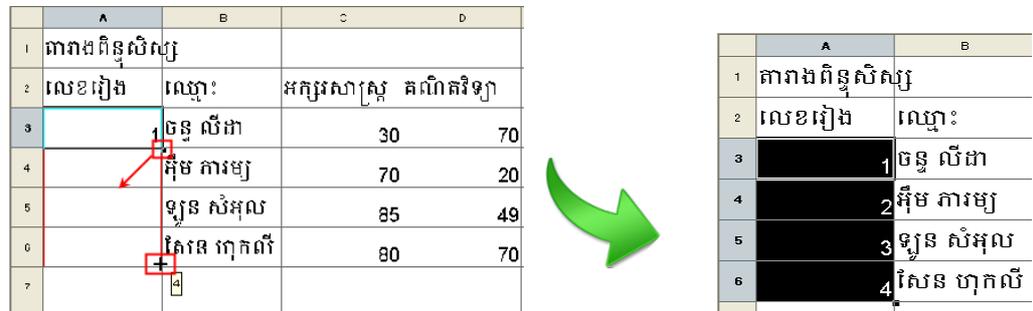
VI. Formatting Text in Cells

In Calc, you can also format text, such as renaming fonts, changing font sizes, aligning text in cells and changing font colors, as in the manuscript program.

You can use the icons on the Formatting bar to format text in the following cells:

➢ **Change Font Name**: Click on the right arrow in the Font Name box

➢ **Change Font Size**: Control the mouse pointer, and click the right arrow button in the Font Size box.

The text of the selected cell will be displayed as follows:
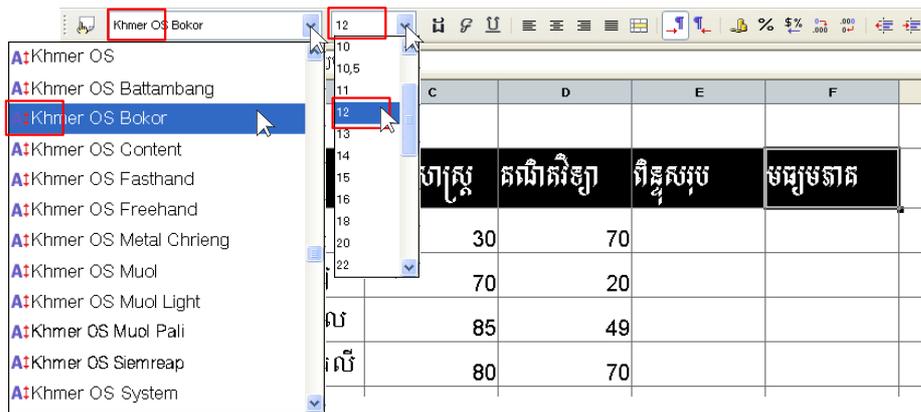
> **Remove/Bold/Italics, Underline and Align.** Control the mouse pointer, click on the bold italic icon, and underline the following:

Bold: Use to make text bold

Italics: Use to make text italics

Underline: Use to underline the text

Alignment: Align text left, right, center and justify as you want

VII. Merge Cells

You can merge multiple cells into a single cell by following these steps:

> Select the cells you want to merge
> Click on the merge icon
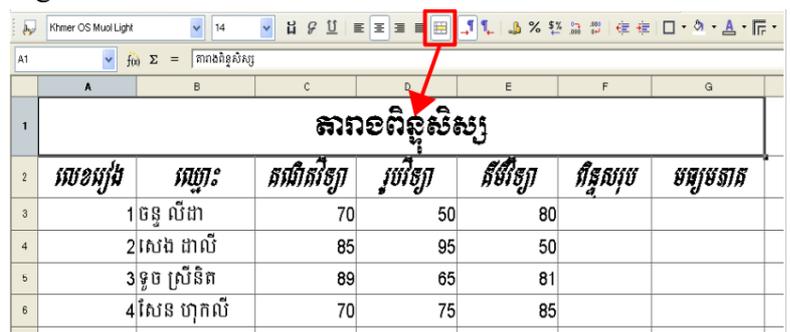
VIII. Insert Border

If you want to frame a cell, you must do the following:

➢ Select the cell range in which you want to add a border

➢ Click on the border icon ▢

➢ Select types of border you want
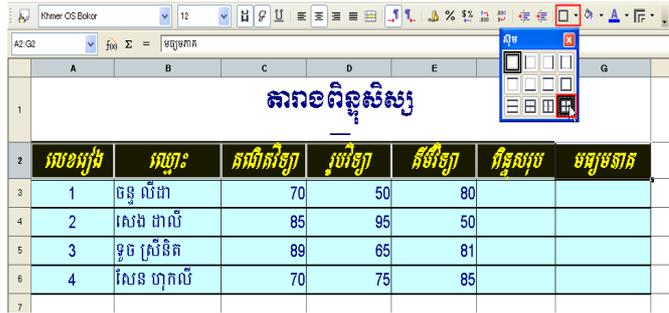
IX. Using SUM

You have already learned about calculations using operators, but this method is only possible if you have a little data. So, to make it easier to calculate the sum quickly, you need to use the SUM () formula, as shown in the example below:

➢ Select the cell that wants to use the formula

➢ Click on the sum icon ∑ to create an auto sum

➢ Click on the OK icon ✔ or press Enter Key.
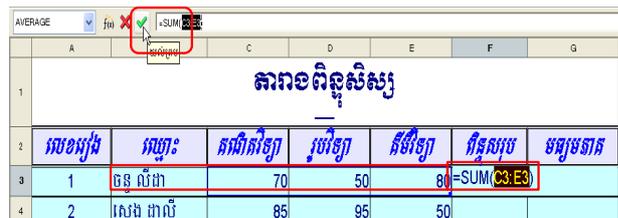
X. SUM Formula

SUM is a formula for calculating the sum of all numbers in a cell range.

Formula: =SUM(number1; number2; ...)

Numbe1; Number2; … can be:

- **Value** =SUM(70;50;80) result is 200

- **Cell Address** =SUM(C3;D3;E3) result is 200

- **Cell Address Range** =SUM(C3:E3) result is 200

XI. Using AVERAGE Formula

AVERAGE is a formula for calculating the mean values in a cell range.

Formula: =AVERAGE(number1; number2; ...)

Number1; number2;... can be

- **Value** =AVERAGE(70;59;80) result is 66,67

- **Cell Address** =AVERAGE(C3;D3;E3) result is 66,67

- **Cell Address Range** =AVERAGE(C3:E3) result is 66,67

Operators and Formula Names:

Operators and Formula Name	Purpose	Example
=	All formulas must start with an equal sign (=)	
+	Perform a sum operation between values	=3+5
-	Perform subtraction operations between values	=A1-B1
*	Perform multiplication operations between values	=B1*2
/	Perform a value division operation	=A1/C2
SUM	Calculates the sum of all values in a cell range	=SUM(A1:A3)
AVERAGE	Calculates the average of all values in a cell range	=AVERAGE(A2,B1, C3)

📖 Summary

- SUM is a formula for calculating the sum of all numbers in a cell range. Formula: =SUM(number1; number2; ...)
  - Numbe1; Number2; … can be:
  - Value =SUM(70;50;80) result is 200
  - Cell Address =SUM(C3;D3;E3) result is 200
  - Cell Address Range =SUM(C3:E3) result is 200
- AVERAGE is a formula for calculating the mean values in a cell range. Formula: =AVERAGE(number1; number2; ...) Number1; number2;... can be
  - Value =AVERAGE(70;59;80) result is 66,67
  - Cell Address =AVERAGE(C3;D3;E3) result is 66,67
  - Cell Address Range =AVERAGE(C3:E3) result is 66,67

❓ Questions

1. Explain how to resize all columns evenly?
2. How do you enter automatic numbering? E.g., 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
3. How do you insert multiple rows and columns?
4. Write the following formula correctly and describe the function of each formula:
   a. SUM
   b. AVERAGE

💡⚙ Exercises

The following is the monthly score of a high school student. The Office of Student Affairs requires that the student score manager enter each subject's score and calculate the "total score" and "average" as below:

- Total score: Sum of the three subject scores: "Khmer" + "Mathematics" + "Physics"

- Average: The average of the three subject scores.

	A	B	C	D	E	F	G
1			តារាងពិន្ទុសិស្ស ប្រចាំខែ មករា ២០០៧				
2	ល.រ	ឈ្មោះ	ភាសាខ្មែរ	គណិតវិទ្យា	រូបវិទ្យា	ពិន្ទុសរុប	មធ្យមភាគ
3	1	សេង សុភាព	75	89	86	250	83,33
4	2	មាន សុភ័ក្ត្រ	67	76	56	199	66,33
5	3	យូ គន្ធី	23	57	67	147	49
6	4	នួន លក្ខិណា	98	56	57	211	70,33
7	5	នួន សុជាតា	76	78	87	241	80,33
8	6	មាន សម្បត្តិ	54	30	30	114	38
9	7	ពុទ្ធ សុជាណែត	74	48	85	207	69
10	8	វ៉ឌ្ឍី ផាណា	98	47	85	230	76,67
11	9	ហ៊ង្ស សុជាតិ	65	98	76	239	79,67
12	10	ជៀម បញ្ញារិទ្ធ	10	57	15	82	27,33
13	11	លីម សូរីតា	34	86	78	198	66
14	12	អ៊ុន មាស	56	20	50	126	42
15	13	អ៊ុន ប្រាក់	36	86	46	168	56
16	14	មាស ហុកលី	76	95	86	257	85,67
17	15	ទ្រី សូនី	56	67	10	133	44,33
18							
19					ភ្នំពេញ, ថ្ងៃទី.........ខែ.........ឆ្នាំ២០០....		
20					ហត្ថលេខាគ្រូបន្ទុកថ្នាក់		

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Lesson 11

Sheet and Number Format

After you finish this lesson, you will be able to:

- ✓ Edit sheets, such as renaming sheets, inserting new sheets, deleting sheets
- ✓ Format cells, such as framing cells, text alignment, text effects, and numeric formatting

In this lesson, you will learn the following:

I.   Sheet Management

II. Number Formatting

Lesson 11 Sheet and Number Format

I. Rename Sheet

You can rename the worksheet to make it easier to identify the data types in the worksheet. You can rename a worksheet in the following ways:

- ➢ Select the sheet tab you want to rename
- ➢ Choose Menu Format -> Sheet -> Rename …
- ➢ Enter a new name in the Name box
- ➢ Click the OK button

Or ...

- ➢ Right-click the sheet you want to rename and select Rename Sheet.
- ➢ The sheet renaming box will then appear as shown below:
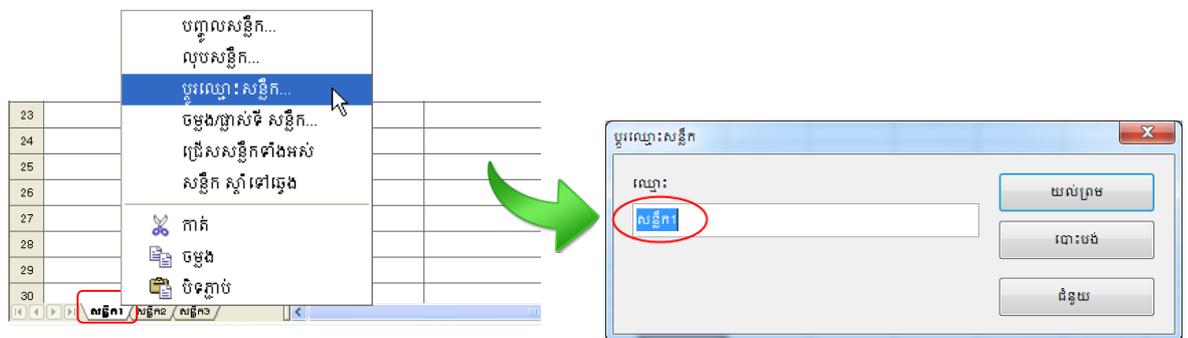
II. Insert New Sheet

If you want to insert a new sheet in a spreadsheet, follow these steps:

- ➢ Choose Insert menu -> Sheet ...
  - • Location: To select a new sheet location to insert
  - • Sheets: To determine the number of new sheets you want to insert
- ➢ Click the OK button
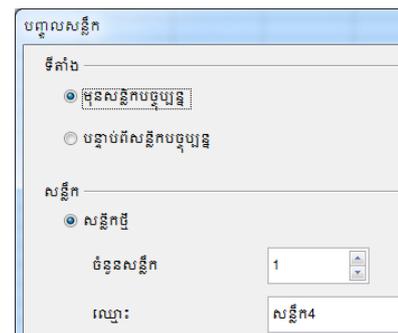
III. Delete Sheet

You can delete a sheet from a spreadsheet by following these steps:

- ➢ Select which sheet you want to delete
- ➢ Choose Edit menu -> Sheet -> Delete.
- ➢ Or right-click on the selected sheet
- ➢ Select Delete Sheet ...

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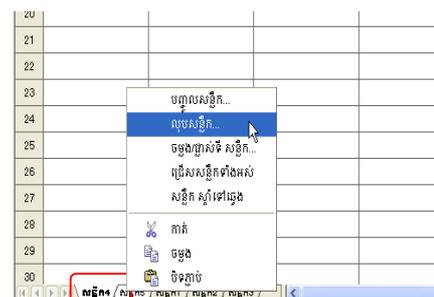
➢ The following box will then appear:

Click the Yes button to delete
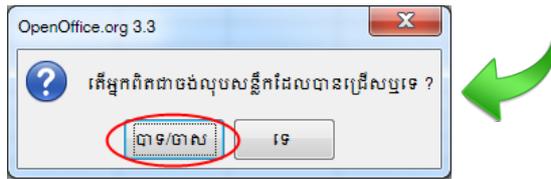
IV. Number Formatting

Number formatting involves fonts, effects, text, alignment and text orientation, cell borders, cell background settings and cell protection. In the Number tab, you can define the number format you want in "User Defined".

The number format settings are as follows:

- Preceded by Zero (001)

- Number in Khmer (១២៣)

- Percentage (12.95%)

- Riel (១.២៣៤៛) Dollar ($ 1,234,00)

- Date (Friday, December 31, 1999)

E.g.

1. Vertical Text Alignment

To align text in any part of a column in a cell, follow these steps:

➢ Select the cells where you want to align the text

➢ Choose Menu Format – Cells
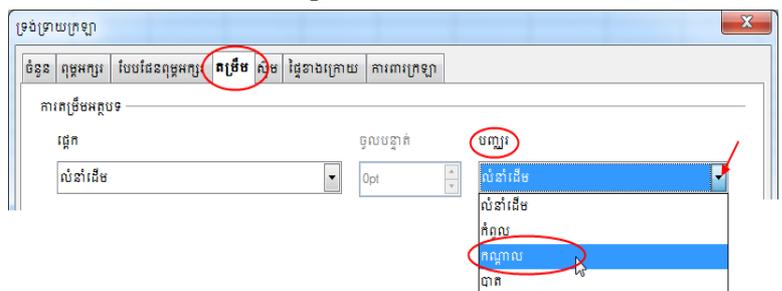
The Cell Format dialog box will then appear as shown below:

➢ Select the Alignment tab

➢ In the Vertical Cell Formatting dialog, select Center

Or ...
➢ Choose a format menu
➢ Select alignment
➢ Select center

Center column

2. Text Orientation

You can orient the text to any number of angles or degrees by doing the following:

➢ Select the cells for which you want to orient the text

➢ Choose Menu Format -> Cells

The Cell   Format dialog box will then appear as shown below:
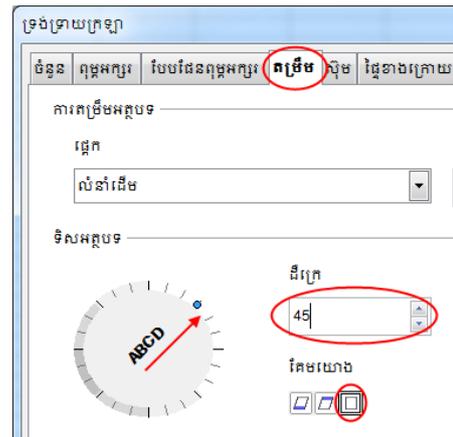
➢ Select the Alignment tab

➢ Enter the number of angles in the Degree box

➢ At the reference edge, select the text extension in the cell in the third box. The text's rotation is unrelated to the cell border.

➢ Click the OK button.

3. Cell Border

To create a table, you need to frame the data cells that you entered in that cell.

How to apply the placing of your selected cell borders:

➢ Select the cells you want to border

➢ Choose Menu Format -> Cells

The Cell Format dialog box will then appear as shown
on the right.

➢ Select the Borders tab and make settings:

✓ Line style

✓ Select a border location in the Default dialog

✓ Or you can set it yourself in the user settings
box

✓ Line color

➢ Click button OK
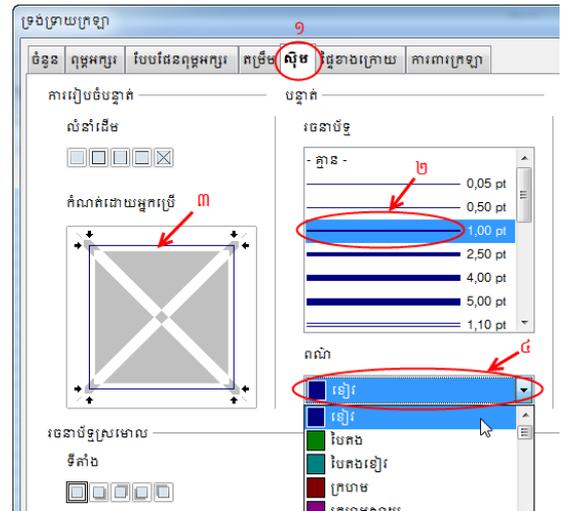
4. Formatting Numbers into Khmer Numbers

In Writer, you cannot use font renaming to convert numbers to Khmer. In Khmer, you need to
define the following cell format:

➢ Select the cell whose number you want to format in Khmer

➢ Choose Menu Format -> Cells

The Cell Format dialog box will then appear as shown below:

➢ Select the Number tab in the
Define Cell Format dialog
box:

- In the Type dialog box

- In the Format dialog, select
the format in Khmer
numbers (e.g., ១២៣៤).
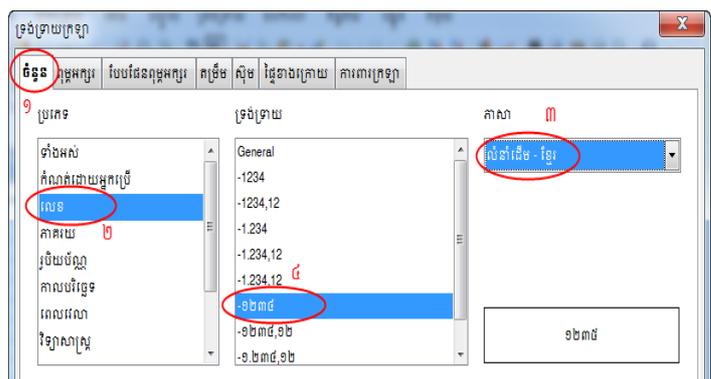
➢ Select Language: ខ្មែរ and Click OK

In the format number box, you can see: **[NatNum1] 0**

- [NatNum1]: To make it display the number format in the cell as a Khmer number

- 0: Represents the numeric value entered in the cell
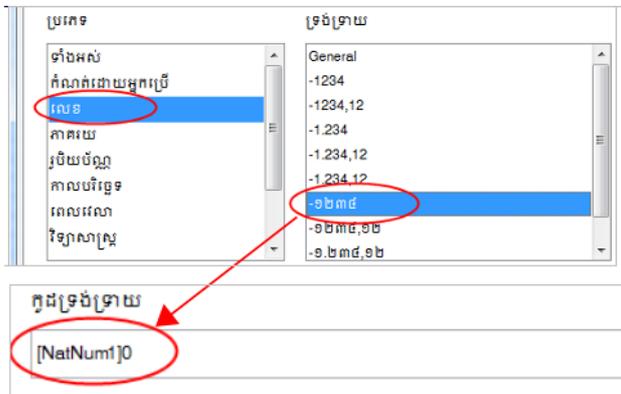
5. Formatting Numbers in Khmer Currency

The numbers you enter in the cell can be formatted in Khmer or other currencies as follows:

➢ Select the cell whose number you want to format

➢ Choose Menu Format -> Cells

➢ Select the Currency Select Number tab

➢ In the Format dialog, select your preferred format type (e.g., 1.234 ៛)

➢ In the Language box, select Khmer
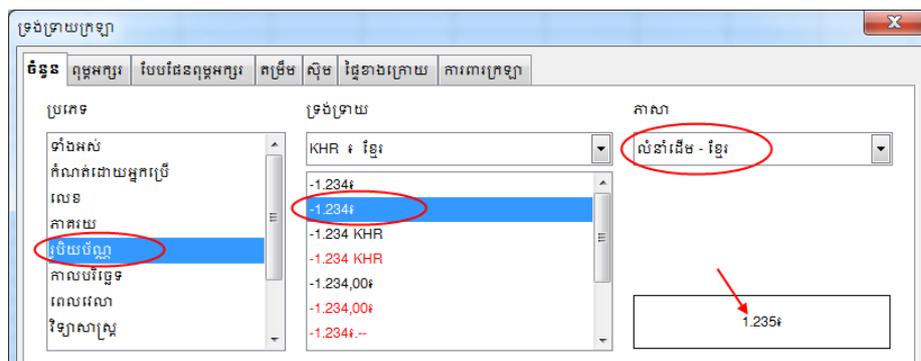
Example: Format the table as follows:

In the Language box, if you select a different language, the Format dialog will display the currency of that language or country.

6. Entering Date

For every date entry in Writer, you must enter the date first. So the number you enter first is the acknowledgment as a day cannot exceed 31, and the month cannot exceed 1.

Date representation characters are:

- dd: Represents the day as a two-digit number

- mm: Represents the month as a two-digit number

- yyyy: Represents the year as a four-digit number
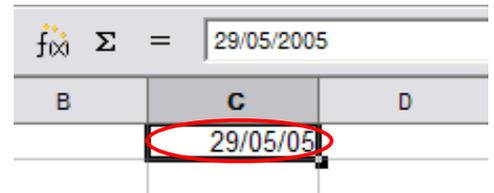
7. Date Formatting

To set the date format, follow these steps:

- ➢ Select the cells that you want to format the numbers to date.

- ➢ Choose Menu Format -> Cells

- ➢ Select the Number tab, and select the date.

- ➢ In the Format dialog, select any of your preferred date formats

- ➢ Click the OK button
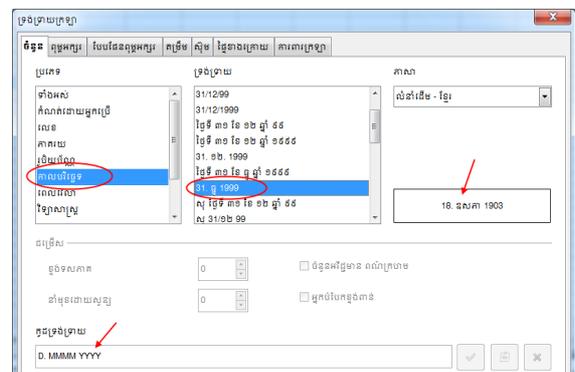
8. Time Format Settings

To set the time format, follow these steps:

- Select the cells in which you want to format the numbers to time

- Choose Menu Format -> Cells

- Select the Number tab, select the time

- In the Format dialog, select any format that you
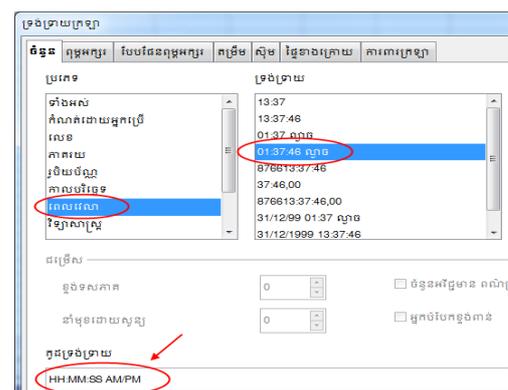
prefer.

- Click the OK button

Example: When you enter 1:35:20, the result is displayed as 01:35:20 AM.

9. User-defined Formatting

Symbols for user-defined format numbers:

- #,##0: Sign for separating thousands. Example: 1,234,567

- ???,??0.0??: Used for decimal floating point. Example: 1234.00

- "Rie": to set the default display of "Rie" letters or numbers in "..."

- #   : Represents the numeric value entered in the cell.

- Example: Set #. ## 0.00 "Riels" -> When entering 4000, it will display the result

- 4.000,00 Riels

- : Represents the least numeric value or number of digits.

- Example: Set 0000 → Input 12 → Output 0012

> If using the # sign, when entering zero (0) - the result will be displayed empty.
>
> mple: Set # Riel - When entering 0 - the result will show Riel
>
> Set # Riel - Enter time 0 - The result will show Riel

User-defined Format:

   You can configure the data manually by following these steps:

- Select the cell or cell range that you want to format.

- Choose Menu Format → Cells

- Enter format number [NatNum1] 0 points

- Click the OK button
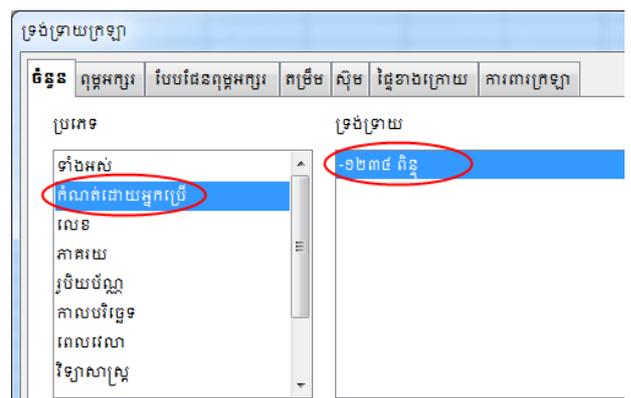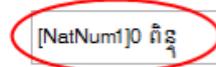
Try to apply the following results:

Here are some formatting sample

Formatting code	Insert in cell	Display
[NatNum1]0000	1	០០០១
00-00000	12	00-00012
[NatNum1]OI-0000#	12	OI-000១២
#.### or #.## or #.#	12345	12.345
#,000	12	12,000
	12,5	12,500
#.###,00	12500	12.500,00
#.###,00 រៀល	12500	12.500,00 រៀល
#.###,00 "Riels"	12500	12.500,00 Riels
អត្រាប្រាក់ $1=#.##,00 រៀល	4150	អត្រាប្រាក់ $1=4.150,00 រៀល
[NatNum1]$1=#.##,00 "Riels"	4150	$១=៤.១៥០,០០ Riels
[NatNum1][Blue]$1= #.###,00 ៛	4500	$១=៤.៥០០,០០ ៛
[Red]ពន្ធ = #,00 %	12,5	ពន្ធ = 12,50 % (ពណ៌ក្រហម)
"Benefit="#%	12,5	Benefit=12,5%
[Red][<0]#.##;[Blue]#.## ឬ	1234	1.234 (ពណ៌ខៀវ)
[Blue]#.##;[Red]-#.##	-1234	-1.234 (ពណ៌ក្រហម)
DDDD/MMMM-DD/YYYY	12/08/05	ថ្ងៃសុក្រ/សីហា-12/2005
HH:MM:SS AM/PM	01:25:15	01:25:15 ព្រឹក
	13:25:15	01:25:15 ល្ងាច

The format you define will be displayed directly by the user. So you can use this predefined format later.

To display the number format in Khmer, you must always put [NatNum1] in front of the number format you have defined. E.g. [NatNum1] #. ## 0.00

📖 Summary

- Number formatting involves fonts, effects, text, alignment and text orientation, cell borders, cell background settings, and cell protection. In the number tab, you can define the number format you want in "User Defined".
  - The number format settings are as follows:
  - Preceded by Zero (001)
  - Number in Khmer (១២៣)

  - Percentage (12.95%)
  - Riel (១.២៣៤៛) Dollar ($ 1,234,00)

  - Date (Friday, December 31, 1999)

❓ Questions

1. Tell us how to edit a sheet, such as renaming a sheet, inserting a new sheet, and deleting a sheet.
2. Tell us how to place a cell frame and color the cell surface.
3. Tell us how to format numbers in Khmer currency.
4. Tell us how to make user-defined formatting.

t.me/moeysnews

sala.moeys.gov.kh

youtube.com/moeyscambodia

💡 Exercises

Write the number format to define the following:

Input Number	Output	Formatting Number
1	００១	[NatNum1]000
5678	៥.៦៧៨,០០ រៀល	?
1234.5	$1,234.50	?
4000	$1 = 4.000,00 Riel	?
15	15 Cases	?
12	12.00%	?
06/07/22	Tuesday, June 07,2022	?

Lesson 12

Basic Function and Cell Address

After you learn this lesson, you will be able to:

- ✓ Use MIN, MAX, COUNT, COUNTA
- ✓ Use NOW, YEARS, MONTHS, DAYS
- ✓ Define the difference between Relative and Absolute cell address
- ✓ Calc formulas RANK and use absolute and reference cell address

In this lesson, you will learn the following:

I. The Basic Function
II. Cell Address

Lesson 12 Basic Function and Cell Address

I. MIN, MAX, COUNT, and COUNTA

This lesson will explain to you how to use some of the following formulas:

- **MIN:** A formula calculates the smallest value in a range.

  Formula:

=MIN(value1; value2; ...)

  Suppose that in cells B1: B5 there are values 19,24,23,21,22 respectively

  = MIN (19; 24; 23; 21; 22) Result 19 or = MIN (B1: B5) Result 19

- **MAX :** A formula calculates the biggest value in a range.

  Formula:

=MAX(value1; value2; ...)

  Suppose that in cells B1: B5 there are values 19,24,23,21,22 respectively

  = MAX (19; 24; 23; 21; 22) Result 24 or = MAX (B1: B5) Result 24

- **COUNT :** Used to count values as numbers.

  Formula:

=COUNT(value1; value2; ...)

  Suppose = COUNT (2; 4; 6; "eight"). The result shows that the number of numeric values is 3.

- **COUNTA :** Used to count values in numbers and letters (all).

  Formula:

=COUNTA(value1; value2; ...)

  Suppose = COUNTA (2; 4; 6; "eight"). The result shows that the number of numeric and alphanumeric values is 4.

- Example: Find the highest score and the lowest score in the table below:

	B	C	D	E	F	G	H	I
2	អឈ្មោះ	ពិន្ទុកីមា	ប្រវត្តិ	ភូមិ	ពិន្ទុសរុប	មធ្យមភាគ	ពិន្ទុខ្ពស់បំផុត	ពិន្ទុទាបបំផុត
3	ចន្ទ លីដា	៧០ ពិន្ទុ	៥០ ពិន្ទុ	៨០ ពិន្ទុ	២០០ ពិន្ទុ	៦៦,៦៧	=MAX(C3:E3)	=MIN(C3:E3)
4	សេង ដាលី	៨៥ ពិន្ទុ	៩៥ ពិន្ទុ	៥០ ពិន្ទុ	២៣០ ពិន្ទុ	៧៦,៦៧	៩៥ ពិន្ទុ	៥០ ពិន្ទុ
5	ទូច ស្រីនិត	៨៩ ពិន្ទុ	៦៥ ពិន្ទុ	៩១ ពិន្ទុ	២៣៥ ពិន្ទុ	៧៨,៣៣	៨៩ ពិន្ទុ	៦៥ ពិន្ទុ
6	សែន ហុកលី	៧០ ពិន្ទុ	៧៥ ពិន្ទុ	៨៥ ពិន្ទុ	២៣០ ពិន្ទុ	៧៦,៦៧	៨៥ ពិន្ទុ	៧០ ពិន្ទុ

II. NOW, YEARS, MONTHS, DAYS

- **NOW ៖** A formula used to display the current date and time by computer settings.

  Formula

  > =NOW()

  Suppose៖   - This time is June 28, 2022, at 1:39 pm.

  - When you enter = NOW () Result 06/28/22 01:39 PM

- **YEARS ៖** A formula for calculating the years between two dates.

  Formula

  > =YEARS(start date ;end date ;mode)

  ✔ Start date: The first date or before the end date. E.g., 07/12/94

  ✔ End Date: The second date or after the start date. E.g., 06/28/22

  ✔ mode: 0 or 1

  – If number 1: The calculation only takes the end year minus the beginning year. E.g., 2022 - 1994 = 28

  – If set to 0: The calculation is to take the end date and subtract the start date by taking both the day and the month. If a month or a day is missing, it will not be enough. The result will be 27 on the above date.

Suppose: = YEARS ("1994-07-12"; "2022-06-28"; 1) then the result shows 28 = 2022 - 1994

Note៖   -To calculate a formula, you need to know the elements or arguments contained in that formula. What does a formula need to be able to be calculated? So you need to know about this to make it easier to use the formula.

- If you need to remember, you can use the Function Wizard to find the formula you want to know.

- **MONTHS:** A formula calculates the number of months between two dates.

  Formula៖

  > =MONTHS(start date ;end date ;mode)

  Suppose: = MONTHS ("2022-04-28"; "2022-06-28"; 1) then the result shows 2 = 06-04

- **DAYS** ៖ A formula used to calculate the number of days between two dates.

  Formula៖

  > =DAYS(end date ; start date)

  Suppose: = DAYS ("2022-06-28"; "2022-04-28") returns 61 days.

  = DAYS ("2022-03-02"; "2022-06-28"), the result returns -118 days.

Note៖

៖ If end date is placed before the start date, the result will be negative.

Perform the following exercises:

	A	B	C	D	E	F	G
1			បញ្ជីបុគ្គលិកដែលត្រូវបំពេញបេសកកម្ម				
2							
3	លខសម្គាល់	ឈ្មោះ	ថ្ងៃកំណើត	អាយុ	ថ្ងៃចេញដំណើរ	ថ្ងៃត្រូវបញ្ញ	ចំនួនថ្ងៃ
4	០០១ វ.ប	ខេង ពិសិដ្ឋ	15/06/80	២៧ ឆ្នាំ	15/05/05	06/06/05	=DAYS(F4;E4)
5	០០២ វ.ប	ជឹម សុជាតិ	23/07/84	២៣ ឆ្នាំ	16/05/05	20/06/05	៣៥ ថ្ងៃ
6	០០៣ វ.ប	អៀ ចរិយា	06/03/81	២៦ ឆ្នាំ	09/04/05	15/05/05	៣៦ ថ្ងៃ
7	០០៤ វ.ប	ឆេង ប៊ុនថា	06/07/86	២១ ឆ្នាំ	15/05/05	30/05/05	១៥ ថ្ងៃ
8	០០៥ វ.ប	ឥុង ម៉ៅ	07/07/86	២១ ឆ្នាំ	16/05/05	31/05/05	១៥ ថ្ងៃ
9	០០៦ វ.ប	អៀន កាំងឈាង	08/07/86	២១ ឆ្នាំ	17/05/05	15/06/05	២៨ ថ្ងៃ
10	០០៧ វ.ប	សេង ជាលី	09/07/86	២១ ឆ្នាំ	18/05/05	02/06/05	១៥ ថ្ងៃ
11	០០៨ វ.ប	ស្រីណិត	10/07/86	២១ ឆ្នាំ	19/05/05	03/06/05	១៥ ថ្ងៃ
12	០០៩ វ.ប	សាយ ស្រី	11/07/86	២១ ឆ្នាំ	20/05/05	04/06/05	១៥ ថ្ងៃ

III. Reference Cell Address

The reference cell address is a common cell address that is commonly used to calculate

formulas. E.g., in cell B13, enter the operator = B4-B11 (B4 & B11 as reference cell addresses, meaning that it takes a value from the cell address B4 & B11 used in the calculation).

The main problem with arithmetic software is that you need to understand how to use it. *Reference cell address*: It is divided into two types, the **Relative Reference Cell Address,** and the **Absolute Reference Cell Address**.

You already know the cell address and cell range address on a spreadsheet in OpenOffice.org Calc. Now you will learn more about using absolute reference cell addresses.

> **Note:** Reference means taking the cell address that contains the value calculated from the other cells used in the calculation. Therefore, the cell address used in this calculation is the reference cell address.

1. Relative Reference (A1)

Relative Reference is a regular cell address (default cell address) used to calculate formulas in a cell and relates to copying that formula to another cell location where the cell address changes after copying.

For example, when we copy a formula from cell address C1 containing the formula, the sum between cell addresses A1 and B1 (= A1 + B1) is placed in cell C3. You will see that the formula you copied in cell C3 varies according to the location of the same cell, and the copied formula is = A3 + B3.

After you copy the formula from C1 to C3, we see that the output and the address of the copied cell vary according to the cell position as each with the copied formula.

How to create a contact cell address in a formula or operation:

➢ Drag the mouse pointer to click on any cell address you want to make a relative reference.
   Example: Click on cell addresses A1 and B1 (A1 & B1 are relative reference addresses).
   Or,

➢ Enter the name of the reference cell for use in a formula directly via the keyboard. E.g., B3

2. Absolute Reference (E.g., $A$1)

Absolute Reference always provides the same address (invariably) even if we copy a formula that uses this absolute cell address to any cell location. But you need to define a cell address as an absolute reference.

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How to create an absolute reference in a formula or operation:

➢ Select a cell address or a range of reference cells (default) (e.g., A1)

➢ Then press Shift + F4, you will get $A$1

or...

➢ Enter a cell address in the keyboard with a dollar sign ($) in front of the column header name and row name of the address of that cell. E.g., enter $B$1

Example: Calculate a formula in cell C1 using the absolute reference cell address ($A$1 & $B$1) as follows:

➢ Then copy the formula from cell C1 = $A$1 + $B$1 into cell C3

We see that the copied result is unchanged because we bind the above address as absolute addresses ($A$1 & $B$1).

Relative Reference   click *(Shift) + F4*   Absolute Reference

Absolute Reference

Result Absolute Reference
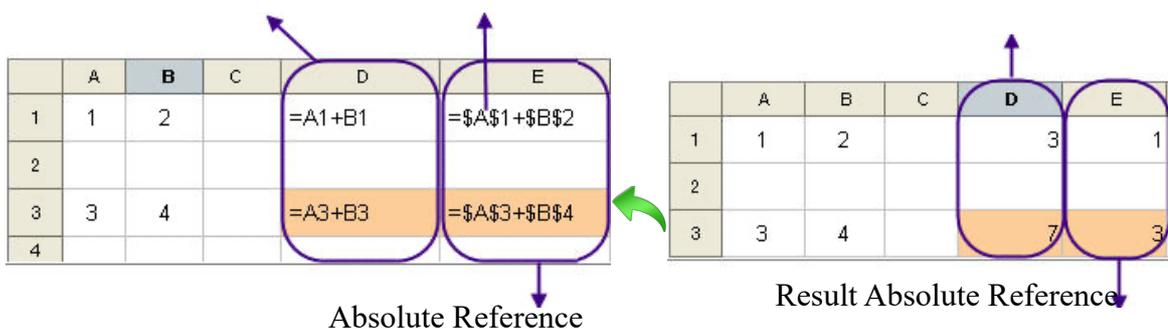
- Copy formula from **D1** to **D3**   ->   **Relative Reference**: changed result by cell
- Copy formula from **E1** to **E3**   ->   **Absolute Reference:** unchanged result (constant)

Relative and Absolute Reference Cell Address:

អាសយដ្ឋានក្រឡាយោង ត្រូវបានផ្លាស់ប្ដូរ ប្រសិនបើ យើងចម្លងវាទៅទីតាំងផ្សេង

វាមិនត្រូវវានផ្លាស់ប្ដូរទេ ទោះបីយើងផ្លាស់ប្ដូរ វាទៅទីតាំងក្រឡាណាមួយក៏ដោយ ។

✔ **Relative Reference Address :** The copied results change.

✔ **Absolute Reference Address :** The copied results do not change.

Perform the following exercises:

	A	B	C	D	E	F	G	
1	អាគារប្តូរប្រាក់សុខសាន្ត							
	អាសយដ្ឋាន ៖ ផ្លូវ ៣៧៤ ផ្ទះ ៖ ១៩ ទូរស័ព្ទ ៖ (០១២) ៩៣៩ ០១៥							

2	អត្រាប្រាក់							
3	បាត/ដុល្លារ	រៀល/ដុល្លារ	រៀល/បាត					
4	៤១,៣៥	៤១៥០	១០០,៣៦					
5								
6	តារាងប្តូរប្រាក់ទី ១				តារាងប្តូរប្រាក់ទី ២			
7	ដុល្លារ	បាត	រៀល		រៀល	ដុល្លារ	បាត	
8	$1.00	41.35 B	៤១៥០,០០		៤១៥០,០០	១,០០	៤១,៣៥	
9	$20.00	827.00 B	៨៣០០០,០០		៨៣០០០,០០	២០,០០	៨២៧,០២	
10	$125.00	5,168.75 B	៥១៨៧៥០,០០		៥១៨៧៥០,០០	១២៥,០០	៥១៦៤,៨៩	
11	$4,550.00	188,142.50 B	១៨៨៨២៦៥០០,០០		១៨៨៨២៦៥០០,០០	៤៥៥០,០០	១៨៨១៩៧,៦៧	

Help:

- In cell B8 enter the formula =A8*$A$4
- In cell C8 enter the formula =A8*$B$4
- In cell F8 enter the formula =E8/$B$4
- In cell G8 enter the formula =E8/$C$4

IV. Formula RANK

RANK: To find a rank, compare the values in the cell range.

Formula:

=RANK(number; data; type)

- Number: The value we want to find in order in the data or list of numbers.
- Data: A data range or list of numbers to be compared.
- Type: This is a number that determines how it is sorted. The number can be 0 or 1.
- 0: Sort big to small. The largest price is ranked No. 1
- 1: Sort small to large. The smallest price is ranked No. 1

Example: Find the value of a value in the range of the average cell:

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	G	H	I	K	L
2	*មធ្យមភាគ*	*ពិន្ទុខ្ពស់បំផុត*	*ពិន្ទុទាបបំផុត*	*ចំណាត់ថ្នាក់*	
3	៦៦,៦៧	=MAX(C3:E3)	=MIN(C3:E3)	=RANK(G3;$G$3:$G$6;0)	
4	៧៦,៦៧	៩៥ ពិន្ទុ	៥០ ពិន្ទុ	២	
5	៧៨,៣៣	៨៨ ពិន្ទុ	៦៥ ពិន្ទុ	១	
6	៧៦,៦៧	៨៥ ពិន្ទុ	៧០ ពិន្ទុ	២	

Summary

- Unicode is a universal encoding scheme for typing and text that defines a consistent, multilingual encoding method that can exchange text data internationally and lay the foundation for universal software.
- To type text using Khmer Unicode, you need to type in the order of spelling, not the order of writing from left to right. And the computer will arrange the letters in the correct order.
- Zero-width space used to separate word.

Questions

1. What is the RANK formula used for? Write a RANK formula.
2. What is the DAYS formula used for? Write a DAYS formula.
3. What is the difference between a relative cell address and an absolute cell address?
4. What is the difference between COUNT and COUNTA formulas?
5. What is the difference between MIN and MAX formulas?

🔎 Exercises

Format the data entry table and do the calculations in the "Total Score", "Average", "Low Score", "High Score", and "Rank" fields. As follows:

- For the Total Score Field: Calculate the sum between the scores of the three subjects.

- For Average Field: Calculate the average between the scores of the three subjects.

- For the Low Score Field: Find the lowest score of each student.

- For the High Score Field: Find the highest score of each student.

- For the Ranking Field: Find the student's ranking according to the order of the average they get in order from small to large.

	A	B	C	D	E	F	G	H	I	J
1			តារាងពិន្ទុសិស្ស							
			ប្រចាំខែ មករា ២០០៧							
2	ល.រ	ឈ្មោះ	មុខវិជ្ជាសិក្សា			ពិន្ទុទាប	ពិន្ទុខ្ពស់	ពិន្ទុសរុប	មធ្យមភាគ	ចំណាត់ថ្នាក់
3			ភាសាខ្មែរ	គណិតវិទ្យា	រូបវិទ្យា					
4	០០១	សែង សំសីហា	៤៨ ពិន្ទុ	៣៥ ពិន្ទុ	៥៤ ពិន្ទុ	៣៥	៥៤	១៣៧	៤៣,០០	ធ្លាក់
5	០០២	ស្យៀន គីមសៀន	៦៥ ពិន្ទុ	៥៤ ពិន្ទុ	៥២ ពិន្ទុ	៥២	៦៥	១៧១	៥៥,៧៥	ជាប់
6	០០៣	តាំង ណាត្រី	៨៥ ពិន្ទុ	៥២ ពិន្ទុ	៣៥ ពិន្ទុ	៣៥	៨៥	១៧២	៥១,៧៥	ជាប់
7	០០៤	មាស សុមីណា	៥៥ ពិន្ទុ	២៧ ពិន្ទុ	៨៥ ពិន្ទុ	២៧	៨៥	១៦៦	៤៨,២៥	ធ្លាក់
8	០០៥	ជា សីលា	៥៣ ពិន្ទុ	៦៨ ពិន្ទុ	៦៥ ពិន្ទុ	៥៣	៦៨	១៨៦	៥៩,៧៥	ជាប់
9	០០៦	ជិន ណារ័ន	៦៥ ពិន្ទុ	៥៤ ពិន្ទុ	៥៧ ពិន្ទុ	៥៧	៦៥	១៩១	៥៩,៥០	ជាប់
10	០០៧	ឡាយ ស៊ីយ៉ូង	៤៥ ពិន្ទុ	៤៥ ពិន្ទុ	៤៥ ពិន្ទុ	៤៥	៤៥	១៩៥	៥៧,៥០	ជាប់
11	០០៨	ម៉ក ស៊ីនសុធារី	៧៥ ពិន្ទុ	៣៥ ពិន្ទុ	៥៣ ពិន្ទុ	៣៥	៧៥	១៦៣	៤៤,៥០	ធ្លាក់
12	០០៩	ពៅ សុខយ៉ាង	៥៥ ពិន្ទុ	៥០ ពិន្ទុ	៣៥ ពិន្ទុ	៣៥	៥៥	១៣៤	៤៣,៥០	ធ្លាក់
13	០១០	ជា សុគ័ន្ត	៥០ ពិន្ទុ	៤៥ ពិន្ទុ	៥៤ ពិន្ទុ	៤៥	៥០	១៨៨	៥៤,៥០	ជាប់
14	០១១	ស៊ុន សុគ័ន្តក្រត្រា	៣៨ ពិន្ទុ	៥០ ពិន្ទុ	៥២ ពិន្ទុ	៣៨	៥២	១៣៦	៤២,៥០	ធ្លាក់
15						ភ្នំពេញ, ថ្ងៃទី.........ខែ.........ឆ្នាំ ២០០៧				
16						ហត្ថលេខាគ្រូបន្ទុកថ្នាក់				

Lesson 13

Function

Objective:

- ✓ Define formulas related to combining text (CONCATENATE)
- ✓ Define formulas for finding the remainder of a division operation (MOD)
- ✓ Define rounding formulas (INT) and other formulas that have conditions in the formula
- ✓ Define logical function

In this lesson you will learn more about the following formulas:

I.   Combining Text (CONCATENATE)

II.   INT and MOD

III. COUNTIF

IV.   IF

Lesson 13 Function

I. Formula Related to Combining Text (CONCATENATE)

- **CONCATENATE:** This is the function for combining multiple text elements into one.

    Syntax:

    =CONCATENATE (text1; text2; ...)

    Or

    =text1 & text & …

   Suppose you want to combine text elements in cells A3 (ខែង) and B3 (ពិសិដ្ឋ) put into cell C3. What should you do? In the cell C3, you should write the formula =CONCATENATE(A3;"-"; B3), then the result will be shown ខែង-ពិសិដ្ឋ, or you can write another way =A3&"-"&B3.

II. INT and MOD Function

INT: This is a function for rounding the value of a decimal number to an integer.

    Syntax:

    =INT(Number)

- If **number**: As a positive decimal, the number will be rounded to an integer.

- If **number**: As a negative number, complete the integer and complete 1 if the last digit is greater than 5.

    Example   =INT (5,8) Result: 5

    =INT (-5,8) Result: -6

    =INT (5/2) the result is shown 2 because 5/2=2.5

- **MOD:** for calculating to find the remainder of a division operation.

    Syntax:

    =MOD(division representative(operands); divisor)

   Example 1: =MOD(5;2) the result is shown as 1 because 5/2 = 2 and will show the remainder is 1.

Example 2: Calculate on cell E3 "in dollars" និង on cell F3 "Remaining Riel"

Rounding the number of fields in "in dollars".

	A	B	C	D	E	F
1						$1=4000 KHR
2	*គោត្តនាម*	*នាមខ្លួន*	*ឈ្មោះពេញ*	*ប្រាក់ខ្ចីបុត្ថម*	*គិតជាដុល្លារ*	*លុយរៀលនៅសល់*
3	ខេង	ពិសិដ្ឋ	ខេង-ពិសិដ្ឋ	10.000៛	=INT(D3/$F$1)	=MOD(D3;$F$1)
4	ឆេង	ប៊ុនថា	ឆេង-ប៊ុនថា	15.000៛	$3.00	3.000៛
5	សេង	ជាលី	សេង-ជាលី	12.000៛	$3.00	0៛
6	ឆុង	ម៉ៅ	ឆុង-ម៉ៅ	5.000៛	$1.00	1.000៛

III. COUNTIF Function

COUNTIF ៖ This formula is used for counterarguments that match a given condition.

Formula:

=COUNTIF(range; criteria)

- **Range:** A range of cells containing data to be counted.

- **Criteria:** A condition to be searched to count in a cell range.

Example: To calculate the value in the table in the cell F4, you should write formulas as below:

	A	B	C	D	E	F	G
1							
2	លរ	ឈ្មោះ	ភេទ				
3	០០១	កាំងលាង	ប្រុស		ភេទ	រាប់	ភាគរយ
4	០០២	ស្រីនិត	ស្រី		ស្រី	៣ នាក់	៣៧,៥០%
5	០០៣	ប៊ុនថា	ប្រុស		ប្រុស	៥ នាក់	៦២,៥០%
6	០០៤	សុជាតិ	ប្រុស		សរុប	៨ នាក់	១០០,០០%
7	០០៥	ជាលី	ស្រី				
8	០០៦	ចវិយា	ប្រុស				
9	០០៧	ឆុងម៉ៅ	ប្រុស				
10	០០៨	ពៅគង	ស្រី				

=COUNTIF($C$3:$C$10;E4)

or=COUNTIF($C$3:$C$10;"ស្រី")

on cell F5, write formulas as:

=COUNTIF($C$3:$C$10;E5)

or =COUNTIF($C$3:$C$10;"ប្រុស")

With conditions, you can use symbols = (equal to) > (greater than) >= (greater than or equal to) <= (less than or equal to) < (less to) <> (not equal to). **Ex.** =COUNTIF(A3:A10;"<=5")

III. IF Function

IF: Used to discuss or test any logical value. If the test is "true" it will throw a "consistent value" but if the test is "false" it will throw an "opposite value".

Syntax:

=IF(logical_test; [value_if_true];

[value_if_false])

✔   **Using Nested Ifs:**

=IF(logical_test; [value_if_true]; IF(logical_test;

[value_if_true]; ...;

[value_if_false])

- **logical_test:** Any value or expression that may be true or false.

- **value_if_true**: This is the value displayed when the test is true.

- **value_if_false:** The value to be displayed when the test is false.

Example 1: Try adding the following formula ៖

=IF(2<5;"value is true";"value is false") the result is shown **"value is true"**

=IF(2<5;"value is false";"value is true") the result is shown **"value is false"**

=IF(5<>2+3;1;0) the result is shown **0**

=IF(5=2+3;1;0) the result is shown **1**

Example 2: Calculate on the cell through the following condition ៖

Pass/Fail: On cell G5 =IF(G3<50;"Fail";"Pass")

- **Rank ៖** On cell **H5** =RANK(G3;$G$3:$G$6)

- **Mention I5 ៖**

=IF(G3<50;"F";IF(G3<65;"E";IF(G3<75;"D";IF(G3<85;"C";IF(G3<95;"B";"A")))))

With conditions for **Mention** below**:**

if the average < 50, Mention: "F"

if the average < 65, Mention: "E"

if the average < 75, Mention: "D"

- if average < 85, Mention: "C"

if the average < 95, Mention: "B"

Opposite to above the conditions is mentioned "A"

| | IF | | ▼ | $f(x)$ ❌ ✔ | =IF(G3<50;"ធ្លាក់";"ជាប់") | | | | | |

	A	B	C	D	E	F	G	H	I	J
2	លេខរៀង	ឈ្មោះ	គណិតវិទ្យា	រូបវិទ្យា	គីមីវិទ្យា	ពិន្ទុសរុប	មធ្យមភាគ	ជាប់ ធ្លាក់	ចំណាត់ថ្នាក់	និទ្ទេស
3	០១	ចន្ទ លីដា	៧០ ពិន្ទុ	៥០ ពិន្ទុ	៨០ ពិន្ទុ	២០០ ពិន្ទុ	៦៦,៦៧	=IF(G3<50;"ធ្លាក់";"ជាប់")		D
4	០២	សេង ដាលី	៨៥ ពិន្ទុ	៩៥ ពិន្ទុ	៥០ ពិន្ទុ	២៣០ ពិន្ទុ	៧៦,៦៧	ជាប់	២	C
5	០៣	ទូច ស្រីនិត	៨៩ ពិន្ទុ	៦៥ ពិន្ទុ	៨១ ពិន្ទុ	២៣៥ ពិន្ទុ	៧៨,៣៣	ជាប់	១	C
6	០៤	សែន ហុកលី	៧០ ពិន្ទុ	៧៥ ពិន្ទុ	៨៥ ពិន្ទុ	២៣០ ពិន្ទុ	៧៦,៦៧	ជាប់	២	C
7										

📖 Summary

- CONCATENATE: This is the function for combining multiple text elements into one. Syntax: =CONCATENATE (text1; text2; ...)
- INT: This is a function for rounding the value of a decimal number to an integer. Syntax: =INT(Number)
- IF: Used to discuss or test any logical value. If the test is "true" it will throw a "consistent value" but if the test is "false" it will throw an "opposite value". Syntax: =IF(logical_test; [value_if_true]; [value_if_false])

Questions

1. What is the COUNTIF() formula used for? What does this formula look like?
2. What is the formula IF() used for? What does this formula look like?
3. What is the MOD() formula used for? What does this formula look like?
4. What is the formula CONCATENATE() used for? What does this formula look like?
5. What is the INT() formula used for? What does this formula look like?
6. What is the COUNTIF() and IF() formula used for? What does this formula look like?

💡 Exercises

Please create a table by entering data and calculating in the columns "Full name", "Age", "Each type of dollar bill ($)" and "Pay 5% tax" and calculate the "Number of male employees", "Number of female employees", "Maximum of salary employee", and "Minimum of salary employee".

	A	B	C	D	E	F	G	H	ចំនួនក្រដាសប្រាក់($)						O
									១០០	៥០	២០	១០	៥	១	
1				បញ្ជីប្រាក់ខែរៀងរាល់បុគ្គលិក											
2															
3	ល.រ	គោត្តនាម	នាម	គោត្តនាម និង នាម	ភេទ	ថ្ងៃខែឆ្នាំកំណើត	អាយុ	ប្រាក់ខែរៀងស្រួ							ចំណូត ៥%
4									១០០	៥០	២០	១០	៥	១	
5	០០១	ជិម	សុជាតិ	ជិម សុជាតិ	ប	15. មិនា 1983	24	$ ២៥២,០០	២	១	០	០	១	១	$ ១២,៦០
6	០០២	អៀ	ចាំយា	អៀ ចាំយា	ប	2. មករា 1982	25	$ ២៣០,០០	២	០	១	១	០	០	$ ១១,៥០
7	០០៣	ផុង	មៅ	ផុង មៅ	ប	7. កុម្ភ: 1983	24	$ ១៨៤,០០	១	១	១	១	០	៤	$ ៩,២០
8	០០៤	នេង	ប៊ុនថា	នេង ប៊ុនថា	ប	9. សីហា 1983	24	$ ១៨៥,០០	១	១	១	១	១	០	$ ៩,២៥
9	០០៥	អៀន	កាំងឡាង	អៀន កាំងឡាង	ប	25. កញ្ញា 1979	28	$ ១៨៣,០០	១	១	១	១	០	៣	$ ៩,១៥
10	០០៦	សុង	គីមស្រៀន	សុង គីមស្រៀន	ស	10. ឧសភា 1984	23	$ ២៣០,០០	២	០	១	១	០	០	$ ១១,៥០
11	០០៧	ប៉	ច័ន្ទា	ប៉ ច័ន្ទា	ស	12. ធ្នូ 1982	25	$ ១៨២,០០	១	១	១	១	០	២	$ ៩,១០
12	០០៨	សាយ	ស្រី	សាយ ស្រី	ស	29. មិនា 1983	24	$ ២៥៤,០០	២	០	២	០	១	០	$ ១២,៦៥
13	០០៩	លាក	សុខបាន	លាក សុខបាន	ប	2. កុម្ភ: 1980	27	$ ២៥៤,០០	២	០	២	០	១	០	$ ១២,៦៥
14	០១០	សម្បត្តិ	ខ្សាន:	សម្បត្តិ ខ្សាន:	ស	5. ឧសភា 1981	26	$ ២៥៧,០០	២	០	២	០	១	២	$ ១២,៣៥
15	០១១	ខេង	ពិសិដ្ឋ	ខេង ពិសិដ្ឋ	ប	15. ធ្នូ 1983	24	$ ៥៥០,០០	៤	១	០	០	០	០	$ ២៧,៥០
16							សរុប :	$ ២.៧៣៧,០០	២១	៥	១២	៦	៤	១២	$ ១៣៦,៨៥
17															
18	ចំនួនបុគ្គលិកភេទប្រុស		៧ នាក់	រៀបស្បូរច្រើនបំផុត			$ ៥៥០,០០								
19	ចំនួនបុគ្គលិកភេទស្រី		៤ នាក់	រៀបស្បូរតិចបំផុត			$ ១៨២,០០								

Lesson 14

Absolute Row and Column Cell Address

Objectives:

- ✓ Define the function NETWORKDAYS

- ✓ Define the function Wizards

- ✓ Define the function SUMIF

- ✓ Define the function Absolute addressing of row and column

- ✓ Define the function HOUR MINUTE SECOND

In this lesson you will learn about:

I.   NETWORKDAYS Function

II.   Function Wizard

III.   SUMIF

IV.   Absolute Address

Lesson 14 Absolute Row and Column Cell Address

I. NETWORKDAYS

NETWORKDAYS: A formula used to calculate the number of working days between two dates, excluding weekends (Saturday and Sundays) and the holidays you have set.

> **Syntax:**

> =NETWORKDAYS(**startdate; enddate; holidays**)

- **Start date:** A date that represents the start date
- **End date:** A date that represents the end date.
- **Holidays:** An optional range of one or more dates to exclude from the working calendar, such as state and federal holidays and floating holidays

Example: Find the number of working days of employees in the following table

➢ Enter Cell F2 = NETWORKDAYS(C2;D2;$A$2:$A$7)

➢ Then you will see the result is 19 (without thinking of holidays and weekends)

	A	B	C	D	E	F
1	ថ្ងៃឈប់សម្រាក		លេខសម្គាល់បុគ្គលិក	ថ្ងៃចាប់ផ្ដើម	ថ្ងៃបញ្ចប់	ចំនួនថ្ងៃធ្វើការ
2	1. ឧសភា 2007		KOS001	1. ឧសភា 2007	31. ឧសភា 2007	19
3	3. ឧសភា 2007		KOS002	2. ឧសភា 2007	20. ឧសភា 2007	10
4	5. ឧសភា 2007		KOS003	8. ឧសភា 2007	17. ឧសភា 2007	6
5	13. ឧសភា 2007		KOS004	2. ឧសភា 2007	10. ឧសភា 2007	6
6	14. ឧសភា 2007					
7	15. ឧសភា 2007					

II. Function Wizards

In OpenOffice Calc, you can use the Function Wizard to help you write formulas in a cell. It's easy if you forget the arguments or elements to use in the formula.

How to apply the calculate NETWORKDAYS formulas using the Function Wizard:

> Example: Use the Function Wizard to calculate the number of employees' working days in the table below

➢ Enter the cell cursor in the cell where you want to display the result:

	A	B	C	D	E	F
1	ថ្ងៃឈប់សម្រាក		លេខសម្គាល់បុគ្គលិក	ថ្ងៃចាប់ផ្ដើម	ថ្ងៃបញ្ចប់	ចំនួនថ្ងៃធ្វើការ
2	1. ឧសភា 2007		KOS001	1. ឧសភា 2007	31. ឧសភា 2007	19
3	3. ឧសភា 2007		KOS002	2. ឧសភា 2007	20. ឧសភា 2007	10
4	5. ឧសភា 2007		KOS003	8. ឧសភា 2007	17. ឧសភា 2007	6
5	13. ឧសភា 2007		KOS004	2. ឧសភា 2007	10. ឧសភា 2007	6
6	14. ឧសភា 2007					
7	15. ឧសភា 2007					

➢ Click the Function Wizard icon *f(x)* on the Formula Bar. You will then see a Function Wizard dialog appear as follows:
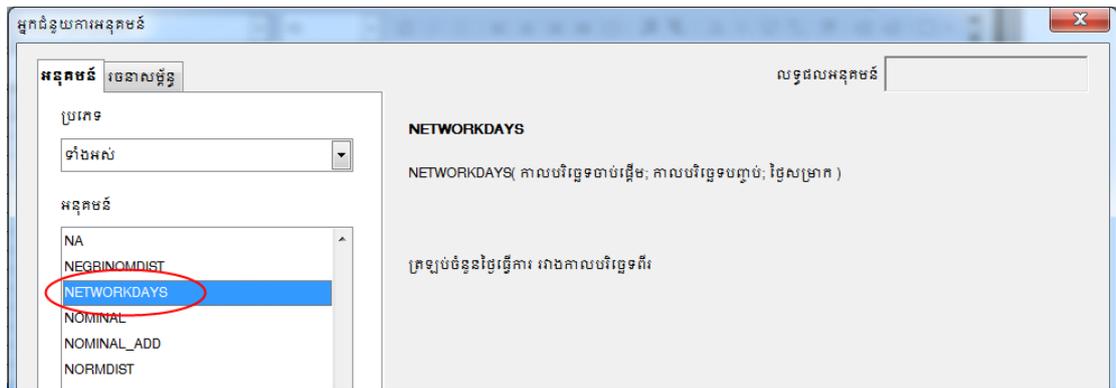
> ➤ Find the NETWORKDAYS formula in the Functions dialog and select this formula
> ➤ Click the Next button, then the following screen will appear:
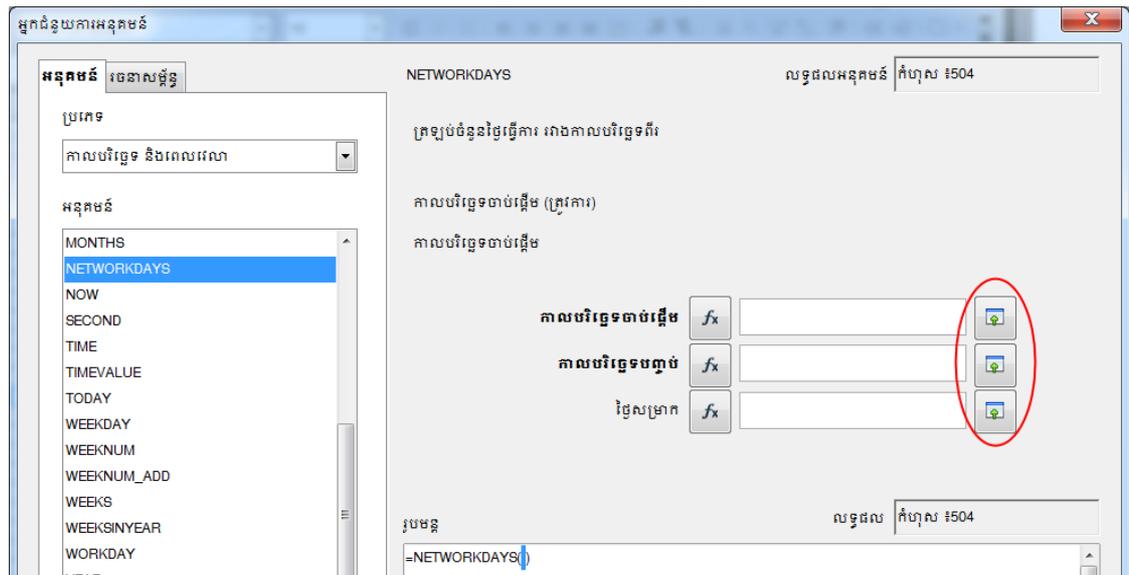
> ➤ Click the Shrink button at the start date to select the cells you want to calculate. E.g. C2

> ➤ Press Max button to return to the original position after you select cell C2
> ➤ The same applies to end dates (D2) and holidays (select cell range A2: A7)

> ➤ After the selection is complete, click the OK button to display the results.
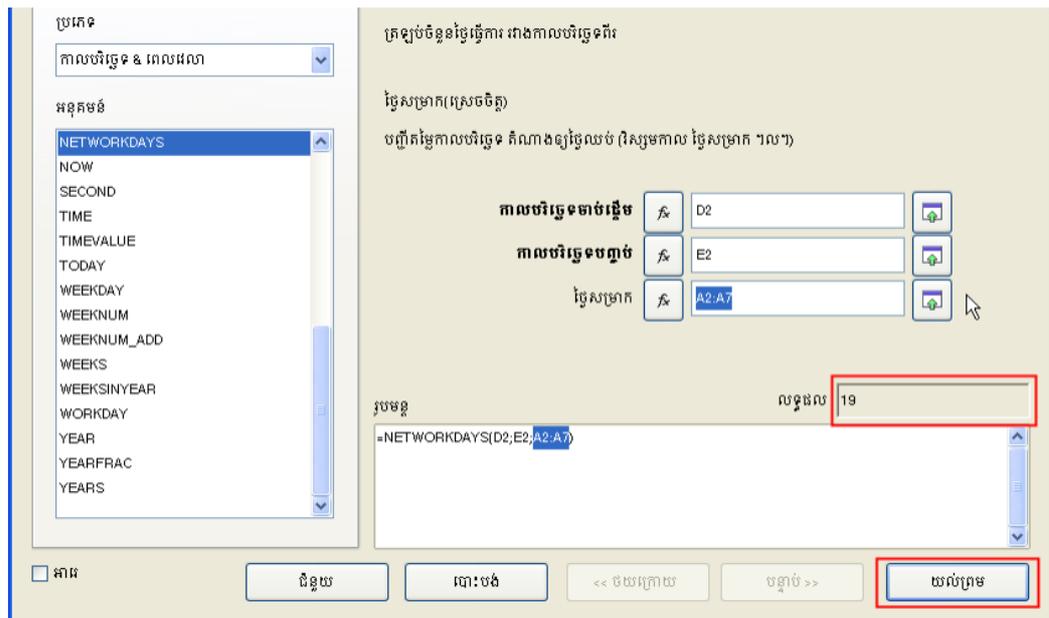
III. SUMIF

SUMIF: A formula used to calculate the sum of values corresponding to a given condition.

Syntax:

> **= SUMIF (range; criteria; range_sum)**

- **Range:** is the value range that contains the criteria in it

- **Criteria:** is the value to be given by the search criteria for calculating the sum.

- **Range_Sum:** a value range that contains the values to be used to calculate the sum according to the criteria.

For example, you have the following employee list data table. Calculate the sum of the salaries of employees over 30 and under 30.

IV. Absolute Addressing

You already learned in the previous lesson about the absolute cell address, which is a type of cell address that does not change. Copy or drag to another cell address (sentence fragment). You can bind a cell address as an absolute cell address using the shortcut keys **Shift + F4** after you Select a cell or cell range.

Absolute cell addresses are divided into two types: rows absolute cell addresses, and columns absolute cell addresses.

1. Row Absolute Cell Address (A1)

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The row absolute cell address (A1) means that column A is variable, row 1 is constant (unchanged).

Example 1: Summarize the values 4, 7 and 6 using the formula = SUM (A $ 1; C1; A2) in cell D1. In this formula, you observe that the cell address A $ 1 is lined up as an absolute address.

Copying the formula from D1 to D3, we see that the result cell copied to change because we bind the absolute value only row 1 in cell address A1, so when copying to row 1, the values remain the same, while column A varies from place to place. With the copied formula, A2 and C1 change and move corresponding to the position of cells A4 (empty) and C3 (empty).

Therefore, the result of our replication is 4 (the value removed from cell A1 bound to the fixed row A $ 1).

Example 2: Calculate the total sum in cell D1 by taking the values in cells A1, B1 and C1 by binding the absolute reference address to row 1 of both cells. Three A $ 1 B $ 1 and C $ 1.

Select A1 when pressing Shift + F4 once to get $ A $ 1. Press again to get A $ 1. Click $ A1 again. Press A1 again.

Example 3: Summarize the values of cells A1, B1 and C1 by tying the absolute addresses, rows of cells A $ 1, B $ 1 and C $ 1 in the formula = SUM (A $ 1: C $ 1) in cell D1

Copy formula from cell D1 to cell D3

Copy formula cell E3

2. Column Absolute Cell Address (eg $ A1)

The column absolute address ($ A1) means that column A is constant (unchanged) and row 1 is variable.

Example 1: Apply a sum formula using an absolute reference cell address column.

➢ In cell B4, enter the formula = SUM ($ B1: $ B3)

➢ Copy formula from cell B4 to cell D5
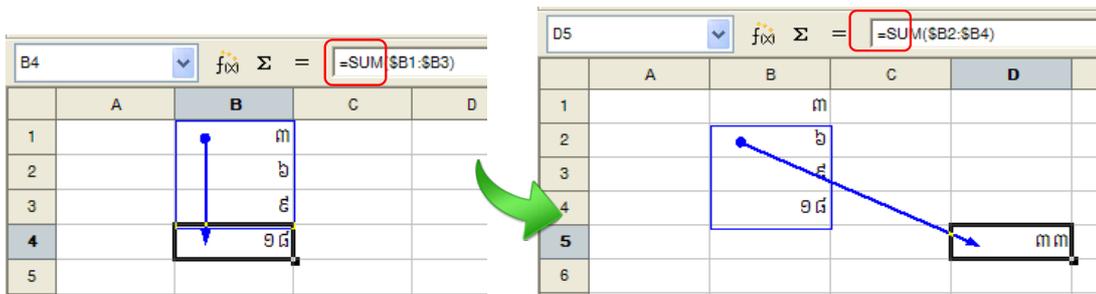
The formula only changes the row = SUM ($ B2: $ B4), so the result of your copy is 33.

Example 2: Summarize the values of cells B1, B2 and B3 by tying the absolute addresses of the columns of cells $ B1, $ B2 and $ B3 according to the formula = SUM ($ B1: $ B3) in cell B4
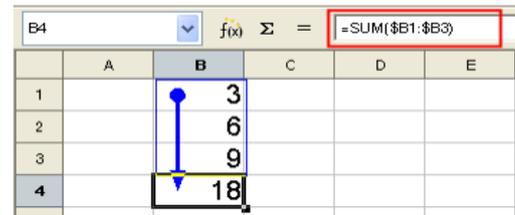
Copy Formula from Cell B4 to C4   •   **Copy Formula to Cell D5**
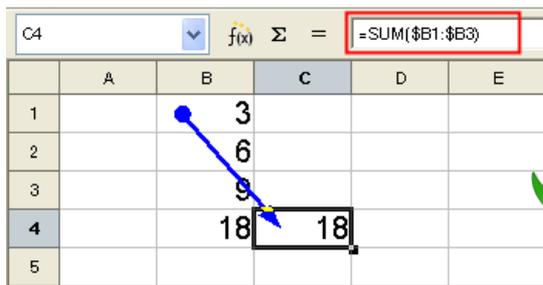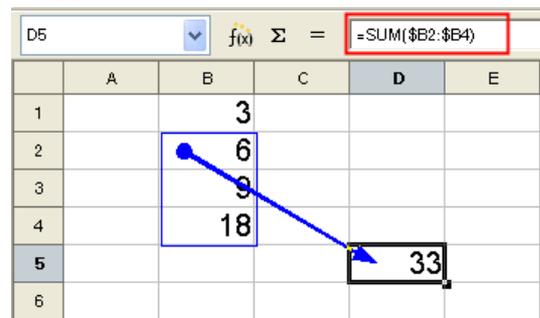
Practice the following exercises:

Calculate the following table according to the SUMIF () formula using the absolute cell address, the row and the absolute column address.

	A	B	C	D	E	F	G	H
1	ទំនិញនាំចូលប្រចាំសប្តាហ៍ក្នុងរយៈពេលមួយឆ្នាំ							
2								
3	*លេខសម្គាល់*	*ឈ្មោះទំនិញ*	*ខែ*	*សប្តាហ៍ទី១*	*សប្តាហ៍ទី២*	*សប្តាហ៍ទី៣*	*សប្តាហ៍ទី៤*	*សរុប*
4	*C0-0001*	សៀវភៅ	មករា	១៥ កេះ	១0 កេះ	១៥ កេះ	២0 កេះ	៦0 កេះ
5	*C0-0002*	ប៊ិក	កុម្ភៈ	២0 កេះ	១0 កេះ	១0 កេះ	១៥ កេះ	៤៥ កេះ
6	*C0-0001*	សៀវភៅ	មិនា	១0 កេះ	១0 កេះ	១៥ កេះ	៥0 កេះ	៨៥ កេះ
7	*C0-0003*	ខ្មៅដៃ	មេសា	២0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១00 កេះ
8	*C0-0002*	ប៊ិក	ឧសភា	២0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១00 កេះ
9	*C0-0001*	សៀវភៅ	មិថុនា	២៥ កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១0៥ កេះ
10	*C0-0001*	សៀវភៅ	កក្កដា	២0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១00 កេះ
11	*C0-0003*	ខ្មៅដៃ	សីហា	២0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១00 កេះ
12	*C0-0002*	ប៊ិក	កញ្ញា	១៥ កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	៩៥ កេះ
13	*C0-0001*	សៀវភៅ	តុលា	១៥ កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	៩៥ កេះ
14	*C0-0001*	សៀវភៅ	វិច្ឆិកា	១0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	៨0 កេះ
15	*C0-0003*	ខ្មៅដៃ	ធ្នូ	៥0 កេះ	១0 កេះ	២0 កេះ	៥0 កេះ	១៣0 កេះ
16							*សរុប*	៩.១១៥,00 កេ
17		=SUMIF($B$4:$B$15;$B21;D$4:D$15)					*តម្លៃធ្លាប់ផុត*	៩៥,00 កេ
18							*តម្លៃយ៉ឺផុត*	១៣0,00 កេ
19								
20	*លេខសម្គាល់*	*ឈ្មោះទំនិញ*	*...ហ៍ទី១*	*សប្តាហ៍ទី២*	*សប្តាហ៍ទី៣*	*សប្តាហ៍ទី៤*	*សរុប*	
21	*C0-0001*	សៀវភៅ	៩៥ កេះ	៦0 កេះ	៩១0 កេះ	២៧0 កេះ	៤៣៥ កេះ	
22	*C0-0002*	ប៊ិក	៥៥ កេះ	៣0 កេះ	៥0 កេះ	១១៥ កេះ	២៥0 កេះ	
23	*C0-0003*	ខ្មៅដៃ	៩0 កេះ	៣0 កេះ	៦0 កេះ	១៥0 កេះ	៣៣0 កេះ	

Figure 18.4   Weekly import list exercise

➢ Enter this formula = **SUMIF ($ B $ 4: $ B $ 15: $ B21; D $ 4: D $ 15) in cell C21**

➢ Hold down the mouse pointer, hold down the mouse, drag to the right cell, and drag down to display the result.

Therefore, to calculate the above exercise using absolute addresses, rows and columns is faster. Once calculated, you can drag or copy this formula to other cells to be calculated.

V. Hour, Minute and Second

HOUR: A formula used to display the numerical value of an hour of time.

> **Syntax:**
> | =HOUR(Time) |
> |---|

- Time: The value of a time you entered. E.g. 10:35:05

Example: = HOUR(NOW ()) returns the current time.
        = HOUR(C2) returns 10 o'clock if C2 = 10:35:05

MINUTE: A formula used to display the numeric value of a minute of a time.

> **Syntax:**
> | =MINUTE((Time) |
> |---|

Example: = MINUTE(NOW ()) returns the current minute
        = MINUTE(C2) returns 35 minutes if C2 = 10:35:0

SECOND: A formula used to display the numeric value of a minute of a time

> **Syntax**

> | =SECOND(Time) |
> | --- |

Example: = SECOND(NOW ()) returns the current minute

= SECOND(C2) returns 05 minutes if C2 = 10:35:05

Practice the following exercises:

For example, you have an online store with four machines for internet service based on the hours and minutes that customers use. In the table below, just enter "start time" and "end time", then the usage time and total value will be displayed automatically.

	A	B	C	D	E
1	ក្លិនធ័ណិតការហ្គ ១២៣				១ ម៉ោង = ២៥០០ ៛
2	លេខម៉ាស៊ីន	ម៉ោងចាប់ផ្ដើម	ម៉ោងបញ្ចប់	ម៉ោងប្រើប្រាស់	តម្លៃសរុប
3	០១	08:25 ព្រឹក	10:05 ព្រឹក	01:40	
4	០២	07:50 ព្រឹក	08:15 ព្រឹក	00:25	
5	០៣	01:45 ល្ងាច	02:00 ល្ងាច	00:15	
6	០៤	01:25 ល្ងាច	01:35 ល្ងាច	00:10	

📖 Summary

- NETWORKDAYS: A formula used to calculate the number of working days between two dates, excluding weekends (Saturdays and Sundays) and the holidays you have set.
  Syntax: =NETWORKDAYS(startdate; enddate; holidays)
- SUMIF: A formula used to calculate the sum of values corresponding to a given condition.
  Syntax: = SUMIF (range; criteria; range_sum)
- Absolute cell addresses are divided into two types: rows absolute cell addresses, and columns absolute cell addresses.
  - The row absolute cell address (A1) means that column A is variable, row 1 is constant (unchanged).
  - The column absolute address ($ A1) means that column A is constant (unchanged) and row 1 is variable.

Questions

1. What formula is used to calculate the number of working days? Write the formula correctly and give examples.

2. What are the benefits of using the Function Wizard?

3. What is the SUMIF formula used for? Write the SUMIF formula correctly.

4. What is the HOUR formula used for? Write the HOUR formula correctly.

5. What are the types of absolute cell addresses? Explain how we bind the absolute cell address.

🔍 Exercises

Make a budget for the TV sales business in the following format:

Discuss with your group:

Prepare a budget based on the business model of selling TVs below and calculate the profit after this 4-month period. Save this budget plan in your folder under the name "TV Sales Plan"

	A	B	C	D	E	F	G	H	I
1									
2				ចំរិកាសម្រាប់ជំនួញក្នុងការលក់ទូរទស្សន៍					
3									
4			កាលបរិច្ឆេទ ៖	ថ្ងៃសៅរ៍ ទី ១១ ខែ សីហាឆ្នាំ ២០១២		តម្លៃ៖		ទិញ	$100
5								លក់	$180
6									
7					ចាប់ផ្ដើម	ខែទី ១	ខែទី ២	ខែទី ៣	ខែទី ៤
8		ចំណូល							
9			លក់						
10				ចំនួនលក់		30	40	40	10
11				តម្លៃលក់		$5,400	$7,200	$7,200	$18,000
12				សរុបចំណូល		$5,400	$7,200	$7,200	$18,000
13									
14		ចំណាយ							
15			ចំណាយប្រចាំទូទៅ						
16				ផ្លូវហាង		$400	$400	$400	$400
17				ប្រាក់ខែបុគ្គលិក		$1,300	$1,300	$1,300	$1,300
18				ថ្លៃទឹក និងអគ្គិសនី		$230	$230	$230	$230
19				សម្ភារប្រើប្រាស់		$23	$23	$23	$23
20				ផ្សេងៗ		$50	$50	$50	$50
21				សរុបចំណាយប្រចាំទូទៅ		$2,003	$2,003	$2,003	$2,003
22			ទិញទំនិញស្តុកទុក						
23				ចំនួន		60	70	60	20
24				តម្លៃទិញ		$6,000	$7,000	$6,000	$2,000
25				សរុបចំណាយ		$8,003	$9,003	$8,003	$4,003
26									
34									
35								ចំណេញ ៖	?

Lesson 15

Data Management and Printing

Objectives:

- ✓ Sorting Data
- ✓ Data Filter (AutoFilter and StandardFilter)
- ✓ Printing

In this lesson you will learn about the following:

I. Sort Data
II. Data Filter
III. Auto Fill
IV. Headers and Footers
V. Printing

Lesson 15 Data Management and Printing

I. Sort Data

Suppose you have a data table like the one on the right. In this table, the data you entered is not in the Khmer language alphabetical order. Therefore, you can sort these data in alphabetical order by following these steps:

Example: Sorts "Last Name" fields in ascending order (A → Z)

How to Apply:

➢ Enter the cursor in the sorted data table

➢ Choose **Data menu -> Sort**

Then you see a sort box appear, as shown below:

➢ Select the **Sort Condition** tab

➢ In the Sort by box, select the **Name** field

➢ Choose option **Ascending**

➢ Click OK Button

You get the following results:
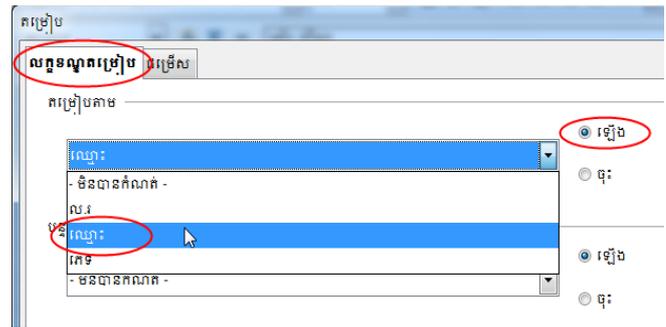
Note: If the Sort by list does not display the selected table's field names, it shows columns 1 and 2 ... then you Select the **Options** tab - Check **Range Contains column labels**.

Copy the Sort Result to Another Cell:

In general, sorting data in a table will apply the result of sorting in this table directly. The dots will teach you how to copy the sorting results to a different cell location.

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How to Apply:

➢ Choose **Data menu -> Sort**

Then you see a sort box appear, as shown below

➢ Select the Options tab
➢ Check the **Copy results sorted to**
➢ Enter the cell address for which you want to copy the result. Example: A20 is the starting cell address of the result table
➢ Click **OK** button
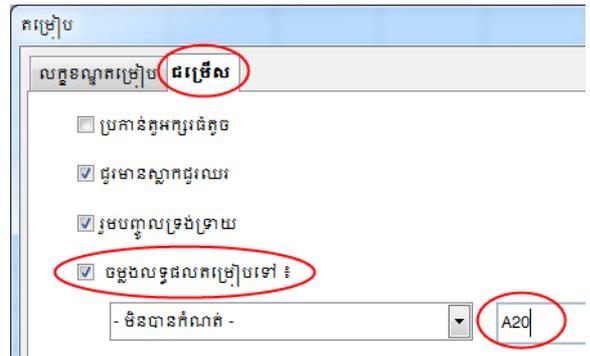
II. AutoFilter

Automatic filtering is used to filter only the records of any data you want. For example, in the data table above, you want to filter only those who are male (M).

How to Apply:

➢ Enter the cursor in the table where you want to auto-filter
➢ Choose **Data menu -> Filter -> Auto filter**
➢ Then you will see the down arrow in every column header of the data table. You can click on this arrow to see the data types in this column.
➢ Drag the mouse and click on the down arrow of the "**Sex**" field, then Select "**M**" (represents male)

The results will show all males as follows:

រូបភាព ១៩.៤ ៖ ការធ្វើតម្រងទិន្នន័យ

For any filtered field, the down arrow appears in blue. To show all records again, click the down arrow and select - All -

Remove AutoFilter:

Once you have filtered the table, only the data you have displayed is displayed. To automatically remove the filter to restore the data to the original, please follow the steps below:

➢ Inserts a cursor into a table that you have automated as filtered
➢ Select the menu **Data -> Filters -> Uncheck** the box next to **AutoFilter.** Then your table returns to its original state.

III. Standard Filter

Standard filters are the same as automatic filters. Still, standard filters allow you to define criteria through a maximum of three fields in Data tables using the AND or OR link, and filtered data can be copied to another cell location.

Example: From the table above, extract data with a letter greater than 5 and gender **M** (male).

How to Apply to Filter Data According to the Above Conditions:

➢ Insert the cursor in the table where you want to make a standard filter

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> ➢ Choose **Data menu -> Filter -> Standard filter.** A standard filter dialog box appears as shown:

> ➢ In the **Field name** box, click the down arrow, then select the **ID** (numbering)
> ➢ In the **Condition** box, click the down arrow, then select Condition> = (greater than or equal to)
> ➢ In the **Value** box, click the down arrow, then select 5
> ➢ In the box below the operator, click the down arrow, then select the AND operator (take only the records that meet the conditions. Both of the above means that unless all conditions are true, it will only take the existing record). A number greater than 5 and male. It will mean that it is filtered. Seals those numbered greater than 5 and all males (M).
> ➢ In the box under **Name**, next row **Field**, click the down arrow, then select gender
> ➢ In the **Conditions** box, click the down arrow, then select the equal sign (=)
> ➢ In the **Value** box, click the down arrow, then select the letter

If you want to copy the result to another cell location:
> ➢ Click button **More**
>> ✔ Click **Copy Result to...**
>> ✔ In the box below the box **Filter criteria,** Type $'សន្លឹក**2'.\$E\$1**

Or control the mouse pointer, click on the icon
>> ✔ Control mouse, click on cell E1
>> ✔ Control the mouse pointer, click on the zoom icon back

> ✔ Click the **OK** button

E	F	G
ល.រ	ឈ្មោះ	ភេទ
០០៥	អៀន តាំងលាង	ប
០០៦	អេង វណ្ណា៖	ប
០០៧	ម៉េង តារា	ប

Remove the Standard Filter:

You have already made a standard filter. If you want to remove a standard filter, follow these steps:
> ➢ Place the cursor in the standard filter table above
> ➢ Choose Data menu -> Filter -> Standard filter. A standard filter dialog box appears as shown:

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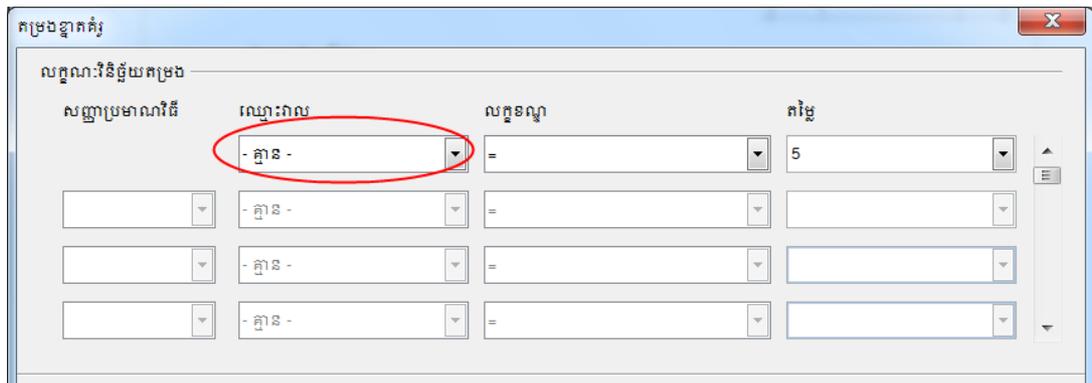
- ➢ In the **Name field**, click the down arrow to select **None**
- ➢ Click button **OK**

IV. Auto Serial Fill

Serial Fill makes it easy and fast to enter data in series without inserting all serial data in a cell range.

1. Auto Fill Day Serial

In Calc, you can automatically drag days in series. E.g., you want to enter the day's name into a cell like Sunday, Monday, or Tuesday.

How to apply to auto serial to the day:

- ➢ Enter a start date. E.g., Sunday
- ➢ Control the mouse pointer on the handle. (?)
- ➢ Hold down the mouse and drag until the desired end date.

Then you will get the result like this >>
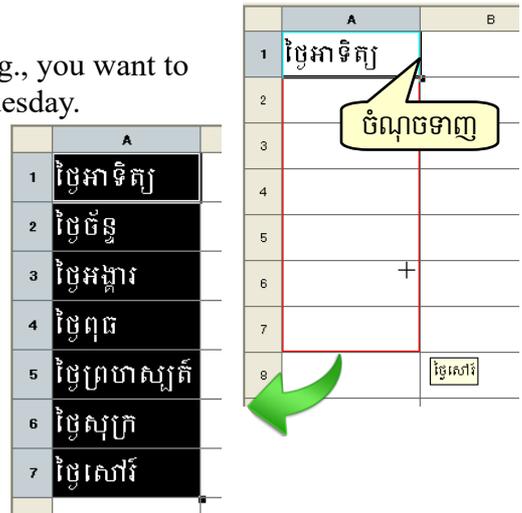
2. Auto Fill Number Series

For example, you want to drag automatic numbering like this: 1 2 3 4 5

How to apply the drawing of numbers in series automatically:

- ➢ Enter a start number. E.g., 1
- ➢ Control the mouse pointer on the handle. (?)
- ➢ Hold down the mouse and drag until the value Desired end number.
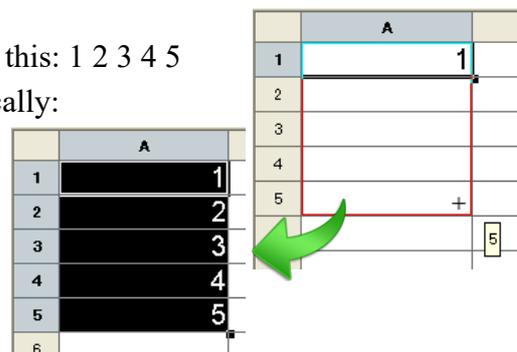
Note:

- For dragging the moon (month?) in series, you do not need to type the word "month" in front of it. Type, e.g., January, and drag it like a number or a day.

	A	B	C	D	E	F
1						
2	មករា					
3						ឧសភា

2	មករា	កុម្ភៈ	មិនា	មេសា	ឧសភា

- For a two-digit suite drag, type the starting number 2 in cell A1 and 4 in cell A2 and select drag both cells to the desired number.

	A
1	2
2	4
3	
4	
5	
6	
7	12

	A
1	2
2	4
3	6
4	8
5	10
6	12

V. Print Preview

The file you have already created needs to be clarified to fit on the correct page. So you can preview the page to know the format of the text before printing.

How to apply to preview the page:

Control the mouse pointer, click on the icon Preview page on a standard bar

You will then see a preview page showing the following:
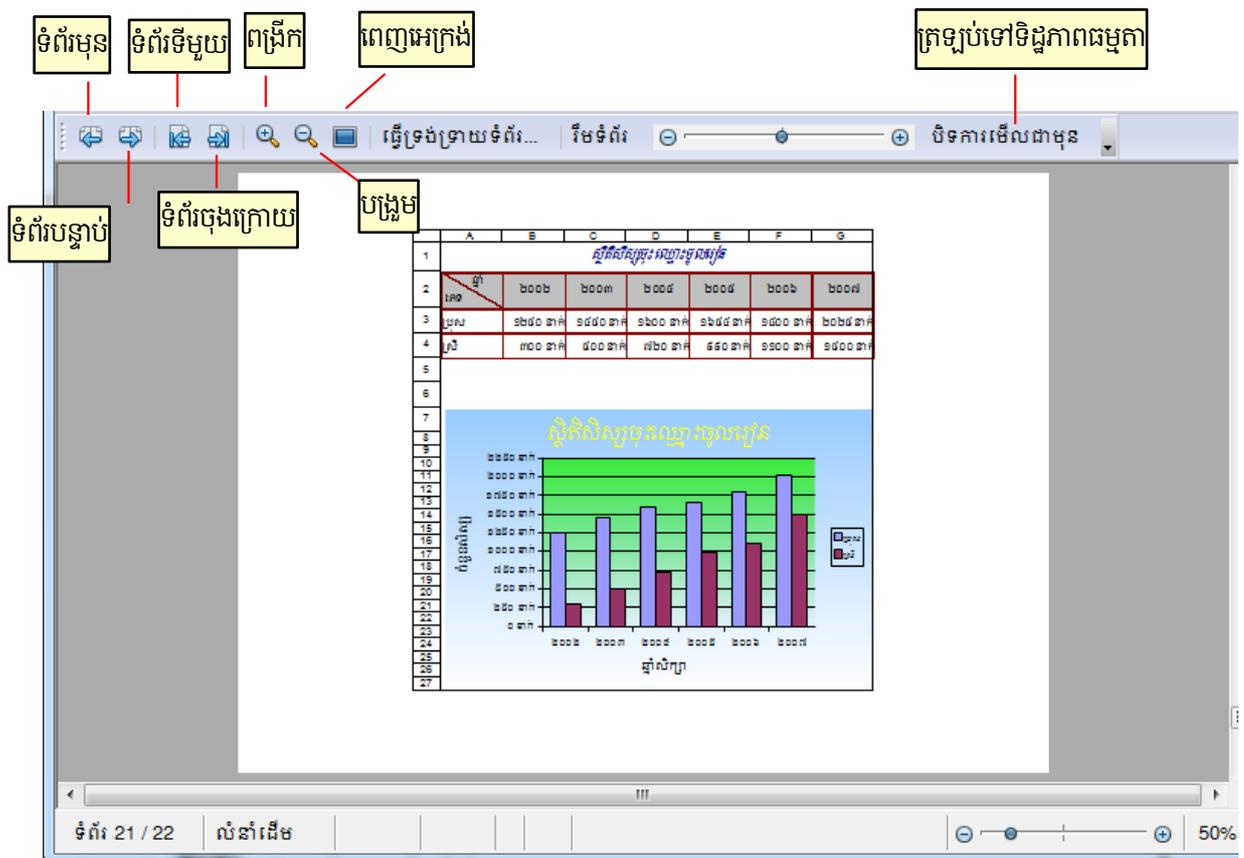
រូបភាព ១៥. ១០ ៖   ការមើលទំព័រជាមុន មុនបោះពុម្ព

- **Previous Page:** To return to the previous page one by one.
- **Next Page:** To return to the next page one by one.
- **First Page:** To return to the first page of the displayed document.
- **Last Page:** To return to the last page of the displayed document.
- **Zoom In:** To enlarge the displayed page.
- **Zoom out:** To minimize the displayed page.
- **Full Screen** (Ctrl + Shift + J): To zoom the page displayed to full screen.
- **Format Page:** Opens the Page Styles dialog to define settings related to page formats, such as pages (margin format, layout settings), primary background border, that the footer and the sheet, as shown below:

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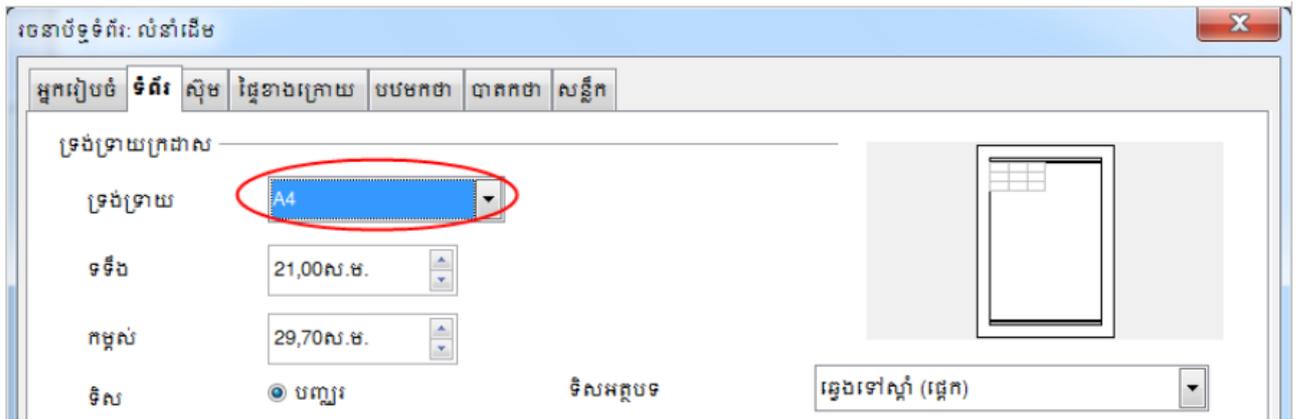
VI. Setting Header and Footer

Header Define is the header setting that will display all the document pages.

How ~~to apply~~ to insert a header:

Select the Header tab in the Page Styles dialog. Or ...

- ➢ Choose Menu Format -> Page ...
- ➢ Choose Header tab
- ➢ Click Open header
- ➢ Click the On button

Click **More** to frame and background to headers. A border/background dialog box appears as shown.
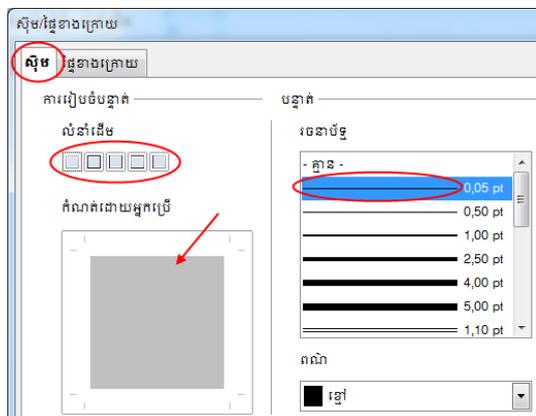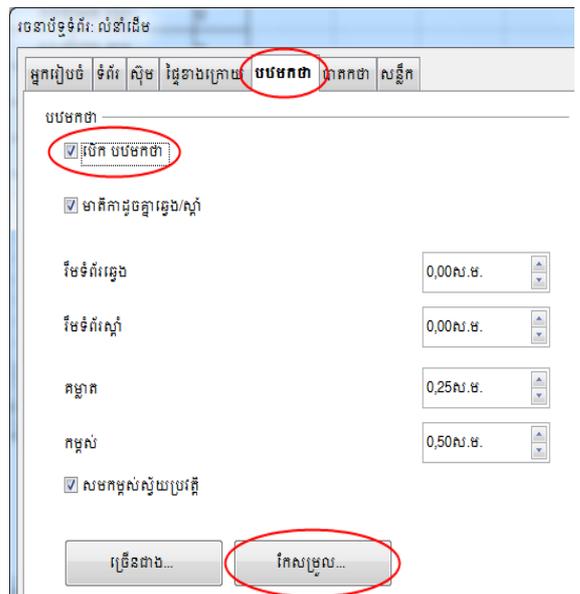
- ➢ Choose **Border**
- ➢ Choose any icon under **Default**
- ➢ Select which line style you want to place
- ➢ Click **OK** button

✔ Click the **Edit ...** button to edit the header contents. A header box appears as shown below: (Enter the header text as in the three boxes below):

- ➢ Click OK button
- ➢ Click OK button

> **Note:** For how to place a footer, as well as how to place a header, you select the footer tab, then follow the same procedure.

VII. Print Preview Row and Column Headings

To set headings, rows, and columns when printing, do the following:

Select a sheet tab in the Page Styles dialog

រូបភាព ១៥.១៤ ៖   ការកំណត់ឱ្យបង្ហាញក្បាលជួរដេក និងជួរឈរពេលបោះពុម្ព

- ➢ Check on the check box Rows and Columns header box: Print, showing both the existing row and column headings on all pages when printing.

Summary

- Automatic filtering only filters the records of any data you want.
- You can short form ascending
- Standard filters are the same as automatic filters. Still, standard filters allow you to define criteria through a maximum of three fields in Data tables using the AND or OR link, and filtered data can be copied to another cell location.
- Serial Fill makes it easy and fast to enter data in a series without inserting all serial data in a cell range.
- You may not be sure that the file you have already created will fit correctly on the page. So you can preview the page to determine the proper formatting of the text before printing.

Questions

1. How do you sort a data table's "Name" fields in ascending order?
2. What are the benefits of filtering data? How do you apply an automatic filter.
3. What is the difference between auto and standard filters?
4. How do you define headers and footers in Calc?
5. How do you print something displaying the name of the row header and column header?

🔍 Exercises

Practices the following exercises:

1. Create a data table as follows.
2. Sort the names of employees in ascending order.
3. Sort the gender and salary fields in ascending order.
4. Use automatic filters to filter out female and male computer instructors.
5. Use standardization to recruit male computer instructors with a salary of more than $ 200.
6. Get a female employee born in Phnom Penh with a salary of less than $ 150.

	A	B	C	D	E	F
1	បញ្ជីឈ្មោះបុគ្គលិក					
2	លរ	ឈ្មោះ	ភេទ	មុខងារ	ទីកន្លែងកំណើត	ប្រាក់បៀវត្ស
3	០០១	ឯង ស្រីជា	ស	គ្រូកុំព្យូទ័រ	ភ្នំពេញ	$250.00
4	០០២	ជា វឌ្ឍន:	ប	គ្រូកុំព្យូទ័រ	កណ្តាល	$200.00
5	០០៣	ហេង ស៊ី	ស	គណនេយ្យករ	ព្រៃវែង	$150.00
6	០០៤	កាំង សុភា	ស	គណនេយ្យករ	សៀមរាប	$150.00
7	០០៥	ស៊ុយ ប៉ាក់	ប	អ្នកទីផ្សារ	សៀមរាប	$100.00
8	០០៦	សៀម ណែ	ស	អ្នកទីផ្សារ	ភ្នំពេញ	$100.00
9	០០៧	ប៉ុន លី	ប	គ្រូកុំព្យូទ័រ	កំពង់ស្ពឺ	$200.00
10	០០៨	មាន សុជាតា	ស	គ្រូកុំព្យូទ័រ	កំពង់ចាម	$200.00
11	០០៩	សុខ សាន្ត	ប	អ្នកសំអាត	បន្ទាយមានជ័យ	$50.00
12	០១០	ឡាយ គឹមជូ	ប	អ្នកសំអាត	កំពត	$50.00
13	០១១	អៀ ជាវ៉ាន់	ស	គ្រូអង់គ្លេស	កណ្តាល	$200.00
14	០១២	អាំង មករា	ប	គ្រូកុំព្យូទ័រ	កំពង់ចាម	$200.00
15	០១៣	ហ៊ិន សុខជា	ប	គ្រូអង់គ្លេស	កំពង់ចាម	$200.00
16	០១៤	ហ៊ិន សុភាព	ប	អ្នកបើកឡាន	ភ្នំពេញ	$50.00
17	០១៥	កាំង កញ្ញា	ស	គ្រូអង់គ្លេស	ភ្នំពេញ	$200.00
18	០១៦	សុង ផេងហ៊ុ	ប	អ្នកបើកឡាន	ភ្នំពេញ	$200.00
19	០១៧	សាន សរ	ប	សន្តិសុខ	សៀមរាប	$50.00
20	០១៨	លៀង ពីងវ៉ាន	ប	សន្តិសុខ	សៀមរាប	$50.00
21	០១៩	សុខ និមល	ស	គ្រូអង់គ្លេស	បន្ទាយមានជ័យ	$200.00
22	០២០	ខេង ពិសិដ្ឋ	ប	គ្រូកុំព្យូទ័រ	កណ្តាល	$450.00

Lesson 16

Introduction to OpenOffice.org Impress

Objectives:

- ✓ Define interface of Impress
- ✓ Creating blank slide
- ✓ Saving a presentation file
- ✓

In this lesson you will learn how to create slides and format text as follows:

   I.   Introduction to OpenOffice.org Impress
  II.   Creating a First Presentation
 III.   Slide Layout Selection
 IV.   Formatting Text and Paragraphs
  V.   Full Screen Slide Show

Lesson 16 Introduction to OpenOffice.org Impress

I. Opening OpenOffice.org Impress Program

Impress is OpenOffice.org's slide show (presentations) program. You can create slides that contain many different elements, including text, bulleted and numbered lists, tables, charts, clip art, and a wide range of graphic objects. Impress includes a spelling checker, a thesaurus, prepackaged text styles, and attractive background styles.

To open an Impress program, you can follow the steps below:

➢ Click **Start** button
➢ Choose **All Programs**
➢ Choose **OpenOffice.org 4**
➢ Choose **OpenOffice.org Impress**

II. Creating a New Presentation

When you create a presentation, you can select the type of presentation, such as a blank presentation or an existing presentation template for your slides.

1. Creating an Empty Presentation

You can create a presentation that has nothing on it. This just means you are starting from an empty slide. When you first open the Impress, you will see a display wizard box appear as shown on the right:

• Select a category, **Empty Presentation**

• Click the **Create** button
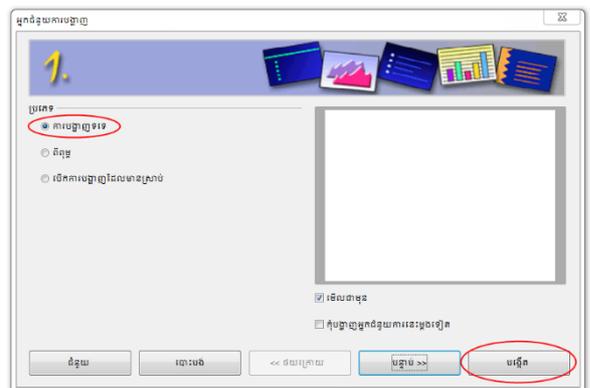
2. Opening Presentation from a Template

Create slides based on existing templates in this Impress.

How to apply:

➢ Choose **From Template**
➢ Select an existing template type
➢ Select the presentation format of the selected template
➢ Click **Create** button

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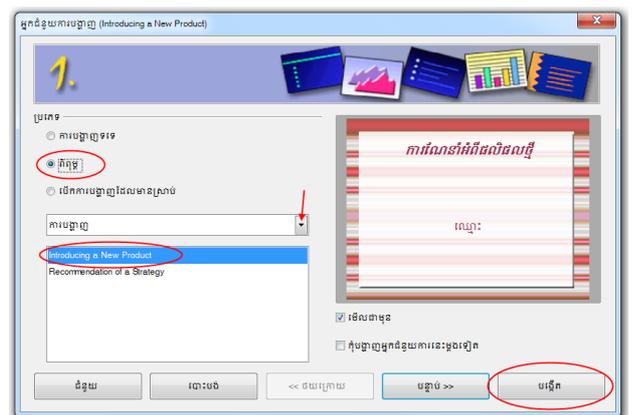
3. Opening an Existing Presentation

You can open a previously saved presentation for further use or editing via the Presentation Wizard dialog below.
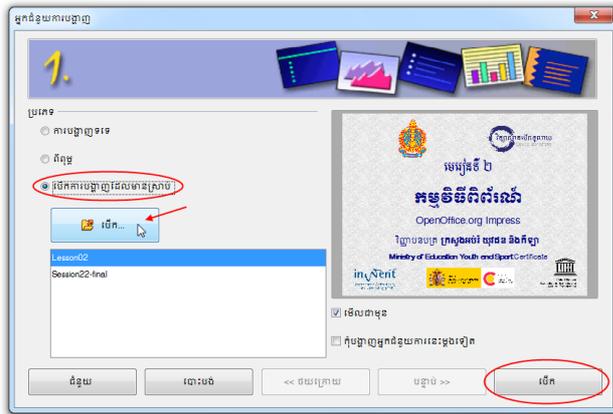
➢ Select the name of a file you have recently opened, or click the **Open** button to select the file you want to open from your computer.

➢ Click the **Create** button.

III. Main Impress Window

Show bar

Line bars and fillers

Drawing bar
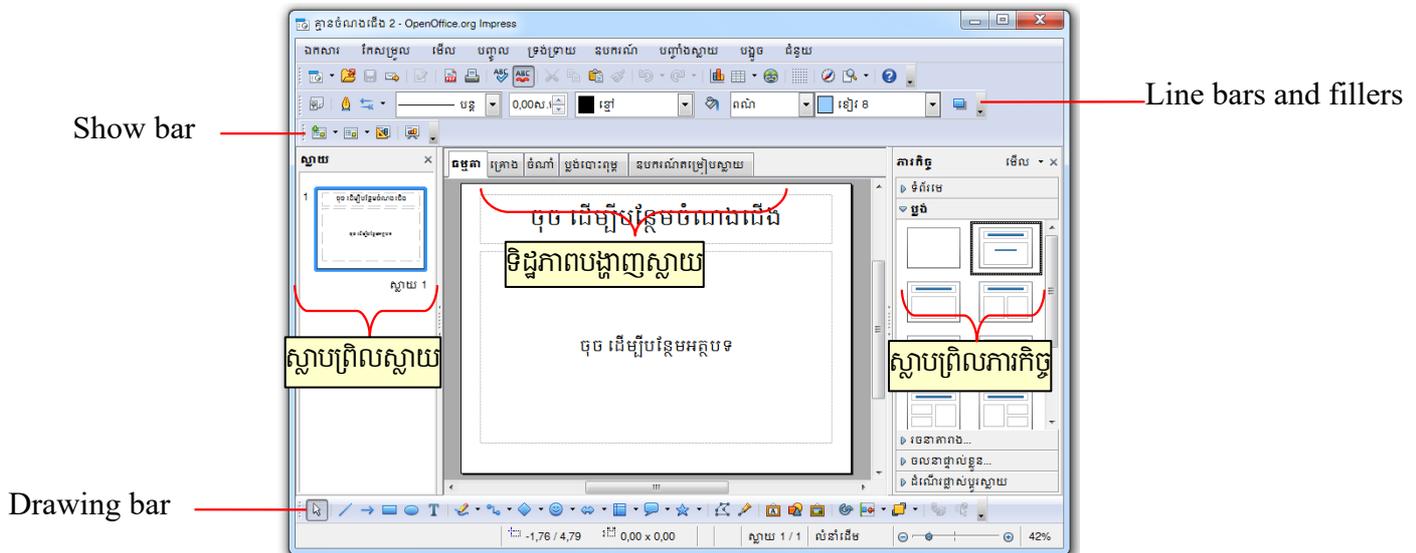
IV. Discover Slide Layouts

On the right side of the program window, you see a task pane containing a layout tab with multiple slide layouts for you to choose from to create slides for your presentation.

1. Slide layout selection

You can select a slide layout with a title and an existing text box for you to enter text

How to apply:

➢ Select the **Layout** tab in the tasks pane

➢ Control the mouse pointer, click on any slide you like

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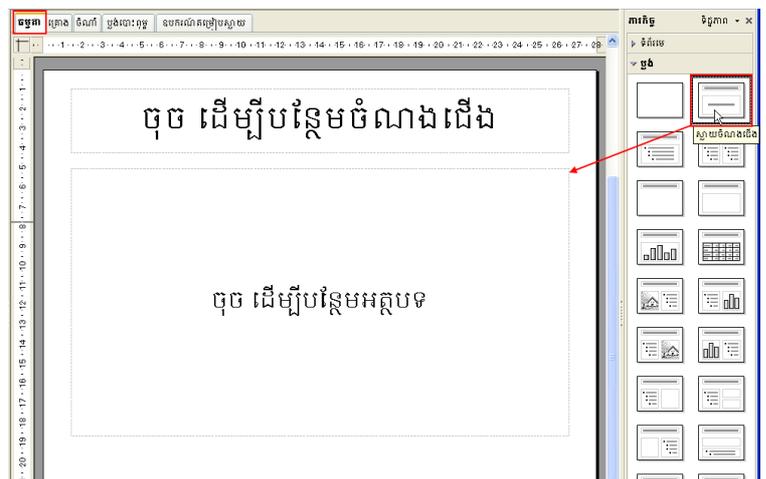
2. Inserting Text in Slides

After selecting a slide layout, you can insert text into the slide by simply clicking the mouse pointer on the desired text box and inserting textual content into it. For example:
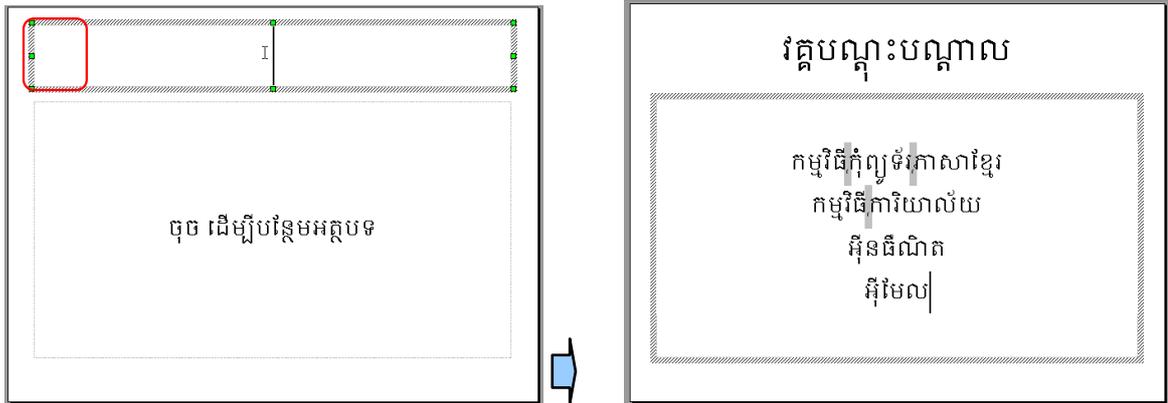
3. Discover the Text Formatting Bar

You can format the text you have entered into various formats using the icons on the format bar as follows:

4. Renaming Fonts and Sizes

- Select the text whose font you want to change.
- Click the arrow next to the **Font Name** icon on the formatting bar.
- Choose a preferred **Font name**

Example: KhmerOS Moul Light

- Right-click the font size and select 48

5. Text Formatting and Paragraph Alignment

To modify the font effect, you need to apply the following:

➢ Select the text you want to format
➢ Click on the icon on the format bar, such as:

- **Bold** icon : For bolding text. If you want to remove the bold text, you need to click on the **bold** icon again.

- *Italic icon* : For italics. If you want to remove the italics, you must click on the **italics** icon again.

- <u>Underline</u> icon : For underlining the selected text. Click this icon again to undo the bottom line.

- **Left align icon** : For aligning text in the text box.

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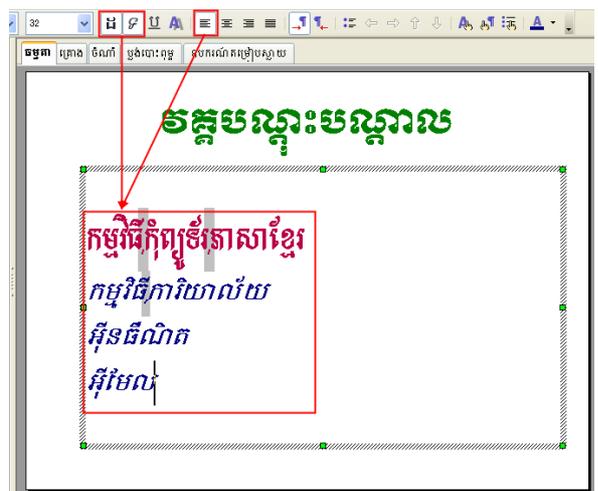
6. Bullet and Numbering

You can click on Icon **Bullet and Numbering** on the formatting bar to place bullets and numbering.

How to apply:

- ➢ Place the cursor on the text that you want to place bullet or number, or select the paragraph where you want to place them
- ➢ Click on **Bullet and Numbering**
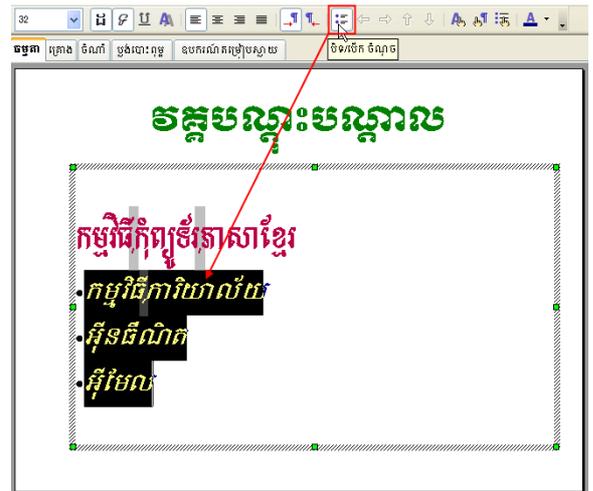
You can use the **Tab** key to move ahead of the dot, but place the cursor at the beginning of the line.

How to ~~apply to~~ change bullet type or numbering:

- ➢ Place the cursor in the text you want to change the point type
- ➢ Click on the icon **Bullet and Numbering** on the bullets and numbering bar
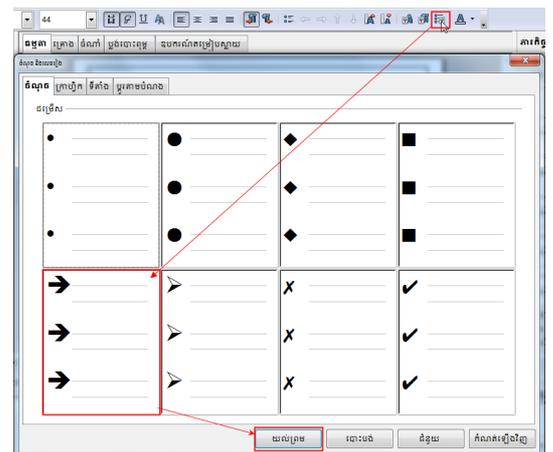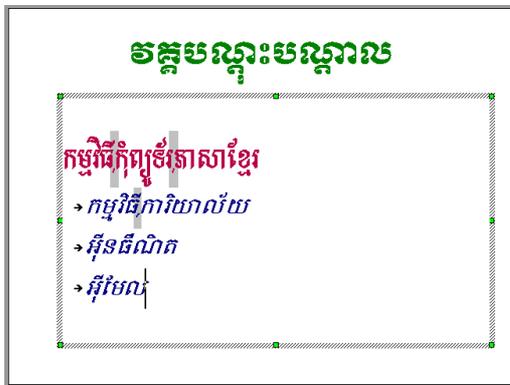
V. Inserting a New Slide

To insert a new slide, follow these steps:

- ➢ Choose **Insert menu -> Slide ...**
- ➢ Or **right-click** a slide in the slide pane **-> Select a new slide**
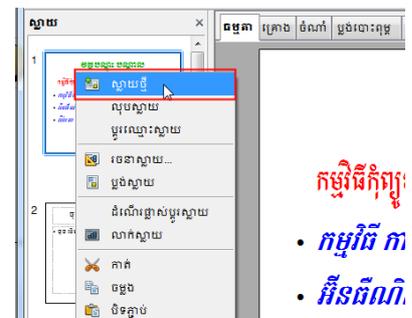
VI. Full-screen Slideshow

To show a full-screen slide, do the following:

- ➢ Click on the icon **Slideshow** on the display bar
- ➢ Or select Menu **Slide Show -> Slide Show**

    Or press the F5 or F9 on the keyboard.

Press the **Esc** key to exit the full-screen slide show.

VII. Closing the Presentation File

How to apply:

➤ Choose **File menu -> Close**

Close the file using the shortcut keys:

➤ *Press **Ctrl** + **W***
➤ *Press **Ctrl** + **F4***
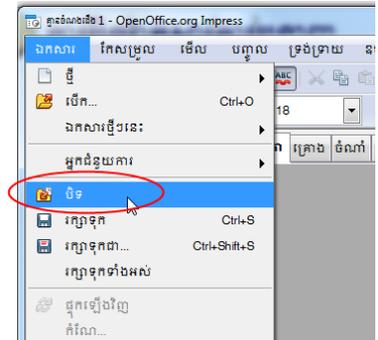
VIII. Closing the Program

To close Impress, you need to:

➤ Choose **File menu -> Exit.** Or click the Close button
   on the title bar.

Use shortcut keys:

➤ *Press (Alt) + **F4***
➤ *Press (Ctrl) + **Q***
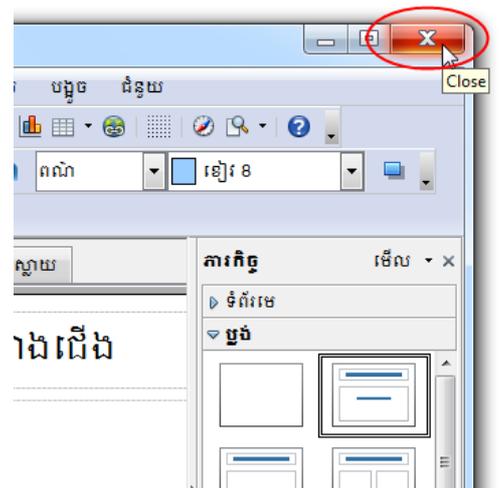
📖 Summary

- Impress is OpenOffice.org's slide show (presentations) program. You can create slides that contain many different elements, including text, bulleted and numbered lists, tables, charts, clip art, and a wide range of graphic objects. Impress includes a spelling checker, a thesaurus, prepackaged text styles, and attractive background styles.

❓ Questions

1. What is the Impress program (OpenOffice.org Impress)?
2. Describe how to insert a new slide.
3. How do we show a full-screen slide show?
4. How do we get out of a slide show?

💡 Exercises

In the classroom, you need to create a presentation consisting of five slides that introduce yourself and your future goals.

1. Open the Impress program (OpenOffice.org Impress)

2. Create a slide and set the format as follows:

Slide 1

Slide 2

Slide 3

Slide 4

Slide 5

Lesson 17

Drawing Object and Animation

Objectives:

In this lesson you will be able to create slides that can add animation
to objects or text and can use the Writer program
to do the following:

    I.   Copy, Cut and Past
    II.   Rename Slides, Delete Slides
   III.   Hide Slide Show
   IV.   Insert, Edit, Move, Resize Text Boxes
    V.   Insert Shape Automatically
   VI.   Add, Change, Remove, Animate Objects or Text in Slides

Lesson 17 Drawing Object and Animation

I. Copy, Cut, and Past

Copying, cutting, and pasting slides are the same as any other program. Copying and cutting is one way to get more new slides with the same format and style.

1. Copy Slides

If you want an identical slide, you do not need to redesign it. You can just copy it. The original slide you copied will not be lost or modified after copying.

How to copy a slide:

- ➢ Right-click on any slide you want to copy.
- ➢ Choose **Copy**

After copying, you need to paste the slides to show the slides you copied.
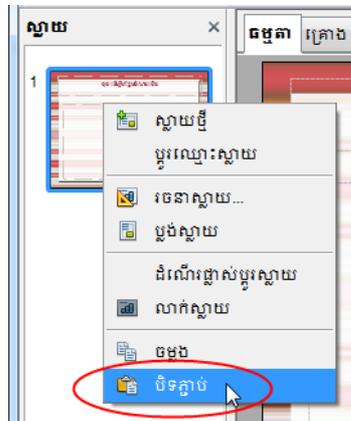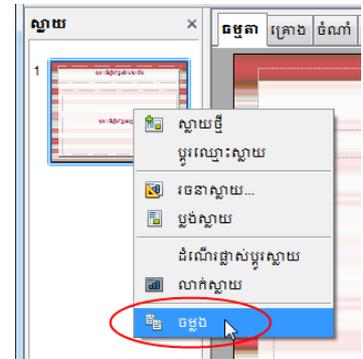
- ➢ How to paste a copied slide:
- ➢ Right-click on any slide you want to copy.
- ➢ Choose **Paste**

Note	If you want to copy multiple slides, you must first select those slides. Hold down the **Shift** key to select multiple slides in a row. Or hold down the **Ctrl** key to select multiple separate slides.

2. Cut Slides

You can cut slides from one presentation file to another. But if you do not have to cut the slides from one place to another in the same document, you can move it by holding down the slide and dragging it to another location.

How to cut slides:

- ➢ Cutting a slide is the same as copying one. Right-click on the slide you want to cut → choose **Cut**

After cutting, you'll notice that the cut slide disappears, so you can retrieve or show the cut slide again by pasting it in the same way as copying it.

II. Rename Slides

By default, each slide in the **slide panel** is like Slides 1 and 2 ... You can rename these slides.

To rename a slide, do the following:

- ➢ Right-click on any slide you want to rename.
- ➢ Choose **Rename Slide**
- ➢ You will then see a box **Rename Slide** as shown below:
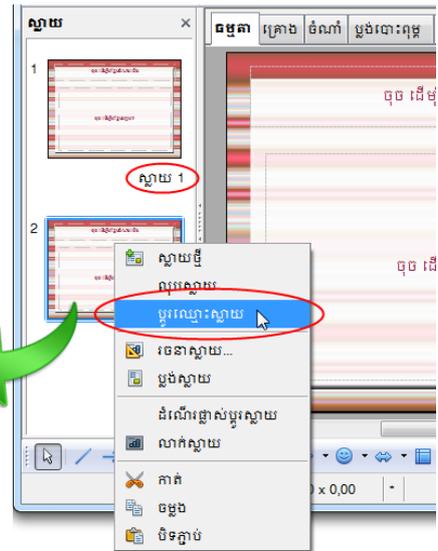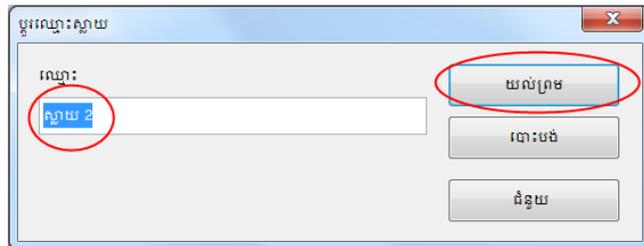
- ➢ Enter the name of the new slide you want to put in the **Name** box.
- ➢ Click **Ok**

III. Delete Slides

To delete a slide, follow these steps:

- ➢ Select the slide you want to delete
- ➢ Right-click the slide you want to delete → Choose **Delete**

Note:	*To return immediately after deletion, you can select the Edit menu → Undo or press the shortcut key + Z*
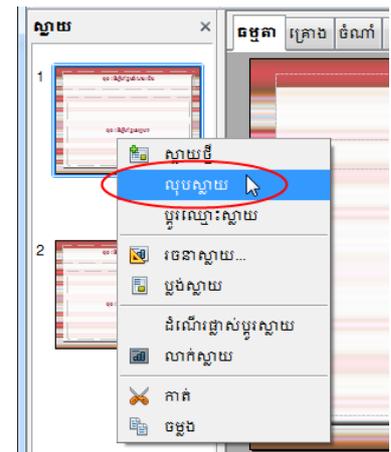
IV. Hide Slide Show

Hiding a slide hides the display only when you show the slide in Full-screen mode. It does not make this slide disappear.

How to hide a slide:

- ➢ Select the slide you want to hide from the display
- ➢ Right-click on the selected slide → Choose **Hide Slide**.

V. Using the Text Box
1. Inserting text boxes in slides

You can insert text anywhere in the slide using the **Text** icon on the drawing bar.
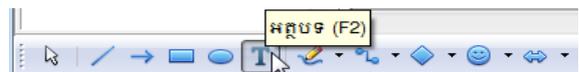
- ➢ Click on **Text** T
- ➢ Hover over the slide at the point where you want to insert text →Then, left-click and drag to the desired size.

Example ៖ Create a text box and enter text like this: >> គម្រោងកម្មវិធីកុំព្យូទ័រភាសាខ្មែរ

2. Text Editing and Formatting

You can edit and resize text in text boxes contained in slides, such as renaming fonts, resizing fonts changing the color, and so on.

How to edit the text in a text box:

➢ Double-click the text box you want to edit–> Use the arrow keys to move the cursor to the position you want to edit → Then make adjustments suiting your needs.
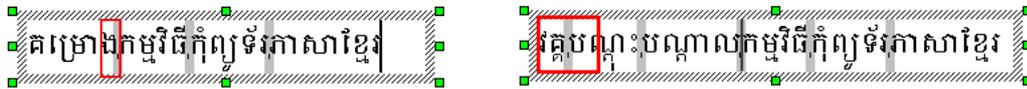
3. Moving Text Boxes

You have already learned about moving a drawing object or text box in OpenOffice.org Writer. This lesson will remind you again about moving the text box by doing the following:

➢ Click the text box and then hover the mouse pointer over the edge of the text box until it displays four front arrow keys.

➢ Hold down the mouse and drag this text box to the desired location.

4. Resizing Text Boxes

To resize a text box, follow these steps:

➢ Click on the text box you want to resize
➢ Place the mouse pointer over any of the handles on the text box until the mouse pointer becomes a double-faced arrow, as shown in the image on the right
➢ Hold down the mouse and drag the text box to the size you want.

VI. Insert Shape Automatically or Draw Objects

You've already learned from this **Writer** about automatic shapes or drawing objects. You can use drawing objects to design a presentation or create various graphic formats as needed.

There are many types of drawing objects that you can use on the drawing bar. Some drawing objects you notice have an arrow to the right of it, and when you click on this arrow, it will show many other sets of drawing objects.
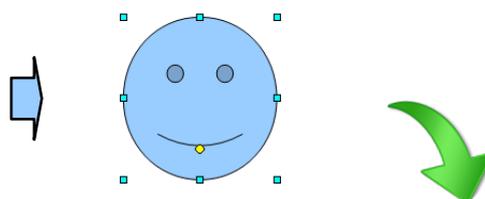
You can define the lines and other fillings of the drawing objects you have drawn as follows:

Try drawing the following drawing objects:

You can insert text in an AutoFormat or drawing object by double-clicking the drawing object.
Or ... select the drawing object and press the **Enter** key.

VII. Adding Animation to an Object or Text

You can add animations to objects or text in your slides. The **Impress** program offers a variety of animations for you to choose from.

How to apply animation to an object in a slide:

➢ Select the object or text that you want to animate. If you want to add animation to multiple objects or text, select them by holding down the **Shift** key and the mouse pointer on the object to be selected.

➢ Choose **Slide Show Menu - Custom Animation**

Or click the Custom Animation tab in the task panel

➢ Click the **Add** button in the Custom Animation tab. You will then see a box appear as follows:

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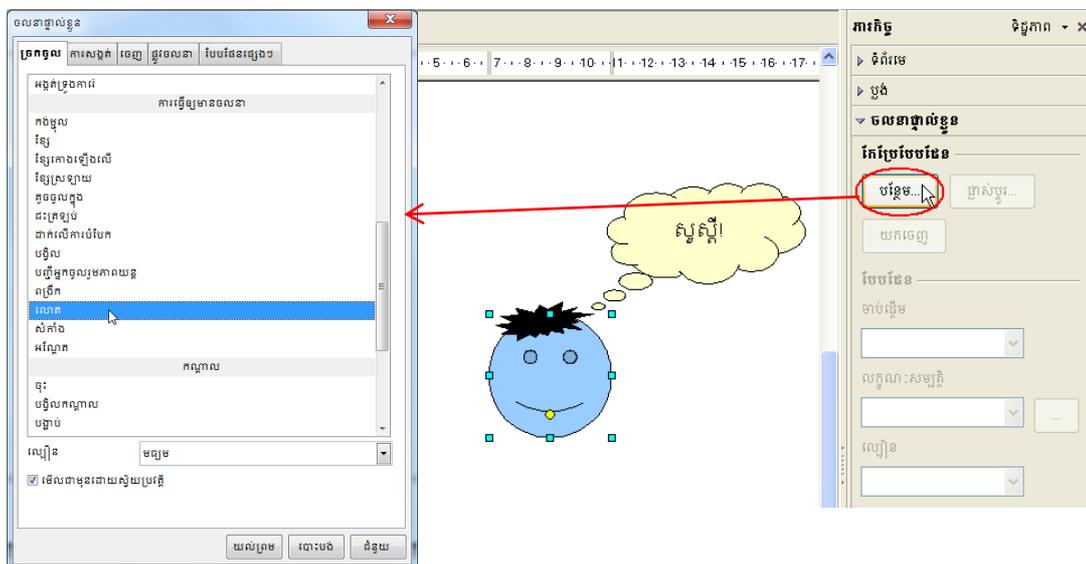
In the Custom Animation dialog

  ➢ Choose your favorite type of movement. E.g., Fly-In
  ➢ Click **OK** button

1. Animation Change

To change the animation of an added object or text, do the following:

  ➢ Select the animated object or text you want to change or modify
  ➢ Click the **Change** button in the **Custom Animation** tab
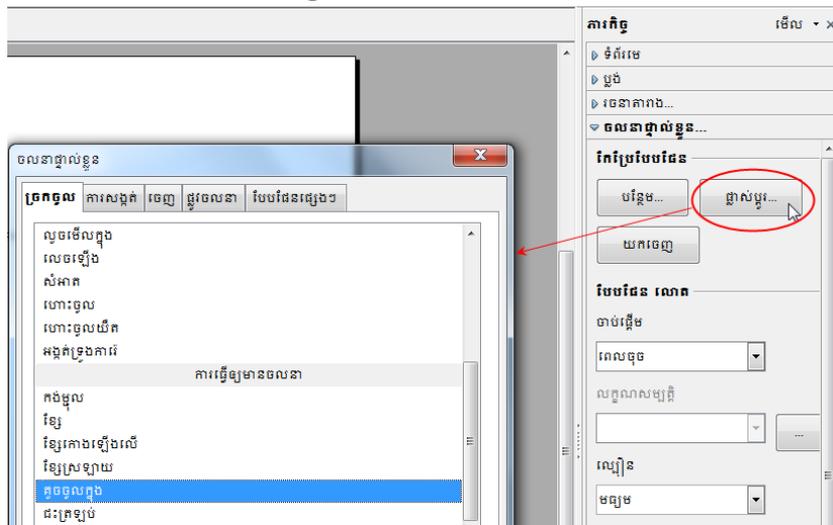
You can select different animation types from the Fly-In or Fly-out or Exit tab or animation paths in the **Custom animation** dialog:

  ➢ Click the **OK** button.

2. Removing Animated Objects or Text

      To remove an object or text animation, follow these steps:

  ➢ Select the object or text you want to animate
  ➢ Click the **Remove** button in the **Custom Animation** tab
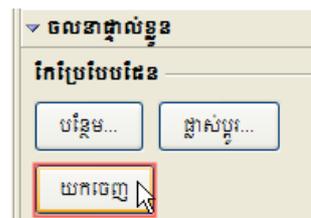
? Questions

1. Do you need to cut slides from one place to another in the same document? Why or why not?
2. Explain how to rename, delete, and hide slides.
3. Why is the slide hidden?
4. Explain how to add animations, change animations, and remove animations from an object.

💡 Exercises

In the classroom, you are required to present your favorite hobby and the reasons it is your favorite one to all your classmates.

1. Opening of Impress

2. Create a slide with the following format:
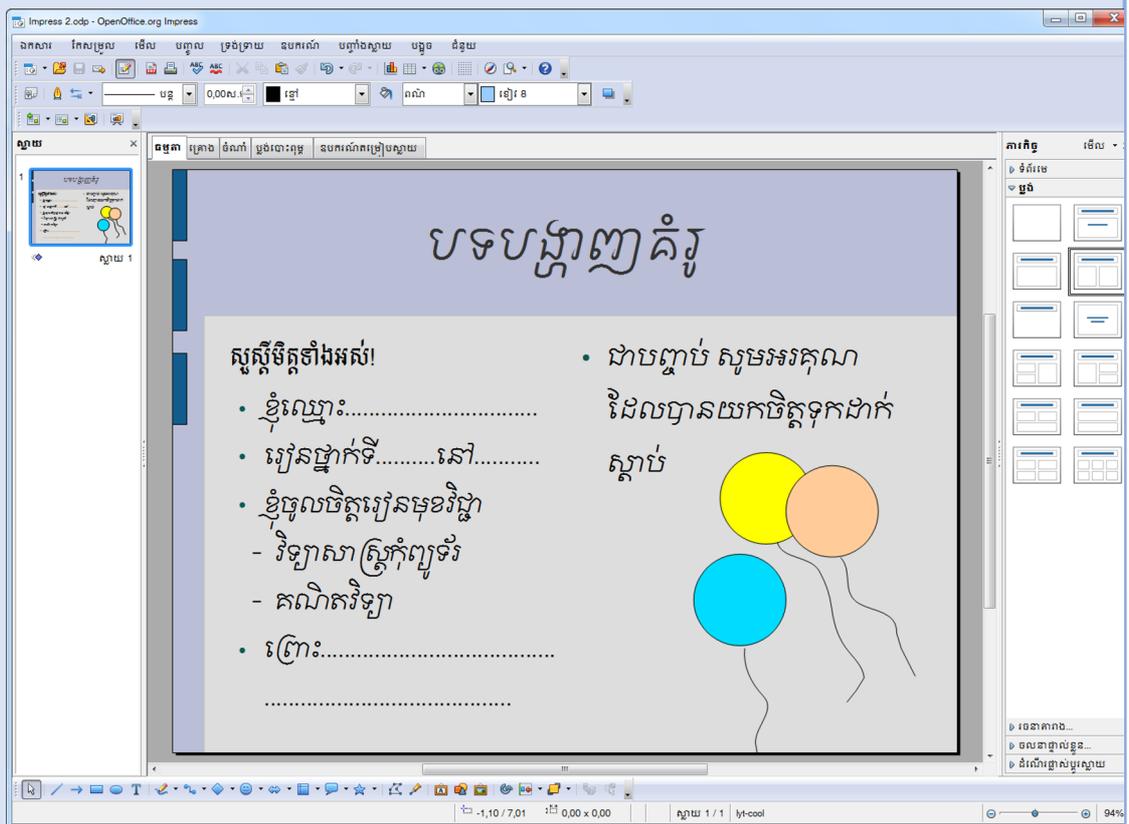
3. Fill in the blanks (….) of your information.

4. Apply **Fly-in** animation.

Lesson 18

Table and Transition

Objectives:

- ✓ Set slide transition animation
- ✓ Insert table and edit table

In this lesson you will learn the following:

I.   Slide Background Color

II.   Learning the Tab of the Slide Show View

III. Transition

IV.   Table

Lesson 18 Table and Transition

I. Sliding Background Color

You can apply various slide colors in the show, **such as gradients, stripes, and images**.

How to apply a color to a slide:

> ➢ Select the slide you want to color the background of
> ➢ Choose Menu Format -> Pages
> ➢ Select the Background tab
> ➢ Select the filling you prefer

E.g., Gradient

> ➢ Choose a preferred gradient
> ➢ Click the OK button
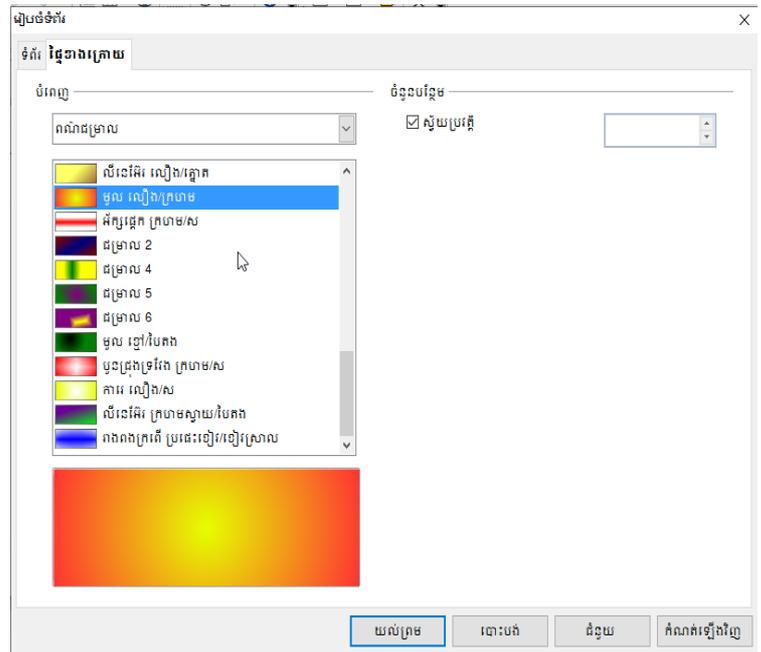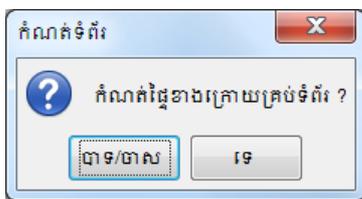
> ✓ Click the Yes button: The selected color will apply to all slides.
> ✓ Click the No button: The selected color will only apply to your selected slide.
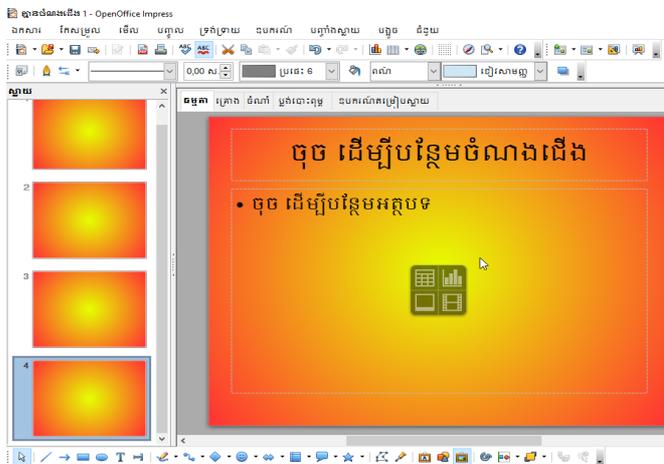
II. Learn About Each Tab of the Slide Show View

When you open an exhibition program, you'll notice a slide show in the middle of the program window with five tabs: **simple outline, layout, print, and slide sorting tool.**

Learn about each of the following aspects:

• **Normal:** The most frequently used important aspects for designing slides, formatting, inserting text, inserting animations, inserting charts, and so on.
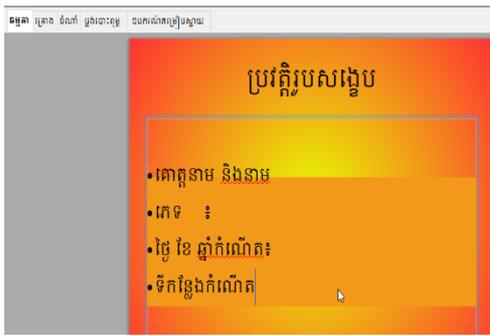
- **Outline:** A view for displaying the title of each slide and the outline of the lesson you created.
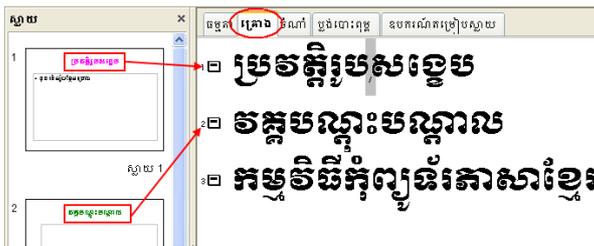
- **Print Layout:** To determine the number of slides to be printed per page, in the settings, you can set 1, 2, 3, 4, and 6 slides.
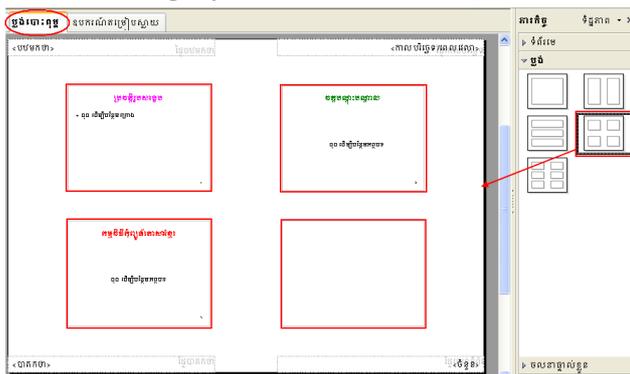
- **Slide Sorter:** A view where you can change the position of the slides you want to sort.
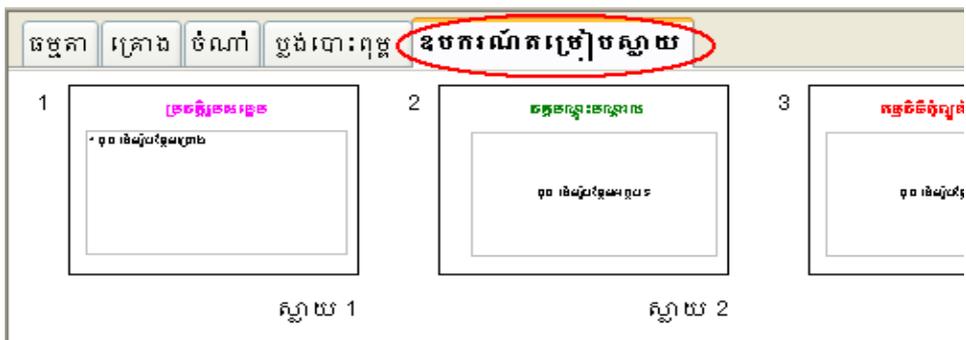
III. Slide Transition

Slide transition is the movement of a slide that must be moved from one slide to another. By default, slides do not move. Therefore, to animate or set the slide transition, you need to do the following:

➢ Chose Menu Slide → Slide transition
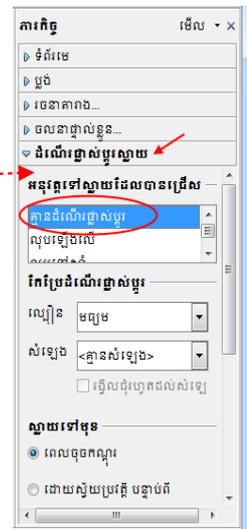
Note	To undo a slide transition, you need to:
	▶ Select the slide that defines the transition
	▶ Select No Transitions in the Slide Transitions tab.

In the **Transitions** Slide tab, you can modify the transitions as follows:

- Speed: Set the speed at which the slide moves.
- Sound: Set the sound when the slide moves.

On the forward slide, you can set the slide transition movement forward to practice:

- **Mouse click**: The slide transition will go forward when you click the mouse or click *Enter*
- **Automatic play**: You can set the number of seconds for the slide to move forward automatically according to the set number of minutes.

You can then try pressing the slide transitions button:

- **Apply to all slides button**: to apply slide transitions selected to all slides in the document.
- **Play Button**: View the slide transitions in the Show Program window for a slide show.
- **Slide show button**: For a slide show, see the transitions in full screen.
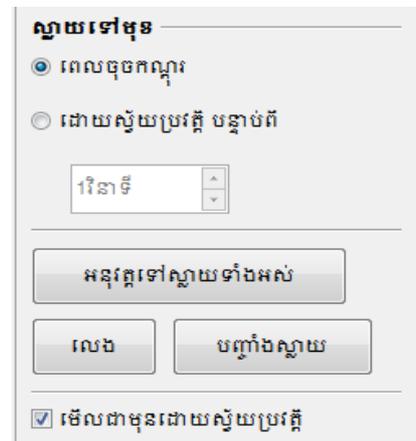
For animated slides, the observer sees a sign at the bottom of the slide.

IV. Inserting Tables in Slides

We can also insert a simple table in the slide in case we want to use data or organize information as a Table structure in slides. For regular tables, you can enter this way faster than through spreadsheets.

How to apply a table insert

➢ Chose Menu insert → table

➢ Determines the number of columns and the number of rows to insert

➢ Click the OK button, and you will see an empty table created as follows:

ល.រ	ឈ្មោះ	ភេទ	អាយុ	ទីកន្លែងកំណើត
១	ឈុំ លាង	ប្រុស	៦៨ឆ្នាំ	កំពង់ចាម
២	សុន វិទ្ធី	ប្រុស	៣៣ឆ្នាំ	ស្ទឹងឃ្លុំ
៣	ម៉ៅ ច ជុយ	ប្រុស	៣១ឆ្នាំ	កណ្ដាល

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Questions

1. When a slide pane does not appear in the slide show, what do you do to show it?
2. What is the function of each tab of the slide show?
3. Describe how to assign a slide transition to an object. How do you get rid of slide transitions?
4. How do you insert a table with 3 columns and 5 rows in a slide?

Exercises

You will be required to create a presentation on your first-semester transcript report for three major subjects (Mathematics, Khmer, and Physics) for all the students in your class.

1. Open the Impress

2. Create a slide with the following format by inserting the following spreadsheet:

ល/រ	ឈ្មោះ:	ភាសាខ្មែរ	គណិតវិទ្យា	រូបវិទ្យា	ពិន្ទុទាបបំផុត	ពិន្ទុខ្ពស់បំផុត	ពិន្ទុសរុប	មធ្យមភាគ	ចំណាត់ថ្នាក់
០០១	សេង សុភាព	៧៥ ពិន្ទុ	៨៩ ពិន្ទុ	៨៦ ពិន្ទុ	៧៥	៨៩	២៥០ ពិន្ទុ	៨៣,៣៣	១
០០២	មាន សុភក្ត្រ	៦៧ ពិន្ទុ	៧៦ ពិន្ទុ	៥៦ ពិន្ទុ	៥៦	៧៦	១៩៩ ពិន្ទុ	៦៦,៣៣	៦
០០៣	យូ គន្ធី	៦៣ ពិន្ទុ	៥៧ ពិន្ទុ	៦៧ ពិន្ទុ	៦៣	៦៧	១៩៧ ពិន្ទុ	៦៥,០០	៧
០០៤	នួន លក្ខិណា	៦៨ ពិន្ទុ	៥៦ ពិន្ទុ	៥៧ ពិន្ទុ	៥៦	៦៨	២១១ ពិន្ទុ	៧០,៣៣	៤
០០៥	នួន សុជាតា	៧៦ ពិន្ទុ	៧៨ ពិន្ទុ	៨៧ ពិន្ទុ	៧៦	៨៧	២៤១ ពិន្ទុ	៨០,៣៣	១
០០៦	មាន សម្បត្តិ	៥៥ ពិន្ទុ	៣០ ពិន្ទុ	៣០ ពិន្ទុ	៣០	៥៥	១១៥ ពិន្ទុ	៣៨,៣៣	៩
០០៧	ពុទ្ធ សុដាវិណត	៧៥ ពិន្ទុ	៤៨ ពិន្ទុ	៨៥ ពិន្ទុ	៤៨	៨៥	២០៧ ពិន្ទុ	៦៩,០០	៥
០០៨	ទ្រី ជារណា	៩៥ ពិន្ទុ	៨៧ ពិន្ទុ	៤៨ ពិន្ទុ	៤៧	៩៥	២៣០ ពិន្ទុ	៧៦,៦៧	៣
០០៩	ហង្ស សុជាតិ	៦៥ ពិន្ទុ	៥៨ ពិន្ទុ	៧៦ ពិន្ទុ	៦៥	៤៦	២៣៩ ពិន្ទុ	៧៩,៦៧	២
០១០	ទ្រី សុនី	៥៦ ពិន្ទុ	៦៧ ពិន្ទុ	១០ ពិន្ទុ	១០	៦៧	១៣៣ ពិន្ទុ	៤៤,៣៣	៨

3. Animate the slide title (move it at any pace you like).

4. Set the slide transition to "split vertically". Set the "fast" speed and the "beam" sound and set the slide to 5 seconds automatically.

5. Give this presentation to your classmates.

6. Save this presentation as "First Semester Grade 10A Results" in your folder.

7. Close the application.

CHAPTER 3

Internet and Online Communication

Lesson 19

Introduction to the Internet

Introduction:

Each day millions of people use the Internet and the World Wide Web at work, at home, and while traveling. Anyone with access to the Internet can connect to and communicate with other Internet users anywhere in the world. At the end of this lesson, you will be able to:

- ✓ Define the Internet and the Web.
- ✓ Categorize websites
- ✓ Define data usage and how it is calculated

When you have finished this lesson, you will have learned:

- I.   Information Regarding the Internet and the Web
- II. Connecting to the Internet
- III. Downloading and Uploading Data
- IV. Categorizing Websites

Lesson 19 Introduction to the Internet
I. Definition of the Internet and the Web
Many people use the terms Internet and Web interchangeably. In reality, they are not the same. The Internet can exist without the Web, but the Web cannot exist without the Internet. The Internet (often referred to as the Net) is a huge global interconnection of computer networks worldwide. The World Wide Web (often referred to as the Web and abbreviated as WWW or W3) is a worldwide collection of interconnected documents (Web pages) and other resources.

1. Web Site
A **Website** is a Web page, or a collection of related Web pages located on the Web. The pages within the Web site can contain text, images, and multimedia elements such as audio, video, and animation. Hyperlinks (often referred to as links) are an essential part of the Web because they automatically connect you to another part of the same Web page or another Web page. A Web page link can be a word, a phrase, or a graphic.

2. Web Page
A web page is a document, commonly written in HTML, that is viewed in an Internet browser. A web page can be accessed by entering a URL address into a browser's address bar. A web page may contain text, graphics, and hyperlinks to other web pages and files.

A web page is often used to provide information to viewers, including pictures or videos to help illustrate important topics. A web page may also be used as a method to sell products or services to viewers. Multiple web pages make up a website, like our Computer Hope website.

3. Home Page
A home page is the main web page of a website. The term may also refer to the start page shown in a web browser when the application first opens.

4. Hypertext Mark-up Language (HTML)
HTML is the main mark-up language used to create Web pages. HTML defines the format and layout of a Web document. Just as most filenames include an extension to identify that file type (such as .docx for a Word document or .jpg for a graphical file), the Web page file often consists of a file extension to indicate the file type. For example, the extension may be .html or .shtml. SHTML is an HTML file that includes special commands for the server to process.

5. Hyperlink
Alternatively referred to as a link and web link, a hyperlink is an icon, graphic, or text that links to another file or object. The World Wide Web comprises hyperlinks linking trillions of pages and files to one another. Hyperlinks allow web pages to connect to other web pages. Without them, you would need to know the URL (Uniform Resource Locator) for every page on the Internet. For example, you likely got to this page from a hyperlink and didn't type "https://elearning.moeys.gov.kh/course/view.php?id=122" into your browser address bar.

6. URL
The Uniform Resource Locator (URL) (often referred to as a Web address) identifies the unique IP address. URL addresses are presented in alphanumeric form because it describes the resource and makes it easier to remember (such as https://elearning.moeys.gov.kh). However, the URL is a set of four numbers separated by periods (such as 212.987.12.3), and the Domain Name System (DNS) translates the alphanumerical address to a numeric address.

7. Domain

A domain is a group of computers and devices on a network that are administered as a unit with common rules and procedures. All devices sharing a common part of the IP address are said to be in the same domain. The domain name provides an online identity (such as an organization or company name). If your Web site has lots information to organize, you can create a subdomain, a domain that is part of a larger domain and dependent on the larger domain. A subdomain is like a folder under your root directory.

Every Web site domain name also ends with a two- or three-letter extension that identifies the domain type or country of origin. There are various domain types, and each type has its own basic rules, such as the type of characters and the minimum and the maximum number of characters. Some of the most common domain types are described in the Table below:

Extension	Description of Domain Type
.com	Commercial; associated with business/commercial and personal Web sites; most popular
.edu	Education; associated with educational institutions
.gov	Government
.info	Information; both commercial and personal sites; unrestricted domain
.net	Network; initially intended to be used only for network providers; recommended for companies involved in Internet infrastructure; widely used.
.org	Organization; mostly associated with non-profit organizations

Domain types and extensions are also assigned to a specific country. For example, Cambodia uses .kh, and Korea uses .kr, Japan uses .jp, and Thailand uses .th. Accredited registrars manage the registrations of domain names. Once the domain name is registered, a Web hosting service makes the Web site accessible via the WWW.

A URL always includes a protocol, the domain name, and the domain type or a country code. As shown in the Figure below, after the single forward slash /, the URL may also include a resource ID that provides the file's name and any directories or subdirectories under which the file is stored on the specified computer. The domain name is the most easily recognized part of the URL.

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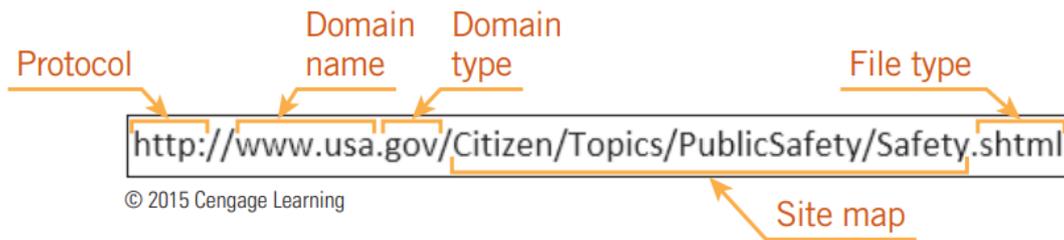
8. Web Browser

A **Web Browser** is a software application you use to view and retrieve documents from the Web and to display the documents in a readable format. Browser software (such as Microsoft Internet Explorer, Safari, Google Chrome, and Mozilla Firefox) sends a message to a Web server to retrieve a requested Web page. For example, when you enter a URL in your browser, you send an HTTP command to the Web server to tell it to locate and transmit the requested Web page. The browser then extracts the HTML code to display the page.

II. Connecting to the Internet

In homes, the common methods of Internet access include dial-up, broadband, satellite, 3G/4G technology for cell phones and Wi-Fi. Wi-Fi uses radio waves to provide wireless high-speed Internet and network connections. When you are away from the office or home, you can use Wi-Fi hotspots to connect to the Internet. A hotspot provides Wi-Fi network access (usually Internet access) to a small area for wireless-enabled devices such as laptops, tablets, and smartphones.

1. SPI (Internet Service Provider)

An Internet service provider (ISP) is an organization or company that provides connectivity to the Internet through a telecommunications line or wireless system. Its service is primarily to provide a connection to the Internet. Different types of Internet connections provide a range of options. Be prepared to balance the features you want, such as connection speed and reliability, with the cost and availability of the options. For example, a dial-up connection is the least expensive type of Internet connection, but it is also the slowest. Broadband connections such as cable modems and digital subscriber lines (DSL) offer a high bandwidth, which refers to the amount of data that can be transmitted. Broadband connections can transmit multiple information channels over a single link, carrying video, voice, and computer data simultaneously and much faster.

After contracting an ISP, you must install some telecommunications software. This software enables your computer to connect to another computer. Your ISP or online service company provides this software, or most likely, you will be able to use software already installed on your computer. Most new computers are set up for a wireless connection.

2. Hotspot

Access to the hotspot services may be free to all, free to customers only, or fee-based. You may need a password to complete the connection. A hotspot can be limited to a confined location, such as a restaurant, or it can be more widespread and cover a large area, such as a school campus.

Web browser

III. Web Browser

The web browser is an application software to explore the www (World Wide Web). It provides an interface between the server and the client and requests from the server for web documents and services. It works as a compiler to render HTML, which is used to design a webpage. Whenever we search for anything online, the browser loads a web page written in HTML, including text, links, images, and other items such as style sheets and JavaScript functions. Google Chrome, Microsoft Edge, Mozilla Firefox, and Safari are examples of web browsers.

Some of the most-used web browsers are Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, etc.

Google Chrome is the world's most used web browser. In 77% of devices, Google Chrome is used. Google developed this browser in 2008 for Microsoft Windows. Later it was used in macOS, Linux, Android, and iOS operating systems. It is a very reliable browser and is available in 47 languages. The installation process of Google Chrome is very easy and free for everyone.

Mozilla Firefox, also known as the Firefox browser, was developed by the Mozilla Foundation and the Mozilla Corporation in 2002. It is available on Linux, Microsoft Windows, Android, and iOS operating systems. In the Linux system, Mozilla Firefox is the default installed browser.

IV. Downloading and Uploading Data

Many ISPs, especially for mobile devices, include a monthly data usage allowance, and if you exceed the limit for your plan, you may pay an extra fee. Therefore, it is important that you understand how data usage occurs and how it is calculated. Almost every time you access the Internet, you will download (receive) or upload (send) data. When you browse the Internet, visit a Web site, send text messages and email messages, and post pictures on social networks, you are using data. **Streaming** is a technique for transferring data in a steady and continuous stream so you can start displaying the data before the transmission is completed. For example, you can start watching an online video before the entire file has been transmitted. Even though the video file may not be stored on your computer, the data is still downloaded in some form.

The data is transmitted in packets, and the size of the packet is defined with the following terms:

- bits: the smallest possible unit of information
- kilobit: 1,000 bits
- bytes: 8 bits
- kilobyte: 8 kilobits
- megabit: 1,000 kilobits
- megabytes—8 megabits

Bytes are capitalized when used in acronyms to distinguish them from bits since both starts with the letter B. For example, Kb is kilobits, and KB is kilobytes. Mb is megabits, and MB is megabytes. So, how big are the files typically accessed on the Internet? The following is a list of commonly accessed files and a typical size for each. Of course, file sizes vary depending on the amount of content, the format, the resolution, and the level of quality.

- 1 text email message ~ 75 KB

- 1-page PDF file ~ 948 KB
- Photo ~ 1.5 MB
- Web page ~ 1.5 MB
- 1 music track ~ 5 MB
- 30 minutes of gaming ~ 25–75 MB
- 10-minute video ~ 100–200 MB

Internet connection speeds are usually measured in seconds. Kbps (kilobits per second) usually refers to dial-up and low-speed DSL connections. Mbps (megabits per second) is the most common unit of speed used. Generally, ISP services offer different download and upload speeds. For example, a service plan may offer a download speed of up to 30 Mbps and an upload speed of 4 Mbps. There are differences in download and upload speeds because most Internet connections are asymmetric, meaning the bandwidth capacity for downloading data differs from the capacity for uploading data. For personal use, the average user downloads much more than they upload, so the speed differences are acceptable. However, businesses often upload significant amounts of data, so they subscribe to a higher-level service that speeds up faster uploading.

Even if you have a high-speed Internet connection, there are times when the transmission of data is very slow. Several factors reduce the speed of your Internet connection.

- As mentioned earlier, the connection type is a major factor.
- At peak times, popular Web sites can become overwhelmed with users. As more data is requested and sent, more bandwidth is used simultaneously. Likewise, home networks are often slow when multiple users are connected to the Internet using multiple browsers. Network administrators for corporate networks monitor Internet use and try to keep employees from downloading large files during peak hours.
- Wireless Internet connections can be slowed down because devices interfere with the wireless signal. Household appliances such as microwaves, cable TV wires, or a neighbor's wireless network can interfere with your network signal.
- Internet speeds can also be slowed down because of outdated equipment or equipment not configured properly for optimal performance.

V. Categorizing Web Sites

There is a vast amount of information available on the World Wide Web. Web sites can be categorized, each with a different purpose and type of information. The following list provides an overview of some types of Web sites available.

Commercial

Also known as an e-commerce site, a commercial site sells or promotes products or services. Almost every business today has a commercial Web site. Many of these Web sites also provide options to purchase products or services online.

Academic

Most educational facilities, elementary to university level and the public to private, have a Web site. Most higher education Web sites provide online registration, courses, and other options. Many research facilities and private and public companies also provide online training for their employees.

Organizational

Examples include Web sites of non-profit organizations such as zoos and advocacy groups such as wildlife and clean air supporters.

Governmental

Most local, state, regional, and national governments have numerous Web sites. For instance, a medium-sized city could have several Web sites for employment, news of the day, parks and recreation, local services, utilities, visitor's guide, customer service, and other public announcement sites.

International

Internet marketing of a product or service sometimes requires that Web sites be hosted in other countries. Each country has unique search engines which use different mathematical algorithms. Web page text also needs to be translated into the country's language. Values and customs vary, so an effective Web site in one country may not work in other countries. Finally, local agencies most likely have a better understanding of the population and search engine optimization related to that population.

Search Sites

A search engine is a software program used for online searching. Hundreds of search engines have been developed to find information on the Internet. Each search engine may work differently, but most share common search features. For example, all search engines support keyword searches.

Membership Sites

Some Web sites, such as those used for email services and e-commerce, require you to register before access to the Web site is allowed. Then to access restricted content or use the services, you must enter a user ID and a password. When you see the letter "S" after "HTTP" in the URL, it confirms that it is a secure Web site. Verifying that the Web address begins with https:// before entering personal information would be best.

Online applications: Also known as Web apps, these online applications host programs you can access with your Web browser. When using a Web app, the browser functions as a client. You interact with the software through your browser. Some applications allow you to store data on your local computer, while others store your data and information on its servers. The Cloud is a good example. You can create documents online, edit the documents from anywhere, and share your documents in real-time for no charge.

Portal

A portal is a Web site that features useful content but also contains links to other sites. You can use a portal as your home page. For example, MSN.com is a portal that includes links to Web sites for news, sports, entertainment, the Bing search engine, etc.

Geographic imaging: Mapping and geographic imaging Web sites use technology to change the imagery of the Earth's surface into valuable information. This information is used by geographical information systems (GIS) to capture, store, analyze, and manage images. Google Earth is one example of this type of Web site.

Wiki

A wiki is a collaborative Web site that people can use to add, edit, remove, and organize Web page content. Wikipedia is a popular online wiki.

VI. Addressing Web Site Issues

The Internet and browsers aren't without their problems. Web sites might not be displayed for several reasons.

When you enter a Web site address and receive a "Page not found" message, the Web site might display a "404 error," which you receive because a) the page was moved, b) an old index is still maintained in a search engine, or c) you made a typing error when entering the Web site address. Sometimes, the Web site is temporarily unavailable because the server is offline or the site is being updated.

A Web page may load slowly because of heavy server traffic or because the page may contain a large number of images. A garbled or offset page could result from several issues, such as the rendering technique used by the browser. If you are using a recent browser, such as Internet Explorer 11, you can use the Compatibility View command to try to display the Web page using older settings.

Pop-up ads can also be an annoyance. Advertisers place these ads on Web sites and they pop up in the middle of a page to call attention to its content. Internet Explorer contains a pop-up blocker that limits most pop-ups. By default, the pop-up blocker is enabled. You can customize the settings to allow pop-ups from specific Web sites.

Internet security is essential. Each time you connect to the Internet, there is the risk of unauthorized parties accessing sensitive resources. And you are vulnerable to viruses and other malicious code. If a password does not protect a wireless connection, anyone with a wireless router and within the range of the signal can use the connection to browse the Internet. However, you might be sharing much more than Internet access. Once they access your wireless connection, they can also access your data. Encryption methods used by routers protect against unauthorized access. Older devices might be programmed to connect using WEP (Wired Equivalent Privacy Protocol). Still, newer devices are likely programmed to use WPA (Wi-Fi Protected Access) or WPA-2, improved encryption methods.

Other forms of security management are gateways and firewalls. A gateway is a computer or dedicated hardware device that connects a LAN (Local Area Network) to another network, typically the Internet or a WAN (Wide Area Network). A firewall blocks unauthorized network access within its LAN or to and from the WAN. Network administrators and information security experts configure the firewall to ensure that only authorized protocols, applications, users, etc., are allowed access to critical data within the network. Antivirus apps help protect against viruses, and antimalware apps help protect against malware. All of these functions need to work together for optimal performance and security.

Some antivirus software programs include firewall protection. You need only one firewall app running on your PC. Windows Firewall comes with Windows, and it is turned on by default. It would be best to turn Windows Firewall off only if another firewall is turned on.

To customize the settings for compatibility viewing, blocking pop-ups, and turning on the firewall, you must switch to Desktop or Private modes.

VII. Get Started with Chrome Browser
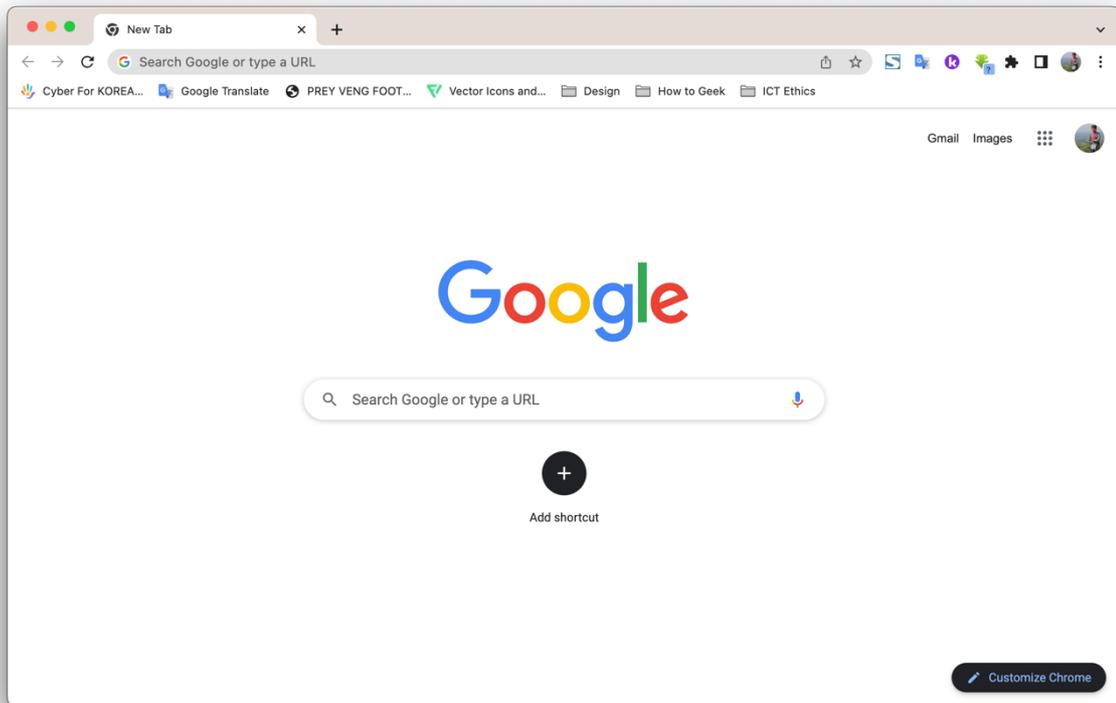
1. Search in Chrome

Use the address bar like a search box to look for content. You can also search for a specific word or phrase on a web page.

A. Search the web:

- Open Chrome browser and enter your search in the address bar.
- Click a result or press Enter.

B. Search a web page:

- Open a webpage in Chrome browser.
- At the top right, click More and then Find. Or, use the keyboard shortcut Ctrl + f (Windows, Linux, and Chrome OS) or ⌘ + f (Mac).
- At the top right, in the search bar, enter your search term.
- Press Enter. Matches are highlighted on the page.
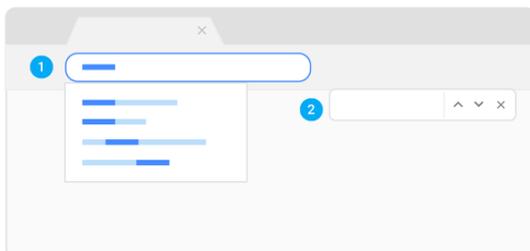
2. Open New Tabs or Windows
- In the Chrome browser, at the top right, click More and then New Tab or New Window.
- (Optional) To move a tab:

- Drag it outside the existing window or into a new window.
- Drag it to a different position in the window.
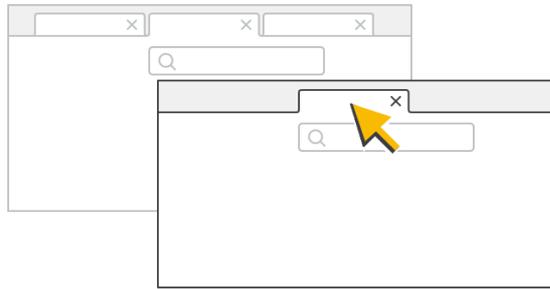
3. Using Apps

You can run Google Workspace apps from the Chrome browser, such as Google Docs, Sheets, and Slides.

- Open an app:
- In Chrome browser, open a new tab.
- Choose an option:
- At the top right, click the App Launcher ⠿ and then click the app you want to open.
- In the address bar, enter **chrome://apps** and press Enter. Then, click the app you want to open.
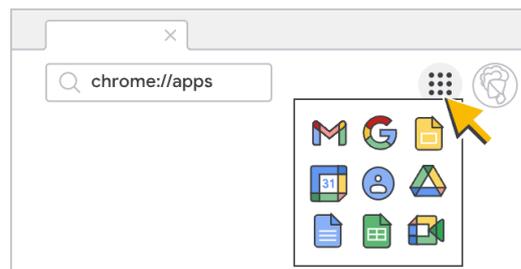
4. Downloading Files

To save a file or image on your computer or device, download it. The file saves in your default download location.

- In the Chrome browser, go to the webpage where you want to download the file.
- For most files, click the download link or right-click the file and select **Save as**.
- Sometimes, how you save a file depends on the file type:

  - **Images**—Right-click the image and select **Save Image As**.
  - **Videos**—Point to the video. Click Download ⬇. If this action isn't available, the video's owner or hosting site doesn't allow downloads.
  - **PDFs**—Right-click the file and select **Save Link As**.
  - **Webpages**—At the top right, click More ❯ **More Tools** ❯ **Save Page As**.

- Downloads appear at the bottom of the Chrome browser window. Click the download to open it.

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- (Optional) To find a downloaded file on your computer, click the Down arrow ›

  Show in Folder or More › **Show in Finder,** next to the filename. You can also see downloaded files on your **Downloads** page.
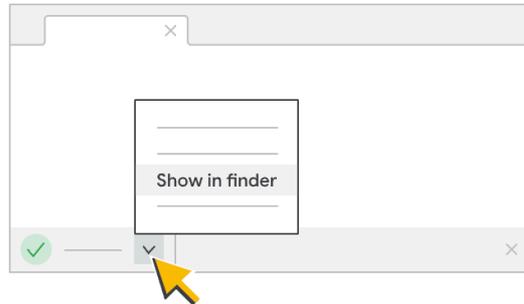
5. Printing Files

You can print from your computer or mobile device with the Chrome browser.

- In Chrome browser, open the page, image, or file you want to print.
- Choose an option:

  - On a computer—Click More -> **Print**. Or, use the keyboard shortcut **Ctrl** + **p** (Windows & Linux) or ⌘ + **p** (Mac).
  - On a mobile device—Click **More**->**Share**->**Print**.

- Select the destination and change any print settings you want.
- Click **Print**.

📖 Summary

- The Internet, the World Wide Web, and Web browsers have their terminology.

- There are several methods for connecting to the Internet, and different types of Internet connections provide a range of (range of what?)

- Almost every time you access the Internet, you are using data. The data is transmitted in packets, and the size of the packet is defined in bits and bytes.

- Websites can be organized into categories, each with a different purpose and type of information.

- Once you connect to the Internet, you need a Web browser to display Web pages. Basic elements exist in all browsers, and most browsers use universal symbols.

- A browser tracks websites you have visited and temporarily stores data you access on the Web.

- Internet security is essential. Each time you connect to the Internet, there is the risk of unauthorized parties accessing sensitive resources.

👩‍🦰 Questions

1. What is the Internet? What are the differences between the Internet and the Web?
2. What is a Website, Webpage, Home Page, and URL?
3. What is the extension's purpose for a website's domain name?
4. What domain type is associated with commercial/business Websites?
5. What is the purpose of a wiki website?

💡 Exercises

1. Discover content on the internet.

    a. Open web browser

    b. Go to eleaning.moyes.gov.kh

    c. Navigate this website.

    d. Describe what contents are on this website. Tell your class.

    e. Download any content related to your subject.

Lesson 17

Using Email

Introduction:

Email (Electronic mail) is a way to send and receive messages across the Internet. At the end of this lesson, you will be able to:

- ✓ Create an Email account
- ✓ Send and receive Email
- ✓ Work with Email settings

When you have finished this lesson, you will know:

    I.   What Email Is
   II.   How to Create an Email Account
  III.   How to Send Email

Lesson 20 Using Email
I. Introduction to Email

Email (Electronic mail) is a way to send and receive messages across the Internet. It's similar to traditional mail but has some key differences. To better understand what Email is all about, look at the infographic below and consider how you might benefit from its use.
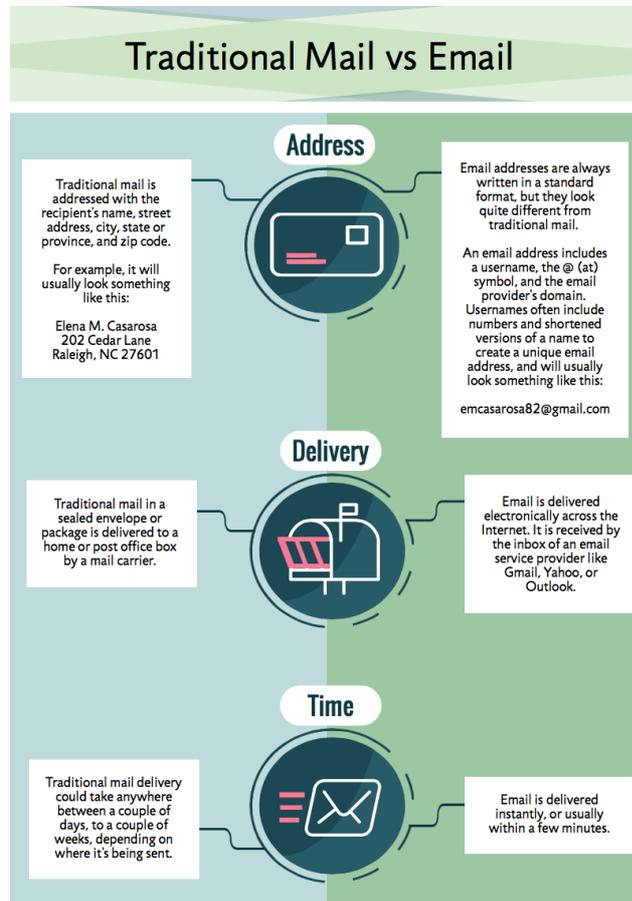
2. Understanding Email Addresses

To receive Emails, you will need an Email account and an Email address. Also, if you want to send Emails to other people, you will need to obtain their Email addresses. It's important to learn how to write Email addresses correctly because you need to enter them exactly right to ensure your Emails are delivered to the right person.

Email addresses are always written in a standard format, including a username, the @ (at) symbol, and the Email provider's domain.

The **Username** is the name you choose to identify yourself.
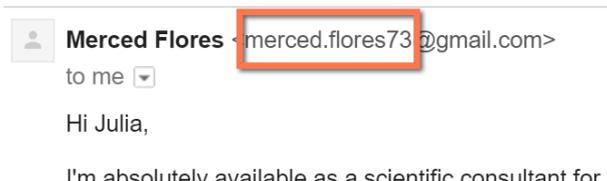
The **Email Provider** is the website that hosts your email account.

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Some businesses and organizations use Email addresses with their website domain.

3. Gmail

Gmail (pronounced Gee-mail) is a free Web-based Email service that provides users with a gigabyte of storage for messages and the ability to search for specific messages. With Gmail, your Email is stored safely in the cloud. You can get messages from any computer or device with a web browser. You can join or start a video meeting in Google Meet right from Gmail. Add Google Chat to your Gmail inbox and get all the features of Chat directly in Gmail. You can also quickly organize and find important Emails and read and draft Emails without an internet connection.

A Google Account gives you access to many Google products. With a Google Account, you can do things like:

- ✓ Send and receive Emails using Gmail
- ✓ Use Google Products in Google Workspace
- ✓ Find your new favorite video on YouTube
- ✓ Download apps from Google Play

II. Set up Gmail for Google Workspace

1. Creating Email

You can create a Gmail account by doing the following:

- ➢ Go to the Google Account sign-in page.
- ➢ Click Create account.
- ➢ Enter your name.
- ➢ In the "Username" field, enter a username.
- ➢ Enter and confirm your password.
  Tip: When you enter your password on a mobile device, the first letter isn't case-sensitive.
- ➢ Click Next.

➢ It will show Verify your information. This is an optional step. You can fill in your information like phone number and recovery Email address. But we recommend filling in this information because it is easy to recover your password if you forget it and it makes your account more secure.

➢ Enter your birthday and select your gender.

➢ Click Next.
➢ Verify your phone number page will appear
➢ Click Send Button

➢ Google will send a 6-digit verification number to your phone
➢ Check your SMS and fill in the 6-digit number
➢ Click verify button

> ➢ Click Yes, I'm in
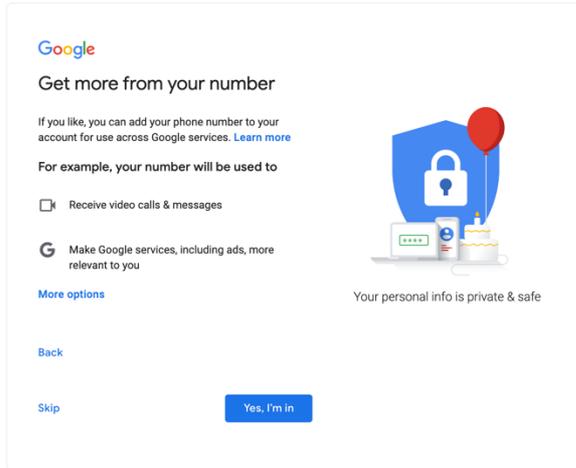
> ➢ When the Privacy and Terms page appears, scroll to the bottom and click on both checkboxes to agree with terms and privacy.
> ➢ And then click Create Account.
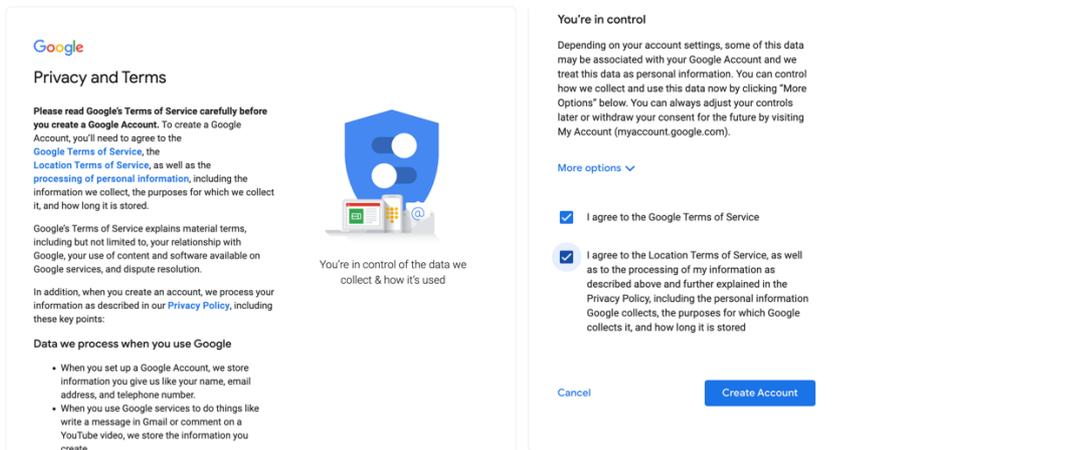
> ➢ Now, your Gmail account has been created successfully. Welcome pages appear
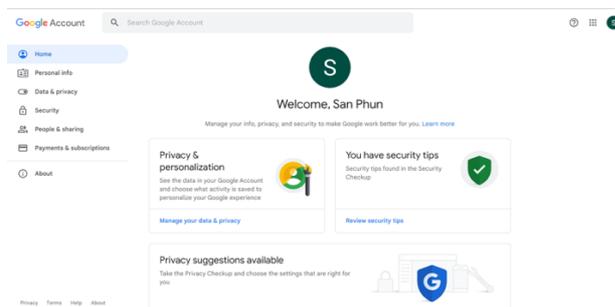
> ➢ Click on the Google app button at the top left
> ➢ Choose Gmail
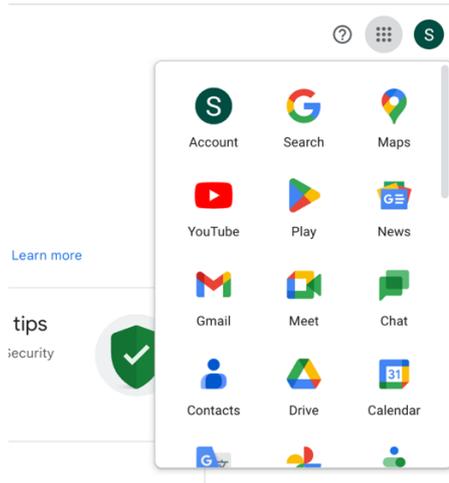
> ➤ Now you can access your Email page.
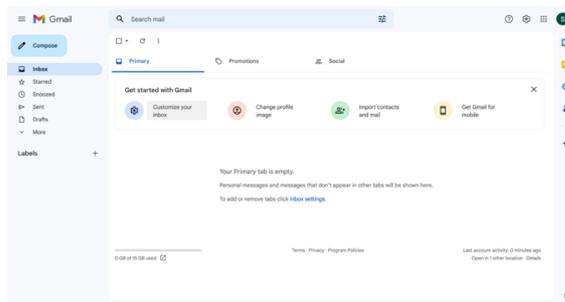
2. Email UI
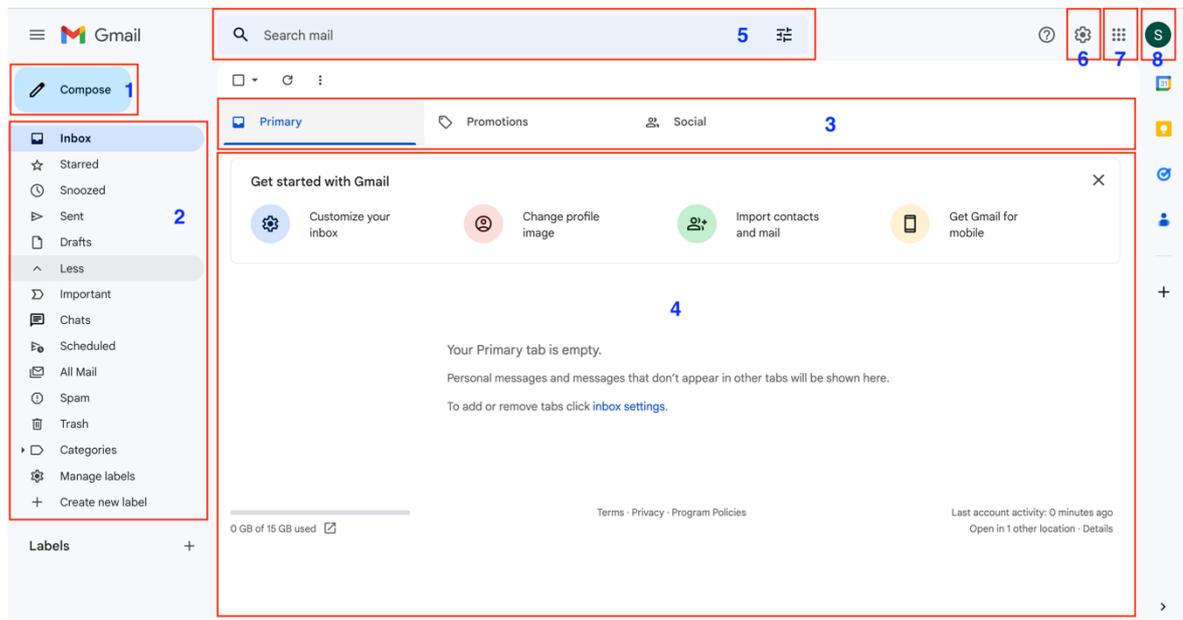
1) Compose: For sending Email
2) Menu: Shows a menu that you can navigate and manage your mail with, such as:
    - Inbox: lists Emails sent to you.
    - Draft: a place where unsent messages are kept.
    - Sent: list all Emails you sent to others

- Spam: the place where unsolicited advertising or promotional messages are kept. Typically, this type of message is sent to many users for advertising, phishing, spreading malware, etc.
  - Trash: lists all mail you deleted.
3) Searching bar: you can search your mail with this bar
4) Setting: setting features in your Email
5) App box: shows all apps that you can use with your Email
6) Account: manage your account

III. Start Sending Mail
1. Sending Email
To send an Email, please do the following:

- ➢ Click on Compose
- ➢ Compose Email page will appear
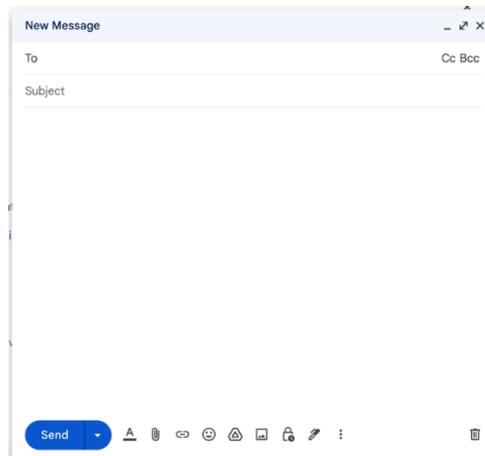
- To: Persons directly involved in the content of the message.
- Subject: Title of the mail that will be first displayed to the receivers. The title should be short and explicit enough to summarize the topic.
- Message body: You type the content of your Email in this part of the screen.
- ➢ Click Send button.

2. Reply and Forward
The Email offers choices to reply and forward

- Reply: when your Email goes to a single person, either the person who sent the original Email or the person who sent the last message in the thread you're responding to.
- Reply to all: when you respond to everyone on the thread. Other recipients will see a message you Reply All to, whether they're in the "To" or "Cc" fields. To, and reply all, forward to, forward all
- Forward: you can transfer the received Email to someone not included as a receiver in the original mail. When you reply to/forward a message, the entire content of the initial mail appears by default. Removing some parts of the original message is possible if you don't want.

Replying to or Forwarding an Email:

- ➢ To respond to a single Email or the last Email in a thread, click Reply ↩ .
- ➢ To respond to an Email within a thread, click Reply all ↞ .
- ➢ To forward a single Email or the last Email in a thread, click Forward ↪ .
- ➢ To deliver an Email within a thread, click More ⋮ ❯ **Forward**.
- ➢ To see the previous Email in a thread, click Show trimmed content ••• ..
- ➢ To forward an entire conversation, at the top, click More ⋮ ❯**Forward all**.
- ➢ To use a Smart Reply, click a suggested reply at the bottom of the Email. You can then edit the Email before sending it.
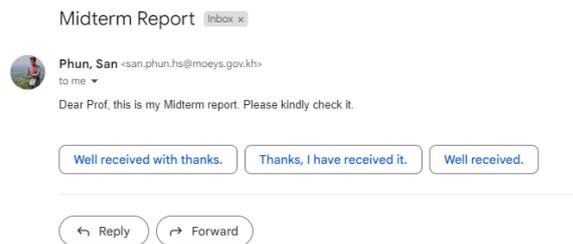
3. Sending with Attached File

When you want to attach a file with your Emails, such as a PDF file, Open office file, Video, or Music file, please do the following:

- ➢ Click on attach file icon on Compose mail page
- ➢ Navigate to the file on your computer
- ➢ Choose the file you want to attach
- ➢ Click open

Note: Attached file supports only 25MB. Attachments larger than 25MB will be automatically uploaded to Google Drive. A download link will be included in your Emails.
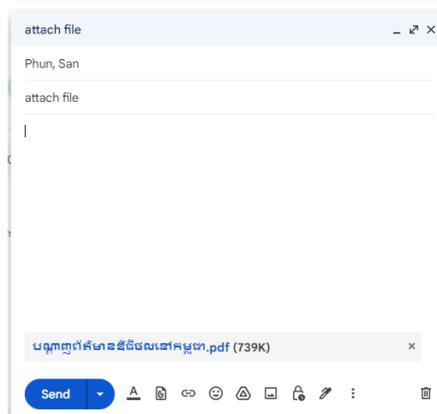
4. Email Signature

An Email signature is a block of text automatically inserted into the end of an Email message you send. Generally, a signature is used to provide the recipient with your name, Email address, business contact information, and website.

To add an Email signature, do the following:

➢ Click settings
➢ Click see all settings
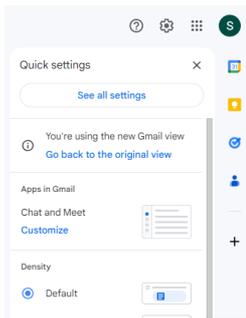
➢ In general, tap scroll down and find the signature.
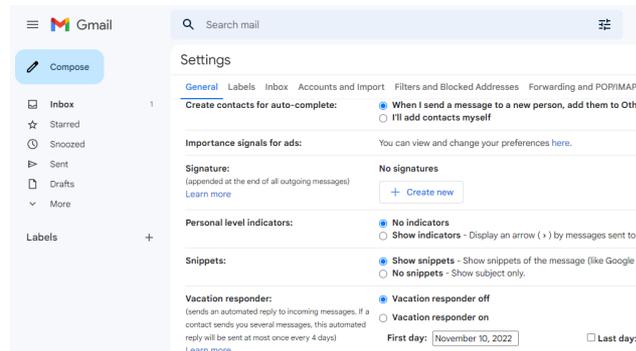
➢ Click create new, and create your name in the Name new signature box.
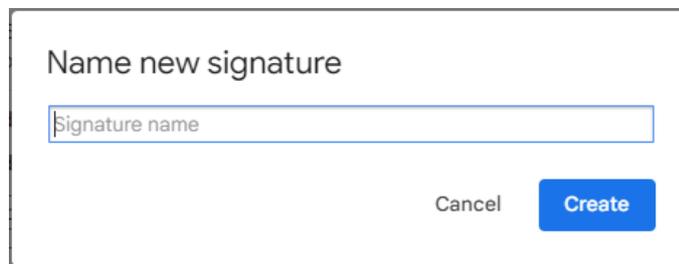
➢ Fill in your information.
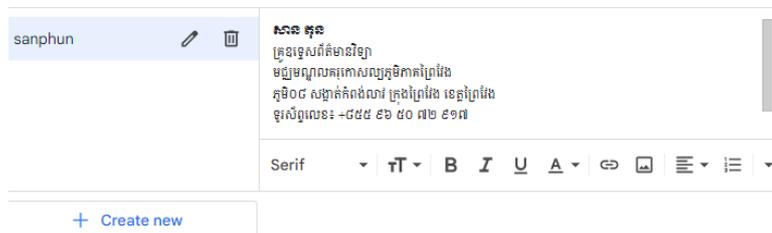
➢ Click save.

5. Download the Attachment File From the Email

To download the attached file, do the following:

• Click on Email
• Drag the mouse to the attached file
• Click on the download button

199
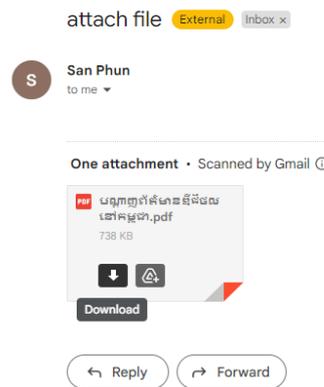
📖 Summary

- Gmail (pronounced Gee-mail) is a free Web-based Email service that provides users with a gigabyte of storage for messages and the ability to search for specific messages. With Gmail, your email is stored safely in the cloud. You can get messages from any computer or device with a web browser. You can join or start a video meeting in Google Meet right from Gmail. Add Google Chat to your Gmail inbox and get all the features of Chat directly in Gmail. You can also quickly organize and find important emails and read and draft emails without an internet connection.
- A Google Account gives you access to many Google products. With a Google Account, you can do things like:
  - Send and receive email using Gmail
  - Use Google Products in Google Workspace
  - Find your new favorite video on YouTube
  - Download apps from Google Play

❓ Questions

1. What is Email?
2. Describe the advantage of Email.
3. What is the Username and email provider?
4. Name four email providers that you know of.
5. When you create a Gmail account, why do you need to fill in a phone number or Email recovery address?

⚡ Exercises

Sending Email:

1. Open the Web browser and log in to your Gmail account

2. Send an Email to a friend in class

CHAPTER 4

Cloud Technology

And

Google Workspace

Lesson 21

Cloud Technology

Introduction:

Storing data safely is important. Sometimes storing data in a local device is unsafe when viruses attack your device. A new kind of technology is Could data storage. You can keep your data on the cloud and access it anywhere when connected to the internet. At the end of this lesson, you will be able to:

- ✓ Understand Cloud technology
- ✓ Classify the types of Cloud technology
- ✓ Know the pros and cons of Cloud storage
- ✓

When you have finished this lesson, you will know:

I. What Cloud Technology Is
II. The Types of Cloud Technology
III. The Pros and Cons of Cloud Technology
IV. Cloud Storage

Lesson 21 Cloud Technology
I. What is Cloud Computing?

Cloud computing delivers computing services, including servers, storage, databases, networking, software, analytics, and intelligence over the Internet ("the cloud"), to offer faster innovation, flexible resources, and economies of scale. You typically pay only for cloud services you use, helping you lower your operating costs, run your infrastructure more efficiently, and scale as your business needs change.
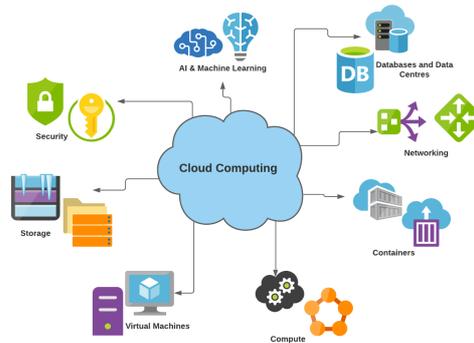
II. Types of Cloud Computing

Not all clouds are the same, and not one type of cloud computing is suitable for everyone. Several models, types, and services have evolved to help offer the right solution for your needs.

First, you need to determine the type of cloud deployment, or cloud computing architecture, that your cloud services will be implemented on. There are three different ways to deploy cloud services: on a public cloud, private cloud, hybrid cloud and Community Cloud.
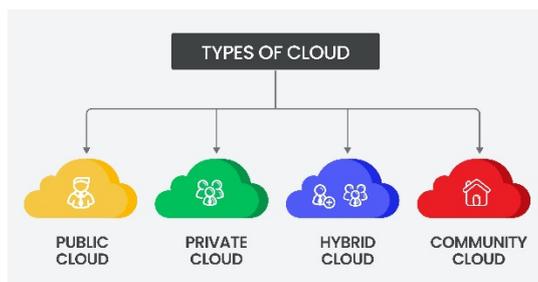
1. Public Cloud

Public clouds are owned and operated by a third-party cloud service provider, which delivers their computing resources, like servers and storage, over the Internet. With a public cloud, all hardware, software, and other supporting infrastructure is owned and managed by the cloud provider. You access these services and manage your account using a web browser. Learn more about the public cloud. Google Cloud Platform, Amazon Web Services, and Microsoft Azure are examples of a public clouds.
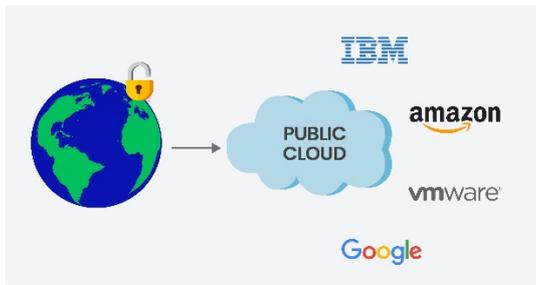
Pros:

Easy to manage. It eliminates the need for you and your team to regularly attend to the maintenance of the system.

Cost. The way services are billed is that you pay for what you use, and then regulate when it needed.

Reliability and performance. There is no limit to the number of users. And the location of users is independent because its services are delivered through the internet.

Cons:

Control. In the event of a failed cloud platform, you would not be able to maintain continuity of operations.

Security. Your data is shared for big number of users.

2. Private Cloud

A private cloud refers to cloud computing resources used exclusively by a single business or organization. A private cloud can be physically located in the company's on-site data center. Some companies also pay third-party service providers to host their private cloud. A private cloud is one in which the services and infrastructure are maintained on a private network.
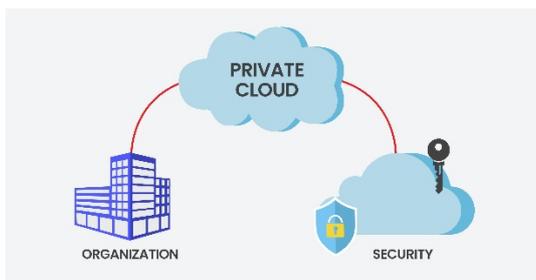
Pros:

Control. Fewer people having access to the admin tools and configuration of your private cloud will give you more control.

Customization. If you have a compelling reason to develop a new feature, you can easily deploy it in-house.

Security. You can easily integrate as many security services as your business needs. Two-factor Authentication is easily the most secure method of cloud security.

Cons:

Team. To take advantage of the power of the private cloud, you need the right skills of developers, security experts, DevOps and etc.

Cost. Most companies can't afford to set up their own cloud infrastructure. Even with the most advanced technology, the cost of running a private cloud is still expensive.

3. Hybrid Cloud

Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared. By allowing data and applications to move between private and public clouds, a hybrid cloud gives your business greater flexibility and deployment options. It helps optimize your existing infrastructure, security, and compliance.
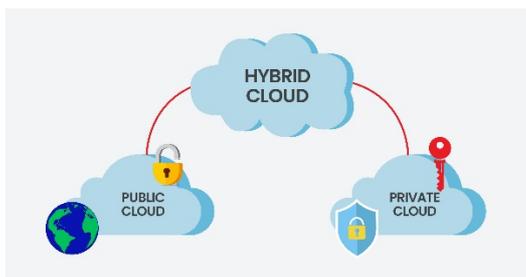
Pros:

Flexibility. One of the best features of the cloud type is that it's very flexible. You can select the parts of it that you would like to integrate into your solution.

Scalability. You can regulate the functionality with the demand of users.

Cons:

Data silos. They are the places where all of your collected data lies. Having the proper separation of these silos can help ensure that all of your data is properly allocated.

Cost. Hybrid cloud delivery models are not as expensive as they may seem, but they are also prone to spending too much. There is a risk of spending too much if you choose incorrect cloud services.

4. Community cloud

This deployment model supports multi-organizations sharing a common cloud environment. For example, universities share computing resources with the police force. Access to a community cloud environment is typically restricted to unauthorized members.

Pros:

Cost. Cost. It is cost-effective because of sharing the cloud with several organizations or communities.

Collaboration. It is suitable to share resources, infrastructure, and other features among various organizations and members.

Cons:

Limitations. There is a fixed amount of data storage is shared among all members. Also, not every organization is suitable to use it.

Security. Security features are better than public cloud but are not good as private capabilities.

III. Advantages and Disadvantages of Cloud Computing
1. Advantages

The first advantage of cloud computing is its simplicity. To use a cloud-based backup, you must install a client program and start using it. In the past, you would have to install software, connect to external hard drives, physically secure the drives, duplicate the backup storage in case it got damaged, etc. Today, the backup company performs all these steps. All you need to do is be connected to the Internet. It's the same for saving your documents with dropbox.com or sharing your photos through iCloud.

The second advantage is the up-front cost. You can enjoy an enterprise-level service for a relatively small subscription fee. If you were to purchase the servers yourself, it would be a much higher up-front cost. If you no longer want the service, you aren't stuck with costly hardware or telecommunications investments. You can simply stop using the service.

The third advantage is the ubiquitous availability. If you use Google Drive, you upload your file once. Google Drive stores it for you and allows you to access it through the browser as often as you wish. Later, you can access the same file on your phone. Finally, at your friend's house, you can use their computer to access the file under your Google Drive account. The service follows you wherever you are with an Internet connection.

2. Disadvantages

The first disadvantage of cloud computing is sustainability. If you use Google Docs as your main company document management system, you become dependent on Google. While Google is a strong company, some cloud companies go out of business. Your business may suffer when your provider is no longer there. You may even lose data or business.

The second concern is privacy. If you store your business documents with Google, does Google read them or use them? Many companies will provide legal agreements reassuring customers that they keep the data private. Since the data is out of your control, this remains a concern.

The third concern is security. Since you have to transmit the data to the cloud provider, a strong layer of protection is required. While the Internet today is generally secure, the base for this security is RSA encryption. New types of computers, quantum computers, are believed to hack RSA encryption easily. If this technology becomes available to consumers, HTTPS sites and cloud services will be vulnerable to attacks.

IV. What is Cloud Storage?

Cloud Storage is the technology that allows you to save files in storage and then access those files via the Cloud. Let's break down this definition. First, storage is the computer's ability to save files and other resources for later use. When you restart a computer, the files still available after the computer turns back on are saved and read from storage. Such storage commonly consists of a hard drive, a USB Flash drive, or another type of drive.

Because local data drives can be damaged or stolen, an idea was developed to use data drives over a network as storage. This allows the drives to be secured in a data center and backed up automatically. Initially, network storage required fast local networks (LAN), but today we have a ubiquitous Internet network.

The second part of Cloud Storage, the Cloud, represents the Internet. Any service, including storage, available over the Internet is called a Cloud Service. If you use Gmail, it is email in the Cloud. If you use Apple Music, that's music in the Cloud.

V. Benefits and Disadvantages
1. Benefits of Cloud Storage:

- ✓ High availability of storage: Enterprise-level providers handle protection against hardware failure, performance problems, and data corruption.
- ✓ Backup: Data backup and replication are done behind the scenes for the storage user. Several disaster recovery strategies protect data, making it more resilient.
- ✓ Portability: Files saved in Cloud Storage are available on PCs, phones, and tablets, anywhere and anytime. Data saved once is available anywhere the Internet is available.

2. Disadvantages of Cloud Storage:

- ✓ Concerns with the stability of providers: All businesses have a risk of going out of business. Your data stored in the Cloud may be at risk.
- ✓ Security concerns: While Cloud Storage can be secure, the Internet adds to the level of risk.
- ✓ Cost: While small amounts of disk space in the Cloud can be inexpensive, large amounts can be costly.
- ✓ Performance concerns: The storage itself is often optimized and tuned well by specialized Cloud providers. However, when the user's access to the Internet is limited, the overall experience and perception of the storage will be negative. Over a slow Internet connection, Cloud Storage will be slow as well.

📖 Summary

- Cloud computing delivers computing services, including servers, storage, databases, networking, software, analytics, and intelligence over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale.
- There are three different ways to deploy cloud services: on a public cloud, private cloud, or hybrid cloud.
- Cloud Storage is the technology that allows you to save files in storage and then access those files via the Cloud.

Questions

1. What is Cloud computing?

2. How many types of Cloud Computing are there? Describe them.

3. Describe the pros and cons of Cloud Computing.

4. What is Cloud Storage?

5. Describe the pros and cons of Cloud Storage.

Exercises

- Use the Internet to research types of popular Cloud Storage. Provide the below information:
    o Cloud Storage Service name.
    o Cloud Storage Provider (Company).
    o Date released.
    o Amount of free capacity storage.

Storing Data in Google Drive

Introduction:

In the previous lesson, you learned about cloud technology and cloud storage. This lesson will cover a cloud storage service provided by Google called Google Drive. At the end of this lesson, you will be able to:

- ✓ Understand Google Drive.
- ✓ Store data and share data using Google Drive.
- ✓ Use Google Drive to store data in daily life.

When you have finished this lesson, you will know how to:

 I.   Use G Drive
 II.   Upload and Store Data
 III.   View Data in G Drive
 IV.   Organize Files

Lesson 22 Storing Data in Google Drive

I. Intro to Google Drive

Google Drive is a free cloud-based storage service that enables users to store and access files online. The service syncs stored documents, photos, and more across the user's devices, including mobile devices, tablets, and PCs.

Google Drive integrates with the company's other services and systems, including Google Docs, Gmail, Android, Chrome, YouTube, Google Analytics, and Google+. Google Drive competes with Microsoft OneDrive, Apple iCloud, Box, Dropbox, and SugarSync.
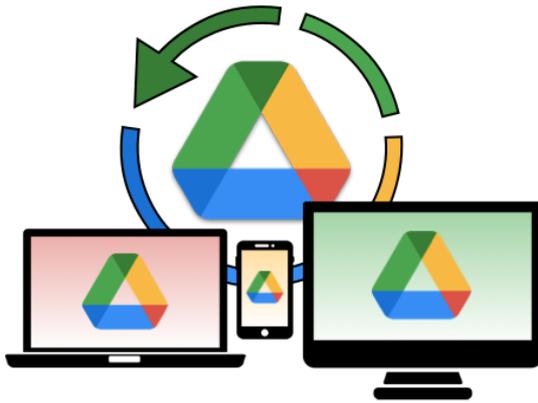
1. G Drive Account Type

Google offers different types of accounts for different kinds of users. There are two primary types of accounts that provide completely separate services:

- **Personal Account**: You can use 15GB of storage with a personal account. If you want more storage, you need to purchase it.
- **Organization Account**: You can store your limited or unlimited data depending on whether your organization or company purchases google service for you. For example, if you use a google account provided by MoEYS, you will get unlimited storage on your drive.

2. Login to G Drive

To login to your google drive account, do the following:

- ➢ Open Web browser
- ➢ Login to your Gmail account
- ➢ Click on the google app
- ➢ Chose Drive
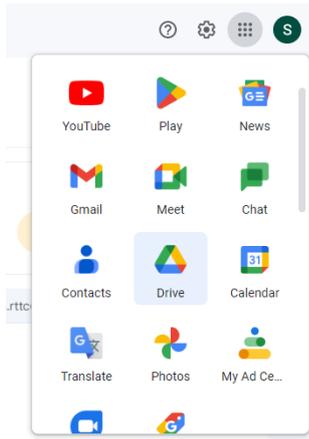
➢ Google drive home page will appear in a new tab of your browser.
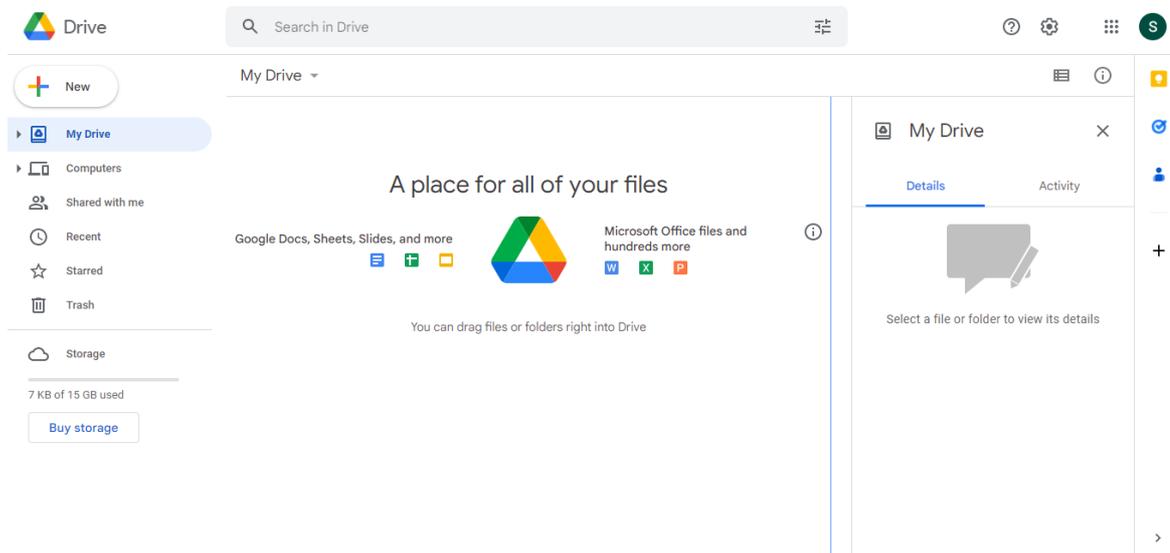
II. Uploading and Storing Data on the Web

To upload data to the drive, do the following:

➢ Click **+ New -> File upload** or **Folder upload**,
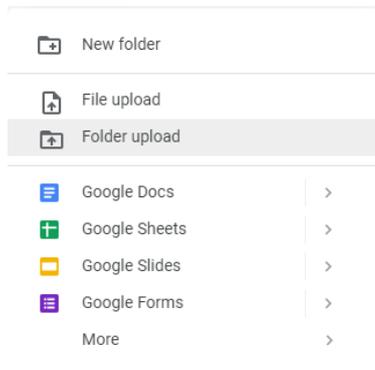
➢ And then, choose the file or folder you want to upload.

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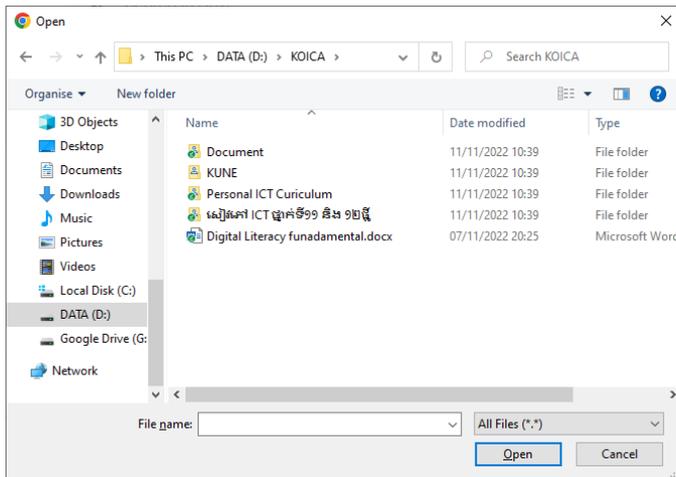
> ➢ Click **Open**.

If you're using the latest version of Chrome or Firefox, you can drag files directly from your computer to the Drive page on your browser.
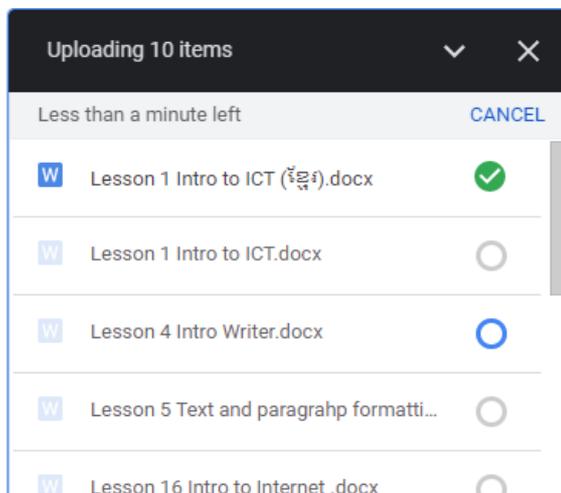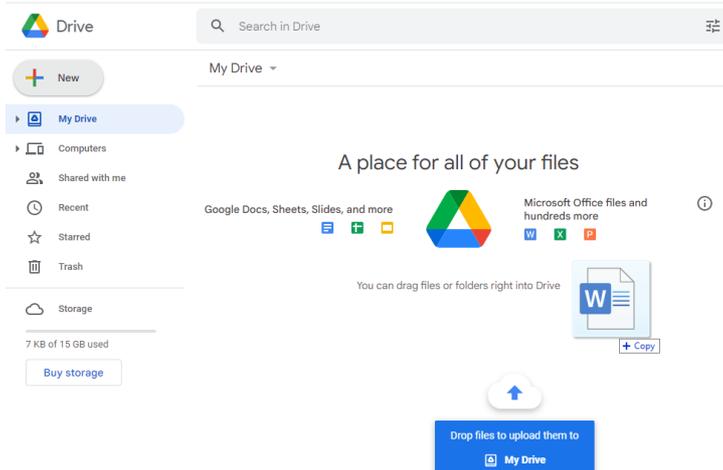
If you upload a file that matches the name of an existing file, Drive will add it as a new version instead of creating a duplicate. To see the previous version of that file, you can manage versions.

When you see **Upload complete**, your files have uploaded successfully and can be accessed in any browser or device that has Drive installed.

III. View the File

1. Preview and Download Stored Files on the Web

To take a quick look at a Drive file, right-click it and select **Preview**.

In the overlay, you can:

- Scroll down or up in your file.
- Click Left arrow ‹ or Right arrow › to see the previous or next file in Drive.
- Open your file to edit it.
- Click Add comment ⊞ to comment on non-Google files.
- Print your non-Google file.
- Click Download ⤓ to download your file.
- Click More ⋮ to share, move, rename a file, and more.

To save a file to access later, download it one of the following ways:

- From the preview screen, click Download ⤓.
- From Drive, select a file, click More ⋮, and Download ⤓.
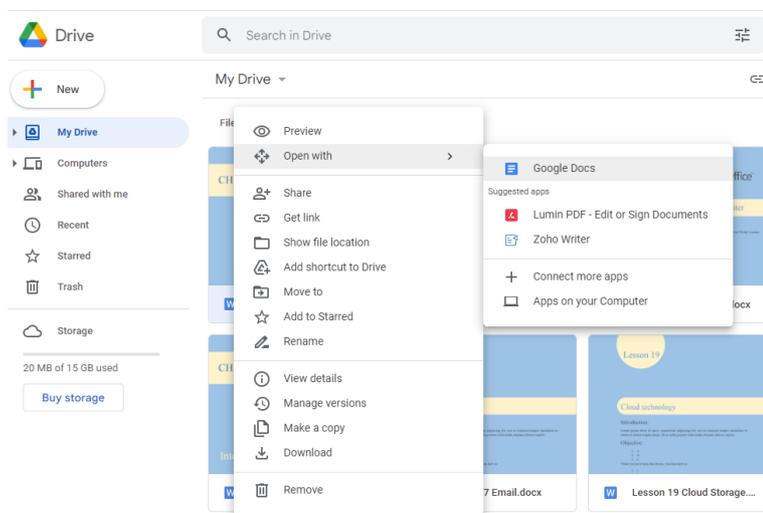
2. Open File

To open the file, do the following:

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➢ Open Drive.

➢ Double-click the file you want to open.
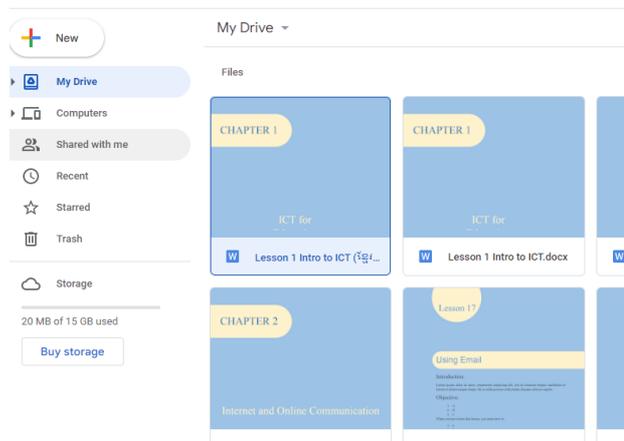
➢ The file will open in a new tab.
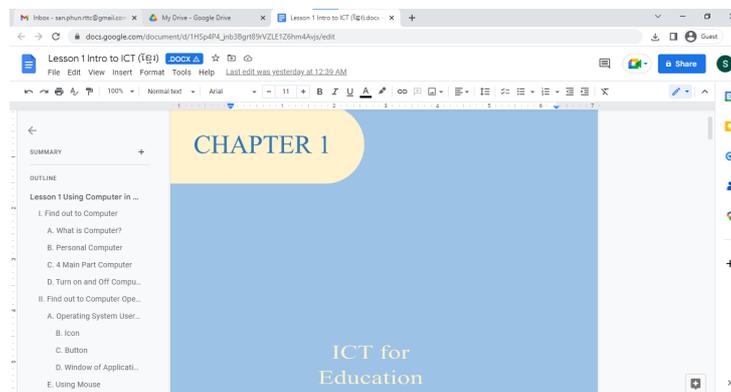
3. Delete File

Removing a file moves it to Trash:

- If you own the file, moving it to Trash removes it from your My Drive view. The file is permanently deleted after 30 days in the Trash. If you share the file, those people can still see it until it's deleted.
- If you don't own the file (for example, if it's been shared with you), moving it to Trash removes it from your My Drive view but doesn't delete it. Only the owner can delete the file.

Note: Removed files you own are moved to Trash in Drive and still count towards your total storage until you permanently delete them on the web.

Method:

➢ Select the files or folders you want to remove and click Remove 🗑.

➢ (Optional) To delete files permanently, do one of the following:

- When in Trash, select a file and click **Delete forever**.

- To permanently delete all your Trash files, click **Trash** and select **Empty trash**.
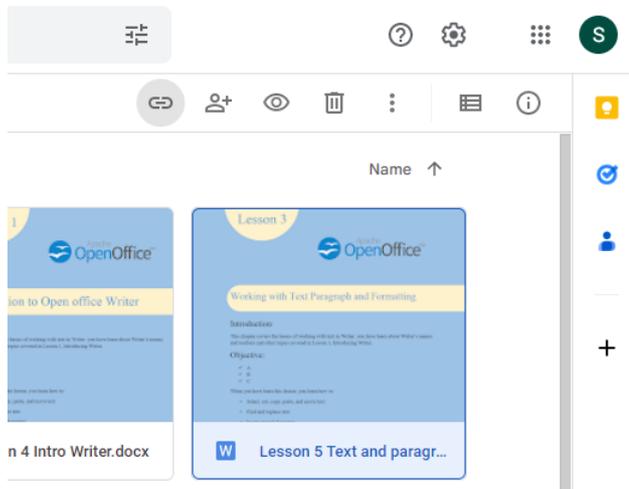
4. Restore Deleted File

If you change your mind after deleting a file or folder, you can restore it to Drive. Whether you delete it from Drive on the web or your computer in Drive for desktop, you restore it the same way.

➢ Open Drive.

➢ Click Trash 🗑.
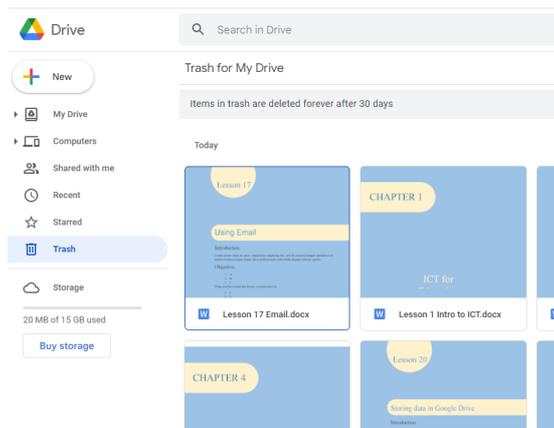
➢ Select the files you want to restore and click Restore ↺.
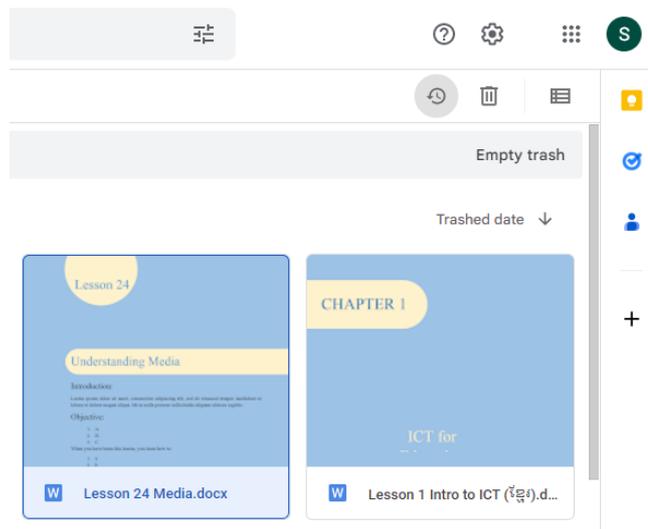
IV. Organize Files in Drive

1. Create Folder

To Create a folder, do the following:

Any new folders you create in your computer's Drive for desktop folders or in Drive on the web automatically appear on your devices so that you're organized everywhere.

➢ Open Drive.
➢ Click ➕ **New -> Folder**.
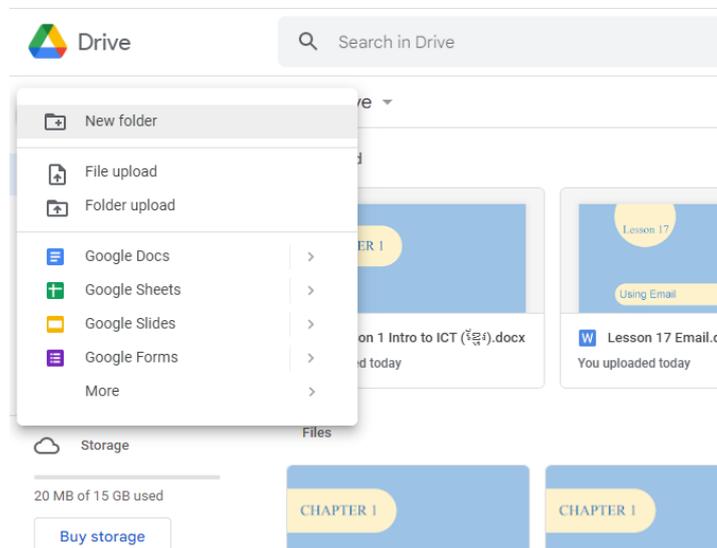
➢ Name your folder
➢ Click Create
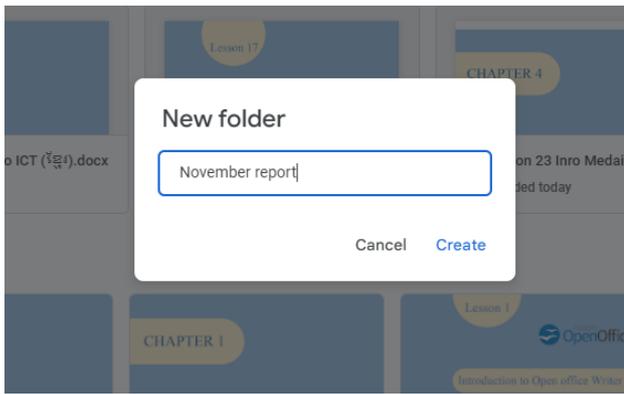
2. Move the File to the Folder

Move a file to a folder in My Drive:

➢ Select the file.

➢ Click More ⋮ -> Move to ↪.

➢ Select the folder and click **Move**.
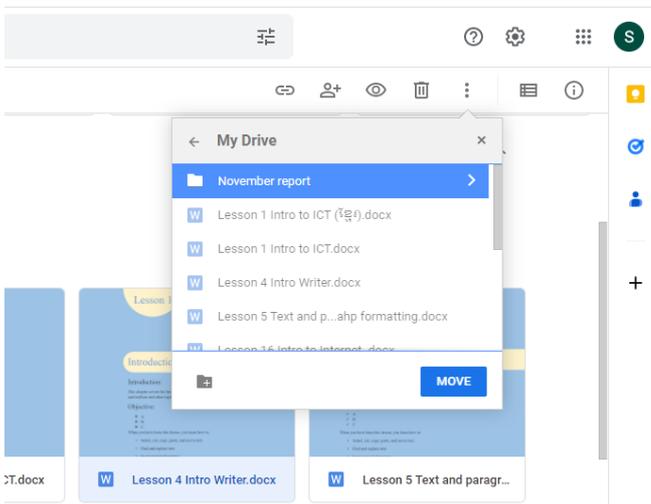
You can also drag files and folders to a folder in My Drive on the left.
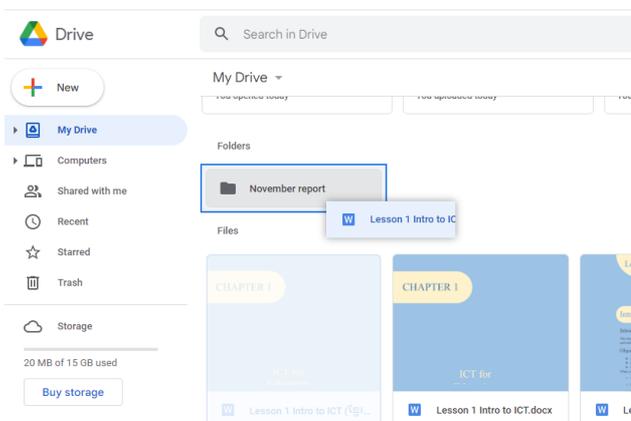
V. Share and Collaborate in My Drive

After you share Google Drive files or folders, you can work on them with teammates.

1. Share a File or Folder with Specific People and Set Access Levels:

➢ Select the file you want to share.

➢ Click **Share** or Share ⁺👤.
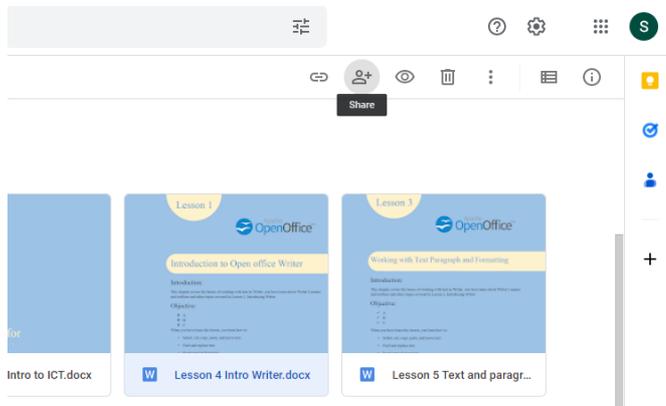
➢ Enter the email address you want to share.

➢ To decide what role people will have on your file, select **Viewer**, **Commenter**, or **Editor**.
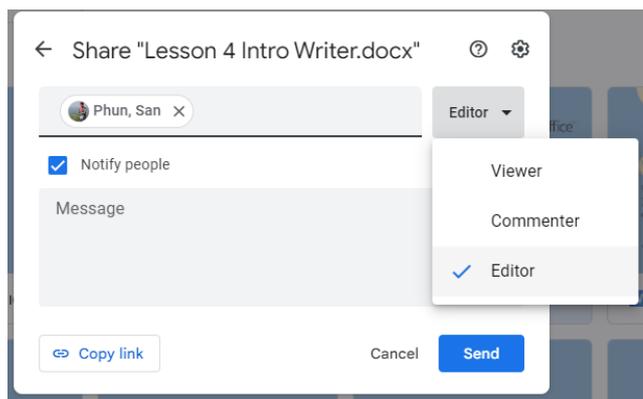
➢ Choose to notify people.

- **If you want to notify people that you shared an item with them**, check the box next to Notify people. If you inform people, each email address you enter will be included in the email.

- **If you don't want to notify people**, uncheck the box.

➢ Click **Send** or **Share**.

1. Allow General Access to a File:

You can choose if your file should be available to anyone or restricted to only those with access. If you allow access to anyone with the link, your folder won't restrict who can access it.

➢ Select the file you want to share.

➢ Click **Share** or Share ⁺👤.

➢ Under "General access", click the Down arrow ▾ .

➢ Choose who can access the file.

- **Restricted**: Only people with access can open the link.

- **Anyone with the link**: Anyone on the internet with the link can view it.
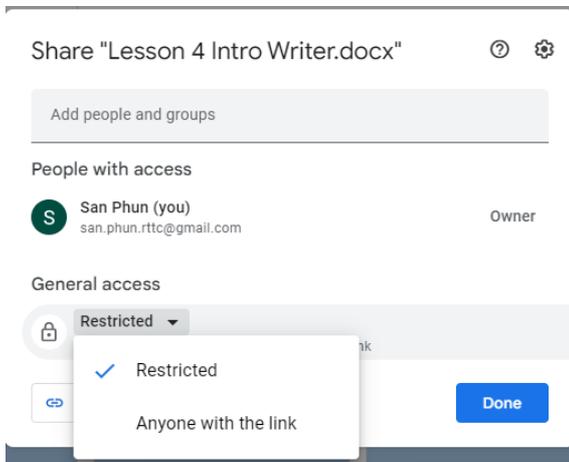
Tip: If you use your Google account for work or school, you can only share files and folders with a specific audience, like your department. You might see a description of each audience when you hover over the group name.

➢ To decide what role people will have with your file, select **Viewer**, **Commenter**, or **Editor**.

➢ Click **Done**.

📖 Summary

- **Google Drive** is a free cloud-based storage service that enables users to store and access files online. The service syncs stored documents, photos, and more across the user's devices, including mobile devices, tablets, and PCs.

- Google offers different types of accounts to different types of users. There are two primary types of accounts that provide completely separate services:

  - **Personal Account**: You can use 15GB of storage data with a personal account. If you want more storage, you need to purchase it.

  - **Organization Account**: You can store your limited or unlimited data depending on whether your organization or company purchases google service for you. If you use a google account provided by MoEYS, you will get unlimited storage on your drive

- After you share Google Drive files or folders, you can work on them with teammates.

❓ Questions

1. What is Google Drive? How many types of google accounts types are there?
2. Describe how to upload files and folders.
3. How many types of permission are there when you share your drive?
4. Describe each permission.
5. In the General access Setting, describe: "Restricted" and "Anyone with the link."

💡 Exercises

1. Upload and share a folder:

   a. Create a folder named: "share with teacher"

   b. Upload any file to your computer.

   c. Share this folder with your teacher.

Lesson 23

Google Workspace for Administration

Introduction:

You learned about OpenOffice in the previous chapter. This lesson will teach you about Google Workspace for Administration, another Office program that runs in a web browser. It is very similar to OpenOffice. At the end of this lesson, you will be able to:

- ✓ Discover Google Workspace for Administration
- ✓ Use Google docs, slides, and sheets to work in administration.
- ✓ Use Google Workspace to improve your working process.

When you have finished this lesson, you will know how to:

   I. Use Google Docs
  II. Use Google Sheets
 III. Use Google Slides

Lesson 23 Google Workspace for Administration

I. Google Docs

1. What Can You Do with Docs?

Google Docs is a free, web-based word processor offered by Google as part of its complete Office suite that Google uses to compete with Microsoft Office. The other main services included in the cloud-based suite are Sheets (Excel) and Slides (PowerPoint).

Google Docs is available on all devices and platforms. All you need is an internet connection and a web browser (or, in the case of mobile, the applicable apps). Google does the rest and handles the heavy lifting while running the software in the cloud.

Docs support several different file types, including .doc, .docx .txt, .rtf, and .odt, making it easy to view and convert Microsoft Office files directly from Google Drive.

And since Docs is an online word processor, you can share and collaborate with multiple people on the same document, track revisions, make changes and suggestions in real time.
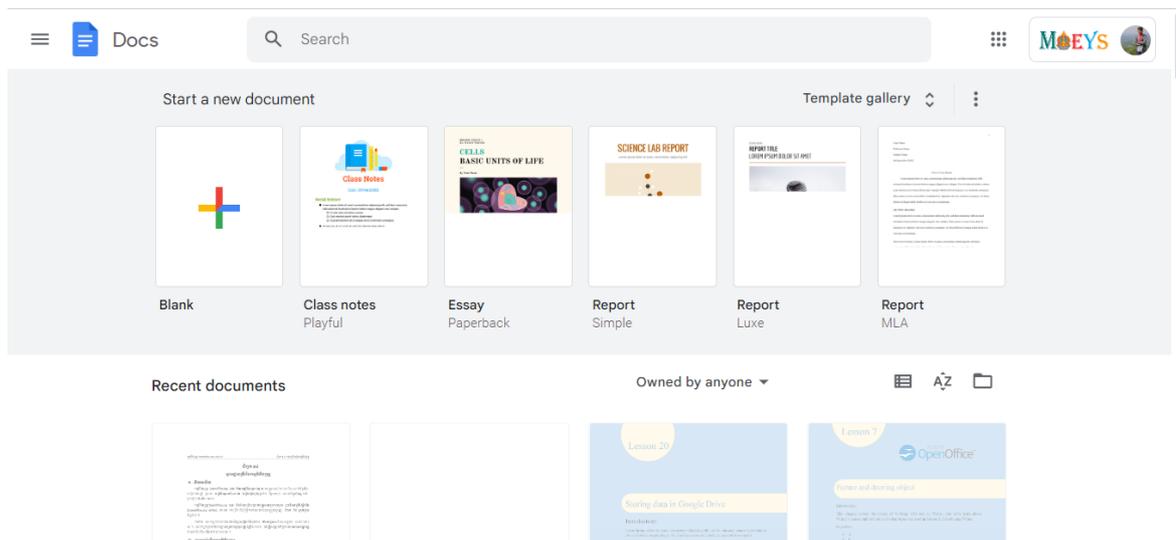
2. Create Files

The first thing you'll need to do before you can use Google Docs is sign up for a Google account (an @gmail account). You use an Email account to log in.

To create a new document, do the following:

- ➢ Login to google docs
- ➢ Click on blank
- ➢ Google docs workspace will be appear
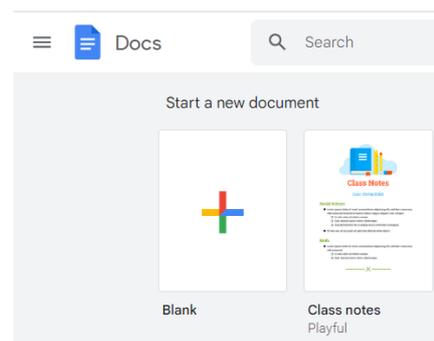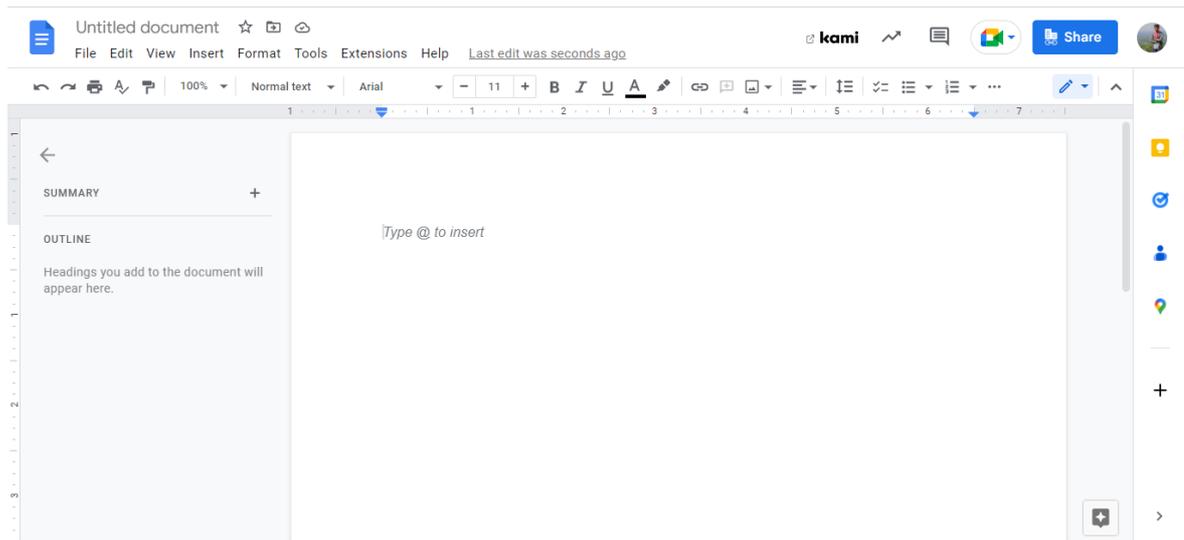
3. Edit and Format a Document

Edit a document, change how it looks, and work in it much as you did in your old program. Google Docs automatically saves every change you make.

A. Add and Edit Text

Rename your document:

➢ At the top of the page, click Untitled document, enter a new title, and click OK.
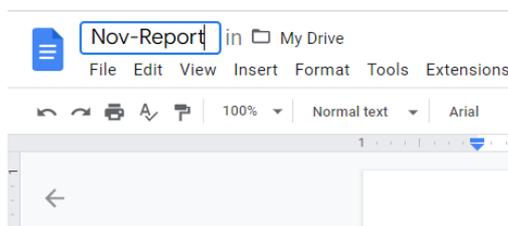
Add or edit text:

➢ Just click on the page and start typing.
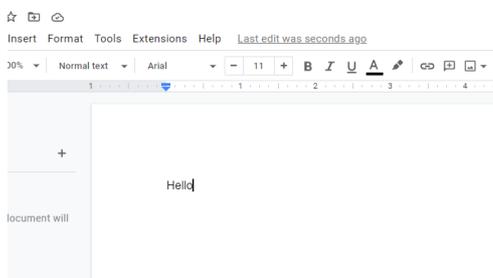
B. Customize your Document

Depending on what you want to change, choose an option:

• To customize margins, page color, and orientation, click File and then Page setup.

- To customize text, images, tables, and more, use the toolbar options.

Note: Some options only appear for certain types of content, such as tables or images.

	Undo or redo your last changes or print your document.
	Check spelling and grammar.
	Copy formatting from any text and apply it to another selection of text.
Normal text ▼ Arial ▼ − 11 +	Change the style, font, or font size.
B *I* U A	Make text bold, in italics, underlined, or change the text color.
	Add or change the text highlight color.
	Insert a link, comment, or image.
	Change the text alignment.
	Change the line spacing or add a checklist, bullets, or numbers.
	Change the text indentation.
	Remove text formatting.
Table and image options	
	Add background color to a table or change the border color, width, or style.
	Crop an image.
Image options…	Change the color, transparency, brightness, or contrast.
Replace image ▼	Replace an existing image with a new one.

C. Add Pictures, Links, Tables, and More

The Insert menu lets you add different features to your document. Here are the highlights:

- **Image**—Insert an image from your computer, the web, Drive, and more.
- **Table**—Select the number of columns and rows to create a table.
- **Drawing**—Create shapes, pictures, and diagrams in your document.
- **Link**—Add a link to another page, header, or bookmark in the same document.
- **Bookmark**—Add shortcuts to specific places within your document.
- **Table of Contents**—Create an auto-generated table of contents that links to each heading in your document with a heading style applied.
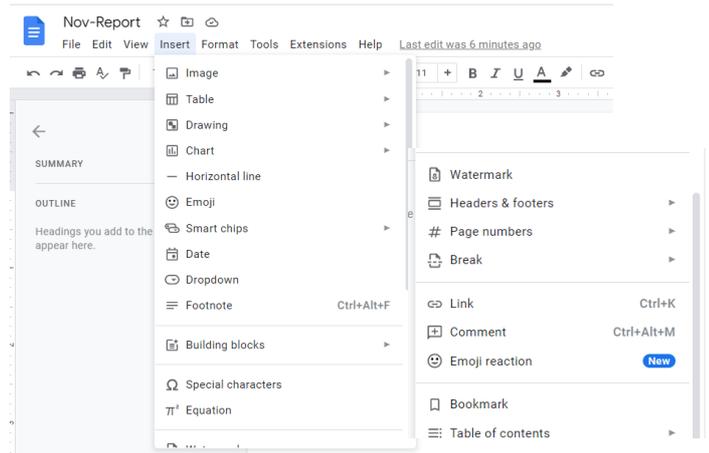
D. Create Page Columns

You can organize your text in columns if you're working on an academic paper or another large document.

- ➢ Click Format and then Columns.
- ➢ Select the number of columns you want.
- ➢ (Optional) To adjust the spacing or add lines between columns, click Format, Columns, and More options.
- ➢ Click Apply.
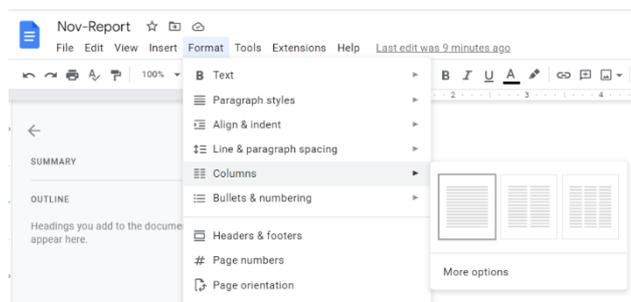
4. Share and Collaborate on Files

A. Share a File or Folder with Specific People:

- ➢ Select the file you want to share.
- ➢ Click **Share** or Share 📇.
- ➢ Enter the email address or Google group you want to share with.

➢ To decide what role people will have on your file, select **Viewer**, **Commenter**, or **Editor**.

➢ Choose to notify people.

  o **If you want to notify people that you shared an item with them**, check the box next to Notify people. If you notify people, each email address you enter will be included in the email.

  o **If you don't want to notify people**, uncheck the box.

➢ Click **Send** or **Share**.
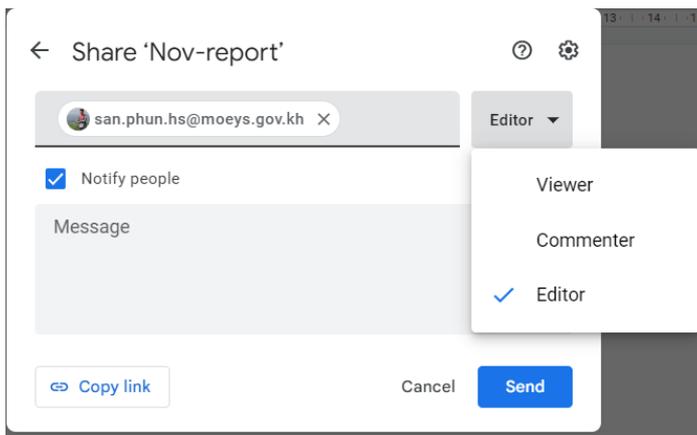
B. Allow General Access to a File:

You can choose if your file should be available to anyone or restricted to only those with access. If you allow access to anyone with the link, your folder won't restrict who can access it.

➢ Select the file you want to share.

➢ Click **Share** or Share ⁺👤.

➢ Under "General access", click the Down arrow ▾ .

➢ Choose who can access the file.

Tip: If you use your Google account for work or school, you can only share files and folders with a specific audience, like your department. You might see a description of each audience when you hover over the group name.

➢ To decide what role people will have with your file, select **Viewer**, **Commenter**, or **Editor**.

➢ Click **Done**.

5. Print and Download Files

A. Print Your File

To print your file, click File and then Print or click Print.

For documents and presentations: In the preview, you can scroll through your document on the right or choose print options on the left.
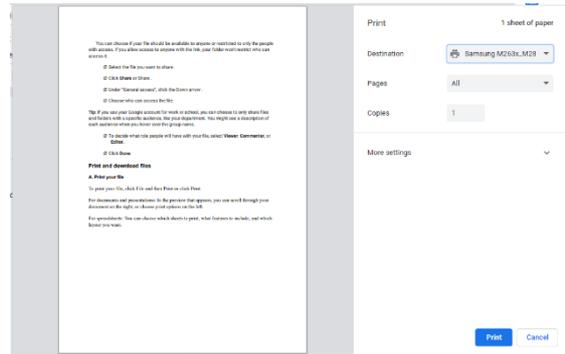
For spreadsheets: You can choose which

sheets to print, what features to include, and which layout you want.

B. Download Versions in Other Formats

To download your file so other programs can open it, click **File Download** and choose one of the following formats:

Docs	Slides	Sheets
Microsoft Word (.docx)	Microsoft PowerPoint (.pptx)	Microsoft Excel (.xlsx)
OpenDocument Format (.odt)	ODP (.odp)	OpenDocument format (.ods)
Rich Text Format (.rtf)	Text file (.txt)	Adobe PDF (.pdf)
Adobe PDF (.pdf)	Adobe PDF (.pdf)	Comma-separated values (.csv)
Text file (.txt)	JPEG (.jpg)	Tab-separated values (.tsv)
Web page (.html, zipped)	PNG (.png)	Web page (.zip)
	Scalable Vector Graphics (.svg)	

C. Make a Copy

Copying a file is useful for creating templates. For example, if you write many proposals, you can make copies of one proposal and then update each document for a new project without having to format it again.

Make a Copy of Your Document:

- ➤ Click File and then Make a copy.
- ➤ (Optional) You can rename the copy, change where you save it in Drive, and share it with the same collaborators.
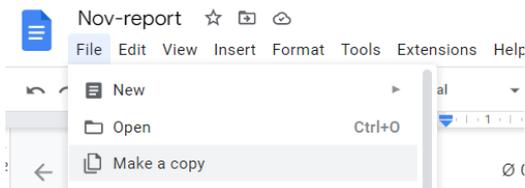
II. Google Sheets

With Google Sheets, you can create and edit spreadsheets directly in your web browser with no special software ~~is~~ required. Multiple people can work simultaneously, you can see people's changes as they make them, and every change is saved automatically.

The first thing you'll need to do before you can use Google Docs is sign up for a Google account (an @gmail account). You use an Email account to log in.

To create a new document, do the following:

- ➤ Login to google docs
- ➤ Click on blank
- ➤ Google docs workspace will be appear
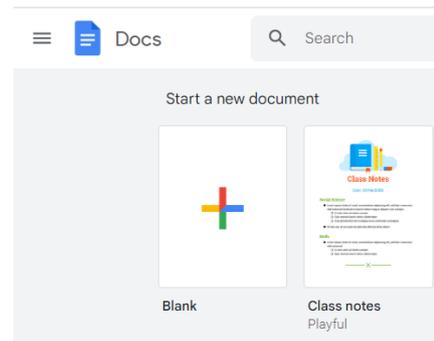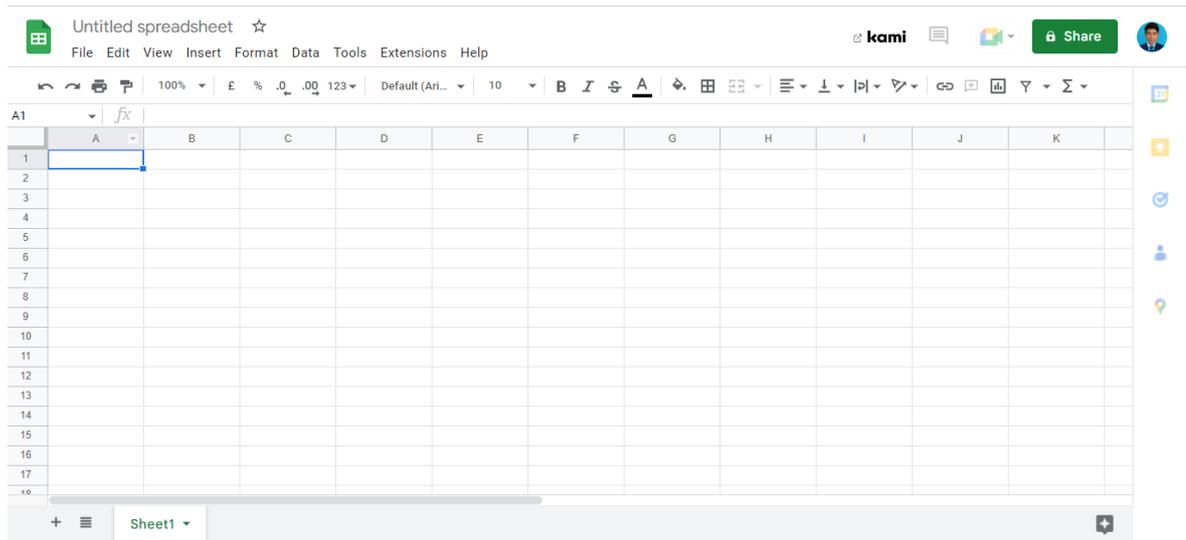
1. Enter and Edit Your Data

- **Rename your spreadsheet:** Click Untitled spreadsheet and enter a new name.
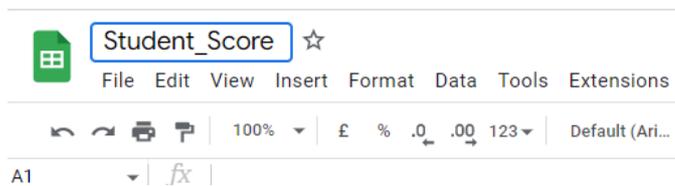
- **Enter text or data**: Click a cell and enter text.

- **Insert more items**: Click Insert and add charts, images, drawings, functions, notes, and more.

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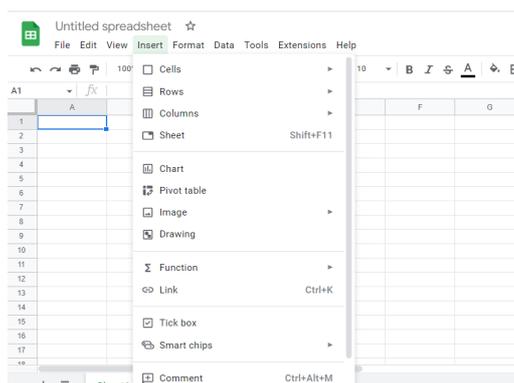
2. Customize Your Spreadsheet

Select cells in your spreadsheet and then format them using the toolbar options.

↶ ↷ 🖶	Undo or redo your last changes or print your spreadsheet.
🖌	Copy formatting from any text and apply it to another selection of text.
$ % .0 .00 123 ▾	Format your data as currency or a percentage, change decimal places, and more.
Default (Ari... ▾ 10 ▾	Change font or font size.
B *I* S̶ A̲	Make text bold or in italics, strikethrough text, or change the text color.
🎨	Add or change the color of cells.
⊞	Add or edit cell borders.
⧉ ▾	Merge cells.
≡ ⊥ ⫶ ⤸	Change the text alignment, how the text wraps, or rotate the text.
🔗 💬 📊	Insert links, comments, or charts.
▽ ▾	Filter your data.
Σ ▾	Add functions.
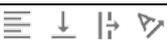
3. Work with Rows, Columns, and Cells

Add Rows, Columns, and Cells:

- ➢ Select the row, column, or cell near where you want to add your new entry.
- ➢ Right-click the highlighted row, column, or cell **Insert** and *choose where to insert the new entry*.

Delete, Clear, or Hide Rows and Columns: Right-click the row number or column letter and choose **Delete**, **Clear**, or **Hide**.

Delete Cells: Select the cells and right-click **Delete cells, Shift left** or **Shift up**.

Move Rows or Columns: Select the row number or column letter and drag it to a new location.

Move Cells:

➢ Select the cells.

➢ Point your cursor to the top of the selected cells until a hand appears.

➢ Drag the cells to a new location.

Group Rows or Columns:

➢ Select the rows or columns.

➢ Click **Data Group rows** or **Group columns**.

Freeze Header Rows and Columns: Keep a row or column in the same place as you scroll through your spreadsheet. On the menu bar, click **View** ˃ **Freeze** and choose an option.

4. Work with Multiple Sheets

A. Add a sheet:

• At the bottom of your spreadsheet, click Add sheet + to add another sheet.

B. Delete or Copy a Sheet:

➢ Open the sheet.

➢ At the bottom of your spreadsheet, click the Down arrow on the sheet's tab.

➢ Select **Delete** or **Duplicate**.
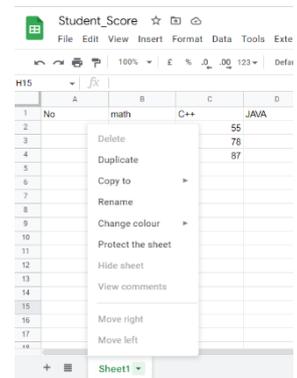
5. Add Formulas and Functions

Use a formula

➢ Open a spreadsheet.

➢ Type an equal sign (=) in a cell and type in the function you want to use. **Note:** You may see suggested formulas and ranges based on your data.

➢ A function help box will be visible throughout the editing process to provide a definition of the function, its syntax, and an example for reference. If you need more

information, click the "Learn more" link at the bottom of the help box to open a full article.

Tip: You might get suggestions to help you complete formulas with the relevant functions. You can accept or reject these suggestions.

To turn suggestions on or off, click on **Tools** ˃ **Enable formula suggestions**.
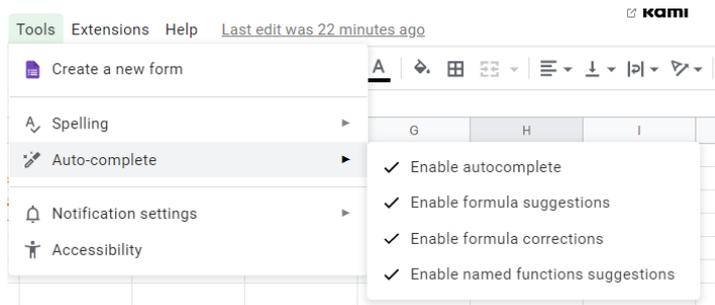
III. Google Slides

Create and present professional pitch decks, project presentations, training modules, and more. With Google Slides, you can build presentations right in your web browser with no special software ~~is~~ required. Even better, multiple people can work on slides at the same time, you can see people's changes as they make them, and every change is automatically saved. Create a new file in Slide, the same as docs and sheet.
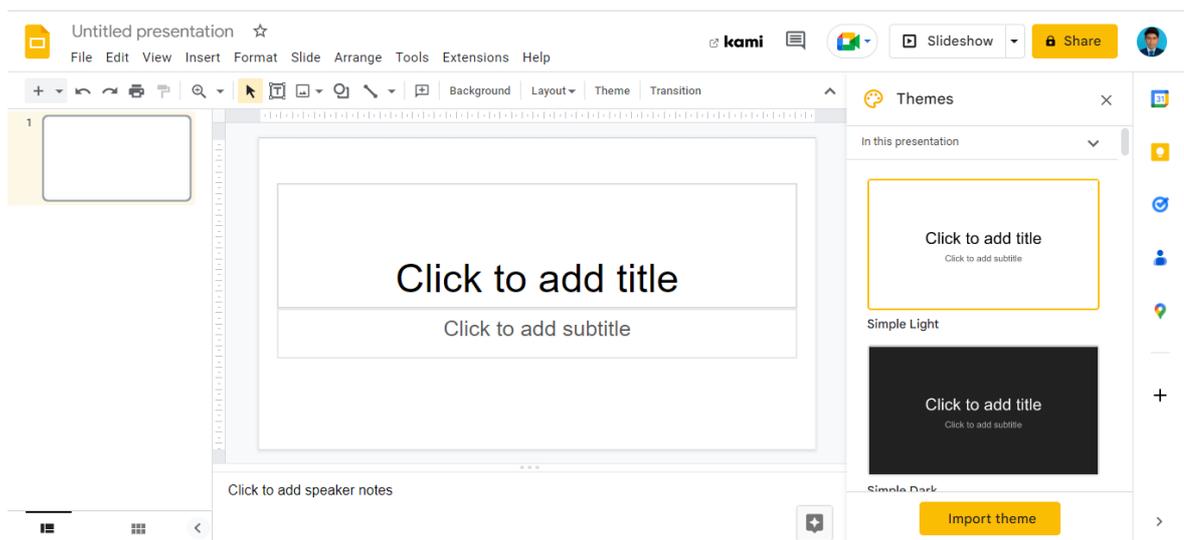
1. Add Content to Your Presentation
A. Choose a Theme and Layout

When you create a presentation, you can choose a theme to give all your slides the same background and text styles for a consistent look and feel.

To add a different theme to your presentation, click **Import theme**.

To change your presentation's layout, click **Layout** and select an option. Or, at the bottom, click Explore and choose a suggested format.
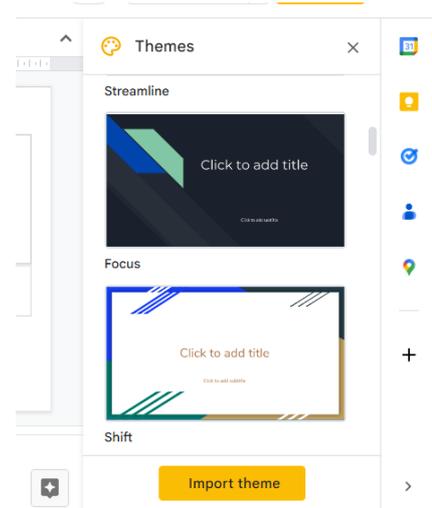
B. Add and Edit Content
Rename Your Presentation—Click **Untitled presentation** and enter a new name.

Add images—Click **Insert** › **Image** to add images from your computer, the web, Google Drive, and more. You can also move, delete, or resize images.

Add text—Click **Insert** › **Text box** to add new text boxes. Then, click a text box to enter text. You can move, delete, or re-size text boxes. You can also change how the text fits in a box.
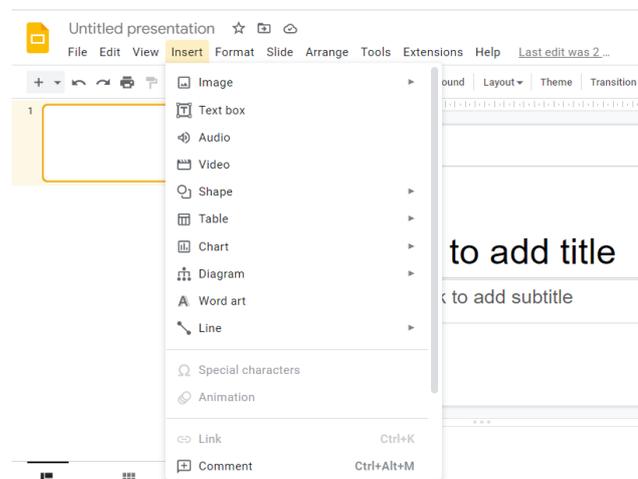
Add Videos, Shapes, Charts, and More—Click **Insert** to add videos, figures, charts, slide numbers, and other features to your presentation. You can also move, delete, or re-size these inserted features.

Add Speaker Notes—Use speaker notes to keep track of your talking points for each slide. In the presentation editor, speaker notes appear beneath the current slides. Your speaker notes show in a separate window when you present your slides.

C. Customize Your Slides

Depending on what you want to change, choose an option:

- To change the size of your slides, click **File** › **Page setup**.
- To customize slides, text, images, and more, use the toolbar options.

Note: Some options only appear for certain types of content, such as text, images, or slides.

+ ▾	Create a new slide.
↶ ↷ 🖨	Undo or redo your last changes or print your slides.
🖪	Copy formatting from any text and apply it to another selection of text.
⊕ ▾	Zoom in or out.
▶	Select an item on your slide.
🔲 🖼▾ ⬭ ＼▾	Add a text box, image, shape, or line.
◆	Add or change the color of an area.
✏ ≡ ┅	Change the color, weight, or style of a border.
Arial ▾ − 28 +	Change the font or font size.
B *I* U A 🖌	Make text bold, in italics, or underlined, or change the font color or text highlight color.
⌖ ⊞	Insert links or comments.
≡ ▾	Change the text alignment.
↕≡	Change the line spacing or add numbers or bullets.
⇤≣ ⇥≣	Change the text indentation.
☓	Remove text formatting.
Image options	
⬐	Crop an image.
↺🖼	Reset an image to its original format.
Replace image ▾	Replace an existing image with a new one.

D. Create and Arrange Slides

➢ **New Slide**—Click **New slide** in the toolbar. Click the Down arrow to choose a layout for the new slide.

➢ **Move Slide**—Drag the slides to a different position in the presentation. To move several slides at once, **Ctrl + click** multiple slides before dragging them.

➢ **Delete Slide**—Right-click the slide and select **Delete**.

➢ **Duplicate Slide**—Right-click the slides in the sidebar and choose **Duplicate slide**.

📖 Summary

➢ Google Docs is a free, web-based word processor offered by Google as part of its complete office suite that Google uses to compete with Microsoft Office. The other main services included in the cloud-based suite are Sheets (Excel) and Slides (PowerPoint).

➢ With Google Sheets, you can create and edit spreadsheets directly in your web browser with no special software required. Multiple people can work simultaneously, you can see people's changes as they make them, and every change is saved automatically.

➢ With Google Slides, create and present professional pitch decks, project presentations, training modules, and more. With Google Slides, you can build presentations right in your web browser with no special software required.

Questions

1. What are Google docs, Google Sheets, and Google Slides?

2. Describe how to create a new file in Google docs.

3. Describe how to share and collaborate on files in Docs, Sheet, or Slide.

4. Describe how to download the file docs to the OpenOffice Writer file.

5. Describe how to download the file Sheets to the OpenOffice Calc file.

t.me/moeysnews
sala.moeys.gov.kh
youtube.com/moeyscambodia

Lesson 24

Online Survey Tools

Introduction:

Survey tools are online tools that can electronically collect answers or responses to questions from a target audience. They feature a variety of question types, including multiple-choice, ranking, open-ended, and many others. This lesson will show you how to use Google Forms as a survey tool. At the end of this lesson, you will be able to:

- ✓ Create survey forms and quizzes
- ✓ Edit and format forms
- ✓ Share forms and collect information

When you have finished this lesson, you will be able to:

I.   Create New Forms
II. Create Different Question Types
III. Edit Forms
IV. Make Forms as Quizzes
V.   Share Forms and Collect Information

Lesson 24 Online Survey Tools

I. Introduction to Google Forms

Google Forms is a survey administration software included as part of the free, web-based Google Workspace suite offered by Google. It's easy to use and one of the simplest ways to collect data. With forms, you can:

- ✓ Surveys
- ✓ Plan events
- ✓ Manage registrations
- ✓ Create a quizzes

II. Set Up New Forms or Quizzes

To set up your google forms, do the following:

- ➤ Open Web browser
- ➤ Log in to your Gmail account
- ➤ Click on the google app
- ➤ Chose Forms
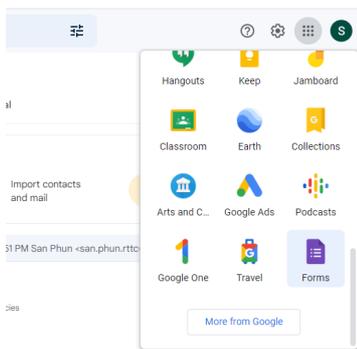
- ➤ Google forms home page will appear in a new tab of your browser.
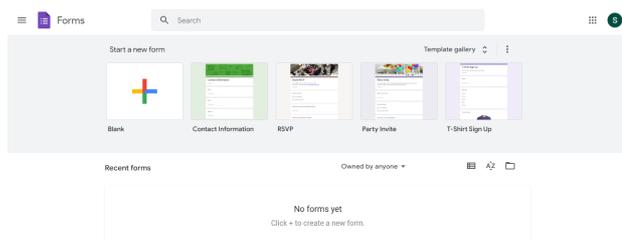
1. Creating New Forms

To create new forms, do the following:

- Click Blank ✚ .
- A new form will open.
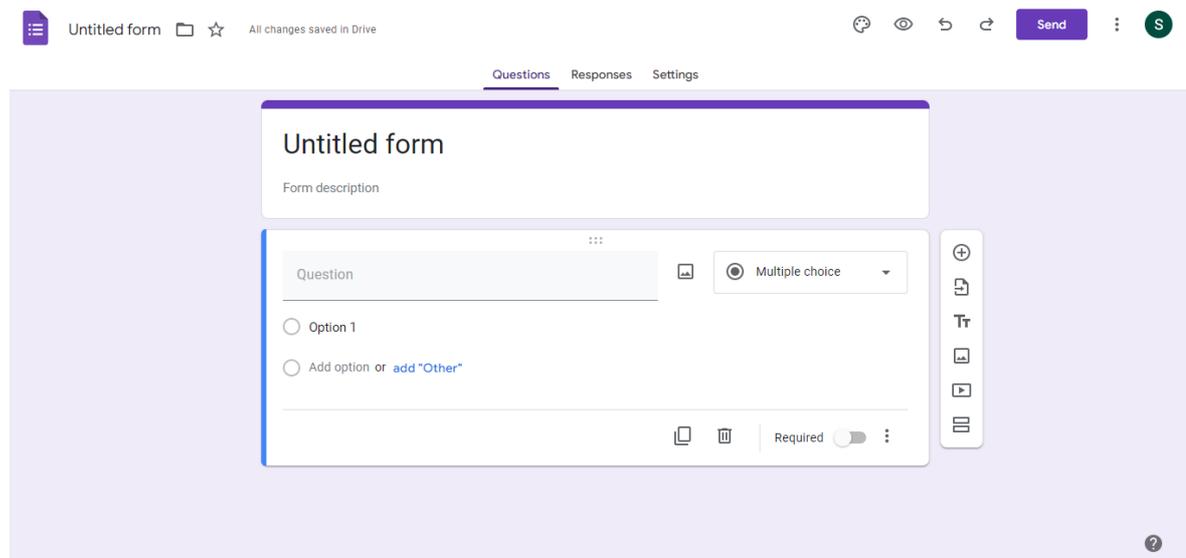
III. Question Types

When you create a form, you can add different types of questions, such as:

- ✓ Short answer
- ✓ Paragraph
- ✓ Multiple choice
- ✓ Checkboxes
- ✓ Linear scale
- ✓ Multiple choice grid and more.

You can add more titles, descriptions, and media files and divide the form into multiple sections.

2. Short Answer:

People can write answers in a few words. You can set rules that people have to follow.

3. Paragraph:

- People can write long answers over one or more paragraphs
- You can set rules that people have to follow.

4. Choose From a List

Options you add to questions in forms are case-sensitive.
Multiple choice:

- People can choose between a set of options.
- People can only choose one option.
- You can include "Other" as an option, and people can type a short answer.
- Based on a person's answers, you can send them to a specific form section.

Checkboxes:

- People can choose between a set of options.
- People can choose more than one option.
- You can include "Other" as an option, and people can type a short answer.
- Based on a person's answers, you can send them to a specific section of the form
- You can set rules that people have to follow.

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Dropdown:
- People can choose between a set of options.
- People can only choose one option.
- Based on a person's answers, you can send them to a specific form section.

5. Upload Files

File Upload:

People can upload files as a response to a question:
- Uploaded files will use Google Drive storage space for the survey owner. Learn how to clear Google Drive space and increase storage.
- Uploaded files will be stored in a new folder.
- You can choose the maximum file size that people can upload.
- You can specify which file types of people can upload.
- To fill out this question, respondents must be signed into a Google Account.

Important: You won't be able to use this question If the form is stored in a shared drive or if your administrator turns on Data Loss Prevention.

6. Choose From a Grid

Linear Scale:
- People can rate your question on a scale.
- Your scale can start at 0 or 1.
- Your scale can end on a whole number from 2 to 10.
- You can set a label for each end of the scale.

Multiple Choice Grid:
- You can create a grid where people can select one answer per row.
- To limit people to one choice per column, click More at the bottom right of the question ⋮ .
- To shuffle the row order, click More at the bottom right of the question ⋮ .

Checkbox Grid:
- You can create a grid where people can select one or more answers per row.
- To limit people to one choice per column, click More at the bottom right of the question ⋮ .
- To shuffle the row order, click More at the bottom right of the question ⋮ .

7. Select a Date and Time

Date:
- People can fill out any date in this box.
- To include the year or time, click More at the bottom right of the question ⋮ .

Time:
- People can fill out the time or duration.
- To switch between time or duration, click More at the bottom right of the question ⋮ .

IV. Edit Your Form

After you've created a form, you can add and edit up to 300 pieces of content, like questions, descriptions, images, and videos. To organize your form by topic, you can add up to 75 sections.

1. Add Questions, Headers and Sections

Add a Question
- ➢ Open a form in Google Forms.
- ➢ Click Add ⊕.
- ➢ To the right of the question title, choose the type of question you want.
- ➢ Type the possible responses to your question. To prevent people from not answering, turn on **Required**.

2. Add an Image or Video

Add an Image or Video to a Question or Answer.

You can add an image to a question or an answer for multiple-choice or checkbox questions.
- ➢ In Google Forms, open a form.
- ➢ Click a question or answer.
- ➢ To the right, click Add image 🖼.
- ➢ Upload or choose an image.
- ➢ Click **Select**.

Add an Image or Video on Its Own

You can add an image or YouTube video to your form. You can't add videos to questions, but you can place them before or after a question.
- ➢ In Google Forms, open a form.
- ➢ To add an image, click Add image 🖼. To add a video, click Add Video ▶.
- ➢ Choose your image or video and click **Select**.

3. Add a Section

Sections can make your form easier to read and complete.
- ➢ In Google Forms, open a form.
- ➢ Click Add Section ▬.
- ➢ Name the new section.

4. Duplicate a Question, Image, or Section

Questions or Images
- ➢ Click a question or image.
- ➢ Click Duplicate ❐.

Sections
- ➢ Click a section header.
- ➢ Click More ⋮.
- ➢ Click the **Duplicate Section**.

5. Reuse Questions From Previous Forms
- ➢ In Google Forms, open a form.
- ➢ At the right, click Add question ⊕ ＞ Import questions ⤒.
- ➢ Click the form with the questions you want to import ＞ **Select**.
- ➢ On the right, click the box next to each question you want to add.
- ➢ Click **Import questions**.

6. Delete or Edit Items

To edit a question, header, or description, click the text you want to change.

Questions or Images
- Click a question or image.
- Click Delete 🗑 .

Section
- Click a section header.
- Click More ⋮ .
- Click the **Delete section**.

7. Reorder a Section
- If you have more than one section, you can change the order.
- At the top right of any section, click More ⋮ .
- Click the **Move section**.
- To move a section, click Up ⌃ or Down ⌄ .

Undo an Action
- If you want to undo a recent change:
- At the top right of your form, click Undo ↺ .

8. Randomly Order Questions and Answers

You can have questions and answers appear differently for everyone who fills out your form.

Note: Questions and answers will only be shuffled once per email address. Ensure each address is entered separately and not sent to a Google Group.

Shuffle Question Order

Important: If you want your questions to appear in a specific order, you should not shuffle your questions.
- At the top of the form, click **Settings**.
- Next to "Presentation," click the Down arrow ⌄ .
- Under "Form presentation," turn on the **Shuffle question order**.

Shuffle Answer Choices

You can shuffle answers to multiple-choice, checkbox, and drop-down questions.
- Click the question you want to shuffle answers for.
- In the bottom right, click More ⋮ .
- Click the **Shuffle option order**.

V. Make Form a Quiz

To make the form a quiz, do the following

- Select Setting on the form tab
- Select Make this a quiz
- and then choose whether to show the results immediately after the form is submitted or later once you review the answers. If you choose the latter, your form will need to require respondents to sign in with their Google account.

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You can then show missed and correct answers and a value for each option if you'd like.

With that enabled, you'll see a new Answer Key button on the bottom left of each question. Click it, then select the correct answer for the question. You can optionally add answer feedback both for correct and incorrect answers.

Note: quizzes only work with multiple choice, checkbox, and dropdown questions.

VI. Share the Form and Collect Responses
1. Share Form
Click the Send button in the top-right to share the form via email or social networks, copy a link, or get an embed code to add it to your site.

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With the link, you can either copy a full-length link or get a shortened goo.gl/forms/ link to share more easily on social networks. The embed option includes width and height options to fit the form within your site's design.

2. View and Manage to Form Responses
View Responses

View Responses by Question

➢ Open a form in Google Forms.
➢ At the top of the form, click Responses.
➢ Click Summary.

View Responses from the Person

See answers by the person or, if you allowed people to submit the form more than once, by submission.

➢ Open a form in Google Forms.
➢ At the top of the form, click **Responses**.
➢ Click **Individual**.
➢ To move between responses, click Previous ‹ or Next › .

Note: Click the Down arrow to select from a list of responses ▾ .

View All Responses in a Spreadsheet

Quickly see all responses in a spreadsheet.

➢ Open a form in Google Forms.
➢ At the top of the form, click **Responses**.
➢ At the top right, click Create Spreadsheet 📗 .

Important: If you've shared a form with a collaborator, they may also have access to the form's linked spreadsheet. If you want to remove a collaborator, you'll have to remove them from the form and the spreadsheet separately.
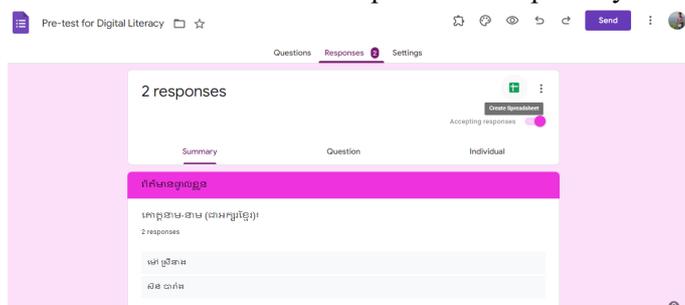
📖 Summary

- Google Forms is a survey administration software included as part of the free, web-based Google Workspace suite offered by Google. It's easy to use and one of the simplest ways to collect data. With the form you can:
  - Take surveys
  - Plan events
  - Manage registrations
  - Create quizzes
- When you create a form, you can add different types of questions, such as:
  - Short answers
  - Paragraphs
  - Multiple choice
  - Checkboxes
  - Linear scale
  - Multiple choice and checkbox grid
  - File upload
  - Date and time

Questions

1. What is an online survey tool?

2. What is Google Form?

3. Describe each question type of Google Form.

4. How many questions types can you create with the quiz?

5. Where can you download form data to a spreadsheet file?

💡 **Exercises**

1. Create a form as the following:

គោត្តនាម-នាម (ជាអក្សរខ្មែរ)៖ *

Short answer text

គោត្តនាម-នាម (ជាអក្សរឡាតាំង)៖ *

Short answer text

ភេទ *

⚪ ប្រុស

⚪ ស្រី

លេខទូរសព្ទ (តេឡេក្រាម) *

Short answer text

⋮⋮⋮

ក្នុងនាទី *

☐ គ្រូបង្រៀន

☐ សិស្ស និស្សិត

☐ បុគ្គលិកឯកជន

Exercises

2. Create a form for the exam:
    a. Select your major.
    b. Create a form for the exam with your major.
    c. Each question should include:
        i. Short answer
        ii. Multiple choice
        iii. Check box
        iv. Drop down
        v. Multiple choice grid
        vi. Check box grid
    d. Add required type if needed.

Exercises

2. Create a form for the exam:

Media and Information Literacy

Lesson 25

Media and Information Literacy

Introduction:

Finding and getting correct information is significant. This lesson will cover the new term "Media and Information Literacy". At the end of this lesson, you will be able to:

- Define the meaning of MIL
- Classify the type of MIL and MIL element
- Understand the advantages of MIL

When you have finished this lesson, you understand:

I. MIL
II. Why We Use MIL
III. The 5 Elements of MIL

Lesson 25 Media and Information Literacy

I. What is Media and Information Literacy?

"**Literacy**" is the ability to read and write. "**Media and information literacy**" (MIL) is the ability to use many types of media safely, wisely, and responsibly. MIL is a set of competencies that enables a person to access media, analyze media content, create new media messages, reflect on existing media content, and take action with media. Media and information literate people can better understand complex announcements from newspapers, books, radio, television, billboards, websites, social media, and all other forms of media. They can better recognize disinformation, know how to verify information, and can produce media messages themselves.

II. The Importance of Media and Information Literacy

Media literacy is essential because it helps people understand the messages that are being communicated to them. With so many sources of information today, media literacy can help people identify reliable sources and filter through the noise to get to the truth.

1. Inherent Media Bias

Media literacy can help people recognize biases in the media and how they may affect their perception of an event or issue. For example, a conservative news outlet might only cover terrorist attacks to make people afraid. That same media organization may also use emotional language to make readers feel negatively toward refugees and immigrants coming into their country. On the other hand, a progressive news site may promote equality for all genders or highlight how poverty affects minority communities. By recognizing those biases, we can decide how to respond to these sometimes-emotive topics rationally.

2. Media Literacy as an Educational Tool

Media literacy can also be used to learn about new ideas, cultures, and perspectives that may not have been previously considered. Understanding media may help you do better

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at school or work (e.g., writing a persuasive essay). Media literacy can also help people decide what they want to learn more about to fill in the gaps in knowledge the traditional media may have left out.

3. Taking Charge

The more aware we are of what's happening around us in our communities, schools, and workplaces, the better equipped we'll be to create change. For example, we can use the media we consume to inform ourselves about what's happening in our nation and world. The more aware we are of how certain groups are underrepresented or misrepresented by mainstream media, the more will be the impetus for these groups to take charge of their representation through social media platforms like Twitter and blogs.

4. Critical Thinking

Learning to analyze media critically provides students with skills they need when entering college or starting their careers. A student who has mastered media literacy skills may comprehend a news article and understand how the reporter is framing it, read between the lines of social media posts for bias or intent, and spot an advertisement from afar on TV.

Media literacy is a skill that has been a part of the curriculum for decades, but its importance is at an all-time high. Not only does it allow students to analyze media in their lives and communities critically, but it also prepares them for college or careers.

Media and information literacy can help people:

- Develop critical thinking skills
- Understand how media messages shape our culture and society
- Identify targeted marketing strategies
- Recognize what the media maker wants us to believe or do
- Name the techniques of persuasion used
- Advocate for changes to the media system
- Recognize bias, disinformation, and lies
- Discover the parts of the story that are not being told
- Evaluate media messages based on our own experiences, skills, beliefs, and values
- Create and distribute our own media messages

III. The 5 Elements of Media and Information Literacy
1. Access

Access is the first step in media and information literacy, and it focuses on learning to find and understand media messages and how to use media technology. With this skill, you will learn how to find and share accurate information relevant to what you want to see. Access is a unique feature of the media, requiring an individual to use different media skills. For example, to find information on the Internet, you must be proficient in technology. You need to know which keywords are right for typing into search engines and which source URLs should be clicked on.

People must gain the skills and ability to use all kinds of media. It is impossible to be an expert at using every technological tool and dealing with every type of content. The objective is having better access to online tools, information, and software to make sense of media and use information.

2. Analyze

Analyzing information is the second step in media and information literacy. Someone skilled at analysis can interpret and evaluate various forms of print and non-print messages, such as photos, texts, news, videos, or video games. Trainees must be guided to develop strategies for interpreting, evaluating, and analyzing print media, like books and newspapers, along with visual media, like video and photography, audio media, like radio and music, and digital media, like video games, websites, and social media.

People with analytical skills must consider the medium's author, purpose, point of view, and message. This is key to understanding what assumptions certain messages are built upon and how they are constructed. Trainees must also learn how important it is to consider a message's target audience, quality, authenticity, and credibility. They also should understand the message's potential effects or consequences.

3. Create

Creation, the third step in media and information literacy, involves trainees learning to create their own media messages. These can be anything from a text, a drawing, or a collage to social media posts, photos, videos, or multimedia products. The type of messages they create depends on their access to specific media technologies and their production skills. Previously, media messages were created using only pens, pencils, and paper. Today, we can use digital devices such as computers or smartphones to produce text, audio, images, music, video, podcasts, digital blogs, websites, animation, and computer games. You can create media messages in this way to express your thoughts and ideas or share your knowledge and experience with the public. But you need to be able to express ideas and

creativity to share digital media. Sharing what we have created helps us be more confident in expressing our opinions and sharing our work. Creating a good media message requires the participation and cooperation of each other because each of us has different abilities and talents.

4. Reflect

Reflection is the fourth step in media and information literacy. Improving this skill requires critical thinking, knowledge about media, and considering one's everyday media experience. When we reflect, we think about the impact that media messages and technologies have on the individual and society. On a personal level, we may use media to communicate, entertain, or get information. On the level of organization, media messages influence public discussions and perceptions. In addition, shared media experiences help shape a generation's identity or society.

Personal media habits and online activities affect people's identity, self-esteem, and relationships.

5. Take Action

Taking action is the fifth and final step in MIL education and builds on all the previously trained competencies. The idea behind taking action is that trainees use the media to achieve specific goals. For instance, they could create a social media campaign to raise awareness about environmental protection. The concept of becoming active is included in MIL education because trainees must take what they have learned inside the classroom out into the world where they can impact society. Ideally, training should connect the classroom to local, national, or global social and political issues trainees care about. Community members can use their newly acquired knowledge and skills to work individually and with others to make their voices heard on a larger scale. In doing so, they can improve the lives of their families and the situations in their hometowns, schools, universities, communities, and the world.

📖 Summary

- **"Media and Information Literacy"** (MIL) is the ability to use many types of media safely, wisely, and responsibly. MIL is a set of competencies that enables a person to access media, analyze media content, create new media messages, reflect on existing media content, and take action with media. Media and information literate people can better understand complex announcements from newspapers, books, radio, television, billboards, websites, social media, and all other forms of media. They can better recognize disinformation, know how to verify information, and can produce media messages themselves.

- *Media and information literacy can help people:*
  - Develop critical thinking skills
  - Understand how media messages shape our culture and society
  - Identify targeted marketing strategies
  - Recognize what the media maker wants us to believe or do
  - Name the techniques of persuasion used
  - Advocate for changes to the media system
  - Recognize bias, disinformation, and lies
  - Discover the parts of the story that are not being told
  - Evaluate media messages based on our own experiences, skills, beliefs, and values
  - Create and distribute our own media messages

- Five elements of media and information literacy
  - Access
  - Analyze
  - Create
  - Reflect
  - Take action

Questions

1. What is "Literacy"?
2. What is MIL?
3. Why is MIL important?
4. How can MIL can help you?
5. What are the five elements of MIL? Describe each element.

Lesson 26

Media

Introduction:

In today's world, getting in touch with regular updates is necessary. No matter what the field is, one must know the important facts. In this case, the media is the only way to help us. A person can learn the most relevant and needed news through the media. At the end of this lesson you will be able to:

- Define the meaning of media
- Classify the types of media
- Define the form and characteristics of media
- Define the core concepts of media

When you have finished this lesson, you will understand:

I. Media
II. The Forms and Characteristics of Media
III. The Difference Between Traditional and New Media
IV. Five Core Concepts of Media.

Lesson 26 Media

I. Understanding Media
1. What is a Medium?

The term medium can be defined in several different ways. According to dictionary.com, a medium is "one of the means or channels of general communication, information, or entertainment in society, such as newspaper, radio, or television". A medium is used to transport messages between people. These messages aren't shared directly face-to-face but indirectly via a letter, a radio program, an email, or a billboard. In these exchanges, the messages are encoded by the person sending them (the media maker or makers) and decoded by those receiving the message (the audience). These messages are referred to as media messages.

II. Forms and Characteristics of Media

The emergence of media began with the development of written languages. For the first time, people were able to write down and copy a message over and over again. They could share these messages with others far away or who lived years, decades, or centuries later. Different forms of non-electronic print media are used to this day:

– Bulletins and notices

– Newspapers and magazines

– Letters

– Books

– Comics

In the 20th century, media technology developed rapidly. Broadcast media like radio and TV were perfected and became ubiquitous. Movies went from silent and black-and-

white to sound and color. Since the start of the 21st century, computers and digitalization have enabled new media technologies and experiences. Examples of electronic and non-print media include:

- Radio –

 Television

- Cinema

- Computers (CD-ROM, USB flash drive)

- Video games

- Email

- Audio recordings

- Mobile phones

- E-books

There are many ways to categorize media. For instance, we can distinguish between broadcast media designed to reach a large audience (radio, TV) and print media (books, billboards, newspapers). We can differentiate between one-way communication (e.g., print and broadcast media) and two-way communication (e.g., social media), where there is a direct interaction between the sender of the media message and its receiver. You could also categorize media into four types: **print, visual, sound, and digital**.

- **Print**: books, newspapers, magazines

- **Visual**: movies, television, photographs, drawings

- **Sound**: radio, recorded music, CDs, MP3 audio files

- **Digital**: internet, email, video games, social media

All these categories only serve as a rough orientation since many media forms and technologies are fluid. They can spill over into other categories. For instance, radio is a one-way broadcast medium, but call-in programs add elements of two-way communication.

1. Newspapers and Magazines

Traditionally, newspapers and magazines were printed media, but nowadays, many are published electronically on the internet. Funding for newspapers and magazines often comes from companies, interest groups, private individuals, and sometimes the state. Media makers include print and photojournalists, editors-in-chief, typesetters, designers, printers, and (online)

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programmers. They use headlines, written text, different font sizes and colors, drawings, caricatures, and photographs to express their messages. Most print media are published regularly and frequently: daily, weekly, or monthly. Their frequent publishing schedules allow them to report on current stories and events and provide background information. Newspapers and magazines generate income through subscriptions, direct sales, and advertisements. Newspaper and magazine owners, who spend money to finance the medium, often want to influence the selection of topics and steer the direction of editorial viewpoints.

2. Books
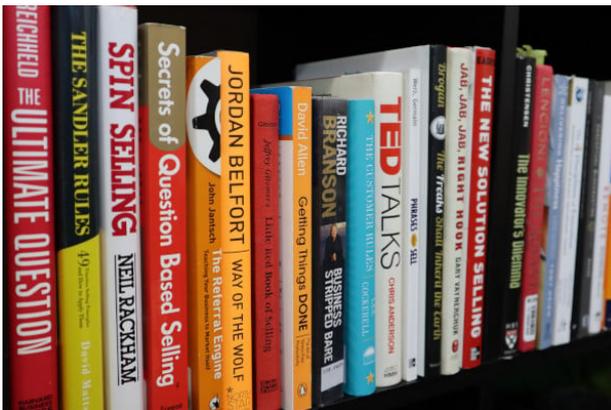
Traditionally, books are a printed medium, but nowadays, some are also published as e-books, which can be read on a tablet, computer, or e-book reader. Funding for books often comes from publishers and companies. Media makers include authors, editors, typesetters, publishers, and printers or programmers (for e-books). They express their messages through the book's contents, which can consist of text and illustrations, but also through the book's title and cover, composition and design, illustrations, and information about the book and author. Books can be categorized according to their content, e.g., fiction, non-fiction, guidebooks, or textbooks. The time needed to create a book ranges from a few months to many years. Income is generated through the book's sales. To increase sales, many publishers spend money on advertising in newspapers, radio, television, posters, and the web.

3. Radio

Radio is a non-printed, electronic medium. Nowadays, many radio stations also broadcast via the internet. Funding for most radio stations comes from companies or private individuals. Sometimes the state also owns radio stations, and in rare cases, even local communities do. Media makers include radio journalists, producers, on-air hosts or moderators, editors-in-chief, news editors, and musicians. A radio station can go on air with just a

few people involved, sometimes as few as a moderator, technician, and news editor. Many radio programs are pre-produced before broadcasts, and moderators often receive introductory texts from journalists to read before their news stories or features are played. Media messages are expressed by selecting program content, voices, spoken language, music, and sounds and contain (current) information and entertainment. The time needed to create a radio broadcast ranges from minutes to weeks or even longer, depending on the radio show and the particular topic. The station's income comes mainly from advertising slots it sells. Some radio stations receive funding from their owners or through listener fees. Community radio stations often rely on donations.

4. Movies

A movie is a non-printed, electronic medium generally first shown in public movie theaters or distributed through streaming services like Netflix, Amazon Prime Video, or Disney+. Later, they are released on DVD or Bluray discs or shared through the internet (often illegally). Funding for movies is complex. Before a film is made, the author and the director look for someone to finance it. The money needed to make a movie varies but is often costly.

Funding can come from private individuals (a producer or producers) or large production companies. Often movies are co-financed by television stations or big companies in return for product placements in the film (e.g., the hero might drive a Mercedes, BMW, or another specific car brand). Hundreds or even thousands of people are involved in the production of a movie. They include directors and co-directors, authors, actors, camera operators, sound designers, costume makers, location scouts, stunt performers, and special effect editors, to name just a few. In movies, the media messages are expressed via the genre, story, dramatization, setting, characters, acting, costumes, visual feel (brightness or darkness, colors), sound elements (voices, music, sound effects), and editing. The time needed to create a movie range from around half a year to several years. Films generate revenue through ticket sales, DVD or Blu-ray disc sales, merchandising, and fees paid by TV channels for broadcasting rights or by viewers for digital streaming rights. To increase ticket sales, moviemakers usually spend money on advertising (cinema trailers, posters, television, or online advertisements) to attract the broadest possible audience.

5. Television

Television is an electronic medium. Many television shows are also put online and can be viewed online. Funding for television channels comes from the government, viewer fees, or companies or individuals. In some countries, citizens donate money to fund television broadcasters. Media makers include program directors, on-air hosts or presenters, television journalists, editors-in-chief, news editors, camera operators, sound engineers, video editors, actors, celebrities, politicians, and musicians, to name just a few. The selection of program content expresses media messages, the program content itself, the choice of hosts or moderators, written and spoken texts, visuals, and sound effects. The time necessary to create a television program varies from a few hours to a month or more. Most income comes from the sale of advertising slots. In some countries, tax money is used to support television channels that the government owns. If a company or private individual spends money to fund a television channel, they often want to influence the channel's selection of topics and steer its editorial viewpoints.

6. Video Games
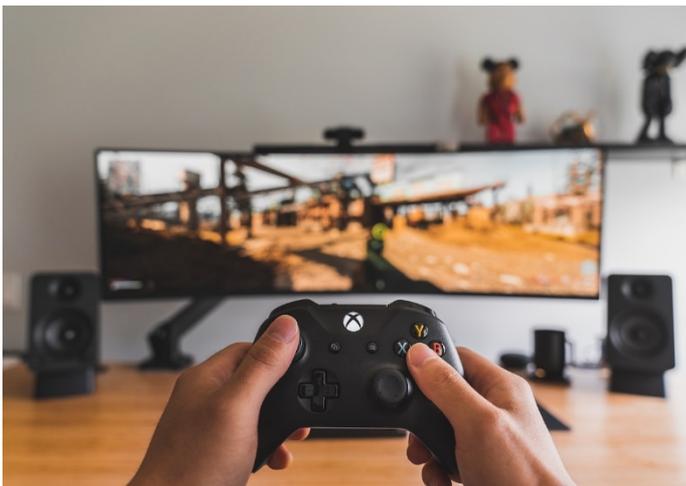
Video games are an electronic medium. They can be played on game consoles, computers, and smartphones. Depending on a game's complexity and scope, the funding for video games comes from the game industry and sometimes from private programmers or start-ups. Media makers include authors, art directors, game designers, programmers, composers, sound designers, and more. Media messages are expressed by the genre, setting, story, interactive options, the game's objective, the language used, and the game's audio and visual design. The time needed to create a video game depends on its complexity and the platform it is made for and ranges from one day to a few years. Most income comes from selling the

game to target audiences, advertisements before or during the game, merchandising and selling in-game features.

7. Internet (Computer/Smartphone)

The internet is an electronic medium. It can be accessed using special hardware like computers, smartphones, tablet computers, game consoles, and e-book readers. The lack of specific funding for the internet sets it apart from other media. Companies, governments, and private individuals own certain websites, blogs, and internet platforms that many people use, such as YouTube, Facebook, and Google. It is hotly debated whether sites like Facebook, Instagram, and YouTube are media or just platforms that provide a service for content creators. If they are considered media in their own right, they share the editorial responsibility for the content and comments users post. This would increase their responsibility for monitoring discussions and deleting offensive posts, hate speech, disinformation, or fake profiles. Media makers on the internet include people who provide content, programmers, web designers, IT specialists, authors, journalists, and media makers from traditional media outlets whose content is reposted on the internet. The interconnection of all media content on the internet is called media convergence. Media messages are expressed through images, videos, audio, and text, and through their design, style, and interactive options. The time necessary to create internet content depends on the content and can range from seconds to months. On-screen advertisements generate the most income through selling user data. Internet content is usually not posted to generate income but to provide information and spread ideas, as well as for self-expression and socializing with others.

6. Social media (Computer/Smartphone)

Social media are platforms on the internet, thus an electronic medium. Social media can be used on computers, tablet computers, and smartphones. Funding for social media comes from companies, individuals, or start-ups. The world's biggest social media platform, Facebook, was developed in 2004 by then-20-year-old Mark Zuckerberg and others. It is now operated by Facebook, Inc. Media makers include programmers, web designers, and IT

specialists who provide the platform and billions of network users, generally individuals, companies, or groups of people who produce and share content. Media messages are expressed mainly by text, images, shared links, videos, and audio. The time it takes to create content for social media is usually short, ranging from a few seconds to a few hours. Income for programming and managing social media platforms is generated by selling on-screen advertising and user data to companies, institutions, or governments willing to pay for the data. Most users do not earn money with their content. Famous bloggers, video bloggers, YouTube stars, and influencers can make money through advertising or when companies pay for product placement. The more followers these individuals have, the more money they can drive.

III. Traditional and New Media

A popular way of categorizing media is between traditional or analog media and digital or new media. The watershed moment was computerization and digitalization that took place at the end of the 20th century, and the beginning of the 21st. Media that existed before that time are sometimes referred to as "traditional media". Those that were invented later are called "new media". Analog media content is printed on paper, recorded on tape, film, or a record. It is disseminated as printed material via radio waves or terrestrial TV signals. Traditional media include newspapers, books, letters, radio, and TV. These days, however, a lot of media content is digital. It can be reproduced and shared electronically without losing quality, often through the internet. Media that only evolved thanks to digitalization include social media, blogs, and email.

IV. Mass Media and Mass Communication

Mass media are various media technologies that aim to reach a large audience (such as books, newspapers, radio, television, films, recorded music, websites, and advertisements). Usually, the messages of a mass medium are one-way: broadcasters or publishers create media content like radio or TV programs or books, and the audience consumes them without having a chance to interact with the creators.

In **mass communication**, the media makers creating the content are small because these media are expensive to produce. They disseminate their media messages to the public to achieve specific goals, ranging from making money to fame or gaining influence and power. Mass media makers can profit through advertising or by selling the music, films, television shows, and video games they have produced.

V. Media Messages

Media messages are messages that are sent and received via a medium. They can include text, images, sound, or video. A media message can contain information, facts, experiences, opinions, feelings, thoughts, and impressions on any topic. Media messages are created by media maker(s). These can be professional journalists producing radio or TV programs or average people sending letters and text messages or posting on social media.

Media messages often use **verbal** and **nonverbal** communication. Verbal communication means communication through spoken or written words and phrases. Verbal statements are made up of both the content and meaning of the terms and how they are used. For example, the media message can differ depending on whether the media maker uses long or short phrases or if the message uses simple or complicated language with foreign words. Non-verbal communication is communicating by sending and receiving messages without using words. It relies primarily on visual and auditory messages. These can include a person's facial expressions, tone of voice and gestures, images, music, sound, emoticons

such as :-), and emojis. Non-verbal cues can help people interpret media messages: if someone smiles while saying something, we understand they are friendly and might even be joking. If they frown or shout, we realize that the message is serious and could involve conflict. In written media messages like letters, books, and text messages, these non-verbal cues are missing. Emoticons and emojis were invented to add an emotional dimension to text messages.

VI. The Goals of Media Messages

Media messages and media products are created for a variety of reasons. They inform, entertain, influence public opinion, and help people and companies make money. This applies to traditional media like TV or radio, movies or newspapers created by professional media makers, and to social media messages posted by ordinary people. Most media messages pursue several aims at the same time. The main goal of a TV show, for example, is to generate revenue for the TV station and its owners. But further goals may be to entertain the public, shape public discussion, or influence how society thinks about specific issues.

When ordinary people post messages on social media, they usually aim to entertain, inform, or present a positive image of themselves. Only a small group of "influencers" manage to make money with social media messages or affect how others think or feel.

VII. Manipulation of Media Messages

It is important to recognize that media convey ideological and value-based messages. This occurs because the person or company financing a medium is pursuing a specific goal and because a media maker's point of view consciously and unconsciously influences the media messages.

First, media makers decide which stories are covered and which are not. This means the public may never find out about "the other side" of an issue or may never find out about the topic at all.

Second, it is technically possible to manipulate media messages like photos and videos. There is a fine line between editing an image to improve its quality with photo editing software and running it, and altering an image for other reasons, and thereby changing its message, impact, or meaning. Videos can also be manipulated using more advanced tools such as facial recognition, algorithms, and artificial intelligence. These forms of controlled video messages are known as deep fakes.

Third, the media use a language of persuasion. Professional media makers have studied the tools and means of enhancing the impact of their media messages. Scientists have found that media are most potent when they operate emotionally. Music in film or TV scenes

is a common way to heighten people's emotions. Other methods include showing people very close up in a photograph, advertisement, or film and providing information in the form of a personalized story in a news report, newspaper, or documentary. Some media makers will manipulate messages to enhance their emotional impact and draw the audience into an article, for example, by using a dramatic headline that is not entirely true. The power of emotionalized or sensationalized media messages can also be seen in the rapid spread of disinformation on social media. Stories that evoke strong emotions like outrage, disgust, or even hatred get more attention and are often widely shared.

VIII. The Five Key Questions to Ask When Analyzing Media Messages

Media transmit messages shaped by the media makers' values, ideologies, and intentions. The audience needs special analytical skills to identify these underlying value systems, motivations, and creeds. That's why educators should focus on developing trainees' critical thinking skills. Trainees should be encouraged to ask critical questions about media messages routinely.

The Center for Media Literacy (medialit.org) has developed five key questions as a starting point for the analysis of any media message or piece:

1. Who created this message? (Authorship)
2. What creative techniques are used to attract my attention? (Format)
3. How might different people understand this message differently from me? (Audience)
4. What lifestyle, values, and points of view are represented in, or omitted from, this message? (Content)
5. Why is this message being sent? (Purpose)

Answering these five questions can lead to further questions that may result in "aha" moments and deeper understanding.

For example, a follow-up question about authorship could be, "Who else was involved in creating this message, and what choices did they make?" For a deeper analysis of a message's format, a question like, "What do I notice about the way the message is constructed?" can be helpful. And to better understand how other people might interpret a media message differently, one could ask, "How close is the portrayal to my own experience or the experiences of others?" A question like, "What is the overall worldview this message conveys?" helps analyze its content. One could also ask, "Who profits from this message and who pays for it?" to reflect on its purpose critically.

Practicing the five key questions will deepen one's understanding of media and media messages, especially how and why they are created. Trainees will learn to make informed choices about accepting or rejecting explicit and implicit media messages.

IX. Five Core Concepts of Media

The five core concepts of media are directly linked to the five critical questions discussed earlier:

1. **Authorship**: All media messages are 'constructed'.

2. **Format**: Media messages are constructed using creative language with its own rules.

3. **Audience**: Different people experience the same media message differently.

4. **Content**: Media have embedded values and points of view.

5. **Purpose**: Most media are organized to gain profit and or power.

These concepts sound very abstract at first. Trainees will probably need time to understand them. That is why starting with the five key questions is a good idea. Each answer to a question or follow-up question will carry the trainees closer to understanding one of the key concepts and thinking critically about media.

📖 Summary

- A medium is "one of the means or channels of general communication, information, or entertainment in society, such as newspaper, radio, or television". A medium is used to transport messages between people.

- You could also categorize media into four types: print, visual, sound, and digital.
  - **Print**: books, newspapers, magazines
  - **Visual**: movies, television, photographs, drawings
  - **Sound**: radio, recorded music, CDs, MP3 audio files
  - **Digital**: internet, email, video games, social media

- The watershed moment was computerization and digitalization that took place at the end of the 20th century and at the beginning of the 21st. Media that existed before that time are sometimes referred to as "traditional media". Those that were invented later are called "new media".

- five critical questions as a starting point for the analysis of any media message or piece:
  - Who created this message? (Authorship)
  - What creative techniques are used to attract my attention? (Format)
  - How might different people understand this message differently from me? (Audience)
  - What lifestyle, values, and points of view are represented in, or omitted from, this message? (Content)
  - Why is this message being sent? (Purpose)

- The five core concepts of media are directly linked to the five critical questions discussed earlier:
  1. **Authorship**: All media messages are 'constructed'.
  2. **Format**: Media messages are constructed using creative language with its own rules.
  3. **Audience**: Different people experience the same media message differently.
  4. **Content**: Media have embedded values and points of view.
  5. **Purpose**: Most media are organized to gain profit and or power.

👩‍🦰 Questions

1. What is media?

2. What are non-electronic print media and electronic and non-print media?

3. How many categories of media are there? What are they?

4. What is the difference between mass media and mass communication?

5. What is the media message and critical questions to analyze about media?

6. What are the five core concepts of media?

Lesson 27

News and Information

Introduction:

Every day there is news and information shared through the media. That information is both true and false. We only have a hard time classifying it if we know MIL. At the end of this lesson, you will be able to.

- Define the meaning of news and information
- Define misinformation, disinformation, and malformation
- Evaluate information and news in the media

When you have finished this lesson, you will understand:

Lesson 27 News and Information

I. Information

Information is anything that informs. It includes knowledge obtained through research or investigation, factual data, or instructions. Information should be timely, accurate, relevant and increase our understanding. Journalists work with information. They analyze, verify, and write it in language that is easy to understand to present their audience with a balanced perspective on a story.

1. Information Source

An information source provides information. Documents, speeches, videos, websites, photographs, and people are all examples of information sources, as are media like newspapers and radio shows. Journalists might use individual sources of information in researching a story but are rarely completely neutral. That's why the journalist must consider where the information is coming from, why it is being shared, and to what extent the information source can be trusted. Because of this, most journalists work with the "two sources" principle to check the authenticity of the information they are dealing with. If two sources that are independent of each other provide the same information, it is more likely that the information is true.

When considering the neutrality of media as information sources, it is helpful to look at who provides the information and who owns and controls the media outlet. Is it owned by an entrepreneur, a government, or a private company, or is it independent? The owners of private media outlets often have an agenda, such as promoting a political opinion. An independent media outlet can also have its agenda, such as supporting a political opinion that contrasts with the government's point of view. It can also be useful to consider what motivates an information source. Is the source interested in making money, pushing an agenda, or informing the public?

The rise of social media has made the information landscape more complicated. Social media platforms can be quality information sources full of disinformation: rumors,

lies, hoaxes, propaganda, and clickbait. Users are confronted with a mix of high and low-quality information in their newsfeeds and must individually determine the truthfulness of every post. For this, they need basic knowledge about how the platforms work and how to judge whether a post is likely to be true or false.

II. News and Information

The word news comes from the word "new". News is new, important, relevant, or interesting information to a specific audience. The information on social media comes from various sources: private individuals, groups, and professional media organizations, to name just a few. Each of these has a different idea of what is newsworthy, and the quality of what they post may differ widely.

In professional journalism, what counts as news depends on various factors, such as the time and location where something happened, the target audience, and an editor or reporter's judgment. For instance, the robbery of a shop in a small village is important news for a local newspaper because it is relevant to the local community. But the same story is unlikely to be considered newsworthy by the national press or by a reporter in a different country.

III. Questions News Needs to Answer

News in professional media outlets should inform the audience about **what** happened, **when** and **where**, and **who** was involved. A good news article will also explain **how** and **why** something happened. When looking for the answers to these questions, consumers should remember that the answers and the way the news is written might not be neutral. For example, reporters might have different opinions about why something happened, depending on political opinions, upbringing, circle of friends, etc. They may also come up with different answers to the key questions depending on whom they interviewed for their news story or how thoroughly they did their research. Good journalists will report neutrally and present the different sides of a story. But no one, even the best journalists, is completely neutral. Different people often see the same information differently, which can be interpreted or presented in various ways. Media messages reflect the values and points of view of media makers.

IV. The Ethical Standards of Journalists

Journalists are responsible for the accuracy of their work. They must conduct research and consult various sources to verify their story. Journalists must be objective when reporting news and neutrally report the facts. They must inform their readers about where

they got their information by attributing it to sources or witnesses, for example. This makes their work more transparent and credible. It allows the audience to form opinions by seeing where the information came from. Journalists should also strive to present information in a way their audience will understand. They should avoid using words that sensationalize or evoke strong emotions. They should rather use neutral, factual, and clear language. Finally, journalists must consider the effects of their reporting: what will the consequences be for their sources or the people they quote? What feelings or reactions will their writing provoke?

V. Importance of Access to Information

Being informed about what is happening in your community, country, and the world is important for understanding society. It also lets you understand how what happens in other parts of the world can affect you personally. For instance, if there is a bad harvest in one country, the price of certain foods could also increase in your country as people scramble for goods. People who are informed can better identify problems in their societies and take steps to solve them.

VI. Getting Good Information

There are many ways to become informed. Reading newspapers and websites, listening to the news on the radio, or watching it on TV are good ways to stay informed about current affairs. It can be a good idea to look at the news from a few different media outlets since they will report differently on some news stories. Or one outlet may choose to include news stories that others have ignored. You can also get informed by talking to people and reading posts on social media platforms like Facebook or Twitter. This will give you an idea of what other people think about what is happening in the news. However, staying informed through social media can be difficult because the platforms contain much false information, rumors, and gossip. Much of the information on social media comes not from professional journalists trained to fact-check and report objectively but from individuals not trained as reporters.

VII. Misinformation, Disinformation and Malformation

When speaking about false or harmful information, we can be more accurate if we use the terms misinformation, disinformation, and malformation. UNESCO and many others have appealed to journalists, policymakers, and citizens to use these three terms instead of "fake news". UNESCO avoids "fake news" because the expression has become politicized. Some people in power are using it to discredit the news industry and undermine reporting that they don't like.

Misinformation is information that is false but not intended to harm. Misinformation can happen accidentally when journalists do not research accurately or make mistakes in their writing, for example, inserting an incorrect date or figure into a story.

Disinformation is false or partly false information that is deliberately created or disseminated with the explicit purpose to harm. Producers of disinformation make up one-sided stories for political, financial, or ideological reasons, e.g., influencing public opinion on certain issues to create public pressure.

Malformation is information that may be true and factual but that is not meant for publication and that is leaked to cause harm, for instance, secret diplomatic documents exchanged between a government and its embassies abroad. Other forms of malformation published to harm are hate speech and online harassment.

Social media contains many mis-, dis-, and malformation, and newsfeeds are generally a mix of high and low-quality information. It often is hard to tell at first which is which. On social media, we must decide for each story whether it is quality information or falls into the mis-, dis-, or malformation categories. This phenomenon of an unstructured, chaotic information supply is called information disorder.

VIII. How Disinformation Spreads Quickly on Social Media

In the age of social media, publishing information is not limited to trained professionals. Anyone can post and comment on anything. There are neither fact-checkers nor editors to verify whether a story is true and whether it is ethical to publish it. So, in addition to useful and accurate information, there are a lot of rumors, gossip, lies, half-truths, satire, and hate speech. People hear something, get emotionally charged or involved, and decide to vent their anger or express their joy by immediately posting or sharing. They often publish or share before checking whether the information is true, having been driven by their hearts, not their heads, to make something public. When other social media users see these highly emotional or sensational stories, they can also get an emotional charge and immediately share the content or comment on it. As emotions build, those comments can become more and more radical.

The more interaction a story or post gets, the more "weight" the social network gives it, meaning it is much more likely to appear on users' timelines. So, one small false story or allegation with an effective emotional trigger can quickly go viral. It can become an avalanche that buries the truth beneath it.

Some people aware of these mechanisms deliberately produce disinformation to make money. They create websites for stories they know people will get worked up about,

comment on, and share. The more exposure these stories get, the higher the revenue is from online advertisements on these websites and the more money the creators of the disinformation make.

VIII. Learning to Evaluate Information (Misinformation, Disinformation)

As a media consumer, it is important to distinguish between different kinds of content to understand the difference between an editorial, for example, and a news article. Editorials express the opinion of an individual, often a journalist or editor, and usually include news and facts to make their case. Professional media separate editorials from news journalism and identify them as opinion pieces so the audience understands. News articles should not include the opinions of journalists or editors. So, when analyzing news, consider whether it is neutral or contains opinions, who wrote the piece, why they are sharing the information, and what other people might think of it. Does it include two sides of the story? Is the audience free to form an opinion after hearing the different sides? Or is the journalist suggesting one way to interpret the facts? Sometimes what is not reported can be an indicator of manipulation. What stories are not covered? What voices are left out? Another sign of manipulation or biased reporting can be how much time and space the medium gives a certain topic: do the time and space reflect the relevance of the story or are the media exaggerating the importance of one topic to divert attention from other issues?

IX. The News Values

News must be new, relevant, and interesting. News values are a set of criteria media makers use to determine how important or newsworthy a story is. They can help journalists decide how to report on a topic, for example, whether it is so important that it should fill the front page of a newspaper or whether it is of lesser relevance and be presented in a smaller column on a page further back in the paper. Some general values help media makers determine how newsworthy a story is. However, individual media also have specific news values tailored to their audiences.

- **Timeliness:** Did the story or event happen? Is it new? Whether a story is new also depends on how often media outlets is published or broadcast it. Media like radio, TV, and websites can update stories live and around the clock. Other media, like newspapers or magazines, only publish once a day or once a week or month. For a weekly medium, a story that happened three days ago may still be timely, whereas media publishing more frequently will consider it old news.
- **Proximity:** Events happening close to the target audience is often the most important to them. A fire or an accident in a nearby town is usually more relevant to the target audience than a conflict or political crisis on the other side of the world.
- **Impact:** The more people are affected, the more important the story is. That's why wars and natural disasters like floods, droughts, and earthquakes are usually big news stories.

- **Consequences:** Events that impact many people or cause other significant events are newsworthy.
- **Conflict:** Conflicts and disagreements disrupt our everyday lives. They often have far-reaching consequences and a major impact. They are often considered newsworthy.
- **Prominence:** Stories involving well-known names are newsworthy. Prominence can relate to famous people like politicians or celebrities and well-known companies like Microsoft, Mercedes, or Mitsubishi.
- **Novelty:** Surprising and unusual stories are interesting because they are out of the ordinary. "Dog bites man" isn't a news story, but "man bites dog" could be.
- **Human Interest:** People are interested in people and stories they can relate to personally. This can help make stories newsworthy even if they lack other news values.

📖 Summary

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- An information source provides information. Documents, speeches, videos, websites, photographs, and people are all examples of information sources, as are media like newspapers and radio shows. Journalists might use individual sources of information in researching a story but are rarely completely neutral.
- The word news comes from the word "new". News is new, important, relevant, or interesting information to a specific audience.
- News in professional media outlets should inform the audience about **what** happened, **when** and **where**, and **who** was involved. A good news article will also explain **how** and **why** something happened.
- Journalists must consider the effects of their reporting: what will the consequences be for their sources or the people they quote? What feelings or reactions will their writing provoke?
- **Misinformation** is information that is false but not intended to harm. Misinformation can happen accidentally when journalists do not research accurately or make mistakes in their writing, for example, inserting an incorrect date or figure into a story.
- **Disinformation** is false or partly false information that is deliberately created or disseminated with the explicit purpose to harm. Producers of disinformation make up one-sided stories for political, financial, or ideological reasons, e.g., influencing public opinion on certain issues to create public pressure.
- **Malformation** is information that may be true and factual, but that is not meant for publication. It is leaked to cause harm, for instance, secret diplomatic documents exchanged between a government and its embassies abroad. Other forms of malformation published to harm are hate speech and online harassment.

Questions

1. What are news and information?
2. What is an information source?
3. Why is it important to get enough good information?
4. What is the difference between misinformation, disinformation, and malformation?
5. Describe the values of news.

CHAPTER 6

Digital Literacy and Responsibility

Lesson 28

Digital Literacy

Introduction:

To make life easier, you need the help of various technologies. To use all those technologies, you need to have digital literacy. At the end of this lesson, you will be able to:

- ✓ Define the meaning of digital literacy
- ✓ Understanding importance of digital literacy
- ✓ Understand digital technology

When you have finished this lesson, you will undersatnd:

Lesson 28 Digital Literacy

I. What is Digital Literacy?

Digital literacy is a new concept that emerged in the 1990s during the Internet revolution. The world is now in a new wave of industrial revolution driven by the development and spread of digital technology, which we call the Industrial Revolution 4.0. With the advent of the Fourth Industrial Revolution, new technologies such as the Internet of Things, Artificial Intelligence, and Big Data are being incorporated into everyday life and used in almost every sector.

New technologies are driving rapid changes in the way we live and work. Today, employers and the job industry require employees to have digital literacy skills to increase productivity and efficiency. According to UNESCO, "**digital literacy**" refers to the ability to use digital technology and tools to find, use, manage, evaluate, create and share information securely and accurately, which requires both technical skills and insights to improve social and economic activities.

Digital literacy focuses on four key areas:

- Finding the right information on the Internet
- Using and sharing information online
- Understanding the security of technology
- Creating digital content and sharing it ethically.

II. Digital Literacy Examples

A digitally literate individual can accomplish a variety of tasks with the use of technology. The following are some examples of digital literacy:

- Sending and receiving emails allows a person to communicate with someone instantly. Email and other internet-based text applications allow people to keep in contact with others in different time zones, countries, and even hemispheres.

- Using an e-reader to read books and periodicals downloaded from the Internet. E-readers allow people to consume more information without a physical hard copy of a book, journal, or periodical. This can reduce waste as well as increase accessibility to information. Electronic versions are often less expensive than physically printed versions.
- Shopping online allows people to peruse inventory without going to the store. Online shopping allows people to purchase presents, clothing, household items, and anything else online.
- Digital safety means that digitally literate people understand that passwords and personal information should not be shared online. A digitally literate individual knows how to protect their personal information online. They can navigate tasks such as online shopping, using an e-reader, and sending and receiving email without compromising their information to hackers and other online threats.

III. The Importance of Digital Literacy

According to Datareportal[1], at the beginning of 2022, 13.44 million Cambodians were Internet users, and 12.60 million were social media users. These data show positive signs of technology capture in Cambodia. On the other hand, digital technologies such as smart devices, e-commerce, digital payments, e-banking, mobile computing, and online information are changing how people work in Cambodia. Therefore, strengthening digital literacy skills is very important to enable Cambodia to keep up with the new trends of the Fourth Industrial Revolution, the digital economy, and labor market changes.

Digital literacy is important to establishing your presence in the modern world. Lacking the ability to use digital technologies means there will be many things you cannot do or access. Possessing digital literacy allows you to improve efficiency, access to things, fulfillment, and happiness in your life.

You gain so many things by ensuring you become digitally literate, and we want to shed some light on them. This is a small list, as there are thousands of little ways to improve your life by learning digital literacy skills. Read on to learn some basic, everyday ways digital literacy can improve your life.

1. Make Connections

Strengthen communication: Digital literacy skills can help us easily communicate online with family, friends, colleagues, and others. At the same time, knowing how to use email on some social networks, such as Facebook, Instagram, Telegram, Skype, etc., allows us to communicate quickly and easily, no matter how far apart.

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[1] https://datareportal.com/reports/digital-2022-cambodia

2. Save Time and Money

Everyone loves saving money, and when you realize how much time you can save on simple daily tasks like shopping, banking, and general errands, you'll want to get online quickly! Online shopping is one of the best ways digital literacies makes your life more efficient. Buying items from websites like eBay or Amazon can save you thousands of dollars on retail over time and save you hours of driving and shopping, as the items are delivered right to your door.

Booking for travel has also been more challenging than it is now. Many websites, such as Home away for property rental, or Expedia for booking hotels and resorts, with a collection of all the best travel websites with the lowest prices, can help you get amazing travel deals and feel safer while booking. It's also much easier to compare vacations or anything you want to buy online than doing these things in a store or at a travel agency. This can help you always get the lowest prices and even track items over time to see when they drop in price to buy them at the optimal time.

3. Increased Safety

When used effectively, becoming digitally literate and understanding good online safety practices can help to increase your safety. There and many ways you can protect your passwords, and personal information, appear anonymously and do more to protect your safety. In addition, if you read a website's Terms of Use and Privacy Policy, you can easily determine what they do to protect your information and what action will be taken if anything is compromised.

There are also many risks associated with using technology, so it's important to ensure that you understand everything you use and that you know how to protect yourself. If you take reasonable precautions to protect yourself, getting online can help increase your overall safety.

4. Enhancing Learning

Students with digital literacy skills can improve their homework quality by using online resources such as Google search, video tutorials, e-libraries, and email correspondence with teachers. Not only from knowledge-based websites and mobile applications, but we can also learn for life through the use of websites and mobile applications such as Khan Academy, YouTube, Lynda, edX, Coursera, Udemy, and Ted.com.

5. Increase Job Opportunities

Nowadays, jobs requiring employees with digital literacy skills are steadily increasing and have become necessary, and those with clear digital literacy skills are often paid higher salaries. Thus, digital literacy skills can help increase job opportunities and better job choices for everyone.

The traditional method of showing up at a place of business with your resume is no longer the standard method for getting a job. Like many other things, employment is moving online, and many job applications and resumes are often accepted exclusively online. Many businesses set up their online applications or, at the least, require you to submit your resume by email. Set up an online professional profile with a website like LinkedIn to get with the times.

6. Increase Productivity and Efficiency

Digital literacy skills allow us to use technology to optimize work individually and as a team. At the same time, we can use technologies such as email automation, file management systems, human resource management software, data analysis tools, and accounting software to streamline work processes, save time and reduce errors to increase productivity and efficiency.

7. Increase Sales

Digital literacy can help businesses increase sales by digitally marketing through video advertising, popular web and social media, and email marketing.

8. Contribute to National Economic Growth

Digital literacy can boost productivity and innovation in almost every sector of the economy and society, including manufacturing and services, trade and investment, and connecting production chains and value chains at both the regional and global levels. These factors show that digital literacy supports national economic growth, especially for developing countries.

9. Entertainment

When you get online, all-you-can-watch television, movies, and videos are at your fingertips. You can stream television for a low monthly price with services like Netflix and Hulu or watch unlimited videos from users for free on a website like YouTube. You can also

find endless entertainment on websites like Buzzfeed or stream music with a service like Spotify.

10. Real-time Updates

Staying up to date with what's happening in the world is always important, and when you need real-time updates on almost anything, the Internet is your place to go. With our digital literacy skills, you can quickly and easily access information related to recent events, sports news, traffic information, and weather forecasts. Not only that, but digital literacy skills can also help us to think critically in evaluating information sources before believing or sharing them.

11. Create an Online Presence

Many people caution against putting yourself "out there" online, claiming it can ruin your reputation. Though this may be true for those who don't make smart decisions about how they present themselves, creating an online presence can greatly improve aspects of your life, especially regarding your personal and professional goals.

You can create your own website with no coding knowledge using websites like Google BlogSpot or WordPress, showcase your photography online with websites like Instagram or Flickr, and promote your business on sites like LinkedIn. Putting yourself or your business online can increase the number of people who know what you do by thousands, even millions.

12. Understand Your Digital Footprint

You can think of your digital footprint as the trail you leave behind as you begin using websites and apps and begin putting yourself out there online. Everything you post can be traced, and it never goes away. Understanding how the things you say or post online can impact the rest of your life is a key component of digital literacy. The more you use websites and apps, the better you understand the trail you're leaving for others to see.

13. Learn Faster and Teach Others

The more you start using digital technology, the easier it becomes to learn new things. Many websites and apps operate in very similar ways, especially when it comes to navigating or distributing information. The more you dive in and try using more devices,

websites, and apps, the easier it will become to keep up with the new trends and things you need to learn.

Teaching others how to use devices and technology is also a great way to improve learning. When you're forced to explain how something works or why it functions in a certain way, it often requires you to gain a deeper understanding of what you are explaining. By simply trying to learn and then trying to help others, you can go from being the person who needs to ask someone for help every time you turn on your computer to the person everyone calls for help!

14. Become a Digital Citizen

Becoming a digital citizen means integrating technology into your life, understanding how these technologies can be utilized for daily tasks, and how technology can improve your life. Similar to improving your digital literacy, a digital citizen can easily use technology and the Internet and learn how to make simple daily improvements, disseminate content, and be creative.

15. Lifelong Learning

Committing to lifelong learning is one of the most important components of increasing digital literacy. In the digital and tech industries, things are constantly changing. There's no such thing as learning it all. Each day, new revolutionary devices, operating systems, websites, apps, gaming consoles, AI, and more are being released, and with them, a whole lot more to learn.

Make sure you keep up with the trends by checking out TechBoomers, so you always know how to use the most popular websites and apps and understand how they may impact your life. You can also check out other websites with information or online courses that can help you keep up with all the skills you need, including Lynda, Wikipedia, Coursera, Udemy, and Ted.com.

IV. The importance of Digital Literacy in Education

As technology advances, the way people study and work continues to change. Learning does not just happen in the classroom and by being obedient to the teacher. Today's students' success depends on their knowledge and skills in the digital world. That is why digital literacy is so important for students.

Students can now take their knowledge with them everywhere, using digital literacy skills for effective learning outside the classroom. At home, they have phones, tablets,

computers, and other devices that can help them learn, research, and write independently wherever and whenever they want.

Students can also easily communicate with their classmates for homework, review each other's work and make suggestions using technology and digital skills. Doing so can help motivate students to perform better and build collaboration between students. Not only that, but teachers can also monitor students' progress and help assess their performance and abilities using digital platforms.

Digital knowledge is important not only in school but also useful for future students. Many workplaces require their employees to use information, create new ideas collaboratively, and use digital tools such as Internet platforms, social media, and mobile devices to communicate with each other.

📖 Summary

- According to UNESCO, "digital literacy" refers to the ability to use digital technology and tools to find, use, manage, evaluate, create and share information securely and accurately, which requires both technical skills and insights to improve social and economic activities.
- Digital literacy focuses on four key areas:
  - Finding the right information on the Internet
  - Using and sharing information online
  - Understanding the security of technology
  - Creating digital content and sharing it ethically.
- Digital literacy is important to establishing your presence in the modern world. Lacking the ability to use digital technologies means that there will be many things you cannot do or access. Possessing digital literacy allows you to improve efficiency, access to things, fulfillment, and happiness in your life.

👩‍💻 Questions

1. What is digital literacy?
2. What are the four keys to digital literacy?
3. Why is digital literacy important?
4. Come up with an example of digital literacy.
5. Why is digital literacy important for education?

Lesson 29

Personal Ethics and Responsibility in Media

Introduction:

Commenting on the media is open for everyone. But those expressions are limited. You need to know your rights and limitations in expressing your opinions to avoid offending others. At the end of this lesson, you will be able to:

- ✓ Understand freedom of expression
- ✓ Use your rights and limitations to express yourself
- ✓ Think before sharing any content on media

When you have finished this lesson, you will understand:

   I.   Accuracy, Thought, and Freedom of Expression
  II.   Freedom of Expression
 III.   Points to Consider in Expressing, Sharing, and Information

Lesson 29 Personal Ethics and Responsibility in Media

I. Accuracy, Thought, and Freedom of Expression

While the Internet contains much accurate information entered by individuals or companies genuinely interested in sharing data, it also incorporates many ideas that can be trusted as factual information from advertisers. Informative ideas are posted online by people with personal beliefs and are not always shared by others.

For example, people worldwide have different religious beliefs and believe only their religion is right. They spread the word online, believing it to be accurate. But for people of other religions or non-religious people, this information is incorrect. In the same way, people of different political persuasions will publish information that reflects their views on the world or their country according to their perceptions. Even in science, not everyone agrees on a particular theory or view. The information disseminated by doctors in Europe is subject to specific criteria that may not be accurate for Cambodia due to geographical factors that lead to different symptoms.

Even identical information can be disseminated or presented in various ways to create a specific impression on the reader. For example, in an event where it is known that there are 100 participants in a group, if the writer wanted to give the impression that only a few people participated, he might write, "There are less than 100 people in a small group" who showed up to attend. On the other hand, if the writer wanted to show that many people were interested in the event, they would write, "Many people showed up, and the room was full of at least 100 people."

This is why textbooks differ from online information. They are expected to present real information about ideas. Internet users must carefully examine all the information they read, discovering whether it reflects a fact or just an individual's point of view. To do this, you first need to find the source of information, who the publisher is, and what the publisher's purpose is. This will help you determine whether the information is a collection of actual events or just an expression of an individual's point of view. For an interpretation of actual events, experienced internet users often look at different sources of information on the Internet for similar information, make comparisons, and form their perceptions of that information. This process is called "accuracy verification," which means setting the bias level of information.

Most websites on the Internet contain information published by private organizations or companies. This information is not verified or reviewed by other people. Other websites, such as the Wikipedia encyclopedia, allow more people to work on the same piece of information and have editors determine the information's credibility and ensure the

information is secure. However, the information on Wikipedia is not entirely accurate. On Wikipedia, users can see how many different people have worked on a given piece of information and how reliable that information is.

Internet users must develop their way of determining the accuracy of the information on the Internet to determine whether it is true or false. In addition to examining its source, they must use their minds and considerations to discover what can and can't happen or is not true.

II. Freedom of Expression

The constitutions of some democracies, such as Cambodia, are considered countries where people have the right to express their opinions, which is an inalienable right. We are free to express our opinions on political and religious matters and comment on other matters by word of mouth, letter writing, or the Internet. This right is restricted by two other rights that all citizens have. the right not to lie, which leads to defamation, and the right not to be insulted. Both of these rights are protected by the laws of the Kingdom of Cambodia and will be punished if violated. Restrictions also apply to lies or insults that damage the institution's reputation.

It is essential to know what is allowed for expression and what can become a violation of the rights of others, the protection of their appearance, and their dignity.

It is possible when a person wants to express his opinion about the activities of a political party or government, expressing his beliefs about what was done, whether it was right or wrong. However, directly accusing an individual or institution of something as a crime leads to punishment unless we have eyewitness evidence. For example, we can say something is wrong or tell people whether or not to do what we think. These are our ideas, and we are free to express them. It is wrong to accuse someone of a crime without evidence, such as murder, as that will damage that person's reputation.

Legally, we are responsible for our actions and the information we share, and it is our responsibility to ensure that our comments are accurate. In fact, for something others have proven to be true, it will inevitably be re-verified before sharing.

Freedom of expression is the foundation of democracy. It is widely used as a powerful tool for defending our ideas. We must learn to use it properly to achieve our goals, prove what is true, and be careful about sharing anonymous information. Changing ideas without lying or insulting leads to a useful discussion that helps society thrive.

III. Points to Consider Regarding Expression and Sharing Information

Here are some points you should consider before you comment or share any information on the Internet.

1. Be aware of what you are saying:

In the case of defamation, you are responsible not only for what you say but also for what people understand. You are also responsible for publishing defamatory statements written by someone, even if their quotes are accurate. You need to determine if your writing will affect someone's reputation. How will the simple or ill-informed person understand the meaning of your ad?

2. Say only what you can prove:

The truth is usually the most important barrier in a defamation suit. Ask yourself what evidence you can present in court if someone is questioning you and how you can convince them. Do you have a source? Are those sources reliable? Do they have personal knowledge? Will they be willing to prove it? If you rely on references, do you have anyone who can verify their authenticity?

3. Tell what you do not know:

This point follows from the above rule. If you are honest with your audience about what you do not know and make it clear that you are not accusing anyone, it is difficult for the plaintiff to claim that the reader will be more discerning.

4. Be ethical:

Ethical conduct is the best way to protect yourself from lawsuits. Following professional ethics makes you less likely to make defamation-related mistakes. And you may

not be susceptible to this type of complaint. If they sue you, you will have something to defend yourself with. And even if you have nothing to defend yourself with, the judges and jury are likely to sympathize with you, and the damage is likely to be lower than usual. How do you act ethically? You need to check the actual information, do not rely on biased sources. Do not say more than you know. You can send your critique to the people you are criticizing before posting and include their responses in the ad. It must be measured. Be prepared to issue corrections and apologize if anything goes wrong. Although this protection may vary, it can still be useful for publication issues when the publisher acts responsibly. So, it would help if you positioned yourself to take advantage of this self-defence's possibility.

5. Who are you facing:

When publishing or sharing information, be aware that some people are more likely to sue you than others. For example, politicians, businesspeople, celebrities, and groups of people who are important to their lives and have many resources to sue you. You should also pay more attention to writing and sharing information about the police and journalists, and especially lawyers, because they are an influential group with enough resources to respond to you.

📖 Summary

- Article 41 of the Constitution of the Kingdom of Cambodia states that Cambodian citizens have the right to freedom of expression, freedom of the press, and freedom of assembly. Cambodians are free to express their opinions in politics and religion, as well as in other matters, by word of mouth, letters, or on the Internet. However, this right is restricted by two other rights that all citizens have: the right not to lie, which leads to defamation, and the right not to be insulted.
- Before commenting or sharing any information, consider the following: Know what you say.
- Say only what you can prove, and be open to what you do not know
- Use the language of expression ethically
- Know whom you are facing
- Excessive use of technology will have many negative effects on young people. So young people need to know the balance between time spent on social media and time spent on privacy and real life.

Questions

1. According to Article 41 of the Constitution of the Kingdom of Cambodia, how are the Cambodian people free to express themselves?

2. What points do you need to consider before commenting and sharing information on the Internet?

3. What does the Constitution of the Kingdom of Cambodia say about expression?

4. How does the overuse of technology affect you?

Content Creation for Digital Media

Lesson 30

Writing a News Article

Introduction:

News articles are written to inform and educate readers on current affairs/events. They are used to provide readers with the information they need/want to know about the world around them. To make your news article appealing to readers, you need to write articles proficiently. At the end of this lesson, you will be able to:

- ✓ Define the meaning of news article and classify news
- ✓ Understand the structure of a writing news article
- ✓ Write a good news article to publish in the media

When you have finished this lesson, you understand:

I. News Articles
II. Rules for Writing News Articles
III. The Structure of a News Article
IV. How to Write a News Article
V. The Important Points of an Interview

Lesson 30 Writing a News Article

I. What is a News Article?

A news article is a writing format that provides readers with concise and factual information. News stories typically report on noteworthy current affairs—including legislation, announcements, education, discoveries or research, election results, public health, sports, and the arts.

Writing a news article is different from writing other articles or informative pieces because news articles present information in a specific way. It's important to convey all the relevant information in a limited word count and concisely give the facts to your target audience. Learning how to write a news article can help you find a career in journalism, develop your writing skills and help you convey information clearly and concisely.

II. Rules for Writing a News Article

Whether you're learning how to write a short news story for a school assignment or want to showcase a variety of clips in your writing portfolio, the rules of news writing hold. There are three types of news articles:

- Local: reports on current events of a specific area or community. For example, "Nine students drown after river ferry capsizes in Kandal Province".
- National: reports on current affairs within a particular country. For example, "Cambodia chairing of ASEAN in 2022 leading of top meeting."
- International: reports on one or more countries' social issues or current affairs abroad. For example, "North Korea launch many rockets that fall near South Korean Island."

Regardless of the type of news article you're writing, it should always include the story's facts, a catchy but informative headline, a summary of events in paragraph form, and interview quotes from expert sources or public sentiment about the event. News stories are typically written from a third-person point of view while avoiding opinion, speculation, or an informal tone.

III. Structure of a News Article

News articles are structured like an inverted pyramid. The most crucial information is presented to the reader, followed by additional story details. A news article concludes with less important supporting information or a summation of the reporting.

When it comes to structuring a news article, use an inverted pyramid. Organizing your content this way allows you to thoughtfully structure paragraphs:

- Begin with the most important and timely information
- Follow those facts with supporting details
- Conclude with some less important but relevant details, interview quotes, and a summary

The first paragraph of a news article should begin with a topic sentence that concisely describes the story's main point. Placing this sentence at the beginning of a news article hooks the reader immediately, so the "lead isn't buried," as they say.

At a traditional newspaper, this practice is described as "writing above the fold," which alludes to the biggest, most pressing news being visible at the top of a folded newspaper.

IV. Writing a News Article

There are a handful of steps to practice when writing a news story. Here's how to approach it.

1 Gathering Information

Source the five Ws (sometimes "6 W's") about your news topic:

- Who: Who was involved?
- What: What happened?
- Where: Where did it happen?
- When: When did it happen?
- Why: Why did it happen?
- How: How did it happen?

Lock down a keen understanding of the timeline of events so you can correctly summarize the incident or news to your reader. The key is to position yourself as a credible and reliable source of information by doing your due diligence as a fact gatherer.

2. Interviewing Subjects

Consider whom you want to interview for the new article. For example, you might interview primary sources, such as a person directly involved in the story.

Alternatively, secondary sources offer your readers insight from people close to or affected by the topic who have unique perspectives. This might be an expert who can offer

technical commentary or analysis or an everyday person who can share an anecdote about how the topic affected them.

When interviewing sources, always disclose that you're a reporter and the topic that you're writing on.

3. Outlining

Draft an outline for your news article, keeping the inverted-pyramid structure in mind. Consider your potential readership and publication to ensure that your writing meets the audience's expectations in terms of complexity.

For example, if this news article is for a general news publication, your readership might include a wider audience than a news article for a specialized publication or community.

Brainstorm a snappy headline that concisely informs readers of the news topic while seizing their interest. Gather the most important points from your research and pool them into their respective pyramid "buckets." These buckets should be based on their order of importance.

4. Writing

Get to writing! The paragraphs in a news article should be short, to the point, and written in a formal tone. Ensure any statements or opinions are attributed to a credible source you've vetted.

5. Revising

Reread your first draft aloud. In addition to looking for obvious typos or grammar mistakes, listen for awkward transitions and jarring tenses or perspective shifts. Also, consider whether your first draft successfully conveys the purpose of your news story. Rework your writing as needed and repeat this step. Don't forget to proofread your work.

6. Fact-checking

Strong news stories are built on facts. The entire work is compromised if any statement or information is shaky or unsupported. Before publishing a news article, double-check that all the information you've gathered from the beginning is accurate, and validate the information your interview sources provided.

V. Important Points for Planning an Interview

Before conducting an interview, journalists should define their information goals: What do they want to find out for the audience? Once the goal is set, they can think of questions. Each answer should bring them one step closer to reaching the interview goal. At the most basic level, there are two forms of questions: closed and open. Closed questions can be answered with yes/no, or just one or two words, like a name or a date. Open questions are different. They usually start with "why" or "how" and give the interviewee a chance to explain the background and give details or a personal opinion. Answers to open questions can sometimes be quite long. If journalists want to get straight to the point or are running out of time, they often ask closed questions, to which the interviewees have to give short, clear answers. Other kinds of closed questions that can prompt short, precise answers are: "how many," "when," or "where." Sometimes journalists have to ask follow-up questions after the closed questions so the audience can make sense of the short answers.

📖 Summary

- A news article is a writing format that provides readers with concise and factual information. News stories typically report on noteworthy current affairs—including legislation, announcements, education, discoveries or research, election results, public health, sports, and the arts.

- Whether you're learning how to write a short news story for a school assignment or want to showcase a variety of clips in your writing portfolio, the rules of news writing hold.

- There are three kinds of news articles: Local, National, and International.

- When structuring a news article, use an inverted pyramid. Organizing your content this way allows you to thoughtfully structure paragraphs:
    o Begin with the most important and timely information
    o Follow those facts with supporting details
    o Conclude with less important but relevant details, interview quotes, and a summary.

- Source the five Ws (sometimes "6 W's") about your news topic:
    o Who: Who was involved?
    o What: What happened?
    o Where: Where did it happen?
    o When: When did it happen?
    o Why: why did it happen?
    o How: How did it happen?

👤 Questions

1. What is a news article?

2. What is the difference between a news article and a novel?

3. What are the rules for writing a news article?

4. How many types of news articles are there?

5. Why is it important to prepare before an interview?

Lesson 31

Photography

Introduction:

Photos can help give a more specific meaning to an article. Sometimes images can give meaning without text. Image production is a necessary skill in the creation of digital content. At the end of this lesson, you will be able to:

- ✓ Define the meaning of the photo
- ✓ Define the power of photos in media
- ✓ Take a good picture
- ✓ Edit a picture

When you have finished this lesson, you will understand:

Lesson 31 Photography

I. What is a Photo?

A photograph is a still image that only contains visual information. It is a record of light falling on a subject (a person, object, event, landscape, etc.) Photos can be made using a camera, a webcam, or a smartphone. These devices have a lens that lets in light for a certain time, typically for a fraction of a second. The light is recorded on the photosensitive material, usually an electronic chip. Photos appear in many media, both in print media (newspapers, magazines, posters, advertisements) and electronic media (websites, web applications, social media). Since the invention of photography in the 19th century, people have loved photos because they like to keep them as memories of people and experiences.

II. Analog and Digital Photography

In the 19th and 20th centuries, the light that entered the camera through the lens was recorded on light-sensitive material, usually film. The light changed the chemistry of the film material: where a lot of light hit the film, the chemical reaction was different than in darker parts of the picture, where less light hit the film. These chemical changes in the film's surface formed the recorded image.
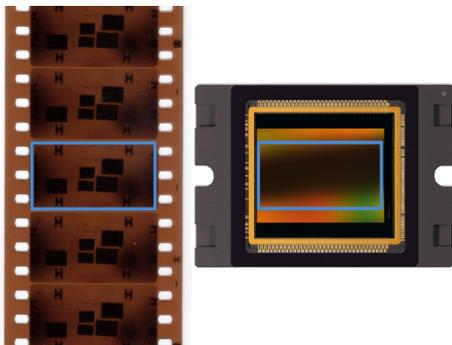
Today, most cameras record images electronically on a digital chip. A digital picture is made up of millions of small dots called pixels. It's almost like a mosaic of these tiny dots. For each pixel, the camera electronically records how light or dark it is and what color it is.

All of these tiny pixels seen together make up the digital image. One characteristic of a digital photo is that it can be copied repeatedly without any loss in quality.

III. The Power of Images

Photos deliver visual information, the information we perceive with our eyes. For human beings, the visual sense is usually dominant and more significant than hearing, smell, or touch. More than 80 percent of the information that reaches our brains is visual information. We process visual information like photos and images much faster than text, and images can leave strong and lasting impressions. They evoke strong emotions, and emotions have a powerful pull on us.

Social media is impossible to imagine without pictures. Pictures attract people's attention, and social media users often post pictures of themselves ("selfies"), their family, and their friends on different platforms. People love to look at photos other users have posted. As attention spans grow shorter overall, photos serve as eye-catchers, helping you decide whether to scan something or look at it in more detail.

III. Who Defines a Photo's Message?

The photographer, the subject, and the viewer determine the message of a photo. The photographer can shape how we see a picture by employing certain composition rules.

The subject, in turn, often evokes a certain feeling or emotion in the viewer. For instance, the picture of a starving child usually evokes sympathy and makes viewers sad. The viewer also determines the message of a photo because everyone perceives and interprets a photo differently. This is due to the individual viewer's cultural context, education, or
societal norms.

IV. Describing and Interpreting Pictures

For a media literate person, it is important to distinguish between the objective description and the subjective interpretation of a photo. When describing a picture, the focus is on facts, not on a subjective impression or emotions. Facts that describe a photo can include the subject, what colors we see, whether the photo provides a broad overview of a scene or event, or if it shows a small detail of something.

When you interpret a photo, you describe the message you think the picture delivers or the emotions it evokes in you. But everyone sees images differently and has associations due to their educational background, culture, age, gender, experiences, and interests. That's why everyone interprets a photo and its media messages differently.

V. Photo Editing

Photo editing is changing the original photo in a postproduction process for a certain purpose, e.g., to enhance its impact. You can easily edit a photo taken with a digital camera or a smartphone on any computer or smartphone. But photos taken with an analog camera can only be edited in a traditional photographer's darkroom or by scanning them and then editing the digital scan. You can crop digital pictures, adjust their brightness, contrast, or colors, or save the picture in a reduced image size. You can add a caption or text to your photo if you like. To edit digital photos, you need editing software. Most computers and smartphones come with some basic photo editing software pre-installed. More elaborate editing software can be bought (e.g., Photoshop) or downloaded for free (e.g., GIMP, PIXLR, Snapseed). Some photo apps like Instagram have their editing software included.

VI. The Difference Between Editing and Manipulation

When you edit a digital image, you usually try to improve it by enhancing the elements of the original photo that aren't perfect. For example, you can increase the brightness, improve the contrast, add saturation to the image and shift colors, or optimize the composition by cropping the picture. However, some modifications can change the story the photo tells. For instance, if you decide to crop important people out of the picture, you change the picture's message. Some people would say you are tampering with the image and even lying. Digital editing technology makes this kind of falsification very easy. We can digitally remove unwanted objects from the image, eliminate imperfections from people's faces, or change the features of their bodies. The person editing the photo can manipulate the image to match their imagination. Manipulating an image means consciously or unconsciously changing the original message. Photo manipulation is often used to make a

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product or person look better for commercial or propaganda purposes. Photojournalists consider photo manipulation unethical, especially when it is used to deceive the public.

VII. Photographs and Copyright

You hold the copyright for each photo you take. Those ownership rights mean that only you can decide whether to allow your photograph to be reproduced, used as the basis for derivative works, and published, transferred, or sold. If others store your photos privately on their devices, they are not infringing on your copyright. But if they make your pictures available to others or sell them, they violate your copyright. Since technology makes it easy to copy and distribute digital photographs, the risk of copyright infringement is high and occurs often. If an owner of a photograph learns of a copyright violation, they can sue the offenders, who may have to pay a fine. To be on the safe side, you should only publish or post photos you have taken or those with a Creative Commons license (CC). You can find Creative Commons photos that you can copy, distribute, or edit using the 'advanced search option in search engines like Google or on platforms like Wikimedia and Flickr. You normally have to credit the copyright owner when redistributing a CC-licensed photo. The specific CC license the photo owner gives determines what you can and cannot do with it.

VIII. Composition Rules for Photos

Composition rules for photos are guidelines and quality criteria that can help a photographer enhance the impact of a photo. Some key composition rules are contrast, perspective, field size, and the rule of thirds.

1. Contrast

Stark differences between dark and light or contrasting colors make shapes and contours easy to recognize. Pictures with high contrast work well online because they are easy to grasp, even if only seen as thumbnails or on small screens. As a composition rule, contrast can also refer to colors that stand in stark contrast to one another (blue >< yellow; red >< green) or highly contrasting shapes that appear on a photo (round shapes >< angular shapes or lines). Any such contrast will help make your photo more interesting.

HIGH CONTRAST   MEDIUM CONTRAST   LOW CONTRAST

2. Rule of Thirds

Imagine that two vertical and two horizontal lines divide your image into nine equal segments. According to the "rule of thirds," pictures seem more pleasant and interesting if key visual elements are positioned approximately where the lines intersect. This adds tension to the picture and makes it appear more interesting than if the subject were positioned right in the middle of the frame.
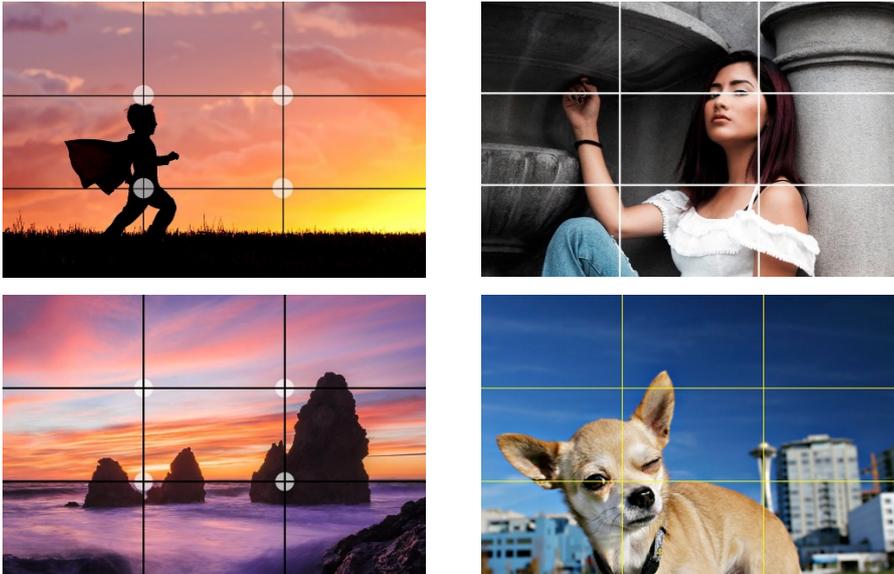
3. Field Size

The distance between the camera and the object usually determines the camera field size. Each field size has a certain purpose: long shots give the viewer much information, like where and when an action took place. Close-ups and details direct the viewer's attention to a person's emotion or a certain object. Slideshows and photo stories are more interesting when the pictures have different field sizes.

A. Extreme Long Shot (Extreme Wide Shot)

This is used to show the subject from a distance or the area where the scene is taking place. This type of shot is particularly useful for establishing a scene in terms of time and place and a character's physical or emotional relationship to the environment and elements. The character doesn't necessarily have to be viewable in this shot.

B. Long Shot (Wide Shot)

This shows the subject from top to bottom. For a person, this would be head to toe, though not necessarily filling the frame. The character becomes more of a focus than in an Extreme Long Shot, but the shot tends to be still dominated by the scenery. This shot often sets the scene and our character's place in it. This can also serve as an Establishing Shot instead of an Extreme Long Shot.

C. Full Shot

Frames character from head to toe, with the subject roughly filling the frame. The emphasis tends to be more on action and movement rather than a character's emotional state.

D. Medium Long Shot (3/4 Shot)

Intermediate between Full Shot and Medium Shot. It shows the subject from the knees up.

E. Medium Shot

Shows part of the subject in more detail. For a person, a medium shot typically frames them from about the waist up. This is one of the most common shots in films, as it focuses on a character (or characters) in a scene while still showing some environment.

F. Medium Close-Up

Falls between a Medium Shot and a Close-Up, generally framing the subject from the chest or shoulder up.

G. Close-Up

Fills the screen with part of the subject, such as a person's head/face. Framed this tightly, the emotions and reactions of a character dominate the scene.

H. Extreme Close Up

Emphasizes a small area or detail of the subject, such as the eye(s) or mouth. An Extreme Close Up of just the eyes is sometimes called an Italian Shot, getting its name from Sergio Leone's Italian-Western films that popularized it.

4. Perspective:

Rather than always shooting from eye level, try photographing from different points of view: from above your subject (bird's eye perspective) or below it (frog perspective). Different perspectives have different effects on the viewer. A person who is photographed from above looks small and insignificant. A photograph taken at eye level treats them as an equal. A photo taken from below could make the person look powerful or dominating.

A. High Angle (Bird's-eye view**)**

The subject is photographed from above eye level. This can have the effect of making the subject seem vulnerable, weak, or frightened.

Another high-angle shot that's taken from directly overhead and from a distance. The shot gives the audience a wider view. It is useful for showing direction and that the subject is moving, highlighting special relations, or revealing elements outside the boundaries of the character's awareness to the audience. The shot is often taken from a crane or helicopter.

B. Eye Level

The shot was taken with the camera approximately at human eye level, resulting in a neutral effect on the audience.

C. Low Angle (Frog Perspective)

The subject is photographed from below eye level. This can have the effect of making the subject look powerful, heroic, or dangerous.

D. Over-the-Shoulder Shot

A popular shot is where a subject is shot from behind the shoulder of another, framing the subject anywhere from a Medium to a Close-Up. The shoulder, neck, and/or back of the head of the subject facing away from the camera remains viewable, making the shot useful for showing reactions during conversations. It tends to emphasize the connection between two speakers more than the detachment or isolation that results from single shots.

E. Two Shot

A shot in which two subjects appear in the frame.

5. Sharpness and Blurring (Focus)

Before taking a photograph, decide which part of the picture you want in focus. Your most important person or object will often be at the center of the picture. Therefore, most cameras' autofocus concentrates on making the picture's center sharp. But if your main subject is off to the side of the picture, there is a way to get that element in focus: if you are using a smartphone camera, tap the part of the image on the screen that you want in focus. The autofocus will make this part of the picture sharp. Then take a picture.

The focus is often on the center of the image.

6. Light and Color Temperature

Light determines the effect of the image. Light in blue and gray tones creates a rather cold atmosphere. Light in yellow and orange tones conveys a warmer, cozier atmosphere. The light is usually warm just after sunrise and before sunset, whereas it is harsher and colder at midday. Use light and shadows intentionally. Bright light from the back makes a subject look dark, e.g., when a subject is standing in front of a window. In these cases, it may be good to use a flash, even in daylight.

Afternoon light brings out warm colors and creates a warm atmosphere.

7. Portraits

Good portraits are more challenging to take than people think. The photographer should opt for interesting picture details and encourage the subject to relax. Do not place the person in the center of the picture; ensure that they look "into the picture" and not out of the frame.

8. Movement

A camera can capture motion. Objects that move quickly in front of the camera can appear blurred (e.g., sports), while the static background stays in focus. Another option to depict movement is to move the camera with the object as you take the picture. Then the fast-moving object stays in focus, but the background is blurred. You can freeze the moving object by high shutter speed or by setting your camera to Sports mode. This will lead to the background needing to be in focus.

9. Depth of Field

When you take portraits, an out-of-focus background makes a face stand out. With newer smartphones or more advanced cameras, you can limit the depth of field by using a wide aperture and short shutter speed. This technique can make everything in the background that is not the photograph's subject look blurry or out of focus.

10. Patterns

Patterns can be visually compelling because they suggest harmony and rhythm. Things that are harmonious and rhythmic convey a sense of order and peace. Patterns can become even more compelling when you break the rhythm, which introduces tension. The eye then has a specific focal point to fall upon, followed by a return to the dominant visual rhythm.

11. Leading Lines

When we look at a photo, our eye is naturally drawn along lines in the picture. Placing lines in your composition can affect how people view the picture. You can pull the viewer into the picture towards the subject or take the viewer on a "journey" through the scene. Different lines are straight, diagonal, curved, etc., and each can enhance your photo's composition. Diagonal lines can be especially useful in creating drama in your picture. They can also add a sense of depth or a feeling of infinity.

12. Symmetry

We are surrounded by symmetry, both natural and artificial. A symmetrical image looks the same on one side as on the other. Symmetry creates a feeling of harmony in the viewer, but symmetrical compositions can also be boring. Sometimes, tension can be added to your picture if the symmetry is broken somewhere.

13. Framing

The world is full of objects that make perfect natural frames, such as trees, branches, windows, and doorways. By placing these around the edge of the composition, you help isolate the main subject from the outside world. In addition, you can create depth through foreground and background. The result is a more focused image, which draws your eye naturally to the main point of interest.

IX. Digital Editing Basics
1. Basic Steps in the Digital Photo Editing Process

When photos are digitally edited, the source image file is changed. This is often intended to improve the image. Compressing a picture into smaller format results in a digitally edited picture. Here are some terms to use in digital editing photography

- **Import**: uploads your photo into the editing software.
- **Crop**: redefines the borders of the image.
- **Contrast**: changes the intensity of dark and light parts of a picture.
- **Colors and Brightness**: turn a photo warmer or colder, brighter or darker
- **Photo Filter**: adds special effects to a photo, e.g., makes it look antique
- **Text/Message**: adds text such as a headline, caption, or speech bubble to provide information or to add humor
- **Resize/Export/Save**: creates a reduced file size to export and upload pictures

2. Digital Editing Software

There are many digital editing software options available online. Many are only available in English. If you are using a smartphone, simple touch-ups and edits can be done using the phone's built-in editing features or apps like PIXLR or Snapseed. If you're editing on a desktop or laptop computer, Microsoft Paint is a simple computer graphics software included with Microsoft Windows. However, those who want more control over their images

should use more advanced photo editing software. Some software is free, but be aware of special conditions. Some editing features are only available if the user pays a fee.

Online Editing Software Digital Editing

- ✓ Fotor (fotor.com)
- ✓ PIXLR (pixlr.com)

Apps for Digital Editing with a Smartphone

- ✓ Pixlr (Android, iPhone)
- ✓ Snapseed (Android, iPhone)
- ✓ PicsArt (Android, iPhone)
- ✓ PicLab (Android, iPhone)

📖 Summary

- A photograph is a still image that only contains visual information. It is a record of light falling on a subject (a person, object, event, landscape, etc.) Photos can be made using a camera, a webcam, or a smartphone.
- Photos deliver visual information, the information we perceive with our eyes. For human beings, the visual sense is usually dominant and more significant than hearing, smell, or touch.
- The photographer, the subject, and the viewer determine the message of a photo. The photographer can shape how we see a picture by employing certain composition rules.
- When describing a picture, the focus is on facts, not on a subjective impression or emotions. Facts that describe a photo can include the subject, what colors we see, whether the photo provides a broad overview of a scene or event, or if it shows a small detail of something.
- When you interpret a photo, you describe the message you think the picture delivers or the emotions it evokes in you. But everyone sees images differently and has associations due to their educational background, culture, age, gender, experiences, and interests. That's why everyone interprets a photo and its media messages differently.
- Photo editing is changing the original photo in a postproduction process for a certain purpose, e.g., to enhance its impact.
- Manipulating an image means consciously or unconsciously changing the original message. Photo manipulation is often used to make a product or person look better for commercial or propaganda purposes. Photojournalists consider photo manipulation unethical, especially when it is used to deceive the public.
- Composition rules for photos are guidelines and quality criteria that can help a photographer enhance the impact of a photo. Some key composition rules are contrast, perspective, field size, and the rule of thirds.

Questions

1. What is a photo?
2. What are analog and digital photos?
3. What makes an image powerful? Who defines its message?
4. What are photo editing and photo manipulation? What is the difference?
5. What are the composition rules? Describe each composition.

Lesson 32

Audio

Introduction:

Media communication uses audio to deliver and transfer information. Audio helps listeners to better understanding the information. At the end of the lesson, you will be able to:

- ✓ Understand audio and sound
- ✓ Record and edit sound
- ✓ Share sound to media

When you have finished this lesson, you will understand:

Lesson 32 Audio

I. What is Sound?

The world is awash in sound. From the quiet rustle of leaves in the breeze to the boom of thunder during a raging storm, we are surrounded by sound. The human voice, the noise of traffic, a melody produced on a flute or clarinet, and an animal's cry are all sounds we perceive with our ears. The sound is made up of vibrations that travel through the air like sound waves. When you beat a drum, the drum skin vibrates, and small changes in air pressure occur. Those changes produce sound waves that leave the drum and reach your ear, causing your eardrum to vibrate. That, in turn, creates nerve signals that go to your brain, which are then interpreted as sound.
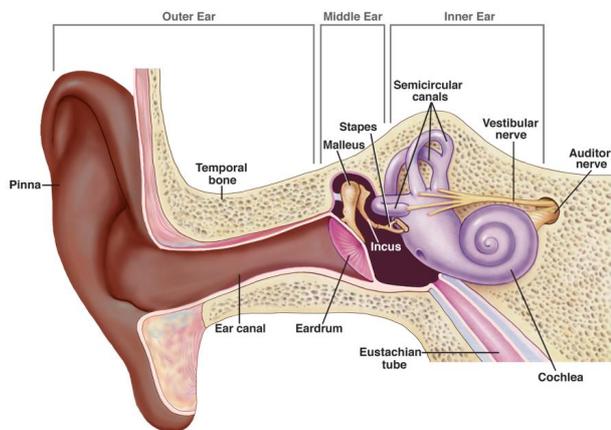
II. How Sound Becomes Audio

Sounds are recorded with a microphone that converts sound waves into electronic waves, which can then be saved as an audio file. The recorded sounds can be reproduced so that you can hear them from speakers that can be as tiny as earphones or as tall as two people standing on top of each other. Large speakers produce loud, high-quality sound at concerts or public events. Microphones and speakers are integrated into everyday devices like smartphones and computers. So, anybody with access to such devices can record sound be it voices, music, or the radio, and store it as an audio file. They can then play it back to listen to or share it with others.

II. Types of Media Using Audio

The medium that uses audio the most is radio. But audio also plays an important role in other electronic media like television, movies, video clips, and video games. Sound and music have become an integral part of media products like movies or video games, and sound engineering has become a profession. The people who do this work are called audio

engineers or sound engineers. They choose or create sounds and music in movies, videos, or TV shows to heighten the perception of reality or enhance moods like anticipation, joy, or fear.

A. Radio

Radio is a sound-only mass medium. When people listen to the radio, they only need the sense of hearing to understand the media messages consisting of news, reports, interviews, or music. Even people who cannot read or write can understand radio content. Most people listen to the radio for entertainment and to get up-to-date information. They hear that audio thanks to radio waves that transmit radio programs. A microphone picks up speech, music, or other auditory information, creating a signal sent to a transmitter, turning it into a broadcast signal, and sent out over the air. Sound waves normally dissipate after traveling a few meters. But radio waves that cannot be seen, felt, or heard can travel far into the atmosphere. A radio antenna picks up this broadcast signal, which the radio receiver processes to turn the signal into sound again. The radio listener adjusts a tuner to find the frequency of a station. Nowadays, many radio stations have more options than just radio waves to get their programs to listeners. Programs can be delivered via cable or broadcast on the internet. Websites run by radio stations often contain additional information, like articles, pictures, or videos that supplement their audio content.

Only a few people are needed to create and produce radio broadcasts. Radio programs can be broadcast live or pre-recorded. Media makers in radio broadcasting include news reporters, producers, radio presenters, news editors, and music editors.

The type of programs a radio station broadcasts depends on its aims and objectives. Information stations focus on news and talk shows, while entertainment stations mostly play music. Typical content types on information stations are news, interviews, reports, and public-service announcements. Entertainment stations that mostly play music often focus on specific kinds of music, for instance, traditional or folk music, pop, rock, or classical music. Programming sometimes includes reports about people in the entertainment industry, like singers, musicians, or celebrities. The on-air hosts usually try to be lively and entertaining. Many radio stations offer call-in programs during which listeners can call the station and ask questions or voice their opinions on air. This allows them to make themselves heard.

III. Vox Pop

  A vox pop is a short interview recorded with members of the public. Journalists use this format to show a variety of thoughts or opinions regarding a topic. In a regular interview, you ask one person several questions. In a vox pop, you ask many people the same question to get diverse opinions, outlooks, or experiences. The people you hear in a vox pop are not carefully selected experts; ordinary people are chosen randomly. Vox pops are supposed to reflect the diversity of personal opinions on a topic of common interest. They can give listeners new insights into how others think, recognize the diversity of thought, and show multiple facets of a subject. Listeners usually enjoy vox pops because they contain the voices of ordinary people like themselves.

IV. Creating a Vox Pop

  You should carefully plan a vox pop, but the answers should be spontaneous. First, think of a question on a controversial topic that people are talking about and will likely hold different opinions about. This way, you are more likely to get various answers for your vox pop. Who is affected by this topic, and where can you find these people? Your topic may affect a broadly defined group like adults, teens, or children or a clearly defined group such as workers from a specific company or industry. Where will you find them? On a city street, in a marketplace, in front of a school, factory, or university? Try to develop a single open question that will reveal contrasting opinions. When approaching people to talk to, try for variety: male, female, old, young. Get your interviewees' spontaneous reactions to your question; don't rehearse answers with them. Make sure that the answers are clear and understandable. When you have recorded 10 to 20 good responses, choose the best ones that reflect diverse voices and opinions. Edit them down to short, punchy statements. Edit your questions so the listener only hears a series of answers. Mix the order to vary the voices and opinions. Start your vox pop with a strong statement and end with a strong one too.

V. How to Record Audio

There are several methods to record audio. You can use a smartphone to record or spend large amounts of money on sophisticated microphones and recording equipment. In any case, you will need a microphone or mic. This can either be a basic internal mic, like the ones built into smartphones, or an external one. External mics must be connected to an audio recording device, such as a digital audio recorder, computer, laptop, tablet, or smartphone. External mics usually provide better sound quality than built-in versions. For recording audio, there is plenty of free, quality software you can use. If you use a laptop or computer, a popular free audio recorder and editor is "Audacity." For smartphones, you can find numerous apps for Android, iOS, and Windows. Some are just for recording sound; others can also edit audio files. Check for highly rated apps in Google Play or the iTunes App Store by typing in "audio recorder" or "audio editor." Some of the recommended audio apps for Android are WavePad Audio, WaveEditor, Editor Free, or Lexis Audio Editor, all of which can be used for recording and editing audio.

1. Audio Recording

Recording audio is easy if you avoid some common mistakes. Here are some basic tips:

- Choose a quiet environment but avoid empty rooms as they can produce a hollow sound and echo.
- Don't record in places with much background noise, like traffic, music, or other people talking. Background noise can make it difficult for you to edit your recording and makes it hard for your listeners to understand what is being said.
- If you record outside with an external microphone, you can reduce wind noise using a mic windscreen.
- When your interviewees talk, do not encourage them audibly by saying "aha," "yes," "I see," or "I agree." Encourage them silently by nodding, smiling, and maintaining eye contact. Verbal encouragement may give your listeners the impression that you agree with everything your interviewee says.
- While recording, don't move your fingers holding the microphone, as this will make sounds that the microphone can pick up. Also, try to avoid making other sounds that could end up on tape, like shuffling your feet or coughing.
- Hold the microphone in the direction of the sound source: near your mouth when you ask a question and near the interviewee's mouth when they answer.
- The distance between the mouth and the microphone is about 20 cm (almost eight inches). You can get closer using an internal microphone, like the microphones built into smartphones.

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- To avoid P-pops, hold the recording device a little off to the side of your mouth, not directly in front of it.
- Always wear earphones or headphones to check the levels and the sound while recording.
- Press the record button a few seconds before asking your first question. Keep recording for a short while after the end of the last answer. You can trim the beginning and the end of your interview later, but you can never recreate missing audio if someone starts speaking before you've started recording.

2. Recording a Vox Pop

1. Preparing a Vox Pop: Researching and Choosing a Question

After selecting a suitable topic and researching the basic facts, choosing one question may take time and effort. You can ask many questions about any topic, but you must choose one key question for a vox pop.

It should:

- ✓ Be short, clear, and easy to understand.
- ✓ Urge people to share personal opinions or experiences.
- ✓ Be an open question.
- ✓ Lead to various answers and not just elicit one possible or desirable response.

2. Approach and Appearance

The first impression counts. So before you go out and ask strangers to answer your question, think about your approach and appearance. Here are some tips:

- ✓ Be friendly and smile.
- ✓ Maintain eye contact. Show people that you are genuinely interested in what they are saying. Nod and smile when they speak to encourage them.
- ✓ Do not wear inappropriate clothing.
- ✓ Look self-confident and optimistic. If you are nervous, try not to show it.

3. Conducting a Vox Pop

It would help if you kept some things in mind while conducting a vox pop. It helps to take notes and check the levels while you record. This will make editing easier.

- ➤ Content
  - ✓ Short and clear answers
  - ✓ Different opinions
  - ✓ Different voices (young/old, male/female)
  - ✓ Do not interrupt people; be patient. You can edit the answers later.
- ➤ Technical tips
  - ✓ Find a suitable location where you will not pick up too much background noise.
  - ✓ Wear earphones or headphones to check the volume while you record.

✓ Start recording a few seconds before the answer starts, and keep recording a few extra seconds at the end to make editing easier.

4. Editing a Vox Pop

Select the best answers. Discard the ones that need to be clarified, well-expressed, or well-recorded. Make sure you have a mixture of different voices and opinions. Start and end with a strong statement.

📖 Summary

- From the quiet rustle of leaves in the breeze to the boom of thunder during a raging storm, we are surrounded by sound. The human voice, the noise of traffic, a melody produced on a flute or clarinet, and an animal's cry are all sounds we perceive with our ears. The sound is made up of vibrations that travel through the air like sound waves.
- Sounds are recorded with a microphone that converts sound waves into electronic waves, which can then be saved as an audio file. The recorded sounds can be reproduced so that you can hear them from speakers that can be as tiny as earphones or as tall as two people standing on top of each other.
- The medium that uses audio the most is radio. But audio also plays an important role in other electronic media like television, movies, video clips, and video games. Sound and music have become an integral part of media products like movies or video games, and sound engineering has become a profession.
- A vox pop is a short interview recorded with members of the public. Journalists use this format to show a variety of thoughts or opinions regarding a topic. In a regular interview, you ask one person several questions. In a vox pop, you ask many people the same question to get diverse opinions, outlooks, or experiences.

Questions

1. What is the difference between audio and sound?
2. How does sound become audio?
3. What types of media use audio?
4. What is vox pop?
5. Describe how to record and edit a vox pop.

Lesson 33

Video

Introduction:

Video is an electronic medium for recording, copying, playback, broadcasting, and displaying moving visual media. Online video production is booming today. For your content to be compelling, you need to learn the techniques for recording and editing videos. At the end of this lesson, you will be able to:

- ✓ Understand video concept
- ✓ Record and edit video
- ✓ Use video to express media

When you have finished this lesson, you will understand:

I.	Videos
II.	Film and Video
III.	Film Genres
IV.	Fiction and Non-fiction
V.	Features of a Video
VI.	Video Sequences and Video Clips
VII.	Frame Rate and Frames per Second(fps)
VIII.	Video Shot Sizes
IX.	Aspect Ratio and Image Resolution
X.	Video Editing, Rough Cut, and Final Cut ~~mean~~
XI.	Video Rolls
XII.	Vlogs
XIII.	Video Copyright
XIV.	Editing Videos

Lesson 33 Video

I. What is Video?

Video is a medium that conveys information via a sequence of images and sounds. The images we see are called the visual part of the video. The sounds that we hear are the auditory part. Thus, video is an audio-visual medium in which images and sound play important roles.

A digital camera records video using sensors that generate electronic signals when they are struck by light. This image data is stored in the camera or memory card. This technology has only been available since the mid-twentieth century. Before then, recordings could only be made on film. The very first video cameras were extremely large and expensive. These days, technological advances have made video cameras much smaller and cheaper. They are now easy to use, even for novices. Since 2003, video cameras have been integrated into phones so that anyone with a cell phone or a smartphone can now record their videos.

II. The Difference Between Film and Video

The terms film and video are often used interchangeably because the film, like video, conveys moving images and is an audio-visual medium. The difference between film and video lies in technology. The film does not record the visual image electronically but chemically on light-sensitive material known as celluloid. The film comes in various formats (8 mm, 16 mm, 35 mm, 70 mm), each of which offers a different resolution. Production on celluloid film is much more expensive than production using video technology since the material on celluloid cannot be recorded. The film is a medium that evolved from

photography. It was discovered that a series of still images shown in rapid succession created the perception of motion. The Lumière Brothers in France created one of the first films in 1895. It depicts a train rolling into a station. These early films were silent. They had no sound because recording and synchronizing sound and visuals were not technically possible until the 1920s. The first feature-length "talking picture" or "talkie" was "The Jazz Singer," released in 1927.

III. Film Genre

Movies with certain characteristics are grouped into film genres based on one of three major aspects: a similar narrative, a similar plot, or a similar mood or atmosphere. Assigning films to particular genres helps us discuss and analyze them and recognize and understand what kind of films we like and dislike. Not every film can be assigned one particular genre since some films combine elements of multiple ones. The most important genres that share a similar narrative form include comedies, dramas, and biographies. Movies with similar plots are found among the adventure, fantasy, science fiction, western, war, crime or whodunit, music, and sports film genres. Genres that share a similar mood or atmosphere include action, thriller, horror, romance, and erotic films.

IV. Fiction and Non-fiction

To be media literate, it is essential to distinguish between fictional and non-fictional media content. A fictional film or video depicts something made up, invented, and designed. The creator does not necessarily aim to illustrate truth or reality, even if the content is based on real-life events. Fiction intends to express something in how the creator perceives it or wants to depict it. The creator invents a fictional world. Most movies and music videos shown in theaters, on television, or YouTube are fictional. They are scripted, and actors tell or act out the story.

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Non-fiction is the opposite of fiction. Here the creator aims to depict reality and illustrate the truth to the best of their ability. The maker of a non-fictional video (such as news, a report for a magazine program, or a documentary) is always obligated to depict events and the individuals concerned as accurately as possible. However, media can never really present reality in its entirety. Media can only offer a glimpse or a segment of it, and as a result, ignores or omits other aspects or angles. This means a filmmaker's choices and viewpoint always influence what part of reality is shown and what is left out.

V. Features of Video

As an audio-visual form, video is a multifaceted medium that can be used for many purposes. It can relay news and information and can be found in documentaries, profiles, magazine reports, and tutorials. Video is also used to entertain. The entertainment industry uses video for movies, TV series, shows, music videos, and much more.

Videos with non-fiction content can convey to viewers impressions of events, places, and people. Videos with fictional content can get viewers caught up in a story, so they completely forget the real world. While both video styles have positive aspects, they also have less positive ones in that whatever is shown is only a small segment selected by the media maker. This can change or even manipulate viewers' perceptions.

Although video combines images and sounds, viewers do not perceive the two as equal. They are usually more conscious of the images than the sound, whose impact unfurls in the subconscious. Media makers are aware of this and sometimes use sounds and music to evoke an atmosphere or a certain mood to influence the video's impact. Slapstick videos, for instance, lose much of their comedic effect without all their amusing sounds. With no sound, horror movies can lose their eerie atmosphere and feel less scary.

In the non-fictional field of news, on the other hand, this kind of manipulation through sounds and music is not desirable. Only original sounds recorded on the event scene, quotes from interviews and the journalist's narration are used in a news video to convey as much authenticity as possible. In the best-case scenario, the images of a news video and its sound go hand in hand; they reinforce each other, and both tell the same story.

Another factor that can make it difficult for viewers to follow and understand a video is that the video's creators determine the playback speed of the images, sounds, and scenes. Viewers cannot slow down or speed up the images. For instance, in a movie shown in a theater or on television, information may be presented so quickly that viewers miss some of it. Viewers can replay a sequence or even the entire video on the internet.

VI. Video Sequence and Video Clip

A video sequence is a video section that forms a distinct narrative unit due to technical elements or content. For instance, an action like frying an egg or making a call with a smartphone can be broken down into five or six video shots. Together, these shots are from a short sequence that tells one distinct part of the story. Another example is introducing a person or a place in a movie through a sequence of shots that go together. Video clips, on the other hand, are audio-visual sequences that are often a few minutes long and stand on their own. Popular examples of video clips include music videos, video tutorials, product reviews, or videos produced by citizen journalists. Video clips are very popular on social media.

VII. Frame Rate and Frames per Second (fps)

The frame rate is the number of single pictures per second shown in sequence in a video. If there are 14 to 16 pictures per second, the human brain perceives the action as one fluid motion. At slower rates, the brain perceives each image individually. The movements become jerky, and the motion seems "stop and go." The standard frame rates for television are 25 frames per second (fps) and 29.97 fps.
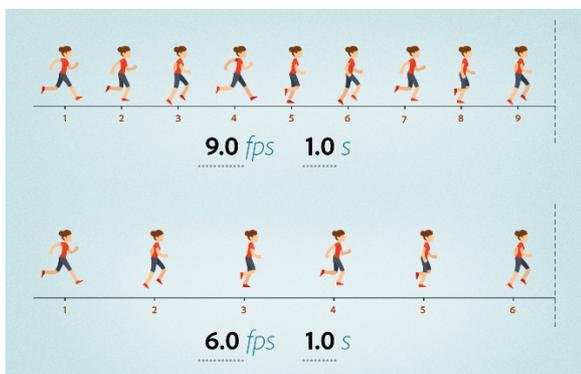
VIII. Video Shot Size

A video shot size is defined by the distance from the camera to the subject. The closer the camera is to a subject, the better you can see the details, which means you can see less of the surroundings. If the camera is far from the subject, viewers have more of an overview of the location or situation. Long, medium and close-ups are the three most widely used shot sizes.

Filmmakers employ a variety of shot sizes to make a video interesting and exciting and keep the story's pace going. The sequence of shot sizes influences viewers' perceptions and emotions as they watch the video. A series of long shots can create a calm feeling,

whereas many close-ups or details in a row can be perceived as disturbing, disorienting, eerie, or mysterious.

The five video shot sizes that are most popular are:

- ✓ Long shot
- ✓ Medium shot
- ✓ Close-up
- ✓ Medium Close-Up
- ✓ Over the shoulder

IX. Aspect Ratio and Image Resolution

The aspect ratio is the proportional relationship between an image's width and height. For quite a long time, the standard aspect ratio for television was 4:3. Nowadays, 16:9 is the standard because it corresponds better to a person's natural field of vision. The evolution of smartphones has also popularized a vertical video format of 9:16. It has become the standard for social media stories or status updates because of how people hold their smartphones. Users don't want to flip their phones sideways to watch a video while scrolling through their newsfeeds.
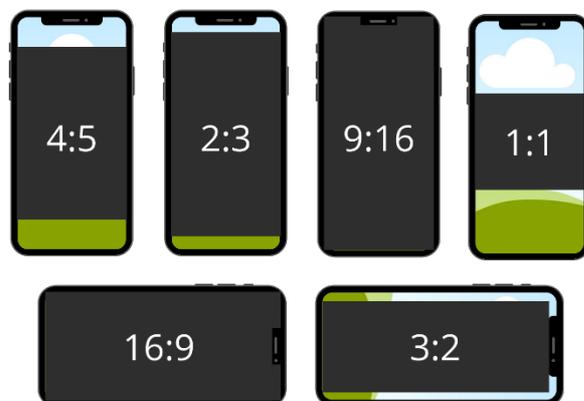
The image resolution for videos is measured in pixels. Pixels are the single dots or points of color that make up a video image. The greater the number of pixels, the sharper the image is. Standards for the internet for 16:9 video are high-definition (HD), with 1280×720 pixels, and full HD, with 1920×1080 pixels. A higher resolution also means a bigger file size. So depending on what the video will be used for, full HD might not be necessary (e.g., posting a video on social media).
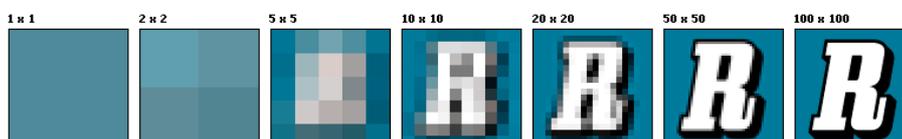
X. Video Editing, Rough Cut, and Final Cut

Video editing combines separate recorded scenes or shots to create one video. In the first step, the rough cut, the individual shots, or scenes are arranged logically, and excessive material is deleted. There should be a mix of shot sizes to give the video an interesting structure. In the second step, the final cut, the transitions between the separate shots or scenes are perfected to ensure one continuous flow of movement. Colors are filtered or altered as needed, and text, music, language, and sounds are added.

XI. Video Roll
1. A-Roll

A great way to think of A-Roll is media that "tells" the story, such as an interview or a news segment. The primary audio and video often consist of one or more people discussing a topic or relating a narrative. A-Roll is the driving media in most documentaries, news broadcasts, talk shows, and reality shows. Another problem with using the A-Roll media alone is that since A-Roll footage is usually of people talking, there are often fumbled lines, coughs, sniffles, and stutters that need to be edited out. That's where B-Roll comes in.

The clip below is a good example of A-Roll media. The anchor's monologue drives the story from beginning to end while he talks about the importance of having a mobile website.

Example of A-roll

With the A-Roll alone, the story is communicated clearly. The problem is that A-Roll tends to become extremely boring, making it harder for the audience to remain engaged. Remember, the audience is watching the video because they expect to have the story shown to them, not just told.

Another problem with using the A-Roll media alone is that since A-Roll footage is usually of people talking, there are often fumbled lines, coughs, sniffles, and stutters that need to be edited out. That's where B-Roll comes in. (repeated)

2. B-Roll

B-Roll is additional footage used to support the A-Roll visually. Think of it as a video that "shows" the story. If the A-Roll narrative talks about residences, the B-Roll might show a house. It just needs to complement and, if possible, confirm the story told by the A-Roll media. Using B-Roll footage helps break up the monotony of a common A-Roll interview shot, making the whole thing much more engaging.

B-Roll is also used as a "cutaway." Cutaways allow an editor to remove parts of the A-Roll undetected. In the same way, an editor may use a quick cutaway to combine two portions of the A-Roll. Since the audio from the A-Roll usually acts an as a voiceover on top of the B-Roll footage, the editor can then cut out or edit parts of the A-Roll audio as needed. Cutaways are perfect for when you want to remove a portion of an interview or when an interviewee sputters, coughs, or says "um" too often.

Example of B-roll

The term "B-Roll" tends to make the supportive footage seem secondary and less important, but it certainly isn't. You only have an interview without the supporting footage showing the action. The B-Roll footage is really what makes a story come alive.

For the news segment A-Roll, we would want to capture B-Roll footage of people using their phones and tablets to access mobile websites, a few customer interactions, and a business transaction. Then we could use those shots to help the anchor show the story more visually engagingly.

Whatever B-Roll footage you choose, make sure each shot supports the narrative driven by the A-Roll media.

Although this is a basic example, you can see how A-Roll and B-Roll are used together to tell and show a story. If you've ever filmed an interview and used supporting-action footage to supplement it, then you've already used A-Roll and B-Roll together properly. When you do, you tell a better story, and telling a better story is what it's all about in the end.

3. A+B Roll

Using editing software, A-Roll and B-Roll media can be mixed and merged to tell a much more engaging story. In this example, we have our B-Roll shown playing over the A-Roll. It starts with the news anchor in the studio delivering his news segment. Then, while the anchor's audio continues to tell the story, the B-Roll footage is cut in to help support what he's talking about.

Example of A+B-roll

XII. Vlog

A vlog, or a video blog, is like a video diary, where a person regularly produces and publishes video material. Unlike a blogger, who regularly publishes new texts and pictures, a vlogger shares material via video, mainly on YouTube. Most vloggers share personal experiences and ideas. Their subjects range from self-expression to travel reports, from observations and thoughts to well-argued opinions, from hobbies such as cooking, sports, and music to social activities or make-up and fashion tips. For vloggers, it is important to develop an audience and keep viewers coming back for subsequent episodes. To do this, they use a variety of techniques. Vloggers may address viewers at eye level and thank them for watching, posting comments and ideas, and subscribing to their YouTube channel. At the end of their video, a vlogger may announce upcoming episodes or refer viewers to existing ones. Anyone can create a vlog with the proper smartphone and an internet connection. But to pursue it seriously, the topics covered must be interesting to a potential audience. In addition, a vlogger must commit to posting new videos regularly, like being on camera, being comfortable sharing personal thoughts and ideas with others, and enjoying building a personal connection with an audience.

1. Important Aspects of a Vlog

A vlog has very clear features that distinguish it from other videos. Normally, just one person, the vlogger, stands or sits in front of the camera and speaks into it, addressing the viewers. The vlogger looks directly into the camera, intensifying their connection with the viewers and giving them the sense that the vlogger is interacting with them. A vlog segment is often recorded using only one-shot size, with the camera stationary on a tripod. The only thing that moves is the vlogger, who employs gestures and facial expressions to emphasize what is being said. A vlog generally lasts from one to around five minutes. A simple vlog does not require editing. Some vloggers use jump cuts to grab a viewer's attention. These are abrupt transitions where the shot size remains unchanged from one frame to another, but the vlogger is in a different place or position in the subsequent shot. This creates the impression of a jump. Some vloggers also complement their videos with

texts, links, or images they add during editing. Space for comments below the video facilitates interaction between the vlogger and viewers, who provide feedback on the vlogger's work.

2. Tips for Vlog Recording

A. Language and Text

It is always important for a vlogger to think about their audience. Please choose an appropriate way to talk to your viewers and speak directly to them. It helps to think of an individual viewer, a friend. Imagine you are talking to that friend, not to a camera.

- ✓ **Introduction**: How do you want to introduce the issue to your viewers? With a personal example? With a question?
- ✓ **Middle Section**: What additional aspects, questions, or examples do you also want to address and when? Do you want to surprise your viewers? How?
- ✓ **Conclusion**: How do you want to end your vlog? With a conclusion? An open-ended question? Regarding a link, another vlog, or a call to action?

B. Voice, Gestures, and Facial Expressions

A vlogger can employ various tools to emphasize the text.

Voice: You can play with your voice and pitch: speak loudly or quietly, and pause occasionally. Just make sure you always speak clearly.

- ✓ **Facial Expressions**: Look directly into the camera and use facial expressions to indicate how you want to get your point across—either seriously or humorously.
- ✓ **Gestures**: Use gestures to emphasize what you are saying.

C. Images and Sound

- ✓ **Image**: Place the camera or smartphone at eye level. Make sure that the shot shows the vlogger from the chest upward and that facial expressions and gestures can be seen clearly.
- ✓ **Sound**: Since background noise can be disturbing, choose a quiet location where no one speaks simultaneously. Do a sound test.

D. Recording

Turn on the recording device before the vlogger begins speaking. Let it run for about five seconds, and then signal the vlogger to start. Hold the device steady. You can place your elbows on a table to help steady your hold. Wait five seconds in the end before you stop recording. Extra material can always be edited out, but you can never record a moment that has already passed.

XIII. Video and Copyright

Copyright applies to all videos uploaded to the internet. This means that a user may only upload content for which the user owns the copyright. If, for instance, someone records a TV show or sports broadcast shown on television and posts it on YouTube without permission, this is a violation of the TV broadcaster's copyright. If you produce your music videos and post them, ensure you respect the musicians' copyrights and the record labels. Producers of video games own the copyrights for game tutorials and Let's Play videos. Given the massive number of videos uploaded to the internet every day, it's not always easy to determine which user has infringed on copyright laws with which video, but it is not impossible. Some YouTube users have already been sued for infringing on copyrights. That's why it is essential to post only self-produced video content online or to work with Creative Commons (CC) licenses.

📖 Summary

- Video is a medium that conveys information via a sequence of images and sounds. The images we see are called the visual part of the video. The sounds that we hear are the auditory part. Thus, video is an audio-visual medium in which images and sound play important roles.

- The terms film and video are often used interchangeably because film, like video, conveys moving images and is an audio-visual medium. The difference between film and video lies in technology. The film does not record the visual image electronically but chemically on light-sensitive material known as celluloid.

- Film genres are stylistic categories where a particular movie can be placed based on the setting, characters, plot, mood, tone, and theme.

- "Fiction" refers to a film created from the imagination. "Non-fiction" refers to films based on fact.

- A video sequence is a section that forms a distinct narrative unit due to technical elements or content.

- The frame rate is the number of single pictures per second shown in sequence in a video. If there are 14 to 16 pictures per second, the human brain perceives the action as one fluid motion. At slower rates, the brain perceives each image individually. The movements become jerky, and the motion seems "stop and go." The standard frame rates for television are 25 frames per second (fps) and 29.97 fps.

- A video shot size is defined by the distance from the camera to the subject. The closer the camera is to a subject, the better you can see the details, which means you can see less of the surroundings. If the camera is far from the subject, viewers have more of an overview of the location or situation. Long, medium and close-ups are the three most widely used shot sizes.

- The aspect ratio is the proportional relationship between an image's width and height. For quite a long time, the standard aspect ratio for television was 4:3. Nowadays, 16:9 is the standard because it corresponds better to a person's natural field of vision.

- A-Roll is media that "tells" the story, such as an interview or a news segment. The primary audio and video often consist of one or more people discussing a topic or relating a narrative. A-Roll is the driving media in most documentaries, news broadcasts, talk shows, and reality shows.

- B-Roll is additional footage used to support the A-Roll visually. Think of it as a video that "shows" the story. If the A-Roll narrative talks about residences, the B-Roll might show a house. It just needs to complement and, if possible, confirm the story told by the A-Roll media.

- A vlog, or a video blog, is like a video diary, where a person regularly produces and publishes video material.

Questions

1. What is the difference between film and video?
2. What are fiction and non-fiction?
3. What are video sequence, video clips, and shot size?
4. What is the difference between frame rate and frames per second?
5. What are A-roll and B-roll?

CHAPTER 8

ICT Ethic

Lesson 34

Professional Communications Via Email

Introduction:

Email is a more popular and official form of e-mail than any other social network. Writing a message is different from saying it orally. It would be best if you learned how to use words to understand them easily. At the end of this lesson, you will be able to:

- ✓ Understanding the ethics of email
- ✓ Know the type of email
- ✓ Prepare the message properly before sending

When you have learned this lesson, you:

I.	Email
II.	Legal value of Email
III.	Email Privacy
IV.	How to speak in email
V.	Multiple Email recipients
VI.	Part of an email
VII.	Effective communication via email
VIII.	Webmail and Mail Client
IX.	Email attachment
X.	Spam and Virus

Lesson 34 Professional Communications Via Email

I. Email

Email (also known as email) is a means of communication using computers connected to the Internet to send messages to each other. In developed economies, email has become the essential form of professional communication.

The email has three main advantages:

✓ When an email is sent to you, your computer will receive the email immediately. Suppose the recipient's computer is not yet open or connected to the Internet. The sent message will be stored on the Internet (server) until the recipient is connected and reads it.

✓ Email can be stored permanently on the user's computer, Internet, or both. It will turn into a list of all the information sent and received by the user. Because it is an easy way to find information in old emails, this list is very useful for storing other information. It is also easy to recover personal and business information.

✓ It can be used with the attached file and allows sending by attaching various files via the Internet to any other user.

The added value of an email is that it is free and can send messages or information without limiting the length or number of characters, even if you send it to different countries.

II. Legal value of the email

It's not the same as a paper-signed letter. Although the email shows the sender's name, sometimes we can not confirm that the email was written by a person whose name shows the sender. It is not difficult to send using someone else's name. Therefore, we can not use email as evidence in the legal system because it is easy to falsify.

So we usually use email only in work and personal relationships daily. Still, you cannot send it via email when there is a need for legal documentation (such as a contract, etc.). Original documents must be printed, signed, and send by post station.

III. Email Privacy
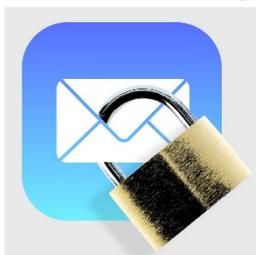
The laws of most countries generally protect the confidentiality of letters sent by post. No one, not even the government itself, has the right to read private letters sent from one city to another, from one company to another, or even to listen to telephone conversations. Police can only do so with the permission of a judge to investigate a crime. The same rules apply to email. No one can read emails sent by

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any citizen or by any private company without the permission of a judge.

Emails are usually password-protected. We can not read someone else's email unless we know their password, and others cannot access our email unless we tell them our password.

IV. How to speak in email

Email is a means of communication using real words. Because we can not use phrasing phrases to connect our emotions to the message or the recipient, all this information will be in the phonetic tone of the email. The problem is that emails can be written as quickly and sparsely as letters, and sometimes the sentences are not clearly defined, leading the recipient to misunderstand that the email is rude—a lack of respect for them.

When writing emails, we must always be careful and respectful, especially when discussing any important issues that could make the reader feel personally.

Email is not much different from the mail. The important thing is that we must understand how we should introduce ourselves to the recipient. We should use the same respect as we used in the letter sent to the same person: the official form is "Respectfully yours ..." and the informal form (for friends) is "Hello ..." Phonics and endings of text should be the same.

V. Multiple Email Recipients

Emails can be sent to one or more people at once. For each recipient, the sender can email them with a direct address to (To) or who will be copying the information (Cc). Once they receive what they received, the recipient may see all of the recipient's email addresses, including the one assigned to "To" or the "Cc" copy.

The sender may also secretly copy an email to a recipient without the other person seeing the recipient's address. Such a copy is called a secret copy (Bcc).

For communication within the company, different sections will also be informed of what happened by copying the email to those involved, even if they are not the main recipients. However, this is done to make the flow of information smooth or transparent in the company to make it more efficient in the work and reduce the problems that occur due to wrong communication.

VI. Part of Email

The email has three parts:

- The address of the person to whom the email will be sent (to, cc and bbc);
- The subject of the email is a brief description of what the email will display To the recipient
- The body, where it will be written, including the salutation, the content, and the signature.

VII. Effective communication via email

Here are some rules and steps you should follow when writing an email.

- ✓ If you are writing to more than one person, you should decide who is the direct recipient and who is the recipient. Enter the correct email address.
- ✓ Write a short but meaningful topic. Once someone gets something, they will preview the email subject based on this topic. They will decide whether to read this email immediately or leave it for later. Meaningful topics help to make them aware of the purpose of the email and how to organize their work.
- ✓ Do not write too long an email. Write too long unless the work is important. It is understood that long emails are difficult to read and most of them are not read at once because it takes too much time for the reader.
- ✓ Emails written fast are also read fast ... and most of their content and phonetics are misunderstood. Before writing a reply to someone's email, especially if you think that the content of the email is rude, you must carefully read the original email before you write a reply, analyzing your purpose. Also, write. Try to see if there is a difference between what you understand now and what you first understood.
- ✓ When replying to someone's message, ensure you have entered enough information to let the recipient know what you are replying to. This is usually done by copying some text from the message we received and then writing a reply immediately below it. The email Manager usually copies the entire message received when we reply to that message. You do not have to copy all the original messages you received. Copy the relevant parts to the response. In this case, you should delete parts that are not relevant to your response to avoid writing emails too long.
- ✓ Please read and review your email, thinking about the tone and mood of your readers as they read what you wrote. Ask yourself if what you have written is negative. Remember that what you read is considered rude. It will make you respond more politely and may damage your relationship.
- ✓ Check for spelling errors. Emails with too many spelling mistakes can make readers think negatively about your professionalism. Then start sending it.

VIII. Web Mail and Mail-Client

There are two ways to read, write and manage your email. The first way is to use a web browser. In this case, all your mail is stored on the Internet, not on the computer you are working with. After using the email address (username) and confirmation password to access the email account you created, you can see the subject of all the emails you have received (emails sent). You) and can read any email you want to read. You can also compose a new message, reply to an email you received, or organize an email to a new folder to update your inbox. You are in the right order. Using email in this way is called Webmail. It is especially interesting for those who do not have a personal computer and want to use their email in a different place where they can access it from any computer as long as that computer is connected to the Internet.

The disadvantage of Webmail is that you can only use it if your computer is connected to the Internet. If you do not have your computer connected to the Internet, you will not be able to view any information.

In general, the free email provided by Yahoo or Google email service providers is called online mail, and their business model is also advertised to you when you are reading your mail. You.

Another way to manage your email or email is by using an email client. The email program is a computer program that allows users to download all their messages to a computer and organize their email without having to connect to the Internet (except when sending and receiving emails).

Using an email client in this way is a common way for those who work in one place with a single-user computer or laptop but do not need an internet connection all the time. In this case, they can go anywhere with an internet connection to receive and send mail. Still, they can read and write mail anywhere without needing the Internet and can send emails back once they have connected their computer to the Internet again.

Using an email client is usually faster than using Webmail (Gmail or Yahoo) because all the information is already on the computer and does not need to be downloaded every time we want to read a message. The downside is that we can not read email in a different location from our computer. We can also combine both email forms. Users can download a copy of all emails to the email program and keep a copy on the Internet, which can be accessed online when needed.

IX. Email attachments

It is not uncommon for sending an email to the Post station to include other documents in the envelope, such as invoices, leaflets, photographs, or CDs. The same can be done with email, but all the files we can send must be electronic.

Inserting a file in an email is called **attaching the file**. It is most commonly used to attach files via email, which can be done easily, quickly, and for free, or at the lowest cost for sending files to other users, including files, typewriters, pictures, and sounds (music).) Etc. The email manager (email or online email program) has buttons that allow you to select the files you want to attach via email while you are writing the email. When this function is used, the selected file will be sent to the recipient with an email.

The file size limit is the size of the attached file. Most email systems determine the file size, and internet speed allows us to send large files. Large music or video files can be difficult to send because they are too large.

X. Spam and viruses

Along with its advantages, the email also has its drawbacks. The first problem is that it is a free, low-cost, and easy-to-use service that sends emails to millions of users. Some companies specialize in doing this. Sometimes they capture the email addresses of as many people as they can find and then use these addresses to send advertisements or try to plot fraudulently or not directly with users.

This type of bulk message is called spam, and it has become a problem on the Internet, with emails sending as much as 30% of all our emails.

Most users receive more spam than regular messages, sometimes up to 20 or more, each of which they receive from someone they know. Spamming is illegal in many countries, but since it is made from various sources on the Internet, it isn't easy to stop.

The second problem with email is that it is used to distribute computer viruses. A computer virus is a small program that installs itself into a user's computer, destroying it and stealing user information. Computer viruses are transmitted from one computer to another through email or various types of media, such as removable media, USB drives, etc.

When sending an email, the virus associated with the email is sent to the user. The virus only affects the recipient's computer if the recipient opens a program or file associated with the email. An infected email is sometimes received from a friend who uses that friend's name to trick the user into opening the virus and affecting the user's computer. To do this, the sender of the virus hijacked the user's email address (by stealing their password first) and then sent an email to all those in the contact list using your name in the address book. They have stolen that. Email users should be careful before opening any attachments that come with the received email unless they are sure it was sent by someone they know for a specific purpose.

The virus only affects computers running Microsoft operating systems such as Windows. Computers running Linux or Mac OS / x will not have to worry about computer viruses.

For Windows computers, you can also buy anti-virus software that protects your computer from the effects of viruses. These programs are called anti-virus programs that can remove viruses from a computer affected by the virus and repair the damaged parts using the program. It is important to have this anti-virus software if your computer is running Windows. Currently, most infections are not caused by email but by USB removable storage devices that can transmit the virus by connecting (plugging) the device with a computer.

📖 Summary

- Email (also known as email) is a means of communication using computers connected to the Internet to send messages to each other.
- When writing emails, we must always be careful and respectful, especially when discussing important issues that could make the reader feel personal.
- Emails can be sent to one or more people at once. For each recipient, the sender can email them with a direct address to (To) or who will be copying the information (Cc). Once they receive what they received, the recipient may see all of the recipient's email addresses, including the one assigned to "To" or the "Cc" copy.
  - o The email has three parts:
  - o The address of the person to whom the email will be sent (to, cc and bbc);
  - o The subject of the email is a brief description of what the email will display to the recipient
  - o The body, where it will be written, including the salutation, the content, and the signature.
- Webmail is stored on the Internet, not on the computer you are working with.
- Email client, all the information is already on the computer and does not need to be downloaded whenever we want to read a message.
- Spam is any unwanted, unsolicited digital communication sent out in bulk.

👤❓ Questions

1. What are the advantages of email?
2. Why speaking in email not the same as using real words?
3. How many parts of the email?
4. What is the difference between Web-mail and Mail-Client?
5. What are Spam and Virus?

Lesson 35

Internet, social media safety and privacy

Introduction:

There is a wealth of content and information on the Internet. We can know something with just one click. But need to learn the dangers of using the Internet. It can be a virus and a threat. At the end of this lesson, you will be able to:

- ✓ Understanding to Characteristics of the internet
- ✓ Understanding of viruses and a threat on the Internet
- ✓ Use the Internet with safety and privacy

When you have learned this lesson, you learn:

   I.   Internet
  II.   Social media
 III.   Safety and Privacy

Lesson 35 Internet, social media safety and privacy

I. Internet

The internet is a network that connects computers around the world. It uses a language common to all computers online called TCP/IP (Transmission Control Protocol/Internet Protocol). This is where the term IP address comes from. The device address that the information you access is sent. This common computer language divides information and data into small chunks (called packets), is sent through data lines, and reassembles for the person accessing them.

1. Characteristics of the internet

The internet is constantly changing and being updated. It gives users seemingly infinite choices when they search for information. Users have instant access to a huge pool of data, which is empowering. No official authority controls the internet, meaning individuals and organizations are responsible for the information they post online. On the one hand, this results in a lack of protection for users, but on the other hand, it means the internet fosters freedom of speech on a global scale. Since there is no editorial control on the internet, there are also a lot of rumors, half-truths, and lies that may look like accurate information at first sight. In addition to these kinds of disinformation, the internet is home to hate speech, pornography, racism, and incitement to violence. Despite a good deal of harmful content, the internet allows individuals, minorities, and special interest groups to voice their opinions. It can connect people with similar interests or experiences around the globe.

The information on the internet is stored on servers and hard drives worldwide. That is why it is almost impossible to delete information from the internet, although it can be difficult to find. The fact that "the internet never forgets" may be worth considering before posting compromising information or pictures.

No one owns the internet itself because it is a "network of networks". Individual companies and organizations own networks connected to millions of other networks to form the internet.

2. The internet's global players

Although no single person or organization controls the entire internet, some key players and companies are very influential online. They include companies like Microsoft, Apple, Facebook, Amazon, and Google from the United States and JD.com and Alibaba

from China. They all have agendas and motives (e.g., to make money, collect data about users, etc.) Other powerful players are involved in the internet's many different aspects. Some offer services like internet providers, hardware, and software developers and producers. Others play key roles in web security, commerce, and communications.

3. Web 2.0

Web 2.0 refers to the second stage in the development of the internet. It became a reality in the first decade of the 21st century. Before that, in the early days of the internet, users mainly used the net to read information online. That's because the internet was slow, data lines were limited, and it wasn't easy to put content on the internet without knowing how to program in a computer language called HTML. This was too complicated or time-consuming for most people. But around the turn of the millennium, technological developments made it possible for anyone to post information in the form of stories, comments, pictures, or videos with just a few clicks of a mouse button. Over the next few years, this made the creation of social media like Facebook, YouTube, Instagram, and Wikipedia possible. Today, we take it for granted that everyone can generate and share content and read it. But this so-called participatory web hasn't been around that long. Web 2.0, which erased the line between content consumers and content creators, has only been around for the last ten or fifteen years.

II. Social media

Social media refers to websites and applications that allow users to create and share content with a network of other users in a virtual community. Users create personalized profiles and can interact with each other and communicate differently. They can share photos and videos, chat online, and create groups that connect people with similar interests. In many countries, social media like Facebook have become people's most important information source. That's why social media have also become important distribution channels for traditional media like newspapers, radio, and TV. Today, many consumers access media content through social media rather than going directly to a media outlet's website or buying a newspaper.

Examples of popular social media sites include Facebook, YouTube, WhatsApp, Twitter, Snapchat, TikTok, and Instagram. They are the market leaders almost everywhere. But some social media are not accessible in some parts of the world. For instance, Facebook, Instagram, and most Google services are banned in China. China has its social media platforms: WeChat can be compared to Facebook or WhatsApp; Weibo is reminiscent of

Twitter, and QQ is another Chinese instant messaging app. In other regions and countries, different social media platforms have become popular. People in Russia and some former Soviet Republics, for instance, like to use VKontakte and Odnoklassniki in addition to Twitter, Facebook, and Instagram.

1. Advantage of Social media

Social media sites are designed to be easy to use and are usually free of charge. Users do not need particular skills to create a profile and start posting content and interacting with other users. Social media makes it easy to keep in touch and find other users with similar interests. Because these sites encourage you to make connections, they can be used to find useful contacts and sources. Social media has great potential to make the internet a more dynamic and democratic place. Ordinary people, who are not professional journalists, have a channel where they can tell their stories and discuss what is on their minds. Social media also helps citizens become more engaged with the media and developments in society because we can all post comments and links about the information we see online.

Social media sites are potentially valuable spaces for political activity. These sites enable direct communication between politicians and voters and allow voters to keep close track of the activities of politicians online. Reactions, debates, and conversations can take place quickly online. Social media can also be useful for informing, connecting, and organizing large groups of people fast. People can organize protests and demonstrations through social media and bring about change. That is why some governments dislike social media's potential to challenge the status quo. But social media also enables governments to monitor citizens closely. It enables those in power to spread messages quickly, which in some cases includes propaganda and lies.

2. Impact of social media on society

Social media sites have been blamed for a loss of privacy. People often share more information about themselves online than they would feel comfortable doing offline. Some people are concerned that human interaction has shifted online, which could negatively affect communication. Since when communicating online, people are usually not physically present with those they are communicating with, social cues can be missed or social norms ignored. That means online discourse can be more negative and aggressive than in person. In addition, users often share rumors and lies without checking them beforehand. This can lead to disinformation spreading rapidly and becoming an avalanche of lies and hatred, which can severely impact society. However, social media also enables instant communication worldwide and have brought many people together who would not otherwise have been able to interact. The fact that anyone can access and create online content has the

potential to create democratic spaces online that foster freedom of speech and freedom of information.

III. Safety and privacy
1. Risks of social media

A big risk connected to social media is the spread of disinformation. Social media users can easily be fooled into thinking that the information they see on the platforms is accurate. But since anyone can publish anything on social media, false information such as lies, rumors, and hoaxes is very common. Worse yet: much of this false information is deliberately created and spread to stir emotions like hatred, fear, or resentment of others, be they minorities, people with other political convictions, religious beliefs, or members of different ethnic groups. Social media works by getting users to share information, but since the platforms are public spaces, others can access this information. This means we must carefully consider the information we post about ourselves. If someone you do not know sees something personal you have posted about yourself, it can feel like an invasion of your privacy. Sometimes employers check the profiles of their employees or job applicants to see what kind of image they are presenting online. Other risks include posting when you go on holiday, which can make your home easy prey for burglars. Since it is easy to post things anonymously on the internet, cyberbullies and hackers can easily post insults or threats, gather information, or create fake profiles. The main risks here involve safety and privacy. Posting or entering information about yourself online can put you at risk of being hacked, which is when others gain access to your data without your permission.

2. What is sexting?

Sexting is intentionally sharing sexually explicit texts, images, or videos between individuals. This is often done by mutual consent. Sending intimate pictures or videos has become fairly common among teenagers or couples in many societies. People take sexually explicit photos or videos of themselves with their smartphones and send

them to their partners. However, this comes with risks. If people send explicit content without having the prior consent of the person they are sending it to, this can be considered sexual harassment. Some people also share their partner's explicit content without that person's consent to show off in front of friends or groups they want to impress. This is a serious violation of trust. There are also many cases where someone shares intimate content after a romance has ended to hurt the former partner ("revenge porn"). When people share such intimate photos, texts, or videos to groups or publicly on social media without consent, the damage can be incalculable. The person in the picture or video whose trust was broken will feel violated and ashamed. Sexting can damage a person's reputation and lead to discrimination or cyberbullying. The victims often develop anxiety or depression.

Sexting can even be a criminal offense, especially if minors are involved and if that sexually explicit material is shared with others. In most countries, it is a crime to possess sexually explicit material that depicts a minor. People can be prosecuted if they forward or share such pictures or videos within a social media group. People who receive such material and do not report or delete it also commit crimes. The role of educators is to sensitize social media users, especially minors, so that they can protect themselves. They should not share sexual material with others, not even their partners. The relationship could end, but the sensitive photos and videos will remain online forever. Once people share anything online, they lose control over it. It is out in the world indefinitely, and they cannot reign it back in. One day, their parents could see it as their boss, siblings, friends, or neighbors. This could be tomorrow or in ten or twenty years. So, if the content is the kind people would not want just anyone to see, they should not let it out of their hands.

3. What is cyberbullying?

Cyberbullying is a form of bullying and harassment through electronic means. Examples include spreading lies about someone on social media, sending hateful text messages, or threatening someone with phone calls. Cyberbullies target individuals. They attack their victim repeatedly to harm. Sometimes bullies act alone, and sometimes groups of people gang up on a victim.

Cyberbullying can go hand in hand with offline bullying, for example, in school or at the workplace. It has a destructive effect. Targeted people feel under attack 24 hours a day, wherever they are. They feel powerless, scared, and ashamed. In many cases, shame prevents them from speaking up or seeking help. While cyberbullying is hard on the victims, it is relatively easy for perpetrators to launch an attack and keep it going. Sometimes they bully just for their amusement or to trigger a reaction. Sometimes, when a group of bullies targets a victim, everyone tries to outdo the other by striking repeated, harder blows. Even if each of these insults is relatively small, the cumulative effect can devastate the targeted person.

To prevent cyberbullying, educators need to sensitize young people about the harm it can do, about ethical behavior on the internet, and about communicating respectfully and responsibly. Unethical behavior online influences how we behave towards each other offline. It can poison our relationships and erode trust. It is essential to understand that everyone plays a role in stopping cyberbullying. Victims should speak up as soon as the bullying starts before things spin out of control.

They should take screenshots to secure evidence or save offensive e-mails. The offenders must reflect and understand that their behavior is harmful and may even be liable

for prosecution. Bystanders and observers should know that they should step in and clarify that cyberbullying is unacceptable.

4. What is hate speech?

While cyberbullying targets individuals, hate speech is often aimed at groups and members of groups minorities, who generally have less power in society. Hate speech attacks people based on attributes like race, religion, ethnic origin, national origin, gender identity, sexual orientation, or disability. It uses different expressions, including insults, defamation, degradation, and threats.

The definition of "hate speech" and its laws vary from country to country. Hate speech occurs both off- and online. Online, it is conveyed through text, images, memes, audio, or videos.

Hate speech is problematic both for individuals and for societies. Being a victim of hate speech is stressful, traumatic, and can be a blow to one's self-esteem. Victims of hate speech sometimes withdraw completely from public forums because they feel marginalized. Hate speech looks for scapegoats, creates social divisions, and wipes out empathy. So, in addition to making the lives of minority groups difficult or even destroying individual lives, hate speech can erode a society from within by creating a climate of fear and hatred. While some haters voice their anger loudly, people who disagree with them often remain silent out of fear of becoming victims themselves. The more people remain silent, the higher the danger that the haters influence public opinion and, ultimately, the political agenda. Hate speech can lead to a polarized society where respectful dialogue is no longer possible.

The first step to countering hate speech is exposing it as such, scrutinizing hateful arguments, and unmasking the intentions of the hater. Educators can train others on how to promote respect on- and offline. They can encourage toned-down, unemotional language, facts, humor, or counter-arguments to tackle hate speech. And they can train others how to create and promote a climate of tolerance and respect.

5. Online disinhibition effect?

The online disinhibition effect suggests that people's online behavior is often different than when dealing with someone face-to-face. Some people do not feel ashamed when behaving immorally or violating common rules of decency, politeness, courtesy, and respect online. This disinhibition can happen quickly on social media because people can often be anonymous or hide behind technology. Humiliating pictures or memes about others can be posted with a few clicks. It is easy to insult someone publicly on their timeline, use emotionally charged, hostile language, or even bully or threaten a person online. There seem to be few consequences. Very often, actions cannot even be linked directly to a perpetrator.

Being invisible, not having eye contact with the target of their hostility, and not being confronted directly with others' reactions can bring out exceedingly unethical behavior.

6. Digital footprint

It is saved as digital data when you type something on your computer or take a picture with your phone. Digital data can be stored, transmitted, and processed repeatedly without losing quality. In addition to the digital data, for example, the photo, your online actions also generate so-called metadata. This is data about your data. In the case of a digital photograph, the metadata could include when and where you took the picture and with what shutter speed and aperture. This information is automatically generated and stored.

When you use a computer or cell phone, you leave data tracks. They can include your phone number, your computer's serial number, the country you live in, the language you use, your browser history, your fingerprint, or the location where you access a Wi-Fi network and the internet. Some smartphone apps and social media platforms also record when you use them and for how long. In addition, some of them store your address, your e-mail address, your contact list, your photos and videos with all their metadata, your list of friends and groups, your likes, shares, and messages. They store it to tailor their services to your preferences, but they may also sell this metadata to advertisers, governments, or interest groups.

Data and metadata say a lot about you. The technology you use makes it possible to trace or identify you. This data may also reveal some things you might rather keep private. Your Facebook likes, for instance, can often reveal private beliefs and personality traits or identify your political viewpoint or sexual orientation. These data traces are easy to tap into. Ultimately, your life becomes more and more transparent to those who store, buy, or even steal your data.

7. What role does my data play in social media's business model?

Social media platforms are businesses. They face the same risks as other businesses and have operating costs to cover. They must pay their employees, like developers, programmers, and web designers. So how can they cover these costs if their services are free? And what role does your data play in all of this?

When you agree to a social media platform's terms of service, you also agree to its privacy policy, which describes how the platform will use your data. Most social media platforms monetize your data. Whoever is interested in your likes, dislikes, opinions, and interests can pay to get your data. There is no way for you to know who buys this data. But many businesses, advertisers, institutions, insurance companies, political parties, governments, secret services, and law enforcement agencies find the data interesting enough to pay good money.

Another way that social media companies make money is through advertising. These platforms have millions of users, so millions of pairs of eyes see their content. This attention is capital that social media platforms can market. They generate income by allowing companies to advertise on their site, and the advertisers hope to profit from getting all those views. Algorithms tailor what advertisements are shown to different users. These algorithms scrutinize users' data and metadata to identify which products or lifestyles appeal to these individuals or which ideologies they follow or show a possible interest in.

8. What is cyber security?

Security means being free from danger or external threats. Cyber security, or digital security, means being safe on the internet: your data, your accounts (social media accounts, online banking), and devices (smartphone, computer, etc.) are protected against criminal activities and other external threats. You can stay more digitally secure by using special software or activating certain website features. For example, you can use anti-virus software, set up firewalls, and install protection against spyware. You can increase the security of your smartphone by adding a secure mechanism to unlock it: a pin, a pattern, or your fingerprint. Social media platforms feature adjustable settings that can improve account and data security. The default settings are often the most convenient, but they are usually also the least secure. For instance, you can log in to Facebook with your name and password. But a safer method is to use two-factor authentication.

9. What is cyber safety?

While security relates to outside threats, safety refers to yourself and how you can prevent harm or accidents. It refers to your capacity to protect yourself and, at the same time, not cause harm to others.

Cyber safety refers to accident prevention being protected on the internet and social media. Safety risks include online bullying, scams, unintentional viewing of explicit or violent content, or online dating pitfalls. To stay safe on social media, you should communicate respectfully and act responsibly when sharing information. Another part of cyber safety is knowing about your digital rights, such as the right to control the commercial use of your name, likeness, image, or other factors that can identify you. These rights are known as personality and publicity rights. Safety also involves respecting your privacy and the privacy of others.

10. Privacy

When something is private to you, it usually means that it is special to you in some way or that you regard it as a sensitive subject that you do not want everyone else to know about. The boundaries and the content of what is considered private vary among cultures and individuals, but there are areas that many people consider private. You may want to keep sensitive issues to yourselves, such as whom you love, aspects of your sexuality, what you fear, or other secrets. You may also not want everybody to know where you lived, when you were born, and how much money you earned. Privacy is a person's ability to conceal parts of himself or herself from others, and that includes information that he or she would rather others not know about. Privacy issues arise on social media, not only when adjusting your

privacy settings but in every interaction you have. The more information you post on social media, the more time you spend on it, the less private you are, and the more data about yourself you give away. Your data will be stored and shared; you can't control what businesses, governments, and secret service agencies use that data for. Even if you think you have nothing to worry about today, remember that sometimes circumstances change. But your data will be stored forever, and you have no control over what is done with it and no way to erase it.

If people took privacy seriously, they would have to stop using social media altogether. But that would kill the fun of participating in the online world. If you want to enjoy social media and benefit from the opportunities the internet offers, you must be active and disclose some information. The privacy paradox describes the trade-off between privacy and self-disclosure. On the one hand, you want privacy and to protect your personal information, but at the same time, you would like to enjoy the benefits of social media. For instance, if you want to connect with old friends, you have to make your profile searchable by providing your real name or a recognizable picture of your face. Are you willing to give up that part of your private information? All social media users have to make these kinds of decisions all the time: what degree of openness are you comfortable with, and what information would you rather keep private? Remember, whatever private information about you is out there forever. The internet never forgets.

11. How can you stay safe online?

Always think carefully about what you share online. Many social networks will allow you to adjust your privacy settings to restrict the number of people who can see what you post. There are also blocking functions that allow you to block certain users. Make sure you use strong passwords with at least eight characters, a mix of upper and lower-case letters, numbers, and symbols, and always keep them secret. If you don't, you risk getting hacked, and someone else can post on your page pretending to be you. If you are targeted online or see another user being targeted, take a screenshot and report the incident to the social network or website.

1. Password

Password is a secret word or expression used by authorized persons to prove their right to access, information, etc., a word or other string of characters, sometimes kept secret or confidential, a user must supply that to gain full or partial access to a computer, computer system, or electronic device.

Hackers and computer intruders use automated software to submit hundreds of guesses per minute to user accounts and attempt to gain access. These tools use lists of dictionary words to guess the password sequentially. Some tools add common symbols, numbers, or signs that may be added to the password to make it more complicated.

Dictionary hacking tools that use an English dictionary list easily find words in that dictionary. If the simple word doesn't give access to an account, the device modifies the submission and tries other iterations of the same word.

For example, a Dictionary hacking tool would attempt these iterations of the word Dog:

Dog	**Dogs**	**Dogcatcher**	**Dogcatchers**
Dogberry	**Dogberries**	**Dogma**	**Dogmatic**
Dogmatized	**Dog1**	**Dog2**	**Dog3Dog**

Password-guessing tools submit hundreds or thousands of words per minute. If a password is anything close to a dictionary word, it's incredibly insecure. When a password does not resemble any regular word patterns, it takes longer for the repetition tool to guess it. Passwords with personal information, such as your birthdate or street address, are easy targets for hackers.

To keep your accounts secure, make a hard guess password and store it in a password manager so you won't forget. A strong password is more resistant to guessing, so it's unlikely to be found in a brute-force dictionary hack.

The best way to create a secure password is to start with a simple password and turn it into a complex one.

The table below shows examples of a simple password progressively made more complex. The first column lists simple words that are easy to remember and are found in the dictionary. The second column is a modification of the first column. The last column shows how the simple password is converted into one that is harder to figure out.

Weak Password	Better Password	Strong Password
kitty	1Kitty	1Ki77y
susan	Susan53	.Susan53
jellyfish	jelly22fish	jelly22fi$h
smellycat	sm3llycat	$m3llycat
allblacks	a11Blacks	a11Black$
usher	!usher	!ush3r
ebay44	ebay.44	&ebay.44
deltagamma	deltagamm@	d3ltagamm@
ilovemypiano	!LoveMyPiano	!Lov3MyPiano
Sterling	SterlingGmal2015	SterlingGmail20.15
BankLogin	BankLogin13	BankLogin!3

Here are other examples of password variations that purposely avoid using complete English word patterns:

Dog.lov3r   **dOG.lov3r**   **i7ovemydog!!**

sn00pdoggyd0G   **Karm@beatsDogm@**   **C@ts-and-Dogs-Living-together**

d0gsaremybestfr13nds

By injecting numbers and special characters instead of letters, these passwords take exponentially longer for a dictionary program to guess.

2. Safety Privacy settings on social media

To keep your safety and privacy on social media, you should know some points about privacy settings on your social account. Here is some question you should answer

Settings

- ✓ **Security settings**: How do I log in and out securely and keep other people from logging into my account?
- ✓ **Privacy settings and tools**: Who can see my stuff? Who can contact me? Who can find me? Timeline and tagging: Who can add things to my timeline? How can I manage tags?
- ✓ **Blocking**: How can I block certain users or their invitations?
- ✓ **Reporting**: How can I report other users to Facebook?

Information

- ✓ **Friends**: How do I divide friends into groups? What rights do they get?
- ✓ **Pages and feeds**: How can I find information via pages and feeds?

Creating

- ✓ **Pictures**: What pictures can I share? What about the other people in the images?
- ✓ **Pages**: How can I create a page, and what can I do with a page?
- ✓ **Events**: How can I create an event, and how do I manage this event?
- ✓ **Groups**: How do I create a group and control who has access to it?

📖 Summary

- The information on the internet is stored on servers and hard drives worldwide. That is why it is almost impossible to delete information from the internet, although it can be difficult to find. The fact that "the internet never forgets" may be worth considering before posting compromising information or pictures.
- Web 2.0 refers to the second stage in the development of the internet. It became a reality in the first decade of the 21st century.
- Social media refers to websites and applications that allow users to create and share content with a network of other users in a virtual community.
- A big risk connected to social media is the spread of disinformation. Social media users can easily be fooled into thinking that the information they see on the platforms is accurate.
- Sexting is intentionally sharing sexually explicit texts, images, or videos between individuals.
- Cyberbullying is a form of bullying and harassment through electronic means. Examples include spreading lies about someone on social media, sending hateful text messages, or threatening someone with phone calls.
- Hate speech is often aimed at groups and members of groups minorities, who generally have less power in society. Hate speech attacks people based on attributes like race, religion, ethnic origin, national origin, gender identity, sexual orientation, or disability. It uses different expressions, including insults, defamation, degradation, and threats.
- Digital footprint refers to one's unique set of traceable digital activities, actions, contributions, and communications on the internet or digital devices.
- Cyber safety refers to accident prevention being protected on the internet and social media.

👤 Questions

1. What is Web 2.0? Until nowadays, how many versions of the web?
2. What is social media, and what is its advantage?
3. How does social media impact society?
4. What is cyberbullying?
5. What is cybersecurity?
6. What is a strong password? Describe how to make strong passwords.

Side margin: t.me/moeysnews · sala.moeys.gov.kh · youtube.com/moeyscambodia

Copyright, licenses, and Digital Piracy

Introduction:

Online resources are all sourced from the original owners. Some resources are free to use, and some are paid. It is illegal to copy and edit without the original owner's permission. At the end of this lesson, you will be able to:

- ✓ Understanding of Copyright, licenses, and Digital Piracy
- ✓ Understanding of the Type of licenses
- ✓ Understanding of digital piracy

When you have learned this lesson, you learn:

I. Software license
II. CC Licence
III. Digital Piracy

Lesson 36 Copyright, licenses, and Digital Piracy

I. Software Licenses

In studying or teaching knowledge of information technology and communication related to computers, one should study what kind of computer programs should be studied to benefit society and not affect the morality of life.

There are two types of computer software for use:

- **Close Source or License**: If you want to use these programs, you have to spend money to buy a license from the manufacturer to install and use on your computer. No distribution without the permission of the owner or original owner. E.g., Microsoft (Microsoft) computer programs such as MS Windows and MS Office, ... When you install, you need to have a code (Serial keys) to install this program.

- **Open-Source Software**: A program of volunteer communities worldwide designed to be distributed to all users for free, legal, and free use.

Example: Linux operating system, Office software, OpenOffice. Etc. Today, in Cambodia, we have also developed many Khmer language programs using Khmer Unicode, translating many open-source programs such as Khmer operating system (OpenSUSE, Ubuntu Linux), Office (OpenOffice), Internet Explorer (Firefox), Email Thunder (Thunderbird) and many other Khmer language software in Linux and Windows operating systems. You can download those programs through the website www.khmeros.info or the Ministry of Education, Youth and Sports website **www.moeys.gov.kh**.

II. CC Licenses

Creative Commons licenses give everyone, from individual creators to large institutions, a standardized way to grant the public permission to use their creative work under copyright law. From the reuser's perspective, the presence of a Creative Commons license on a copyrighted work answers the question, "What can I do with this work?"

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1. The Creative Commons License Options

There are six different license types, listed from most to least permissive here:

- **CC BY:** This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use.

  CC BY includes the following elements:

  BY – Credit must be given to the creator

- **CC BY-SA**: This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use. If you remix, adapt or build upon the material, you must license the modified material under identical terms.

  CC BY-SA includes the following elements:

  BY – Credit must be given to the creator

  SA – Adaptations must be shared under the same terms

- **CC BY-NC**: This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format for non-commercial purposes only, only so long as attribution is given to the creator. It includes the following elements:

  BY – Credit must be given to the creator

  NC – Only non-commercial uses of the work are permitted

- **CC BY-NC-SA**: This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format for non-commercial purposes only, and only so long as attribution is given to the creator. If you remix, adapt or build upon the material, you must license the modified material under identical terms.

CC BY-NC-SA includes the following elements:

BY ⓘ – Credit must be given to the creator

NC 🛇 – Only non-commercial uses of the work are permitted

SA ↻ – Adaptations must be shared under the same terms

- **CC BY-ND**: This license allows reusers to copy and distribute the material in any medium or format in unadapted form only so long as attribution is given to the creator. The license allows for commercial use.

CC BY-ND includes the following elements:

BY ⓘ – Credit must be given to the creator

ND ⊜ – No derivatives or adaptations of the work are permitted

- **CC BY-NC-ND**: This license allows reusers to copy and distribute the material in any medium or format in unadapted form only, for non-commercial purposes, and only so long as attribution is given to the creator.

CC BY-NC-ND includes the following elements:

BY ⓘ – Credit must be given to the creator

NC 🛇 – Only non-commercial uses of the work are permitted

ND ⊜ – No derivatives or adaptations of the work are permitted

2. The Creative Commons Public Domain Dedication

CC0 (aka CC Zero) is a public dedication tool that allows creators to give up their copyright and put their works into the worldwide public domain. CC0 allows reusers to distribute, remix, adapt, and build upon the material in any medium or format with no conditions.

III. Digital Piracy

Digital content can be expensive, especially in high-end software packages. Sometimes this content costs several thousand dollars. But not everyone can afford these prices. If you have spent time on the internet, you have heard of digital piracy. Digital piracy is a form of copyright infringement. However, piracy is not limited to just software. Piracy

can include movies, music, books, and games as well. There are many consequences of digital piracy.

Digital piracy is downloading and/or distributing copyrighted material and intellectual property without paying for it. And it is most certainly an illegal act. Digital piracy is a violation of federal copyright laws. It can result in steep fines and imprisonment. Think of digital piracy as a form of digital theft. Digital piracy costs companies billions of dollars each year. However, it is not just about financial loss.

1. Why Does Piracy Exist?

Not everyone who uses the internet is a computer pirate. Most people abide by the laws and pay for the content and software they use. However, some users believe software, movies, music, and games should be freely available. Others do so out of financial hardship. But it is not always just about the money.

- The most common reason for digital piracy is the unwillingness to pay. People want things for free. Torrent websites and P2P sharing make it easier than ever to download. You can obtain everything from software to movies and books. And in many cases, it can take only a few minutes to download them.
- In many cases, people download illegally due to financial hardship. They cannot afford to buy it. Many people do not have the finances available to purchase legally.
- Another common reason is the belief that companies have enough money already. They may believe they have the right to freely distribute to the less fortunate and allow everyone to enjoy or use it.
- Some people do it for financial gain. Hackers download pirated content to resell it, making a profit.
- Hackers and social engineers use pirated content to spread malware and infect a user's system.
- One-time use is another excuse for pirating copyrighted content. Users may want to see if a movie is good before watching it at the theatre. Similarly, one may want to download software to run a singular task. After using it one time, they delete it or uninstall the software.
- Some people do not see digital piracy as theft. They do not view digital content the same as they do something physical.

2. The Consequences of Digital Piracy

The consequences of digital piracy can be high. Imagine, for a moment, that you are an aspiring songwriter and musician. You invest an entire year writing your first album. Your new album is finally produced and hits the market. You begin making a modest amount of money. However, you discover that your album has been copied and distributed for free over the internet. Now you begin losing money. Due to this financial loss, you cannot afford to write a second album.

Additionally, you discover someone selling your album for a reduced price. As a result, not only are you losing money, but someone else is profiting from your work. Without copyright laws, you would have no legal recourse.

Aside from legal trouble, digital piracy can also have implications for cybersecurity. As stated above, hackers can use pirated content to spread malware, trojans, and viruses. Companies that use pirated software open themselves up to copyright violation and

infringement. They also expose their networks to potential malware or virus infection. Hackers then use these infected systems to launch an attack or to mine cryptocurrency.

Torrent downloading comes with its own risk. Because those who download are also distributed, IP addresses are public and can be easily tracked. Because pirated software cannot be updated, this opens the system to attack through vulnerabilities. Security patches are not installed because the update server cannot validate the software. Pirated operating systems can have critical services disabled. Firewalls and updates can be disabled, resulting in open vulnerabilities and less security.

3. Protecting Yourself

It can be tempting to pirate digital content. But the risks often outweigh the benefits. You can get into serious legal trouble if caught, resulting in jail time and serious fines. But legal trouble is not the only threat from digital piracy. Malware and vulnerabilities can put systems at serious risk of attack. While it may seem harmless, piracy costs billions yearly in damages and loss. As a result, that cost impacts consumers through increased prices.

The only way to protect yourself from piracy is not to download illegally. Only use trusted software from trusted sites. Do not accept copies from friends or unfamiliar sources. If you cannot afford it, look into trial versions or free software. Open-source software is a great free alternative to piracy. Use streaming services to listen to music and watch movies. Subscriptions are becoming more affordable as time passes. These steps can spare you much trouble in the end. The consequences of digital piracy are very real. Only you can protect yourself from the dangers.

📖 Summary

- **Close Source or License**: If you want to use these programs, you have to spend money to buy a license from the manufacturer to install and use on your computer. No distribution without the permission of the owner or original owner. E.g., Microsoft (Microsoft) computer programs such as MS Windows and MS Office,... When you install, you need to have a code (Serial keys) to install this program.

- **Open-Source Software**: A program of volunteer communities worldwide designed to be distributed to all users for free, legal, and free use.

- Creative Commons licenses give everyone, from individual creators to large institutions, a standardized way to grant the public permission to use their creative work under copyright law. From the reuser's perspective, the presence of a Creative Commons license on a copyrighted work answers the question, "What can I do with this work?"

- Digital piracy is downloading and/or distributing copyrighted material and intellectual property without paying for it. And it is most certainly an illegal act. Digital piracy is a violation of federal copyright laws. It can result in steep fines and imprisonment. Think of digital piracy as a form of digital theft. Digital piracy costs companies billions of dollars each year. However, it is not just about financial loss.

🙋 Questions

1. How many types of software licenses? Describe it.
2. What is a CC license?
3. What is a logo mean?
4. What is a logo mean?
5. What is Digital piracy? Describe how to protect yourself.
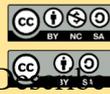
Computer Fundamental And Maintaining

Lesson 37

Introduction to Computer

Introduction:

This lesson introduces you to computers and their role in daily life, and defines what it means to be computer literate. The lesson also focuses on the tyes of a computer. At the end of this lesson you will be able to:

- ✓ Understading to computer and type of computer
- ✓ Classify type of computer
- ✓ Understanding main 4 Computer Architecture layer

In this lesson you will learn:

  I.   Computer
  II.   4 Computer Architecture layer
 III.   Information processing cycle (IPOS)

Lesson 37 Introduction to Computer

I. Computer

1. What is Computer?

Computers are everywhere. During a typical day, you might use your phone to message a friend about meeting for lunch and listening to music as you walk to class. Although you might not realize it, you also use a computer to withdraw cash from an automated teller machine (ATM), change the temperature setting on a home thermostat, and turn on cruise control while driving a car.

Depending on your job, you probably use computers to take a diner's order at a restaurant, process a sale, or control a robot on a factory floor.

A **Computer** is an electronic device that receives data (input), processes data, stores data and produces a result (output). Data is a collection of raw, unprocessed facts, including text, numbers, sound, images, and video. To perform tasks, a computer receives data through an input device such as a keyboard, processes the data, produces information on an output device such as a monitor, and stores the information on a storage device. When data is processed into a meaningful form, it becomes information.

2. Type of Computer

Although thousands of models of computers are available today, they can all be organized into three categories: **Personal computers**, **Embedded computers,** and **Server computers.**

A. Personal computers

A personal computer is a computing device that can perform activities independently and is designed to be used by one person at a time. Two types of PC are **Desktops**, **Laptops**, **tablets,** and **smartphones.**

B. Desktop computer

A **desktop computer** is a computer that fits on or next to a desk, is designed to be stationary, and runs on power from a wall outlet. With a traditional desktop computer, the system unit, monitor, keyboard, and pointing devices are separate pieces of hardware. The system unit containing the processing components is called a tower, which usually stands vertically on the floor. Some cases are designed to sit horizontally on a desktop, under the monitor. The traditional desktop computer has been popular in offices, schools, and homes because it is economical and durable.

C. Laptop computer

A **laptop computer** (sometimes called a notebook) is a lightweight mobile computer about the size of a paper notebook that includes the system components, keyboard, pointing device, and display screen in a single unit. Laptops use a battery as a power source, but you can also plug them into a wall output to recharge the battery and power the computer. Many personal computer users prefer laptops to desktop computers because laptops are easy to carry and move, use less energy, and can fit almost anywhere, including on a user's lap. In addition, you can use laptops without cables for power or peripheral devices, which reduces clutter. Laptops are especially popular with students and mobile workers, such as salespeople who can take their computers to classes, the library, meetings, and other out-of-office activities.

D. Tablet Computers

A Tablet Computer is a one-piece handheld computer that typically includes a touchscreen. Like laptops, tablets run on battery power and can be plugged into a wall outlet. True tablets use a slate design; they are rigid and do not fold. Convertible tablets use a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet.

E. Smartphones

Recall that a smartphone is a cell phone that includes many features of a computer, allowing it to run general-purpose computing applications. Smartphones connect wirelessly to the Internet; include built-in cameras, music players, and global positioning systems (GPSs); and let you send and receive phone calls, e-mail messages, and text messages.

Many smartphones have touchscreens, though some include a small keyboard below the display screen or one that slides out from behind the display screen.

The main advantage smartphones offer over other mobile computing devices is communication. As a type of cell phone, the smartphone was originally designed for making and receiving voice calls—tools and features on a smartphone support phone calls. For example, smartphones include a small microphone and speaker for voice calls and a camera for video calls.

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F. Embedded computer

An embedded computer is a processor built into a household appliance or devices such as an ATM, navigation system, refrigerator, television, or other consumer electronics. The appeal and strength of an embedded computer are that it adds computing power to a device without needing intervention from a user. For example, a washing machine with an embedded computer can use power and water more efficiently than one without an embedded computer. Cars use many embedded computers. Features such as sensing when your car moves out of its lane or when a person or object is blocking your path as you back up are controlled by embedded computers.

3. Understanding Servers and Other Large Computers

You indirectly encounter other types of large computers in your daily life, including mainframes and supercomputers. For example, people who work for banks use mainframe computers to process financial transactions, including those for credit card purchases you make at stores and online. To bring you up-to-date weather forecasts, meteorologists access information provided by supercomputers.

Servers, mainframes, and supercomputers are large computers because they are designed for more than one person, up to tens of thousands of people in many cases. Large computers need much more processing power, memory, and storage capacity to support that matter than personal computers.

A. Servers Computer

A Servers Computer a server is a computer that provides network services such as e-mail to client computers. Some servers look similar to the tower used with desktop computers, while others look like racks containing cases of storage media.

Servers are dedicated to handling data with minimal user interaction. They do not include optical storage drives, speakers, high-end graphics displays, or other peripherals that

make computers entertaining. Most include system components with no monitor, keyboard, or other peripherals for users to provide input.

A server is usually dedicated to a single type of task. A **Web server** handles the exchange of information across the Internet. For example, an Internet service provider (ISP) is a company that uses Web servers to provide Internet access to subscribers for activities such as viewing Web pages, sending and receiving e-mail, and transferring files. Large corporations use enterprise servers to provide employees access to special software used to run the company's business. Smaller businesses use file servers to share files and programs among employees.
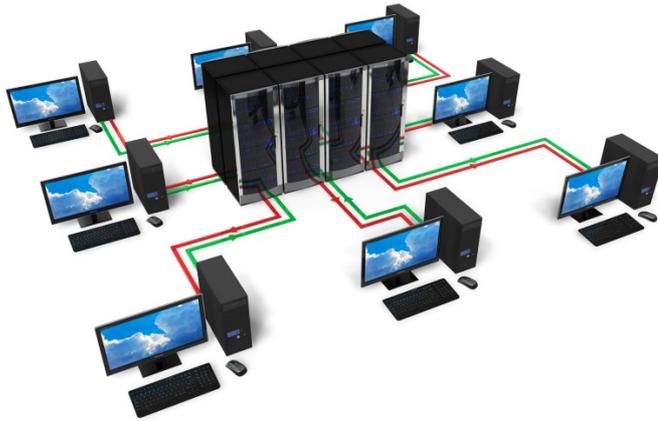
B. Mainframes Computer

A **Mainframes computer** is a powerful computer designed to simultaneously process huge amounts of data for hundreds or thousands of users. Mainframe computers are larger and more expensive than servers and are typically located in climate-controlled, secure data centers to keep the processing components cool and the data safe.

Typical tasks for a mainframe computer include processing payroll and billing operations for a large corporation, handling millions of credit card transactions for a bank, gathering and tabulating census information for the U.S. government, and scheduling flights for an airline.

Although both servers and mainframes can process data for thousands of users, these types of computers differ in design and usage. Mainframes are designed to handle large volumes of data on their own, while servers transfer data around a network, responding to requests from client computers to retrieve, send, and store data. In fact, mainframes can store hundreds to thousands of times as much data as a server and access it much more quickly. Large organizations rely on mainframes to process and store records of data that are too large for other

computers. In contrast, organizations use servers to share data and provide services to other computers, especially for communication.

C. Super Computers

A supercomputer is also a very powerful computer distinguished by its processing capacity, especially its calculation speed. To be classified as a supercomputer, a computer must be one of the fastest computers in the world.

Rather than using the quad-core processors that personal computers use, supercomputers have processors with a million or more cores. The extraordinary power of supercomputers is used primarily for scientific applications that need to perform complex calculations very rapidly, such as launching astronauts or robots into space.

II. Four Computer Architecture layer

A computer can be cut into four main layers, **hardware, operating system, software,** and **users**.

The **hardware layer** is made up of the physical components of a computer. These are objects you can physically hold in your hand. Laptops, phones, monitors, keyboards, you get

the idea. In the next lesson, you'll learn all the computer components and how they work. You'll even be able to build your computer by the end of this module.

The **Operating system layer** allows hardware to communicate with the system. Many different manufacturers create hardware. The operating system allows them to be used with our system, regardless of where they came from.

The **software layer** is how we, as humans interact with our computers. When you use a computer, you're given a vast amount of software you interact with, whether a mobile app, a web browser, a word processor, or the operating system itself.

The last layer may not seem like part of the system, but it's an essential layer of the computer architecture, the **user layer**. The user interacts with the computer, and she can do more than that. Users can operate, maintain, and even program the computer.

III. Information processing cycle (IPOS)

To perform tasks, a computer receives data through an input device such as a keyboard, processes the data, produces information on an output device such as a monitor, and stores the information on a storage device. The input and output devices connected to the computer, such as keyboards and monitors, are also *peripherals*. When data is processed into a meaningful form, it becomes *information*.
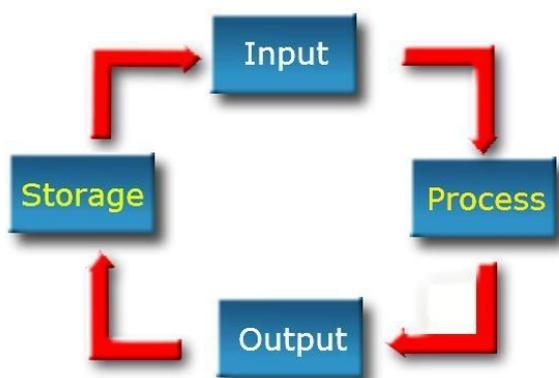
If you work as a clerk in a store, you might use a computer to complete a sale for a customer as follows:

- *Input data*: As you scan an item with a barcode reader, the computer records the name and code of the item.
- *Process data*: The computer uses software instructions to process the data, the item name, and the code by looking up the price.
- *Output information*: The computer displays the information, the name, and the item's price on a screen and then prints it on a receipt.

- ***Store data and information***: The computer temporarily stores the item name and code as it looks up the price and then permanently stores information about the sale on a ***hard disk***, which is hardware for storing data.

This series of steps in input, processing, output, and storage (IPOS) is often called the ***information processing cycle***. You, the computer user, perform the input step first, and then the computer takes over to process the data. The computer often stores the data temporarily, displays the output, and then stores the information during the same stage in the cycle.

📖 Summary

- A **Computer** is an electronic device that receives data (input), processes data, stores data, and produces a result (output).
- They can all be organized into three categories: **Personal computers**, **Embedded computers,** and **Server computers.**
- A computer can be cut into four main layers, **hardware, operating system, software,** and **users**.
- Series of steps of input, processing, output, and storage (IPOS) is often referred to as the ***information processing cycle***.

Questions

1. What is a computer? How many types? Describe it.
2. What are the four computer architecture layers? Describe it.
3. What is the Full meaning of IPOS? Describe it.

Lesson 38

Computer Hardware

Introduction:

To be able to troubleshoot and set up a computer, you must first know the essential components of a computer. At the end of this lesson you will able to:

- ✓ Understanding to Computer component
- ✓ Understanding to fucntion of each component
- ✓ Assembly a desktop computer

In this lesson you will learn:

Lesson 38 Computer Hardware

I. Types of hardware

Computer hardware refers to the physical parts of a computer and related devices. The internal hardware parts of a computer are often referred to as components, and the external hardware devices are usually called peripherals.

In this unit, you will learn more about the types of hardware found in a computer. These are:

- Input
- Output
- Storage
- Processing

II. Input device

1. Keyboard

The keyboard is the most common input device for entering text and numbers into a computer. Keyboards can be built into the computer, as they are in mobile computers, attached using a cable plugged into a USB port or connected using a wireless connection. Figure 5.7 shows a typical keyboard for a desktop computer, which includes special-purpose keys in addition to those for typing text and numbers.

Like most keyboards, the one shown in Figure 2.6 arranges keys into groups. In the center are the standard alphabetic and numeric keys. Along the top are media keys, which you use to control media settings such as speaker volume. Below the media keys are function keys, which the software uses for special purposes. For example, most applications display Help information when you press the F1 key. To the right is the numeric keypad, which arranges keys so you can enter numbers quickly. In addition, the keyboard has modifier keys, such as the Alt key, which you hold as you press other keys to perform a task; navigation keys, which move the insertion point on the screen; and toggle keys, which can be on or off. For example, the Caps Lock key

is a toggle key. You press to type in all uppercase letters and then press it again to return to lowercase typing.

Mobile computers have more limited keyboards that only provide essential keys for input tasks. This is because the keyboards on mobile computers are built into the system unit and therefore need to be compact. For example, the keyboard shown in Figure 2.7 does not include media keys or a numeric keypad. Mobile computer users who want these extra keys can attach a desktop keyboard through a wireless or wired USB connection.

While laptop keyboards are built into the computer, other mobile devices use clip-on or onscreen, also called virtual keyboards. If the device has a touchscreen, you can touch the screen directly to use the onscreen keyboard.

2. Pointing Devices (Mouse)

A pointing device, sometimes called a pointing tool, is a hardware input device that allows the user to move the mouse cursor in a computer program or GUI operating system. Using a pointing device, you can point at or manipulate any object or text on the screen. For example, you could point at and select an icon from a list of icons using a pointing device.

A computer mouse is a handheld hardware input device that controls a cursor in a GUI (graphical user interface) for pointing, moving, and selecting the text, icons, files, and folders on your computer. In addition to these functions, a mouse can also be used to drag-and-drop objects and give you access to the right-click menu.

For desktop computers, the mouse is placed on a flat surface (e.g., mouse pad or desk) in front of your computer. The picture is an example of a Logitech desktop computer mouse with two primary buttons and a wheel.

Below is a list of all the computer mouse functions and options to give you an idea of all the mouse capabilities.

- **Move the mouse cursor** - The primary function is to move the mouse pointer on the screen.

- Point - Once the mouse is moved, you can point something out for another user or point to a digital object. For example, in a game, you can use the mouse to point a gun in the direction to shoot.

- **Open or execute a program** - Once you've moved the pointer to an icon, folder, or another object clicking or double-clicking that object opens the document or executes the program. Some programs even support triple-clicking. See our click page for further information on mouse clicking.

- **Select** - A mouse also lets you select text or a file or highlight and select multiple files at once.

- How to select or highlight multiple files and folders.

- **Drag-and-drop** - Once something is selected, it can be moved using the drag-and-drop method.

- **Hover** - Moving the mouse cursor over objects with hover information helps discover each object's function. For example, hover the mouse over the "hover" link to see an example.

- **Scroll** - When working with a long document or viewing a long web page, you may need to scroll up or down. To scroll, rotate the mouse wheel or click and drag the scroll bar. The mouse wheel can also be used as a button. See the IntelliMouse page for further information and functions of the mouse wheel.

- **Perform other functions** - Many desktop mice also have buttons that can be programmed to perform any function. For example, many mice have two side buttons on the thumb portion of the mouse. The button closest to the palm can be programmed to return to a browser's previously viewed web page.

3. Touchscreens

Many mobile computers, especially tablets and smartphones, use touchscreens, which have a touch-sensitive surface that overlays the screen display and responds to the electrical impulses in your fingertips. In addition, computers provided at kiosks in public places, such as an airport,

have touchscreens to make it easy for users to enter data and select options. See Figure 2.13. Touchscreens are popular because they let you interact with a computer without using an external input device.

4. Touchpads

A touchpad (also called a trackpad) is a touch-sensitive surface that can convert the motion and position of your fingers to a relative position on the screen. Touchpads are usually rectangular and include left and right buttons that serve the same function as mouse buttons. Most laptop computers include a touchpad, so you can use the computer without attaching a mouse. Portable media players such as iPods include circular touchpads for selecting songs and other media. Touchpads are also available as separate devices for desktop computer users. Some touchpads accept the same motions you make on a touchscreen, such as sliding a finger to drag an onscreen object. Figure ## shows a variety of touchpads.

5. Digital Pens devices

Many mobile and desktop computers accept input from a stylus, a pen-like writing instrument that works with touchscreens. See Figure ##. You use a stylus for precise touch input by writing, drawing, or tapping on a screen. You often use a stylus to provide an electronic signature on a touch-sensitive pad in a retail location.

Other digital pens are devices you use to write or draw on any surface, though some require special paper. The digital pen captures your notes or sketches so you can transfer them to a computer.

6. Game controllers

The joystick and wheel are pointing devices you use when playing games or as adaptive equipment when you need an alternative to a mouse, requiring expert fine motor skills. A joystick consists of a plastic or metal rod mounted on a base. You can move the rod in any direction. Some joysticks have switches or buttons that you can manipulate to enter data or select options. A wheel is similar to a steering wheel; you use it to simulate driving a vehicle. See Figure ## Most wheels also include foot pedals for braking and acceleration.

Other input devices used with games include musical instruments such as guitars and motion-sensitive controllers such as dance pads and balance boards.

7. Audio input device

Audio input is sound entered into a computer and includes speech, sound effects, and music. Examples of audio input devices are microphones, portable music players, radios, and other hardware, such as electronic piano keyboards. Voice or speech input is a category of audio input. With the appropriate software, you can use voice-recognition devices such as built-in or external microphones to speak commands into the computer and enter text. External microphones are typically part of a headset, which includes one or two headphones for audio output and a microphone for audio input. See Figure ##. Mobile phones and hands-free navigation systems in motor vehicles use voice-recognition systems, as do devices that accept voice commands to control wheelchairs and other objects that increase mobility.

8. Video Input device

When you capture still or moving images with a digital camera, they are stored digitally in the camera as the video input to the device. The images can also be used as the video input to a computer. After transferring the images to the computer, you can view and edit them with photo-editing or video-editing software. Most tablets and smartphones include digital cameras, so you can skip the transferring step and take photos directly with your mobile device.

A PC video camera or Webcam is a type of digital video (DV) camera you can use to send live images over the Internet, participate in video telephone calls, and send e-mail messages with video attachments. Most computers include built-in Webcams, though they are also available separately.

Besides capturing images, you can use the cameras built into mobile devices to conduct video phone calls that allow you and your contact to see each other while you speak. See Figure ##.
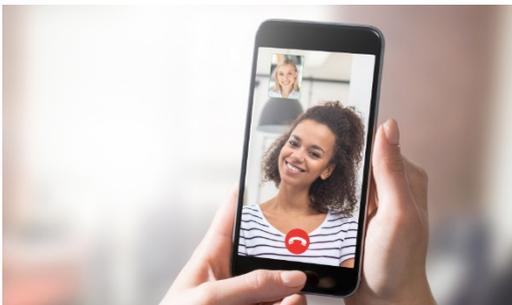
9. Scanner

Scanners are devices that can change images into codes that the computer accepts as input. The quality of a scanner is measured by pixels per inch (ppi)—the higher the ppi number, the better the input image. Scanners are available in various sizes and types, including the following.

- Flat-bed scanner These devices convert printed documents and images into electronic objects you can store in a computer's memory. You can then manipulate the documents and images. Flat-bed scanners resemble copy machines, with a glass surface where you place the material you want to scan. The text you scan is stored as a single object, which means you cannot edit it.

- Bar code scanners—A bar code is a matrix or series of lines with varying widths and heights representing letters and numbers. Figure 2.18 shows the type of scanner that reads bar codes printed on products, such as at a grocery store. Many mobile phones can also scan and read bar codes, especially Quick Response (QR) codes, configured as squares rather than lines. You might scan a QR code in a print ad with your mobile phone to display a product's Web site.

10. Biometric devices

Consider the following scenario: You are going on a two-week vacation overseas— you are packed and ready to go, but you don't need a wallet or credit card. You use your fingerprint as an input device to pay for your expenses. Such technology is called biometrics.

Biometrics is a security technique using automated methods of recognizing a person based on a physical characteristic. Biometric devices consist of scanning hardware and software that converts the scanned physical information into a digital format. Additional software compares

the scanned information to a collection of stored biometric data. For example, if your fingerprint matches a stored image, you can use a computer or complete a transaction.

Figure 2.19 shows a keyboard with a built-in fingerprint scanner, which you can use to identify yourself by swiping a fingertip over the scanner instead of entering a password, for example.

In addition to identifying people based on fingerprints, biometric technology can identify people based on face, handwriting, or voice recognition. Other less common techniques use the retina (analysis of the capillary vessels located at the back of the eye), iris (analysis of the colored ring surrounding the eye's pupil), hand geometry (analysis of the shape of the hand and length of the fingers), or vein (analysis of the pattern of veins on the back of the hand and the wrist). See Figure ##.

III. Output Device

An output device is any device that takes data stored on a computer and makes it available to the user in an easy-to-understand way. This data may be made available using pictures (such as on a monitor or printed to a page) or sounds (such as with speakers and earphones). The output devices can be divided into the following:

- display devices – monitors (LCD, LED)
- printers (Inkjet, Ink tank, Laser, 3-D)
- data projectors (HDMI, VGA)
- Audio Output device.

1. Display device

A. Monitors

All computer software is built around a visual representation of data, therefore the monitor is one of the most important output devices for any computer. To check the quality of a monitor, we need to look at some important characteristics.

These are:

- **Number of pixels:** Each pixel can be seen as a tiny dot of color on the monitor. Pixels are put together to create the picture we see on the monitor. The more pixels there are, the more detailed a picture can be. A good monitor is a full HD monitor with 1 920 pixels across the monitor's width by 1 080 pixels across the monitor's height. Some modern monitors can have up to 3 840 × 2 160 pixels (called 4K).

- **Screen size:** The size of a monitor is measured diagonally (that is, from the top left corner to the bottom right corner), and the size is given in inches.

- **Refresh rate:** The refresh rate of a monitor determines how quickly the image on the monitor can be updated with the newest information. Most monitors have a refresh rate of 60 Hz.

- **Contrast ratio:** A measure of the number of shades the monitor can show between its blackest black and brightest white. The higher the number of shades, the clearer and sharper the images will be, and the brighter and truer to life the colors will be.

- **Aspect ratio:** This is the screen's basic shape based on the width ratio to the height measured in inches. For example, if a screen is 16 inches (40,6 cm) wide and 10 inches (25,4 cm) tall, the aspect ratio is 16:10.

- **Brightness:** Brightness is the perception of how intense or bright the light coming from a screen is. The brighter the light, the more power will be drawn from the computer.

B. Projectors

Projectors use a bright light to project the content displayed on a computer monitor onto any flat surface. One example of where projectors are used is at the cinema. They use large,

high-quality projectors to display the movie on the screen in front of you. However, projectors can also be connected to computers at home or in office settings to display your computer's screen on a wall or screen.

There are two types of cables connecting video output devices:

- VGA – an analog video-only connection.

- HDMI – a digital video audio connection.

Projectors provide the following advantages:

- they are easy to carry around
- they display the content from your computer at a large size.

However, projectors also have disadvantages:

- replacing the lamps is expensive

- low-quality projectors can show washed-out or faded images

- low-brightness projectors need to be placed close to the screen, decreasing the size of the image

- low-brightness projectors may require a dark room.

The quality of a projector can be measured using three main factors:

- **Lumens**, which measure the brightness of the projector.

- **Resolution**, which determines how many pixels can be displayed.

- **Contrast ratio**, which measures the difference between the darkest and lightest parts of the image (that is, the contrast).

2. Audio Output Devices

Speakers are another type of output device. Speakers, headphones, and earbuds generate sounds, such as music or speech. Most computers have an internal speaker that produces low-quality sound, which is adequate for the beeps, chimes, and other sounds software uses to alert you to software events, such as the appearance of a warning dialog box. You can attach speakers to a computer to produce high-quality sound, especially if you are playing games or watching movies.

You use headphones or earbuds to hear music, voice, and other audio output privately. Headphones cover the ear, while earbuds rest inside the ear canal. When you plug a pair of headphones or earbuds into the computer, the internal or attached speakers are muted automatically.

3. Printer

A printer allows a computer to use data and output it to paper. There are three main types of printers. These are:

- **Dot-matrix printers:** These printers use a series of small pins to strike a ribbon coated with ink, causing the ink to transfer to the paper at the point of impact. Dot-matrix printers are mostly outdated as personal printers are still used in banks and manufacturing businesses where it is necessary to use **carbon paper** to produce multiple copies of a document.

- **Ink-jet printers:** An inkjet printer operates by painting an image using a spray. This is done by hundreds of tiny nozzles that spray drops of ink directly onto the paper while moving across it. There are two types of ink-jet printers: continuous printers, usually used for commercial purposes, and on-demand printers. It is a good, all-around printer that is most commonly used for smaller jobs. They are, however, slightly less reliable.

- **Laser printers:** A laser printer is a popular printer for personal use. These printers use **electrostatic technology**. To start the process, the drum is given a positive electrical charge. While it rotates, the printer shines a narrow laser beam over its surface, drawing or projecting the letters and images to be printed as a pattern of electrical charges onto the surface of the drum. When the pattern is set, the drum is rolled in **toner**, which sticks to certain parts of the drum, that is, the image. When rolled over a piece of paper, this image is 'burned' into the paper with heat and pressure. When the printing is done, the electrical charge is removed from the drum, and the excess toner is collected. Laser printers are used for mass production printing because they are generally faster and more reliable but with worse quality prints.

- **Ink-tank printer:** These printers have print heads built into the printer and use an integrated bulk ink system. This means that ink is supplied continuously to the print head from an ink tank within the printer itself, and no expensive cartridges are needed. When the ink is finished, it can be refilled from an ink bottle. Because of this, printing costs are much lower. They produce low-cost, high-volume printing.

- **3D printers:** 3D printing makes three-dimensional solid objects from a digital file. A 3D-printed object is created by laying down successive layers of material until the object is created. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object, e.g., prosthetics and movie props.

When evaluating printers, it is important to know what the printer will be used for because different printers are good at different things.

Factors to consider when looking for a printer are whether it is black and white and/or color, how quickly it can print, and how much it costs to print a page.

Other factors to consider include the following:

- **Dots per inch (DPI)** measures how many dots a printer can print in one inch (or 2.54 cm). The higher the DPI, the more detailed the prints.
- **Pages per minute (PPM)** measures how many pages of black text a printer can print in a minute. The higher the PPM, the faster the printer can print.

IV. Processing Derive

Processing devices are responsible for carrying out instructions and performing calculations. In this section, you will learn about the most important processing devices:

- central processing unit (CPU)
- graphics processing unit (GPU).

1. Central processing unit (CPU)

The central processing unit (CPU) is located inside the computer case on the motherboard. It is the part of a computer responsible for receiving and carrying out computer instructions (processing).

Each CPU comprises multiple cores and independent processing units that can complete tasks independently (multithreading vs. multiprocessing). By adding multiple cores to a CPU, the processing power available to the computer can increase dramatically, with little heat gain. These types of processors are called multi-core processors.

The CPU contains a control unit (CU) that coordinates all activities in the CPU and an arithmetic logic unit (ALU) where the logic operations and arithmetic calculations are carried out.

2. Graphics Processing Unit (GPU)

The graphics processing unit (GPU) is located on plug-in cards on the motherboard or in the same chip as the CPU. It is responsible for creating and doing the calculations needed to display images on the screen.
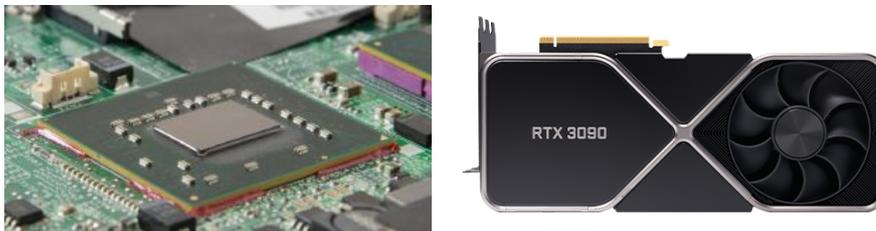
V. Storage device

Storage devices all serve the same general purpose: to store data. Because of the differences in storage capacity, portability, and speed, different storage devices are generally used for different reasons.

When evaluating any storage device, there are certain things that you must take into consideration. These are:

- **function** – that determines whether you need an SSD or an HDD.
- **storage capacity** determines how much information you can save on the device.
- **portability** determines how easily it can be carried around and moved from one computer to another.
- **use** – that determines what the storage device will most likely be used for. This includes transferring files and running applications.
- **volatility** – determining if the device will lose the data when turned off. You do not want a device that will lose all data in case of a power outage.
- **reliability and durability** – that determines how likely the device is to break down.

In the following section, you will learn more about the differences between storage devices.

1. Types of storage devices

A. Hard Disk Drive (Hdd)

A computer hard disk drive is a secondary storage device consisting of magnetic disks or platters that rotate at high speed. Its main function is to store data permanently by controlling data's positioning, reading, and writing onto the hard disk.

Currently, modern hard drives can have huge storage space and are either internal (fixed) or external (portable).
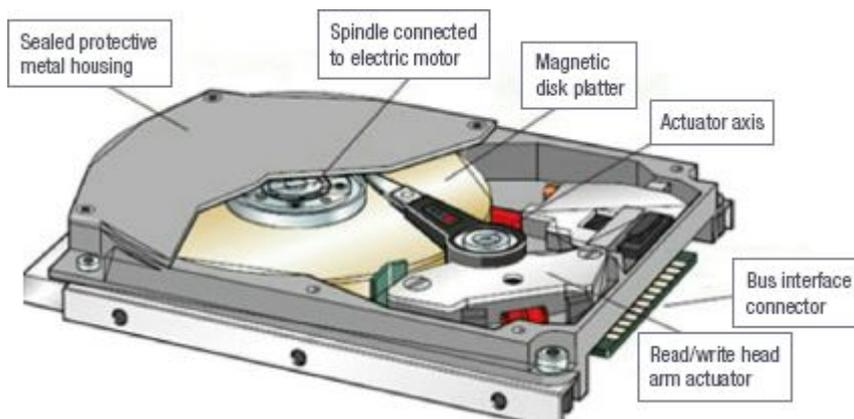
Of all types of computer storage devices, hard drives are the most popular for storing data because of their speed, capacity, and cost. Access times range from 6–11 ms, whereas a CD takes up to 500 ms to retrieve data. Computer ads often note the hard drive speed as revolutions per minute (rpm), which refers to how fast the platters spin when the read/write head is accessing data. The higher the rpm, the faster the read/write heads can locate specific data. Ads always mention the storage capacity of a hard drive, as this factor directly affects the computer's price. Hard drives typically range from hundreds of gigabytes to a few terabytes of storage capacity. Current hard drives store data for pennies per gigabyte.

B. Solid-State Drive

Solid-state drives (or SSDs) are storage devices that, unlike hard drives, do not have any moving parts. Instead, SSDs use special floating gate transistors to store data electronically. Solid-state drives (SSDs) are generally faster than normal hard drives. Since SSDs have no moving parts, they are much quieter, more reliable, and more robust than HDDs. They also generate less heat, thus increasing their life span, and use less power than an HDD, which means they are more suitable for mobile devices.

C. External Hard Drives

To increase the storage capacity of your computer, you can use an external hard drive, a separate, freestanding high-capacity storage device that you attach to a computer, usually using a USB port. Physical sizes and storage capacities vary, ranging from small portable devices designed to hold songs, photos, and other personal files, to larger desktop units designed to store copies of an entire computer system. External hard drives can use magnetic or solid-state technology.

D. Portable Storage Drives

In addition to external hard drives, you can attach other types of drives to a computer and use them to store data. These removable drives are ideal for transporting data from one computer to another, adding storage capacity, and securing data away from a computer. Removable drives use the same solid-state technology as internal SSDs do. The smallest types are collectively called memory cards, frequently used with cameras, smartphones, portable media players, and other similar electronics. Figure 2.29 shows three types of memory cards, including a microSD card, which you insert into an adapter and then plug into a USB port or

memory card slot. You insert larger memory cards into a slot on a computer or mobile device, which usually accepts more than one type of memory card.

Popular USB flash drives are another type of solid-state storage media. This small removable data storage device uses a USB connector to plug into your computer's USB port or another electronic device. USB flash drives are also known as thumb drives, jump drives, flash drives, and USB sticks. Storage capacities of removable solid-state drives vary from a few too many gigabytes, which is usually enough to transfer documents, photos, music, and video files. If you use a USB flash drive with your computer, you should not remove it while the drive is in use. Disconnecting a USB flash drive while it is storing data can damage the files on the device. Windows and other operating systems provide an option to remove or eject removable storage devices safely.

E. Optical Storage Devices

Optical storage devices use lasers to read and write data on plastic platters that contain a metal layer, which reflects the laser light back to a sensor in an optical drive. Desktop and laptop computers often have optical drives. See Figure 2.30.

Optical media such as compact discs (CDs) and DVDs are called discs. The technology for storing data on CDs and DVDs is similar, though DVDs have much higher storage

capacities. CDs were popularized as media for sound recordings, whereas DVDs are often used for software, video games, and movies. A more recent type of optical storage media is the Blu-ray disc (BD), which provides more than five times the storage capacity of a traditional DVD.

CDs, DVDs, and BDs are available in read-only memory (ROM), recordable (R), and rewritable (RW) formats. For example, a rewritable CD is noted as a CD-RW. In addition, CDs are produced in a digital audio (DA) format, also known as audio CDs, which are used for music publishing and distribution. You can only use optical discs in the RW format to store (or write) data multiple times. After the information is written on an audio CD or any optical disc in the ROM or R format, it cannot be changed.

VI. Motherboard

The motherboard is the foundation that holds our computers together. It lets us expand our computer's functionality by adding expansion cards. It routes power from the power supply and allows the different parts of the computer to communicate. In short, it's a total boss.

Every motherboard has a few key characteristics. First is the chipset, which decides how components talk to each other on our machine. The chipset on motherboards is made up of two chips. One is called the Northbridge, which interconnects stuff like RAM and video cards. The other chip is the Southbridge which maintains our IO or input/output controllers, like hard drives and USB devices that input and output data. In some modern CPUs, the Northbridge has been directly integrated into the CPU, so there isn't a separate Northbridge chipset. A chipset is a key component of our motherboard that allows us to manage data between our CPU, RAM, and peripherals. Peripherals are the external devices we connect to our computers, like a mouse, keyboard, and monitor.

In addition to the chipsets, motherboards have another key characteristic that allows the use of expansion slots. Expansion slots also give us the ability to increase the functionality of our computers. If you want to upgrade your graphics card, purchase one and install it on your motherboard through the expansion slot. The PCI Express or Peripheral Component Interconnect Express is today's standard for an expansion slot. A PCIe bus looks like a slot on the motherboard, and a PCIe base expansion card looks like a smaller circuit board. The last component of motherboards that we'll discuss is the form factor.

There are different sizes of motherboards that are available today. These sizes of form factors determine the amount of stuff we can put in it and the amount of space we'll have. The most common form factor for motherboards is ATX which stands for Advanced Technology eXtended. ATX comes in different sizes too. In desktops, you'll commonly see full-sized

ATX's. If you don't want to use an ATX form factor, you could use an ITX or Information Technology eXtended form factor. These are much smaller than ATX boards. For example, the Intel NUC uses a variation of the ITX board, which comes in three board sizes; mini-ITX, nano-ITX, and pico-ITX.

When building your computer, you must consider what type of form factor you want. Do you want to build something small that can't handle as much workload? Or do you want a powerhouse workstation to which you can add many functionalities? The form factor will also play a role in what expansion slots you want to use.

Understanding motherboards and their characteristics can be a big plus when fixing hardware issues since things like the type of RAM module or processor socket are dependent on the kind of motherboard they need to fit into. Let's say you're responding to a ticket for a user with video problems; you want to make it to their desk only to realize the graphics card you brought as a replacement doesn't fit the motherboard of their computer uses. Now, make sure that your motherboard can fit any replacement or upgrade that you want to implement.
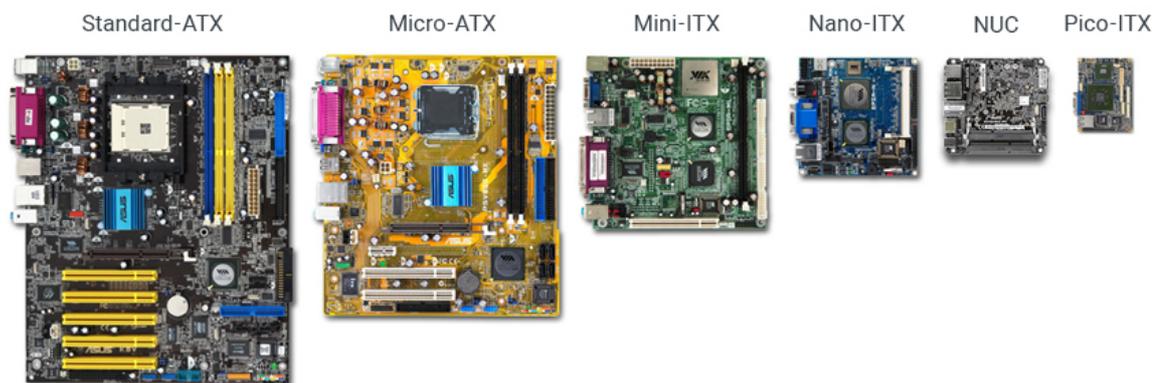
The functions of the motherboard are to:

- provide a place for other devices or interfaces to be connected to (such as more memory or other graphics cards)
- distribute power to the various components
- act as a communication hub as the components send and receive information through the motherboard.

1. RAM

Let's talk about RAM, our computers' short-term memory. We use RAM to store data that we want to access quickly. This data changes all the time, so it isn't permanent. Almost all RAM is volatile, so once we power off our machines, the data stored in RAM is cleared.

Remember that our computer is comprised of programs. To run a program, we need to make a copy of it in RAM so our CPU can process it. When you see a new phone or laptop that says it has 16 gigs of RAM, it can run up to 16 gigs of programs, meaning you can run lots of

programs simultaneously. When you type in a document, you're using RAM. If you've ever had the misfortune of working on an important paper presentation and losing power, you know the feeling you get when all your work is lost. It's a total bummer. This happens to anything with RAM, even video games. Have you ever gone on a long campaign without saving, then right as you get to a safe point, the power goes off on the console, and all the progress you've made is lost forever? It's not fun at all.

You spend the next hour or so deciding whether or not just to rage quit the game completely and start all over from scratch. Not that this happened to me or anything, that was just a friend. Anyway, all of this happens because RAM clears its data.

There are lots of types of RAM. And the one commonly found in computers is DRAM or dynamic random-access memory. Where a one or zero is sent to DRAM, it stores each bit in a microscopic capacitor. This is either the charge or discharge represented by one or zero. These semiconductors are put into chips on the RAM and store our data.

There are also different types of memory sticks that DRAM chips can be put on. The more modern DIMM sticks, which usually stands for Dual Inline Memory Module, have different sizes of pins on them. We don't buy RAM based on the number of DRAM chips they have. They are labeled by the RAM capacity on a stake, like an 8 gig stick of RAM.

After DRAM was created, RAM manufacturers built something called SDRAM, which stands for Synchronous DRAM. This type of RAM is synchronized to our systems' clock speed, allowing quicker data processing. Today's system uses another type of RAM called double data rate SDRAM, or DDR SDRAM for short. Most people refer to this RAM as DDR, even shorter. There were lots of iterations of DDR, from DDR1, DDR2, DDR3, and now, DDR4. DDR is faster, takes up less power, and has a larger capacity than earlier SDRAM versions.

The latest version, DDR4, is the fastest type of short-term memory available for your computer. And faster RAM means that programs can run faster and more programs can run simultaneously. Remember that any RAM sticks you use need a compatible motherboard with a different number of pins aligned with the motherboard RAM slots. Like with the CPU, ensure your motherboard is compatible with any RAM sticks you buy. Up next, we'll take a deep dive into motherboards.
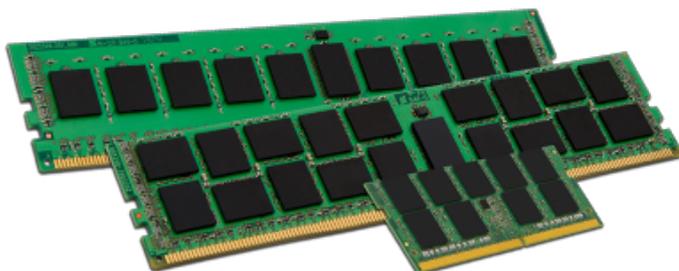
VI. Power supply

To get our computer to work, let's give it some power. Computers have a power supply that converts electricity from your wall to something usable. There are two types of electricity, DC, or direct current, which flows in one direction, and AC, or alternating current, which changes directions constantly. Our computers use DC voltage, so we have to have a way to convert the AC voltage from our power company to something we can use. That's what our power supply does. It converts the AC we get from the wall into low-voltage DC power that we can use and transmit throughout our computers.

So most power supply units have a fan. They also have voltage information just normally listed underneath or on the side, cables to power your motherboard, and,

To understand electricity, we must use the example of water pipes. Our sinks have a faucet that's connected to a pressurized water tank. When we turn on the faucet, water comes out. This is like how electricity works. Electricity flows when we plug an appliance into a wall outlet and turn it on. If we added more pressure to our water tank, would more water come out of it? The higher the pressure, the more water there will be. When it comes to electricity, we refer to the pressure as voltage. If you plugged that 120-volt appliance into a 220-volt outlet, the power came busting through and fried your charger. If it was the other way around, and a 220-volt appliance was plugged into a 120-volt outlet, you wouldn't have seen the same outcome. You'll still be able to get electricity, but slowly. This would be similar to a water tank that is only half pressurized; it will draw water slowly. In some cases, though, this can deteriorate the performance of the device and cause damage in the long term.

As a general rule, use the proper voltage for your electronics. We refer to the amount of electricity coming out as current or amperage, and it's measured in amps. We can think of amps as pulling electricity, as opposed to voltage, which pushes electricity. Amps will pull as much electricity as needed, but the voltage will give you everything. Look on the back of one of your device charges; you might see something like 1 or 2.1A. A device with 2.1 amps will charge a device faster because it can put current from a 2.1 amp than a 1 amp charger. Finally, the other important part of electricity that you will need to know is the wattage. Wattage is the number of volts and amps that a device needs. If your power supply has too low of wattage, you won't be able to power your computer, so make sure you have enough. This means you'll only overpower your computer if you have a large power supply. Power supplies just give you the amount that your system needs. It's best to an error on the side of large power supplies. You can power most basic desktops with a 500-watt power supply. Still, suppose you're doing something more demanding on your computer, like playing a high-resolution video game or

doing a lot of video production and rendering. In that case, you'll likely need a bigger power supply for your computer. On the other hand, if you're just browsing the Web, the power supply that comes with your computer should be fine. A bad power supply causes all kinds of issues. Sometimes the computer doesn't even turn on at all. Since power supplies can fail for lots of reasons like burnouts, power surges, or even lightning strikes, knowing how to diagnose power issues and replace a failed power supply is a skill every IT support specialist should have in their toolbox.
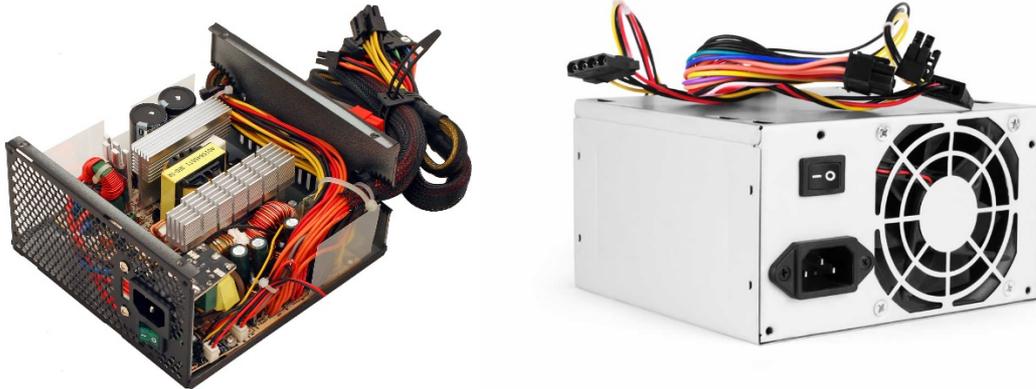
VII. Cooling System

Computer cooling systems are similar to car engine systems. A computer is an electronic device that performs millions of operations per second. This means the electronic components generate a lot of heat. Electronic components like transistors, diodes, and others require a certain temperature for optimum operation.

The processor (CPU) of the computer generates heat from the operation it is carrying out. The heat is dissipated to a heat sink mostly made of aluminum. When the heat is on the sink, a fan blows fresh cool air to cool it down.

There are 2 main types of computer cooling systems air and liquid. The cooling system is used to ensure that the heat generated by computer components is removed and a cooler environment is maintained.

- **Air cooling system**: These are the most common type of cooling systems in most PCs. They are also the cheapest. They have a heat sink to dissipate heat and a fan to blow fresh cool air into them. These types of systems make noise due to fan rotation.
    - o **Heat sink:** is made up of high heat conductor material such as copper or aluminum. They have a large surface area and fins to absorb more heat to add even more surface. They soak the heat away from the processor.

o **Cooling fans**: after the heat has reached the sink surface, the fan blows away hot heat from away and brings in fresh cool air. In most air cooling systems, there are 2 fans near the processor and another on the power supply.

Liquid cooling system: They are mostly used for high-end computers like gaming which carry out many operations. They are better at cooling and have less noise than the air type but are bulky in size and expensive.

There are 4 functions of the Cooling system.

- **Prevent overheating**: the main work of a cooling system is to remove heat from system components to prevent overheating.

- **To help achieve a high processing speed**: the cooler the system is, the high chances of having a high speed. This is because the computer will be working to its optimum capacity.

- **Reduce hardware breakdown**: different components have a different threshold of how much heat they can bare. The cooler system ensures that all hardware components don't break down.

- **Prevent random computer shutdown**: when the computer starts overheating, the sensor activates the fan, and the cooling system starts. If the cooling system doesn't function well, the computer is set to shut down to prevent components breakdown.

VIII. Computer Case

The computer case is a metal and plastic box containing the computer's main components, including the motherboard, central processing unit (CPU), and power supply. The front of the case usually has an On/Off button and one or more optical drives.

Computer case form factors outline the type of motherboard that will fit in the case and the number of components that can be added to the system. Bigger cases can host bigger motherboards and accommodate more components such as disk drives, graphics cards, and more powerful cooling systems.

There are two main categories of computer cases: desktop and tower. The desktop case is a singular form factor, while tower cases branch into different sub-categories: full tower, mid-tower, and mini-tower. Full tower cases can host full-sized motherboards and are compatible with smaller ones. Mid-tower and mini-tower cases do not fit full-sized motherboards. Still, they can fit motherboards in mini and micro categories, such as mini-ATX and micro-ATX motherboards.

Different Types of PC Cases

Full Tower   **Mid-Tower**   **Mini-Tower**   **SFF**
                                                 (Small Form Factor)
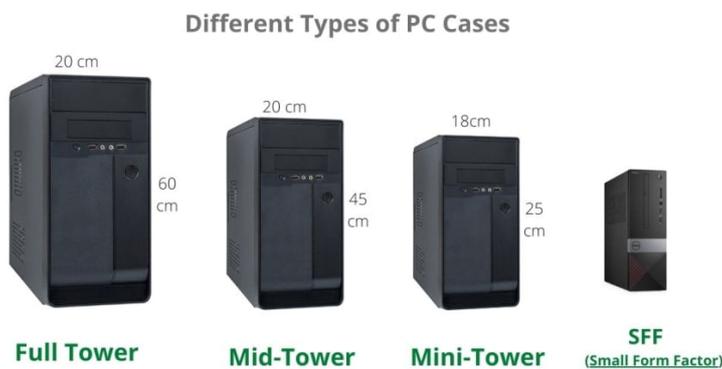
IX. Computer Assembly

Step1: choosing Component

- ✓ **Processor** (CPU) — Acts as the "brain" of your computer. In most builds, the CPU is usually the most expensive component.

- ✓ **Motherboard** — Serves as an interface between all of your computer's components and the processor.

- ✓ **RAM** — Random Access Memory. More RAM will provide more "workspace" to increase your computer's performance. Think about the RAM as a table: more RAM gives you more room for doing things on that table. Less RAM is like having a smaller table!

- ✓ **Storage Drive** — Stores data. You can buy a traditional hard disk drive (HDD) or opt for a more expensive solid-state drive (SSD) if you want an exceptionally fast drive.

- ✓ **Power supply** — Powers all of your computer's individual components. The power supply is also the interface between your computer and the wall socket you plug into.

- ✓ **Case** — Necessary for storing and cooling your components.

✓ **Graphics card** — Used to render images on your computer. While most processors have a built-in graphics processing unit (GPU), you can buy a dedicated graphics card if you plan on gaming or using your computer for intensive editing.

✓ **Cooling system** — This includes case fans and coolers for specific parts and keeps the inside of your case at a safe temperature. Only necessary for gaming and editing PCs—regular PCs should be fine with a stock cooler.

Step2: Choose Tools for Installing

✓ A Philips head screwdriver (though a set of screwdrivers is preferable)

✓ anti-static wrist wrap

📖 Summary

- Computer hardware refers to the physical parts of a computer and related devices. The internal hardware parts of a computer are often referred to as components, and the external hardware devices are usually called peripherals.
- types of hardware found in a computer.
  - Input device
  - Output device
  - Storage device
  - Processing device
- The motherboard, the foundation that holds our computer together. It lets us expand our computer's functionality by adding expansion cards. It routes power from the power supply and allows the different parts of the computer to communicate.
- Computers have a power supply that converts electricity from your wall to something usable.
- computer cooling systems are similar to a car engine system. A computer is an electronic device that performs millions of operations per second. This means the electronic components generate a lot of heat. Electronic components like transistors, diodes, and others require a certain temperature for optimum operation.
- The computer case is the metal and plastic box containing the computer's main components, including the motherboard, central processing unit (CPU), and power supply.

👩 Questions

1. How many types of hardware?
2. What are the Input devices and Output devices?
3. What is CPU?
4. How many types of storage devices?
5. What is a motherboard?
6. When you turn off your computer, is data stored on RAM lost?

Lesson 39

Software and Operating system

Introduction:

In order for all computers to communicate, software is required. This lesson will explain the types of software and how to install them. At the end of this lesson you will able to:

- ✓ Understanding to software
- ✓ Classify type of software
- ✓ Install and Uninstall software

In this lesson you will learn:

- I.   Type of software
- II.   Type of Operating system
- III. Operating system task
- IV.   Installing Operatng system

Lesson 39 Software and Operating system

I. Types of Software

Suppose you shop for a computer at a retail store. In that case, the salesperson emphasizes hardware details, such as how quickly the data is processed into information (referred to as processing speed) and how much information can be stored (storage capacity.) However, hardware does not make a computer use the software installed on it. A computer is only a collection of electronic components in a case without software.
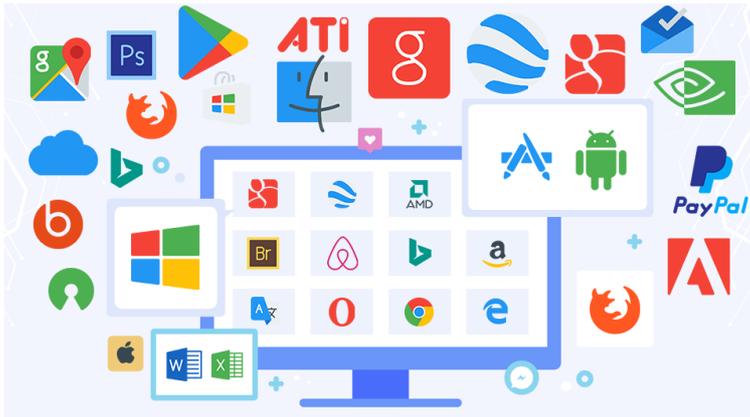
The software provides the means to interact with the computer's hardware by entering and receiving information through the user interface. The software on most personal computers has a *graphical user interface (GUI)*, which displays pictures called *icons* and other visual elements that allow you to interact with data and execute commands. For example, to print a document created and stored on a computer, you might select an icon of a printer on the computer screen. The software on the computer sends the information necessary to print the document to a printer attached to the computer.

Some software uses a *command-line interface*, which requires you to type text commands to interact with the computer.

Although command-line interfaces require you to remember and type complex commands and allow little room for error, many advanced computer users prefer them because they offer precise control over system details.

In contrast to command-line interfaces, graphical user interfaces are visually inviting and easy for novices to use with only basic training. However, they rarely let users directly access detailed technical settings as command-line interfaces do.

A computer relies on two main types of software, **application software,** and **system software**.

System software is the software that runs a computer and includes the operating system and utility programs. An operating system is a software that coordinates the resources and

activities on a computer. A utility program helps the operating system set up, maintain, and protect a computer. For example, you use a utility program when you connect your computer to the Internet, a worldwide system of linked computers.

As you use a computer, system software works in the background to manage hardware and run other software,

Called **application software**, which you use most directly to complete a specific task or to create something electronically. You can use application software to perform tasks such as writing a report, creating a video, viewing a Web page, or sending photos to a friend. In general, a computer runs system software to perform computer tasks, while you run application software to carry out your work or personal tasks.

The table below compares operating systems and application software.

	Operating System	Application System
Purpose	Operates and controls computer hardware and runs application software	Provides services and information directly to users
Role in a computer system	Coordinates the activities of users, application software, and hardware	Performs tasks based on user input
Typical tasks	Monitors hardware Manages resources Controls input and output Processes data	Creates documents such as reports and charts. Provides entertainment Displays photos

Examples	Windows 11 Mac OS X Android IOS	Microsoft Word (word processing) Adobe Photoshop (graphics editing) Mozilla Firefox (Web browser)

II. Types of Operating Systems

Operating systems fall into four categories that depend on the type of device for which they are designed: personal computers, mobile computing devices, servers, and devices other than computers. When you purchase a personal computer or mobile device, the operating system is already installed, so your preference for an operating system often determines the computers you can consider purchasing.

1. Personal Computer Operating Systems

Operating systems installed on a single computer are personal or desktop. These are considered single-user operating systems because one user interacts with the operating system at a time. They also multitask operating systems because they let you work with multiple programs simultaneously. For example, you can look up definitions on the Internet as you write a report and receive an e-mail on your laptop.

Windows, Mac OS, and Linux are the three most popular personal computer operating systems. Currently, Microsoft Windows runs on more personal computers worldwide than any other operating system. For many years, the most widely used version of Windows was Windows XP, released in 2001. Windows 7, released in 2009, recently surpassed Windows XP in popularity. *Windows 11*, the most recent major version of Windows, was released in 2020.

Windows became widespread because it ran on inexpensive personal computers created by various computer manufacturers. It retained its popularity because it is easy to use and personalize and runs more types of applications than other operating systems.

In contrast, Mac OS runs only on Apple Macintosh computers. The current version of the operating system is called *Mac OS X*, where the X is the Roman numeral 10. Releases of Mac OS X up to 10.8 are named after big cats, such as Snow Leopard and Mountain Lions. **Figure** ## shows a Macintosh computer running Mac OS X Mountain Lion. Mac OS X version 10.9 is called Mavericks, which marks the beginning of a change in the naming scheme from big cats to places in California. (Mavericks is a surfing location in northern California.)

Mac OS sets the standard for GUI operating systems. Mac OS X has developed a reputation among its users as being a very secure, reliable, and easy-to-maintain operating system.

Linux is a personal computer operating system related to UNIX, an operating system first developed in the 1960s for large, special-purpose computers that scientists and programmers frequently use. Unlike Windows and Mac OS, which are proprietary operating systems, meaning they are owned and updated solely by their companies, Linux is released to the public as *open-source software*, meaning anyone can use, modify, and distribute it. Programmers around the world have collaborated on improving Linux and developing utilities, applications, and enhancements.

Linux is available in versions called distributions, including commercial distributions such as Fedora, OpenSUSE, Ubuntu, and Mandriva. Distributions offered by noncommercial Linux communities include Debian, Slackware, and Gentoo. **Figure** ## shows Ubuntu (named after the African philosophy that encourages humanity toward others), which includes features similar to Windows and Mac OS.
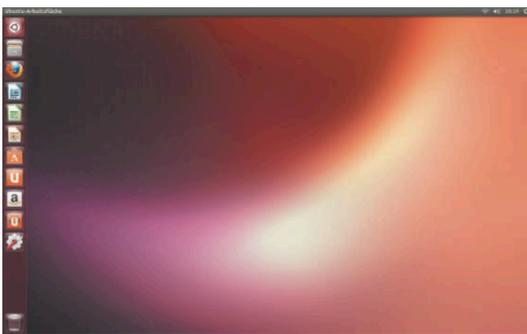
Some distributions of Linux, such as BSD, have command-line interfaces. All distributions offer the advantages of running on any hardware, providing excellent security, and being free to install and use.

2. Mobile Operating Systems

A mobile operating system is designed for small handheld computing devices such as smartphones or tablets. A mobile operating system includes features similar to a personal

operating system but is simpler and significantly smaller. A ***smartphone*** is a cell phone that includes many features of a computer, allowing it to run general-purpose computing applications. Larger than smartphones, ***tablets*** are one-piece mobile computers that typically include a ***touchscreen***, a screen you touch to interact with the GUI. Mobile operating systems are designed to fit into the limited memory of mobile devices and work well with mobile hardware and features such as touchscreens, navigation systems, and speech recognition.

Four popular mobile operating systems include iOS, and Android, which are designed for smartphones and tablets. ***iOS*** is a version of Mac OS X written for Apple's mobile devices, including iPhones and iPads. Google developed ***Android*** as an open-source operating system designed to run on many smartphones and tablets. Android is derived from Linux.

3. Embedded Operating Systems

Mobile operating systems are ***embedded operating systems*** that run devices such as ATMs, navigation systems, portable media players, digital video recorders, and other consumer electronics. An embedded operating system is included in the hardware of a standalone device. Unlike mobile operating systems, however, embedded operating systems are designed to meet a specific purpose and perform a single type of task, such as providing maps and directions. In addition, an embedded operating system runs with little or no intervention from you or other users. You provide a specific type of input, such as a destination, and the embedded operating system provides the output, such as directions.

Many embedded operating systems are specialized versions of their more fully featured counterparts, such as Linux and Windows. For example, computerized cash registers, or point-of-sale devices, use an embedded version of Windows to manage sales transactions and keep them secure. Household electronics such as microwave ovens and digital video recorders use embedded versions of Linux to perform their tasks. The iPod has an embedded version of iOS that lets you select and play songs.

4. Server Operating Systems

A ***server operating system*** resides on a server and is used to manage a ***network***, a group of two or more computers linked together. A ***server*** is a computer that provides network services such as e-mail to other computers or clients. Because of their purpose, server operating systems are sometimes called *network operating systems*.

Each client computer on a network has its operating system, while the server runs a server operating system to manage the requests for services from the client computers. For example, if a user on the network wants to print a document, the server operating system handles the request and sends the print job to the printer, which lines up with other print jobs in a certain order. That way, the printer isn't overloaded with print jobs from dozens of other users on the network. An expert, the network administrator, uses the server operating system to manage the network and its users.

Server operating systems are ***multiuser*** because they let many users run programs and simultaneously take advantage of the server's resources. One important task a server operating system performs is balancing user needs so that everyone can access the services and resources they request and that a problem with one user doesn't affect all users.

Windows Server is the server version of Windows, and Mac OS X Server is the server version of Mac OS. Versions and distributions of UNIX and Linux are also servers operating systems. Many servers that handle e-mail and Internet access use UNIX because it is a powerful, flexible multiuser operating system.
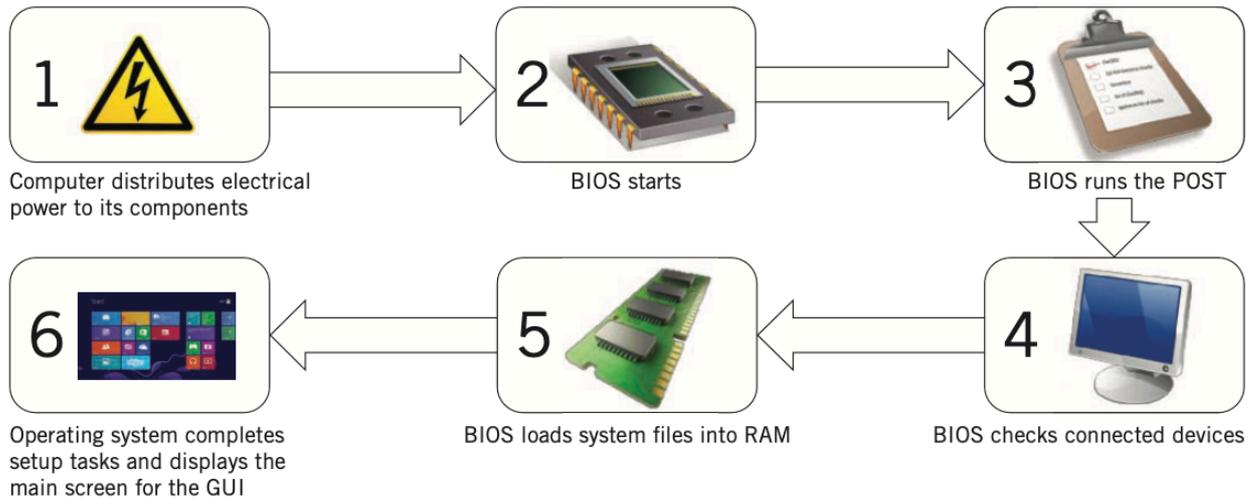
III. Operating System Tasks

The operating system controls your computer from soon after you turn on the power until you turn it off. During that time, the operating system takes care of technical tasks so that you can focus on completing a school project, listening to music, or communicating with others, for example. An operating system's technical tasks include completing start-up steps, managing memory, processing input and output, controlling hardware, and ending a computer session.

1. Completing Start-Up Steps

You turn on the power to the computer to start an operating system. The ***boot process*** is a series of steps the operating system must complete before you can interact with the operating system. **The figure** below illustrates the boot process.

1   Computer distributes electrical power to its components

2   BIOS starts

3   BIOS runs the POST

6   Operating system completes setup tasks and displays the main screen for the GUI

5   BIOS loads system files into RAM

4   BIOS checks connected devices

1. The computer receives and distributes electrical power to its circuits so the system components can run.

2. When a system component called the ROM chip receives power, it starts a utility program called the BIOS, which stands for basic input/output system. The BIOS contains instructions for starting the system before the operating system is loaded.

3. The BIOS performs the power-on self-test (POST) to check critical system components and ensure they are running properly. During this step, your computer might beep and flash messages on the screen.

4. If the system components are running properly, the BIOS looks for devices connected to the computer and checks their settings. If the BIOS finds an error, the computer might beep again and display error messages describing the problem.

5. If Steps 3–4 are successful and error-free, the BIOS searches for the system files the computer needs to run the operating system and then loads them into *random access memory (RAM)*, which is the memory the computer uses to store instructions and data temporarily. Next, the BIOS loads the kernel, or core, of the operating system into RAM. The kernel takes over control of the computer from the BIOS.

6. The operating system completes setup tasks, such as requesting your username and password, starts and runs utility software and other programs in the background, and then displays the main user interface screen.
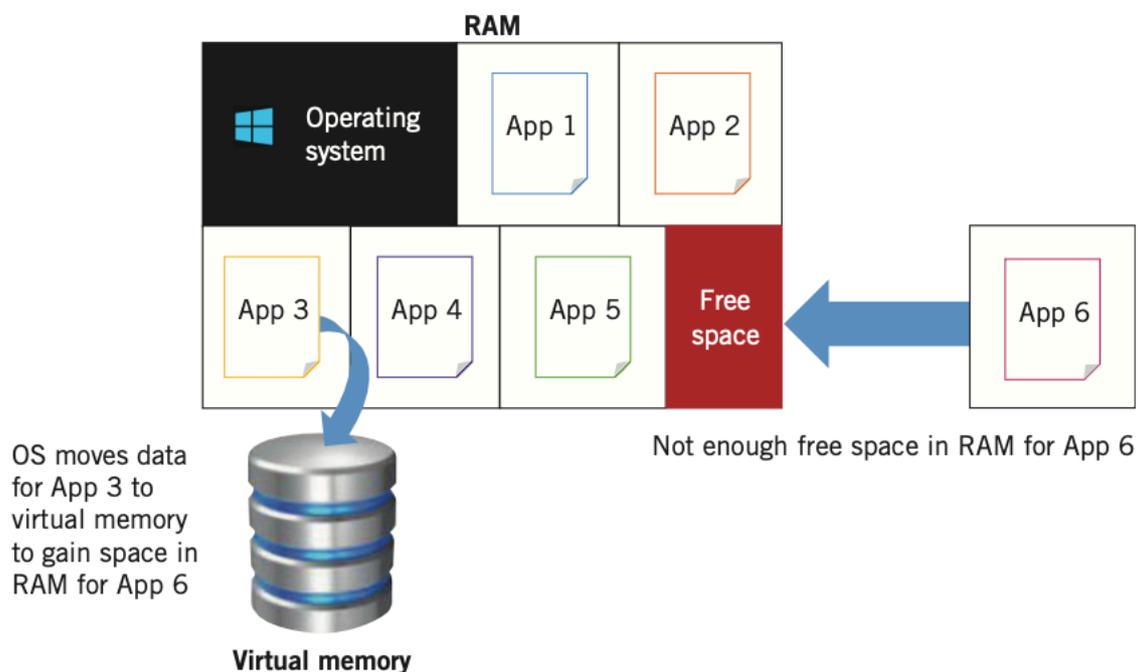
2. Managing Memory

After starting up, one of the main tasks an operating system performs is managing computer resources. In a computer system, a ***resource*** is any component the system requires to

do work. The main resources are memory, processing components, storage space, and peripherals.

An operating system manages memory so that it uses RAM efficiently. RAM is a critical resource because computers have only a limited amount, and every program—applications, utility programs, even the operating system itself—needs space in RAM to run. When you start an application, the operating system allocates RAM for that application. When you close an application, the operating system reclaims the RAM to assign it to another program.

The computer can run out of RAM if you run multiple applications simultaneously. In that case, the operating system might close an application or shut down the computer unexpectedly (this is called a crash). To prevent crashes and gain memory, operating systems take advantage of *virtual memory*, which is part of a computer's hard disk that can work as additional RAM. For example, suppose you have five applications running and then start the sixth application. Windows might have enough RAM to display the user interface for the application but not enough to allow you to complete any tasks in the application. To gain memory to start the sixth application, Windows moves data from one of the other running applications out of RAM and into virtual memory. This processing is called *swapping* and continues until you close one of the open applications.

RAM

Operating system

App 1

App 2

App 3

App 4

App 5

Free space

App 6

OS moves data for App 3 to virtual memory to gain space in RAM for App 6

Not enough free space in RAM for App 6

Virtual memory

In general, as the operating system runs out of RAM for programs, it swaps pages of data from RAM to virtual memory. (A *page* is the amount of data and instructions the operating system can swap at one time.) The part of a computer's storage space dedicated to virtual memory is called the page or swap file.

Although virtual memory means the operating system can access more than is available in RAM, swapping is slower than using RAM alone. If you notice an application responding more slowly than usual to your commands, the operating system is probably using virtual-memory.

3. Processing Input and Output

Another major task for the operating system is processing input and output. When you type text on the keyboard to provide input to a software application, the operating system accepts and processes the data so the computer can display the text as an output on the monitor.

Often, the operating system must handle many input and output tasks simultaneously, such as when you click buttons and enter text to create a document or when you have more than one application running simultaneously. The operating system sets a sequence for processing input and output tasks to keep your computer running smoothly. For example, the printer must receive the entire document before printing if you want to print a large document containing text and graphics. Instead of waiting for the printer and slowing down processing, the operating system places the document data into a ***buffer***, part of memory or storage where data waits until it can be transferred to a device. In the meantime, you can continue working with the computer without interruption. When the printer has received the entire document, the operating system removes the data from the buffer—sending print data to a buffer before printing is called ***spooling***.

OS stores a document
to be printed in a buffer

When the printer is ready,
the OS releases the
document from the buffer
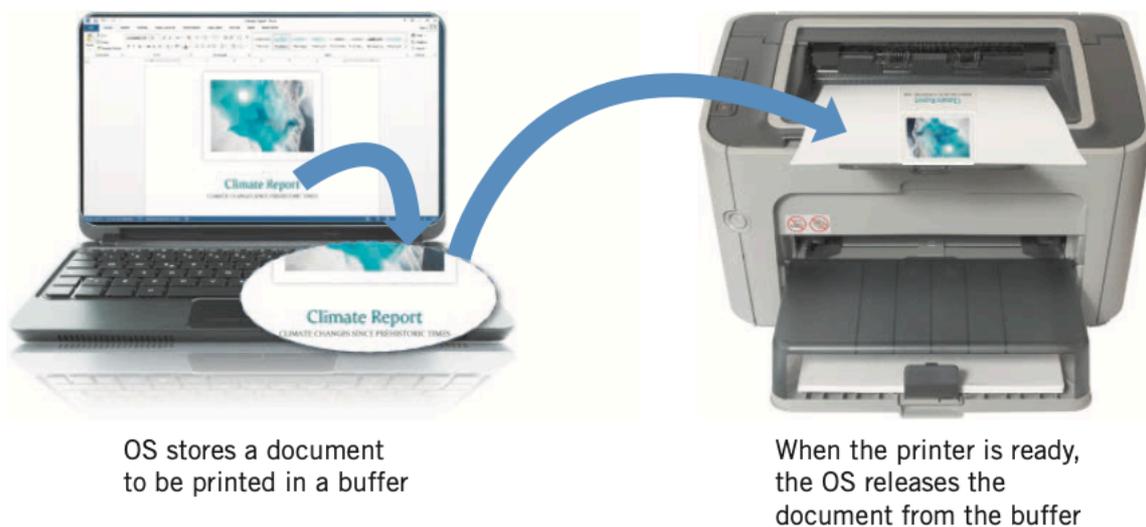
4. Controlling Hardware

The operating system considers every hardware device connected to the computer as an input or output resource. For example, a microphone is an input resource, and a speaker is an output resource for audio data such as music and spoken words. To control a hardware resource, the operating system communicates with a ***driver***, also called a device driver, which is a small

program that enables the operating system to interact with the device. Each device must have a driver, which is typically provided by the device manufacturer. One of the operating system's setup tasks is to activate the driver for each device connected to the computer, so the device works as you expect it to work.

If you install new hardware, such as speakers that plug into your computer, the operating system usually recognizes the device immediately, or the next time you start the computer. Because the operating system includes drivers for common devices, it searches for the correct driver on the computer and then installs it so you can use the new hardware right away. This feature is called *Plug and Play*. If the operating system can't find the right driver on the computer, it typically displays instructions for acquiring and installing the driver software.

5. Ending a Computer Session

A personal operating system needs to know when you're finished working with a computer to protect itself and other software and keep your information private while you are away. Although you select an option to end a session, the operating system takes care of the tasks, which range from shutting down to restarting, signing out (also called logging off), switching users, and locking the computer. The options for signing out and switching users apply only if a computer has more than one user. Shutting down is the only option that turns off the power to the computer. To work with the computer again, you turn on the power and wait for the computer to complete the boot process. So that you can avoid this delay while the computer reboots, operating systems provide alternatives to shutting down, such as sleep and hibernate. These are low-power states that the operating system triggers automatically and lets you quickly resume work without rebooting. **The table** below summarizes the ways to end a computer session.

OPTION	DESCRIPTION	WHEN TO USE
Shut down	Completely turns off the computer	You plan to be away from the computer for more than a day or your computer is vulnerable to electrical damage (such as during a lightning storm).
Restart	Closes applications and resets the operating system	You need to reboot the operating system, such as when you install new applications or hardware.
Sign out	Closes applications but keeps the operating system running so another user can sign in without restarting the computer	You share your computer with someone else who wants to use it when you are finished and you are planning to be away for an hour or more.
Switch users	Applications and the operating system continue to run while another user signs in; the other user is not allowed to access your applications or data	You share your computer with someone else who wants to use it briefly.
Lock	Applications and the operating system continue to run, though you cannot access them until you sign in	You are leaving the computer but plan to return to it soon, and want to keep your work and data private.
Sleep/Hibernate	Applications and the operating system continue to run, though in a low-power state	You are leaving the computer but want it to quickly resume working when you return.

As with the boot process during startup, an operating system follows a procedure to shut down completely. It completes the following steps to ensure all users have saved their data, all applications and system software are stable, and the operating system has not developed a problem.

1. ***Checks users***: If the computer has more than one user, the operating system checks whether others are signed in to use the computer. If they are, they might be required to end their sessions before the operating system can shut down.

2. ***Closes application***: The operating system sends a shutdown signal to each running application. If you have not saved data in an application, the operating system allows you to save it before it sends a shutdown signal to the next application. The operating system also clears application data from virtual memory and swaps it to RAM.

3. *Closes system software*—The operating system ends the running programs and processes that are part of the system software, making sure they close properly. If the operating system detects a problem, it displays a message now or during the next startup. The operating system also clears data from RAM and buffers.

4. *Turns off the power*—The operating system signals the computer's power management hardware to turn off the power.

VI. Installation of Operating System

There are many instances where you might need to reinstall your operating system or get a new one entirely. For example, you'd need to reinstall Windows if you encountered a serious error, your hard drive became damaged or corrupted, or you're upgrading/downgrading your system.

When planning to reinstall or install a Windows operating system on your PC, you need to have the necessary installation files beforehand. This will allow you to boot and install the system.

Because CDs and DVDs are becoming less practical, many computers and laptops no longer come with a drive to read and write physical disks. This makes it impossible for you to create or use an installation media unless it's on a bootable USB drive. While this may sound impractical initially, USB sticks have a huge advantage over disks.

USBs are incredibly accessible, given the fact that almost every computer has a USB port that you can use to connect external devices. It's the easiest and most streamlined method of installing an operating system. Nowadays, you can create a bootable USB to install various versions of Windows.

1. Create a Windows bootable USB with the Media Creation Tool

Before installing Windows using a USB, you need to create the installation media itself. Your computer will read this once the USB flash drive is connected, allowing it to boot from USB. Below are the steps to create this bootable USB flash drive using the Media Creation Tool issued by Microsoft.

1. Download the appropriate installation media from Microsoft: Download Windows 10

2. Follow the steps to download the Windows version you want. Some versions may require you to provide your **Windows product key** to verify your eligibility to download disc images.
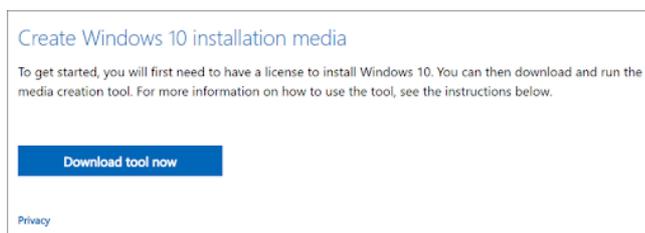
3. Save the Media Creation Tool to your computer. Launch the file and click Accept when prompted to agree to the software license terms when the download is finished.
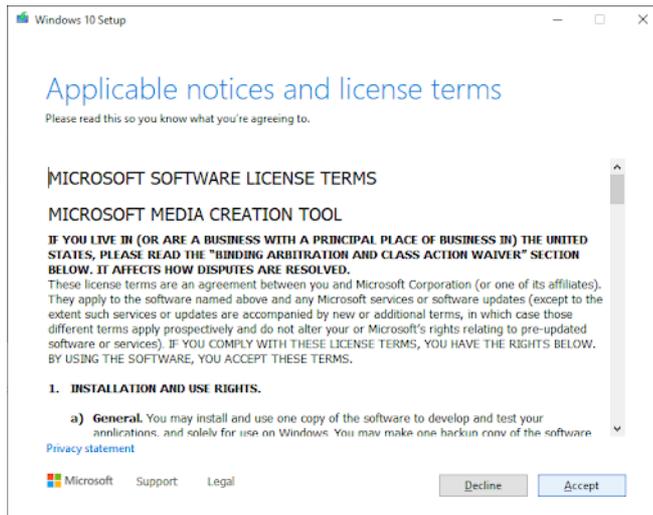

4. Select **Create installation media (USB flash drive, DVD, or ISO file) for another PC** and click the **Next** button.
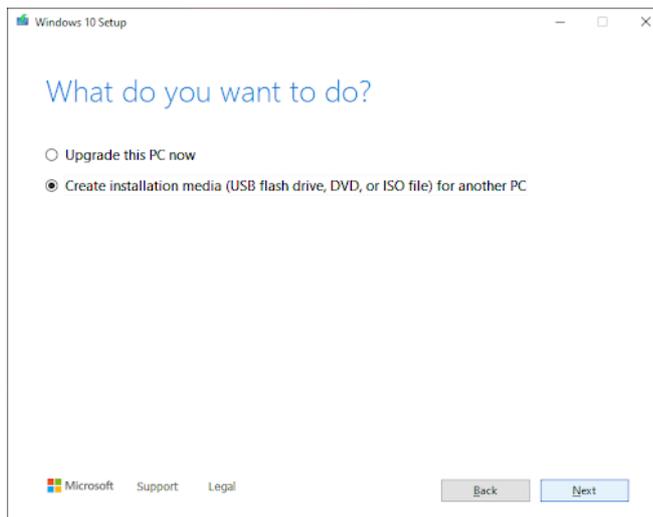
5. Follow any on-screen instructions to set your preferred language, Windows edition, and System Architecture. If unsure, check the **Use the recommended options for this PC** option and proceed.
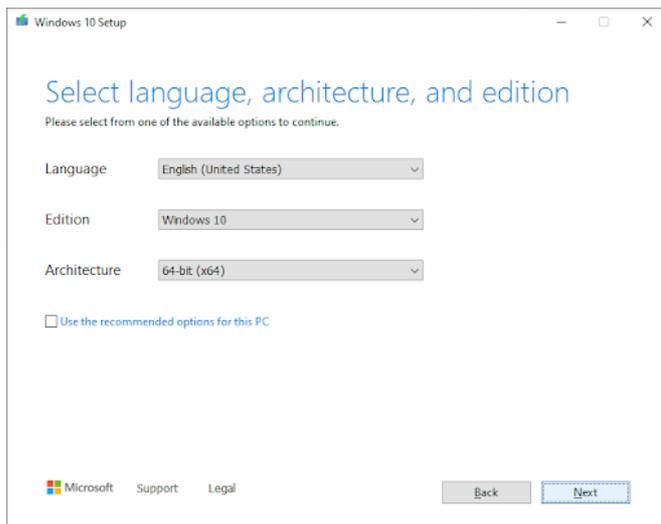
6. Choose the **USB flash drive and** select your USB from the list. The Windows installation files will start to download to your USB drive.
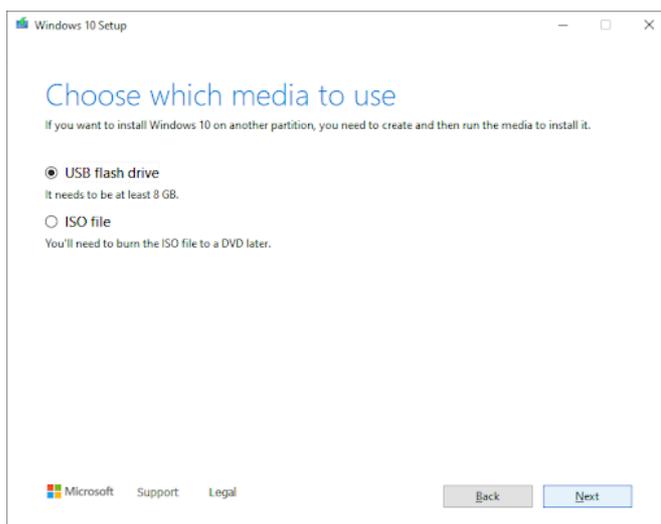
7. Note that the download may take a long time, depending on your internet connection. Ensure not to disrupt the process until the bootable USB drive is created.

Here's a summary to boot from a USB.

You first need to create the USB itself, which will be read by your computer and used to boot up. You can find the guidelines on creating a bootable USB using the Media Creation Tool issued by Microsoft.

1. Open the Microsoft Download Windows page in your web browser and click on the **Download tool now** button.

2. Save the tool to your computer. Launch the media creation tool when the download is finished and click **Accept** when prompted to agree to the launch.

3. Select **Create installation media (USB flash drive, DVD, or ISO file) for another PC** and click the Next button.

4. Set your preferred **Language**, **Windows 10 Edition**, and **System Architecture**. If you can't change the settings, place a checkmark next to the **Use the recommended options for this PC** option and proceed.

5. Choose the **USB flash drive**, then hit the Next button and select your USB drive from the list. The Windows installation files will start to download to your USB drive.

6. The download may take a long time, depending on your internet speed. Ensure not to disrupt the process until the creation tool has been created.

2. Change your computer's boot order

After creating an installation media, you must know how to boot from USB. This is needed to install Windows from the bootable USB.

The trick is: you need to change your computer's boot order. Doing so will place the USB flash drive at the top of the boot order priority list, meaning that your computer will read the files on it first. This will prompt your computer to load the installation media instead of the already installed system.

You need to change the boot order in your computer's BIOS to boot from USB. After completing this step, during the next start-up sequence, your system will immediately boot from USB and use the installation media you created, starting the Windows installation process.
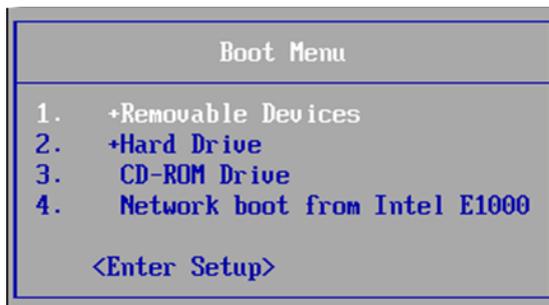
With your computer's boot order successfully changed to load up from a USB device first, you can now crack on with installing Windows using your USB's installation file.

Note: Make sure you've backed up all your files before installing them to ensure you don't lose any valuable data.

3. Step to Install

1. Plug your USB device into your computer's USB port, and start up the computer. You may be asked to press a key to boot from the USB.

2. Choose your preferred **language**, **timezone**, **currency**, and **keyboard settings**. Once you're happy with customizing these settings, click **Next**. (Note that these settings can

be changed in the future after the Windows 10 installation is complete.).

3. Click **Install Now** and select the Windows 10 edition you've purchased. Now click **Next** to start the installation process.
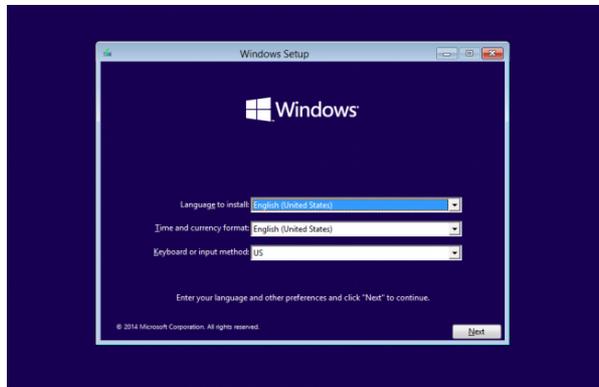

4. Choose your installation type. You can either choose **Upgrade**, which will allow keeping your current files, settings, and apps, or do a fresh, clean installation by picking **Custom**. In this example, we'll be choosing custom to do a fresh Windows installation.
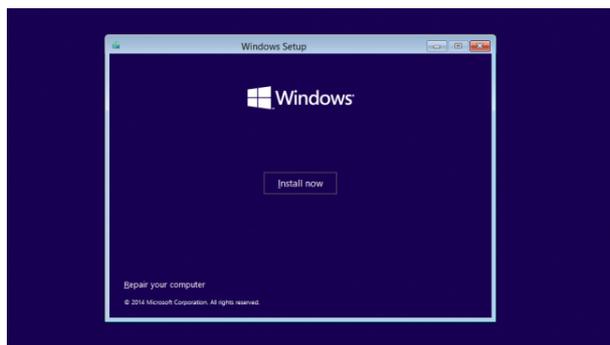

5. To install Windows, you need a partition on your hard drive for storing system files; this will become the main C: drive. You can either pick an existing partition and format it or delete everything and create new partitions.

- Note: If you haven't yet backed up your hard drive, you may want to stop now, back everything up, and start over. Once you've deleted a partition, you won't be able to recover the data previously stored on it.

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You can either use one of the existing partitions on your hard drive by formatting it, or you can delete the ones there and create new ones from fresh instead:

- To use one of the existing partitions, select it and click **Format**.
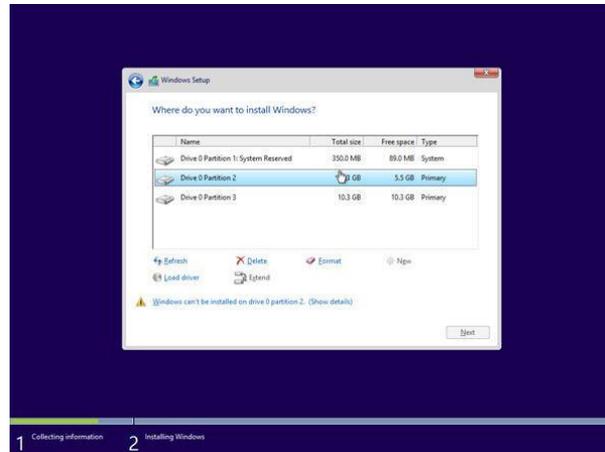
- To delete the existing partitions, select each one and click **Delete**, then **OK**.
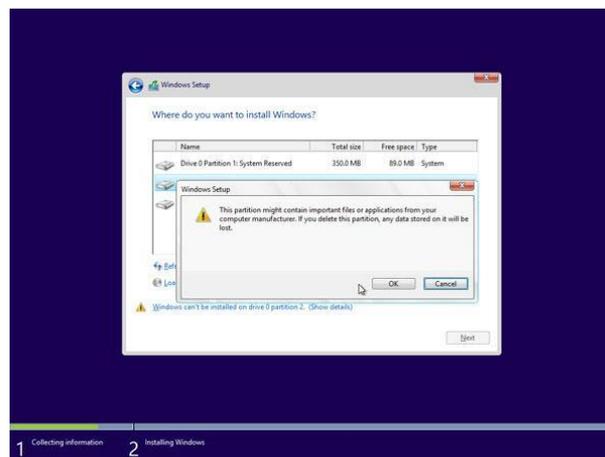
6. If you've deleted all the existing partitions, your hard drive's space will be unallocated, and you'll need to create new partitions. If you just formatted an existing partition, then skip to Step 7 now. **To** create new partitions:

- Click **Drive options (advanced)**.
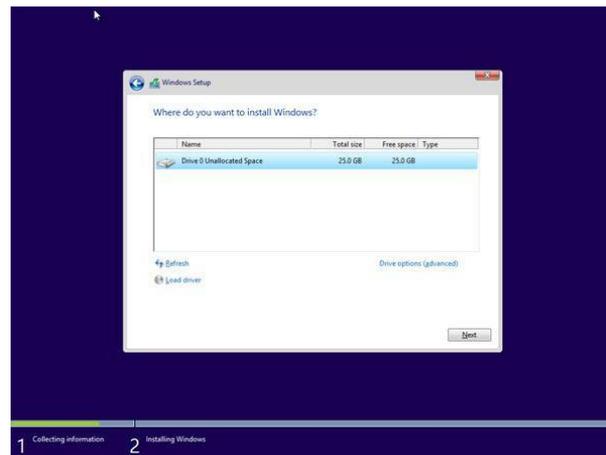
- Now click **New** and choose the size for your new partition, then click **Next**.
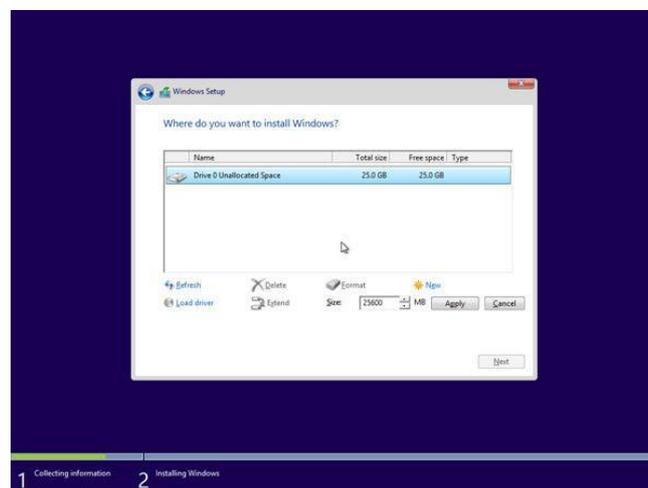
- Windows will now create a new partition for storing system files. Click **OK** to accept.
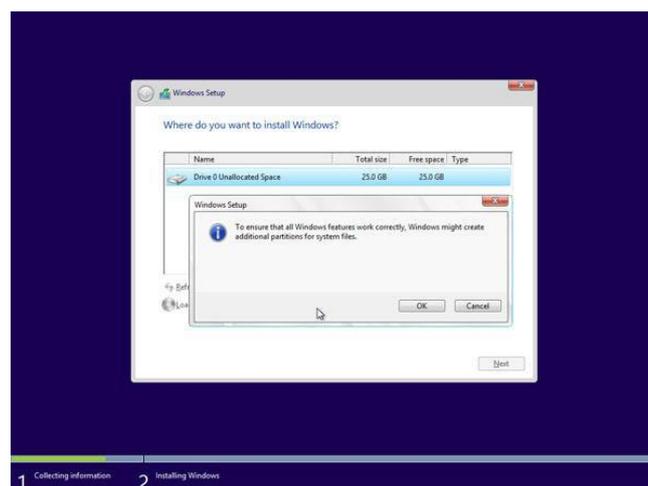
- Repeat this process if you wish to create more partitions. **Once** you've finished creating all the partitions you want, format each one except for the partition you want to store your Windows system files, select

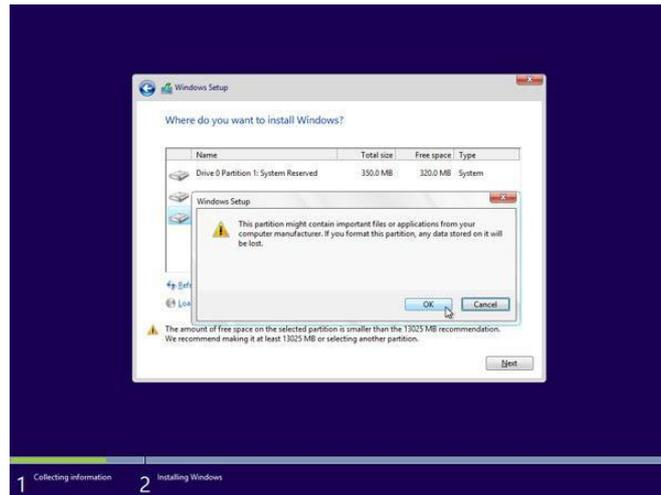the partitions one by one, and click **Format**, then **OK** when prompted.

7. Now select the partition where you want to install Windows and click **Next**. The Windows 10 installation will begin. Your computer may reboot a few times during the process. This is normal.

8. After the installation is complete, your computer will automatically restart one last time. When it starts up again for the first time, you'll be able to choose more of your settings or use express settings recommended by Microsoft.

9. Finally, sign in to your Microsoft account to use some of the new features with Windows 10, such as password recovery, and to access One Drive. If you don't want to sign in with your Microsoft account, click **Skip this step** and follow the instructions to create a local user account instead.
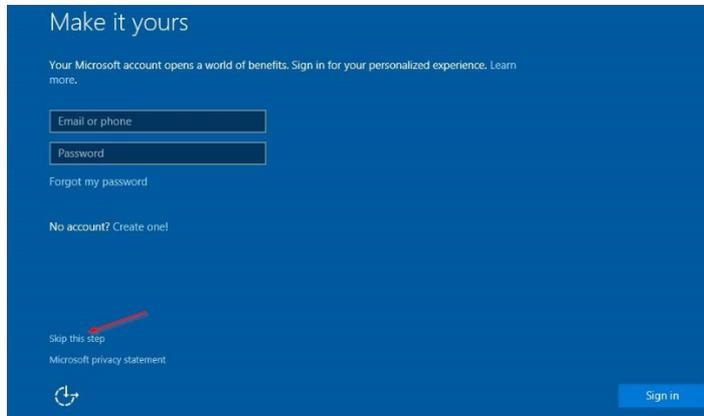
📖 Summary

- Software provides the means for you to interact with the computer's hardware by entering and receiving information through the user interface.
- A computer relies on two main types of software, **application software,** and **system software**.
- **System software** is the software that runs a computer and includes the operating system and utility programs. An operating system is a software that coordinates the resources and activities on a computer.
- **Application software** is the software you use most directly to complete a specific task or to create something electronically.
- There are 4 types of Operating systems:
  - Personal computer OS: Operating systems installed on a single computer are called personal or desktop operating systems.
  - Mobile OS: A mobile operating system is designed for a small handheld computing device such as a smartphone or tablet.
  - Emended OS: An embedded operating system is included in the hardware of a standalone device.
  - Server OS: resides on a server and is used to manage a network, which is a group of two or more computers linked together.
- The technical tasks an operating system performs include completing start-up steps, managing memory, processing input, and output, controlling hardware, and ending a computer session.

👤 Questions

1. What is Software? How many types? Describe it.

2. What is an Operating system?

3. What is the difference between a Personal Operating system and a Server Operating system?

4. Describe the task of the operating system.

5. What do you need before installing the Operating system?

Lesson 40

Software Management

Introduction:

In this lesson, you learn about installing application software, utility programs, and operating systems on various types of computing devices, including desktop computers and mobile computers.

after completion of this lesson, you should be able to:

- ✓ Describe how to install various types of software.
- ✓ Identify the tasks a setup program performs during installation.
- ✓ Explain when and how to uninstall software.
- ✓ Describe how to reinstall software, including operating systems.
- ✓ Identify types of software licenses.

In this lesson you will learn:

I.   Installing software
II.   Uninstalling software
III.   Reinstalling software
IV.   Reinstalling Operating system

Lesson 40 Software Management

I. Installing Software

When you purchase a personal computer, it already contains software such as the operating system, utility programs, and some basic applications, so you can use the computer as soon as you turn it on. Eventually, you may want to install other software to perform productivity tasks, enjoy games and other entertainment, and add tools that enhance the operating system or improve system performance. Recall from Lesson 2 that when you install software, you move a copy of the software from its distribution location to your computer. A ***setup program*** is included with the software to guide you through the installation steps and prepare the software so you can use it on your computer.

The method you use to install software varies depending on the type of personal computer you are using, the type of software you are installing, and how it is distributed. You typically install four types of software: desktop applications, Windows 8 apps, mobile apps, and utility programs such as drivers and system tools. Recall that a desktop application is a program that opens and runs in a window on the desktop. The term usually applies to Windows applications but includes those for Mac and Linux applications. You install desktop applications on desktop computers and laptops.

As you know, a Windows 8 app is one you start from the Start screen; it then takes up the entire screen instead of opening in a window on the desktop. You can install and run Windows 8 apps on a desktop computer, laptop, or tablet with Windows 8 installed.

A ***mobile app*** is specifically designed for a handheld computer, such as a tablet or smartphone. For example, applications developed for Windows RT are mobile apps, as are those created for the Apple iPad and Android phones.

1. Overview of Installation Steps

You can install software using one of three distribution methods: a CD or DVD, a compressed file on a Web site, or a store app, such as an Apple App Store app or a Windows Store app. If you receive software on a CD or DVD, you insert the disc in a CD/DVD drive on your computer and wait for the setup program to start. If the setup program does not start automatically, display the files on the disc using a file manager such as File Explorer, and then double-click the setup program file, which usually has a name similar to setup.exe. See **Figure ##**.
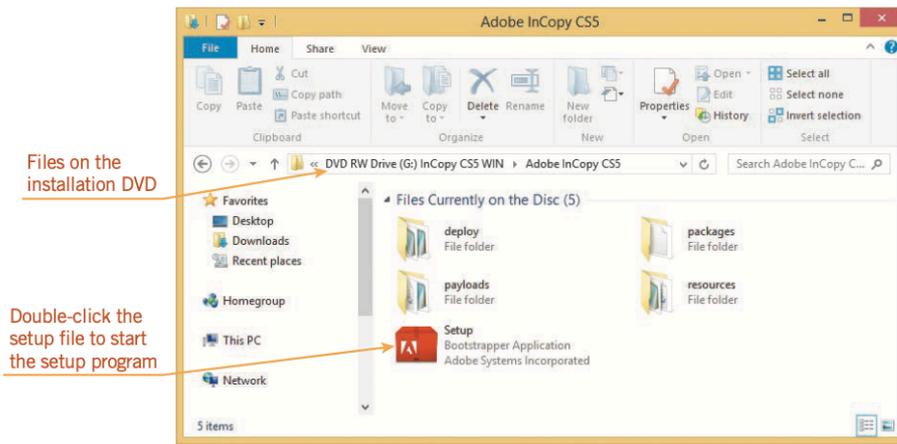
The setup program guides you through the steps to install the software, including choosing the components you want to install and selecting a folder for the software. See **Figure ##**.
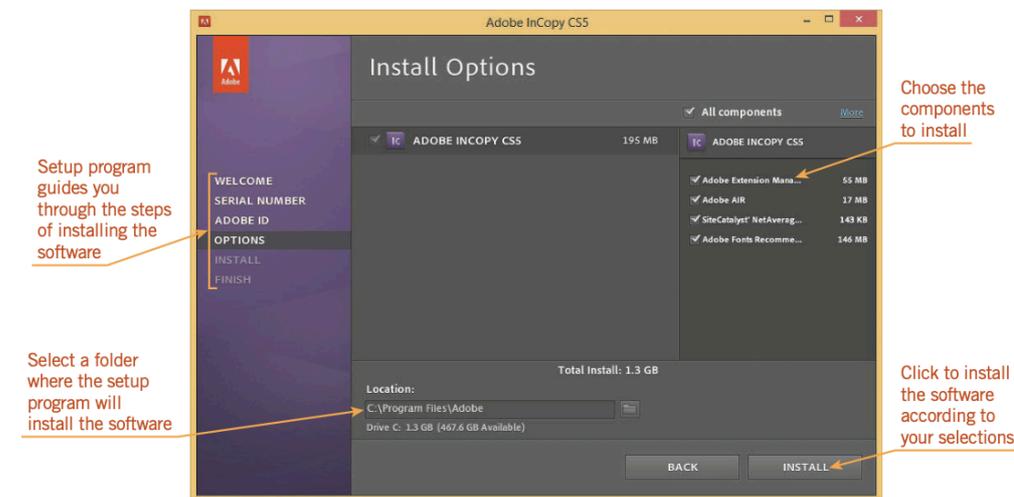
Another way to install software is from a Web site, such as one provided by a software developer or publisher. In this case, the software and a setup program are contained in a single compressed file available on the Web site. To install software using this distribution method, you select options on a Web page, such as the operating system you are using and the language for the software, and then click a link or button to download and save the compressed file on your hard disk. See **Figure ##**.
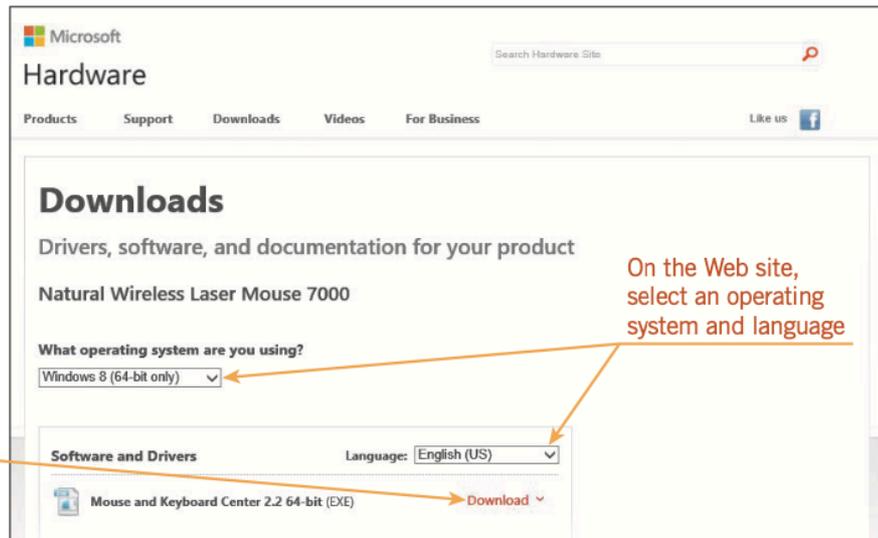
Usually, the setup program starts as soon as the file is downloaded. If it does not, you use a file manager to extract the files from the compressed file and then double-click the setup.exe file to start the setup program. If the compressed file is not too large, you can bypass saving and extracting the files by running the setup program immediately instead. **Figure ##** illustrates the process of installing a mouse driver from a compressed file on a Web site to a computer running Windows 8.
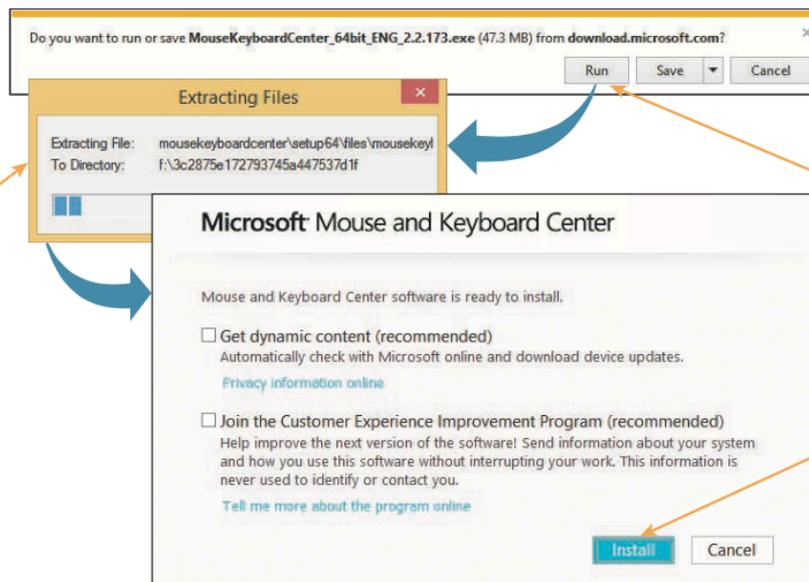
Store apps such as the Windows Store, the Apple App Store, and the Google Play Store provide access to apps designed for a particular operating system. For example, you use the Windows Store app to display apps available for Windows 8 and Windows RT. On an iPhone or iPad, you select the App Store icon to visit the Apple App Store and display apps available for iOS. See **Figure ##**.

Use the App Store icon to visit the Apple App Store

Apple App Store

Review the available mobile apps

When you find an app you want to install, you use a button or link to purchase it, if necessary, and then download and install it automatically. See **Figure ##**.

Tap the Install button to download and install the app
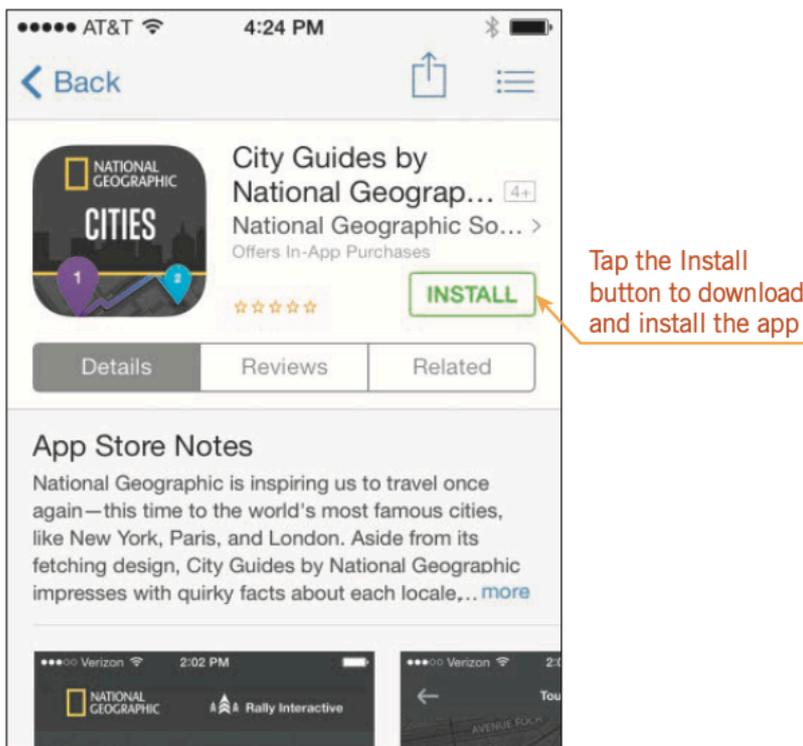
2. Installation Tasks

Depending on the size of the files, installation can take from a few seconds to several minutes if you are installing a desktop application, mobile app, or utility program. Installing an operating system takes longer, sometimes up to an hour, and requires you to restart your computer one or more times.

If you are installing software on a personal computer, the setup program typically performs the following tasks:

- ▪ *Copies files*—The setup program copies files from the distribution location to your hard disk and then creates a log to indicate where it stores files during installation.

- ▪ *Extracts files*—If the files are stored in a compressed file, the setup program extracts them so they can all be used in the installation. The setup program might also create folders and subfolders for the files, usually in a folder in the root directory named Program Files or Program Files (x86). For example, Microsoft Office has stored in subfolders of the Program Files ▶ Microsoft Office folder. This program folder contains most of the files the application needs to run. (The setup program also stores a few files in system folders.) The program folder is different from the folder where you download the files and where the setup program extracts them. If the files in the program folder are corrupted, you can use the extracted files to reinstall the software.

- ▪ *Checks for existing versions of the software*—The setup program scans for other versions of the software. If it finds an earlier version, it might need to uninstall it first, or it might be able to use files already installed on your computer. If it finds the current version of the software and all the files are up to date, the setup program stops and displays a message indicating the software is already installed.

- ▪ *Verifies system requirements*—The setup program checks system components, such as RAM and the hard drive, to ensure they have enough capacity to run and store the software. If your computer does not meet the minimum system requirements, the setup program stops and displays a message describing the problem.

- ▪ *Finds drivers and other system files*—If you are installing application software, the setup program looks for and activates drivers the software uses, such as printer drivers. It also looks for system files it might need to provide services such as Internet access.

- ▪ *Updates system files*—The setup program provides configuration data to the operating system so it can run the software. On a Windows computer, this information is stored in the Windows *registry*, a database of information about your computer's configuration.

- ▪ *Provides a way to start the software*—The setup program adds a button, icon, or tile to the graphical user interface so you can start the software. For example, it adds a tile to the Windows 8 Start screen or an icon to the iPad home screen.

II. Uninstalling Software

You can uninstall almost any software installed on your computer, including applications, utility programs, and operating systems. You typically uninstall an application if you no longer use it. Doing so frees up space on your hard disk, sometimes a significant amount of space,

depending on the software. To uninstall a desktop application from a Windows computer, you use an ***uninstaller***, which is a tool similar to a setup program. Uninstallers are provided with installed software so you can completely remove the software from your computer. Suppose you delete the program folder of a Windows desktop application. In that case, system files still contain configuration settings and other data that can slow system performance or prevent the operating system from loading correctly. In addition, most Windows applications store files in more than one folder, and you need the uninstaller to track them down. You use a Control Panel tool called Programs and Features to start an uninstaller that completely removes a desktop application from your computer.

In most cases, you can uninstall a desktop application from a Mac by dragging the application's icon to the Trash, a Mac OS X tool similar to the Windows Recycle Bin. Mac OS X performs a few clean-up tasks behind the scenes. Larger applications or those that interact with other applications, such as Microsoft Office for Mac, pro- vide an uninstaller that you use to remove an application thoroughly.

To uninstall a Windows 8 app, right-click the app's tile on the Start screen or Apps screen, and then click the Uninstall button on the Apps bar. See **Figure ##.**   The app's uninstaller takes care of completely removing the software from your computer.
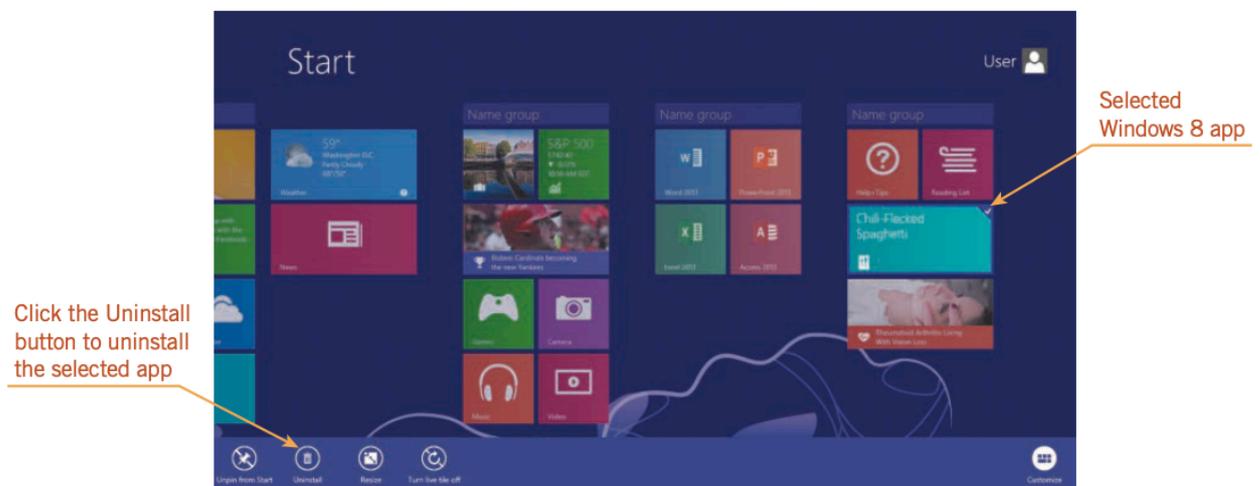
To uninstall a mobile app from an Android tablet or smartphone, you use the Application manager on the Settings menu. The Application manager lists all the apps installed on the device. You select the app you want to uninstall and then tap the Uninstall button. Uninstalling is even more straightforward on an iPhone, iPad, or iPod Touch: you press and hold the app's icon until the icon begins to shake and a circled X appears on the icon, and then you tap the X to uninstall the app. See **Figure ##.**

Press and hold an icon until the circled X appears, and then tap the X to uninstall the app
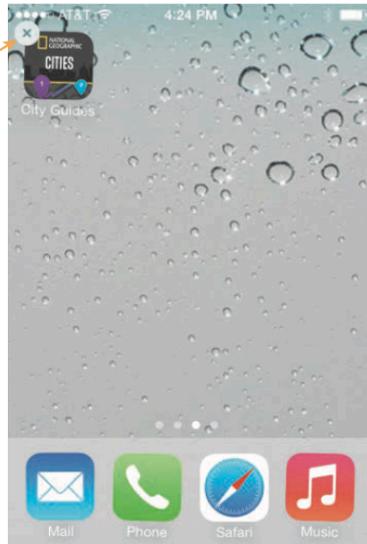
You can also uninstall a driver or utility program if you are having trouble with a device or no longer use the program. In addition, a hardware manufacturer might instruct you to uninstall a driver if you upgrade to new hardware, such as a monitor or video card. In all cases, you should use an uninstaller to uninstall the driver or utility program from your computer so you can remove the files as safe as possible. Uninstallers for some system tools are listed in the Programs and Features window that you access from the Control Panel. Others are included with the tool itself. For example, as you learned in Lesson 5, you can open the Properties dialog box for a device, click the Driver tab, and then click the Uninstall button to uninstall the driver. Uninstalling an operating system means deleting it from your computer. If you don't immediately replace the deleted operating system with a new one, your computer won't run. You might want to uninstall the operating system when you are preparing to recycle a computer and need to remove any personal information, such as passwords, stored in system files. In that case, you should first back up and then thoroughly remove all of your data. You can use a system tool called a disk wiper or disk eraser to uninstall the operating system and remove your data at the same time. If you are selling or donating your computer, you can wipe the disk and then reinstall an operating system from CDs or a DVD, so the new owner has an operating system to work with.

1. Uninstalling Tasks

If you are uninstalling software other than an operating system on a personal computer, the uninstaller typically performs the following tasks:

- ▪ *Deletes files*—The uninstaller refers to the log created by the setup program to locate and then delete the software's files.

- ▪ ***Restores system settings***—If the setup program changes system settings, the uninstaller restores them to their original settings. On a Windows computer, this includes registry entries. The uninstaller refers to the setup log again and reverses the changes to the registry.

- ▪ ***Restores the graphical user interface***—The uninstaller removes the button, icon, or tile for starting the software from the graphical user interface.

III. Reinstalling Software

If you've installed software, but it's not running properly, you can reinstall it. For example, if you install a desktop application, Windows 8 app, or mobile app, try to start the software as usual, and then discover that the application doesn't start, you can uninstall the software and try installing it again on the same computer. Reinstalling can replace files that might have become corrupted during or shortly after installation. In fact, corrupt or missing files are the most common cause of software problems, and uninstalling and then reinstalling is the easiest way to solve it.

To reinstall a desktop application, Windows 8 app, or mobile app on the same device as the original software, you can complete the following general steps:

1. Uninstall the software as described in the "Uninstalling Software" section of this lesson.

2. Restart the computer. This resets the computer and frees system resources, greatly reducing the possibility of corrupting a file.

3. Install the software as described in the "Installing Software" section of this lesson. If possible, select a Web site or store app as the distribution location so you can install a recent version of the software.

4. If the setup program prompts you to check for and install updates, choose the option to do so. In most cases, it's best to install the most recent version available.

Developers of system software don't usually require you to uninstall programs such as drivers before reinstalling the software. If you received the software on a CD or DVD, which might be the case with drivers for the hardware you purchased, you can insert the disc in a CD/DVD drive and wait for the setup program to start or double-click the setup.exe file in File Explorer to start it yourself. If updates have been installed for the drivers, the software on the disc is probably older than the software currently installed on your computer. In this case, reinstalling the software replaces the most current drivers with older drivers that might not be compatible with new hardware.

IV. Reinstalling an Operating System

If an electrical storm, power surge, virus, or another threat causes system problems severe enough to prevent your operating system from running normally, you can reinstall it. Most set-up programs or the operating systems themselves provide an option to install a fresh copy of the operating system while retaining your data and settings. Some also retain your application software. For example, you can reinstall Windows 8 using a Refresh option that retains your original Windows 8 apps, though not your desktop applications. You'll learn how to refresh Windows 8 next. You can reinstall other operating systems as follows:

- *Mac OS X*—You can reinstall Mac OS X by choosing the Restart command on the Apple menu and then holding down the Command+R keys as the computer restarts. When an option to reinstall Mac OS X appears on the screen, click it to download and install the software from an Apple server. (You must be connected to the Internet to reinstall.) Follow the on-screen instructions to complete the reinstallation. Reinstalling keeps your data files and settings intact.

- *Linux*—The method to reinstall varies depending on the Linux distribution. For most distributions, you reinstall using your original installation media, which overwrites all the files except your data files. However, you can back up the files containing your settings and then restore the files to your fresh installation of Linux.

- *iOS*—You can reinstall or update iOS by connecting your smartphone or tablet to the Internet or to a computer where iTunes software is installed. (iTunes is the software you use to play, download, and organize digital media files on a personal computer.) With the first method, you use the General category in the Settings app to select the Software Update command and then follow the on-screen instructions. To use iTunes, you connect your smartphone or tablet to a desktop or laptop computer running iTunes. On the iTunes menu, click Check for Updates and then follow the on-screen instructions to reinstall iOS.

- *Android*—You can reinstall or update Android by using the Settings app. Select a command called About Tablet or something similar, and then choose System Updates to check for an update or reinstall Android. Manufacturers of Android smartphones and tablets also send notices about updates to their firmware when it's available. (Recall that firmware consists of instructions stored on a ROM chip, so it is a combination of hardware and software.) To reinstall firmware on your own, however, you need to contact the manufacturer directly and then send the device to them for reinstallation.

Windows 8 includes the Refresh tool, which installs a fresh copy of Windows on your computer and retains your data, settings, and original Windows 8 apps, but not desktop

applications. The Refresh tool is designed to reinstall Windows 8 if your system is unstable; that is, you can start the computer and run applications but receive error messages or have trouble opening and using system tools. If you are having problems even starting Windows, you can use the Reset tool to remove all of your files and applications, reinstall Windows, and then change all of your system settings to their defaults. The Reset tool is also ideal if you are disposing of your computer or giving it away because it removes all of your data and personal information.

While using the Refresh or Reset tool, Windows needs to access setup files stored on its installation or recovery medium. You could use the original installation medium (such as the USB drive or DVD containing the setup program and files) or a system recovery disk if you made one during the original installation of the operating system.

📖 Summary

- When you install software, you use a setup program to guide you through the steps of copying the software from its distribution location to your computer and then preparing the software so you can use it.

- The method you use to install software varies depending on the type of personal computer you are using, the type of software you are installing, and how you access it. You typically install four types of software: desktop applications, Windows 8 apps, mobile apps, and utility programs such as drivers. You obtain the software one of three ways: CD or DVD, a compressed file on a Web site, or a store app.

- To install software, a setup program copies and extracts files, checks for existing versions of the software, verify system requirements, finds drivers and other system files, updates system files, and provides a way to start the software. To uninstall a desktop application from a Windows computer, you use an uninstaller, which is a tool similar to a setup pro- gram that completely removes software from your system. To uninstall a Windows 8 app or mobile app, you use an Uninstall command.

- You might need to uninstall a driver if a hardware manufacturer instructs you to do so. You can also uninstall utility programs if you no longer use them. In these cases, you should use an uninstaller provided by the software to uninstall the software from your computer so you can remove the files as safe as possible.

- You rarely need to uninstall an operating system, though you might want to uninstall one when you are preparing to recycle a computer and need to remove any personal information, such as passwords stored in system files.

- When you use an uninstaller, it deletes the software's files, restores system settings, and restores the graphical user interface.

- If you've installed software, but it's not running properly, you can reinstall it. Reinstalling can replace files that might have become corrupted during or shortly after installation.

- If a threat such as an electrical storm causes problems severe enough to prevent your operating system from running normally, you can reinstall the operating system. In most cases, you can use an option to install a fresh copy of the operating system while retaining your data and settings.

- To reinstall an operating system, the computer needs to access setup files stored on the installation or recovery medium. Most desktop operating systems let you create a system recovery disk, which contains tools and files to help restore a computer if a serious system error occurs.

Questions

1. What are the three factors that determine the method you use to install software?
2. How do you install software provided in a compressed file on a Web site?
3. What are the seven tasks a setup program typically performs to install software?
4. After you download and install a Windows desktop application such as Free Alarm Clock, how can you verify it has been installed successfully?
5. What are two reasons to uninstall application software?
6. How do you start an uninstaller to uninstall the software from a Windows computer?
7. What types of situations might you want to reinstall an operating system?

Lesson 41

Software Usage

Introduction:

In this lesson, you learn about the purpose and use of application software, including word-processing applications, presentation software, spreadsheets, and databases. You also examine applications for desktop publishing, entertainment, and media editing. Finally, you explore typical utility programs, including those that compress files, manage disks, and scan for malware.

after completion of this lesson, you should be able to:

- ✓ Define productivity software.
- ✓ Describe word-processing, desktop publishing, and presentation software.
- ✓ Compare spreadsheet and database software.
- ✓ Describe entertainment and media-editing software.
- ✓ Use typical software tools for maintaining a computer.

In this lesson you will learn:

I.   Using software
II. Using Software tool

Lesson 41 Software Usage

I. Using Application Software

The range of application software covers nearly every task you might need to perform, including producing documents and other types of work, exchanging electronic messages, accessing Web pages, watching movies, and playing games. In this lesson, you explore three types of applications: productivity, entertainment, and media-editing applications. You use productivity applications to perform work and other activities effectively. Productivity applications include word processing, spreadsheet, database, desktop publishing, and presentation software. Entertainment software is designed for viewing or playing music, videos, and photos, while media-editing software is designed for creating and modifying graphics, animations, videos, music, and other media.

Related applications are often packaged together and distributed in a *software suite*. For example, Microsoft Office, Apple iWork, Google Docs, and Apache OpenOffice are considered office suites because they typically include word-processing, spreadsheet, and presentation applications that are useful in a professional or business setting. Many office suites also include a database or an e-mail application. Media-editing applications can also be provided in suites such as Adobe Creative Suite and CorelDRAW Graphics Suite, which include software for editing photos, creating graphics, and developing animations.

Software suites offer some advantages over installing individual applications. The cost of a software suite is usually less than the cost of buying each application separately. The software in a suite uses the same interface, so you can apply the skills you learn in one application to the other applications. Suite software is also designed to work together, often by sharing content. For example, in an office suite, you can copy a chart created in a spreadsheet and paste it into a word-processing document. A disadvantage is that many people use one or two suite applications most of the time while rarely using the others, so the disk space consumed by the suite overall could be used more efficiently.

1. Word-Processing Software

You use word-processing software such as Microsoft Word, Apple Pages, Google Documents, and Corel WordPerfect to produce written documents such as reports, letters, memos, research papers, and flyers. As you are working on a document, you can enter and reorganize text, correct errors, insert graphics, and format the document before producing a final version.

A typical word-processing application such as Microsoft Word, shown in **Figure ##**, displays a work area where you create and edit a document and controls for viewing, formatting, and managing the document.
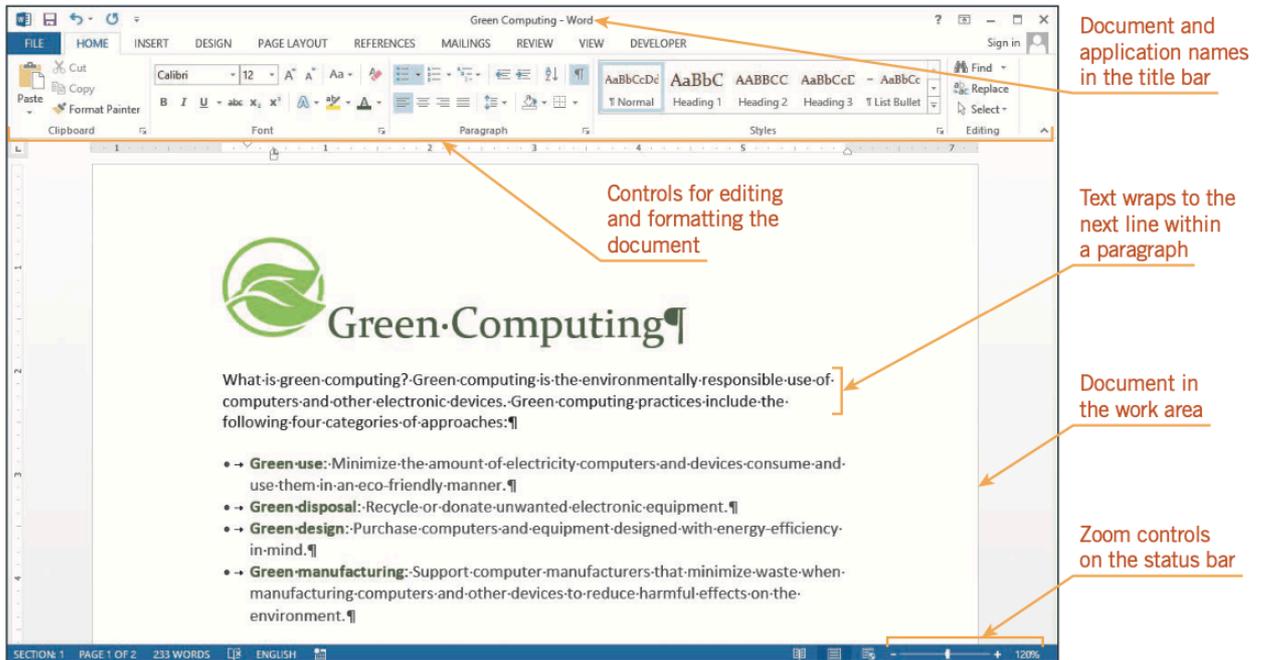

2. Spreadsheet Software

A *spreadsheet* is an arrangement of text and numbers in a rectangular grid or table. You use spreadsheet software such as Microsoft Excel, Open Office Calc, or LibreOffice Calc to organize numeric data in such a way that you can calculate, analyze, interpret, and present it. This type of software is ideal for tasks such as preparing budgets, balancing checkbooks, forecasting loan payments, and maintaining grade books.

A typical spreadsheet application such as Microsoft Excel, shown in **Figure ##**, displays a grid of columns and rows that can contain text, numbers, and formulas. Excel calls this grid a *worksheet* or a *sheet* for short.
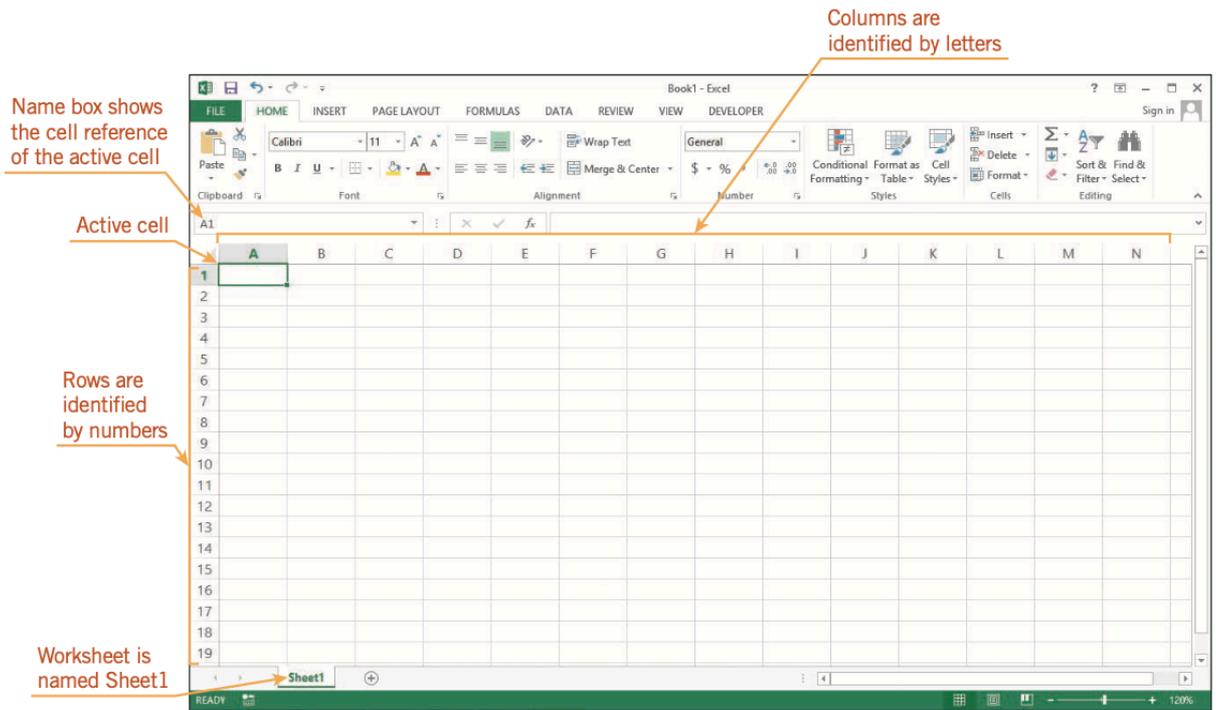
3. Presentation Software

You use presentation software, such as Microsoft PowerPoint, iWork Keynote, LibreOffice Impress, and Prezi, to organize and present text, graphics, and other media as a slide show. To guide you in creating a slide show with visual appeal, presentation software provides *layouts*, which are pre-set arrangements for slide content, including text and graphics. Layouts provide placeholders in which you can enter and edit the text in formats that audiences can view and read easily, including headings and bulleted and numbered lists. You can also use placeholders to insert tables, charts, pictures, and videos. **Figure ##** shows an example of a slide show created in presentation software.
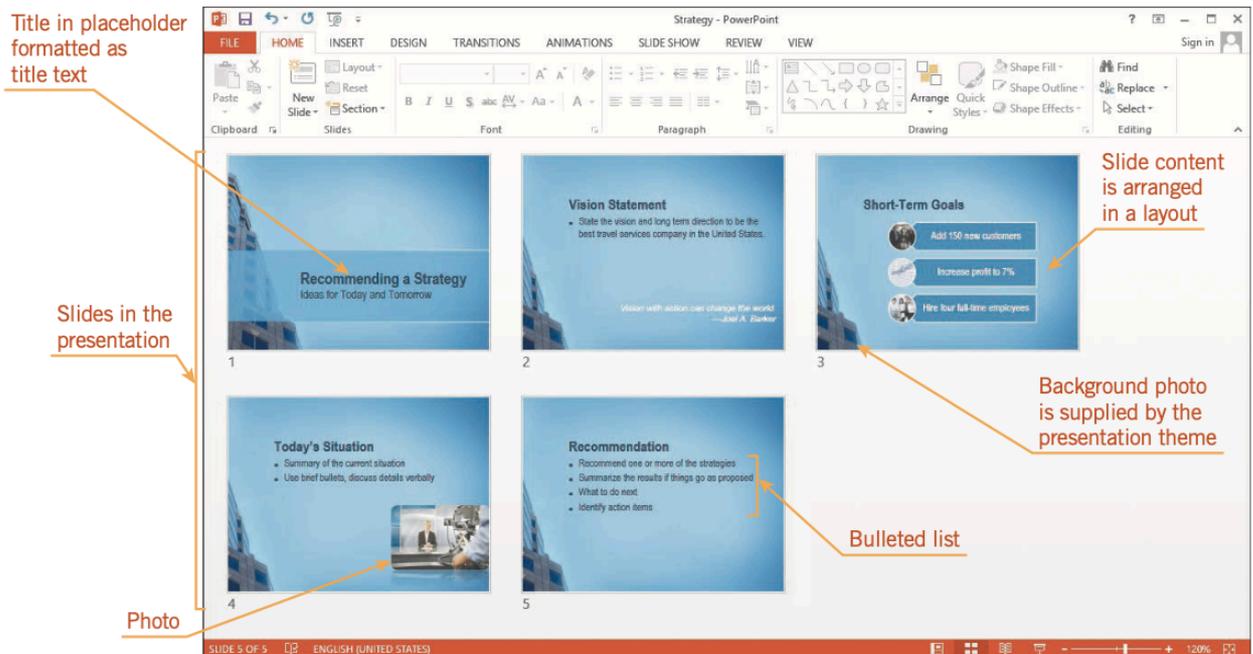
4. Entertainment Software

Entertainment software includes applications that let you download and listen to music or the radio, watch movies and television shows, and play games. Some applications, such as Apple iTunes, provide access to more than one type of digital media, including songs, movies, TV shows, and radio stations. Other software, such as music players, radio applications, and video players, concentrate on a single type of media.

A. Music and Video Applications

You use music applications such as Windows Media Player and iTunes to build a collection of digital music and arrange it into *playlists*, which are lists of songs or pieces of music organized in sequence, though you can also shuffle the order. You can play the music files on a computer or transfer them to a handheld device such as a portable media player. Mobile music apps such as Google Play Music and iTunes for iOS are especially popular because they are designed for listening to music on the go. Video player software includes QuickTime, RealPlayer, and the VLC media player; all of these applications also play music. You use the applications to play videos in a variety of file formats, organize videos into playlists, and set preferences such as displaying or hiding subtitles.
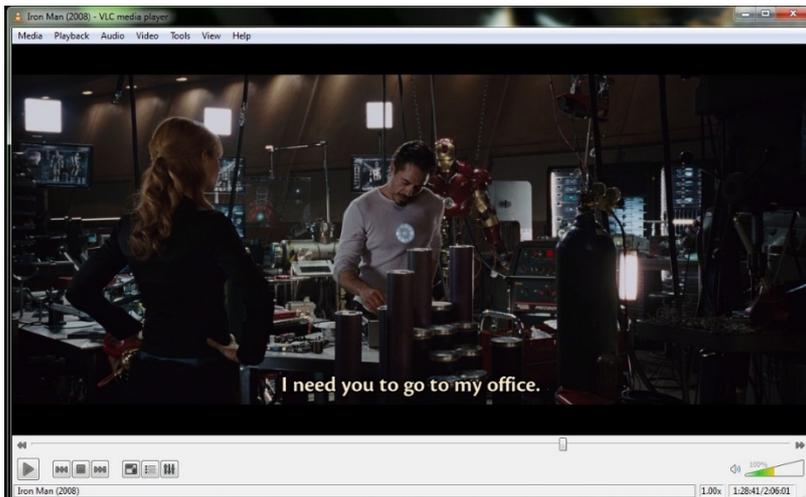
B. Game Software

Game software for personal computers is one of the most popular types of software that people use today. Some game applications are electronic versions of physical games, such as Solitaire or Scrabble, that have rules that are familiar or easy to grasp and can be played for short periods of time. They are sometimes called casual games because they require little time commitment to learn and play.

5. Desktop Publishing Software

Desktop publishing (DTP) software is similar to word-processing software because you use it to create documents containing text and graphics. However, DTP software includes more sophisticated features that enable you to use a personal computer to arrange text and graphics on a page to create and print high-quality documents such as brochures, magazines, newspapers, and books typically produced by professional typographers. Adobe InDesign, QuarkXPress, and Microsoft Publisher are examples of DTP software.
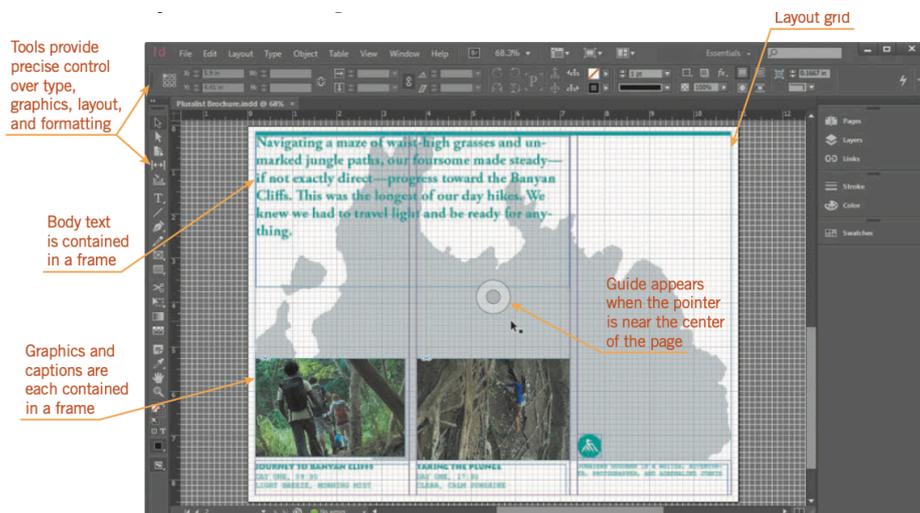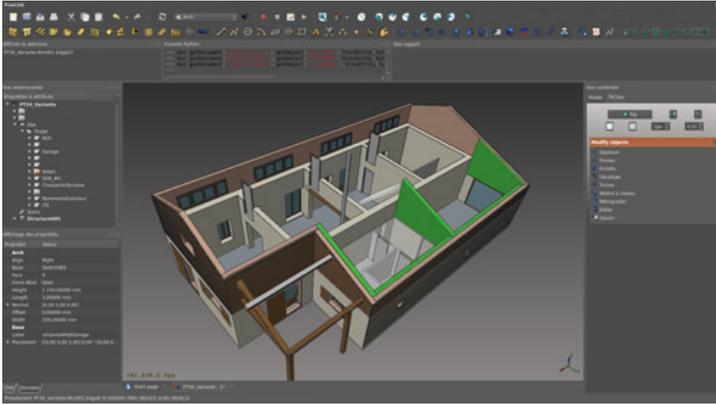
6. Media-Editing Software

If you acquire digital media such as music, video, and image files, you often need to edit them to suit your purposes. For example, suppose you want to make a short video demonstrating how to make sushi. You could use a digital video camera to record yourself making the sushi, select a music file to play at the beginning of the video, and take photos of the finished product to display at the end of the video. To fine-tune each component, you use graphics software to correct any flaws in the photos, music-editing software to play only a short segment of a song, and video-editing software to edit the video recording and produce it with the photos and music.

A. Graphics Software

You use graphics software such as Microsoft Paint, Adobe Photoshop, and CorelDRAW to create, edit, and print graphics, including pictures, drawings, photographs, icons, and other images. The three major types of graphics software are paint, photo editing, and drawing software. Paint software such as Microsoft Paint provides tools for painting the screen, which involves manipulating pixels by filling them with color. You can use paint software if you need to create a graphic on a Web page, for example, or any other object displayed on a computer screen.
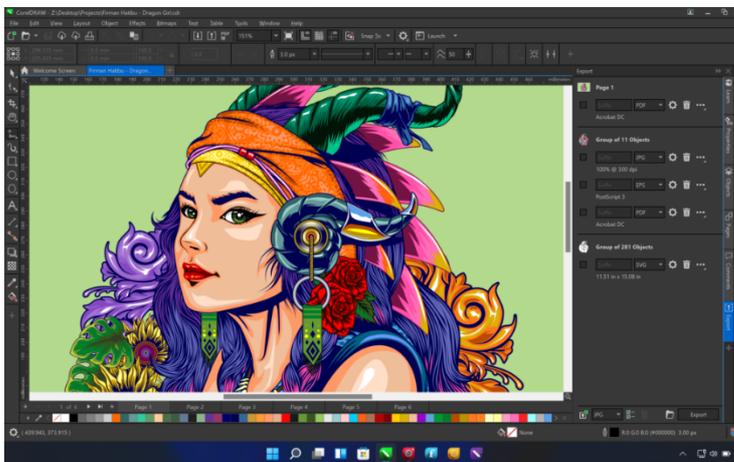
Unlike paint software, drawing software approaches a graphic as a set of geometric objects, including lines and closed shapes. Because of this approach, graphics created with drawing software can be resized without reducing the quality of the image, which is not the case with paint software. 3-D graphics software also uses mathematics to represent 3-D objects and allows users to rotate and view them from many angles. A special type of 3-D graphics software is *computer-aided design (CAD) software*, which professional designers use to create models of products, buildings, and other objects; engineering and technical drawings; and blueprints for architectural projects.

B. Video-Editing Software

When you use video-editing software such as Windows Movie Maker, Apple iMovie, or Camtasia Studio, you work with video segments called *clips*. You arrange the clips in sequence on a timeline or storyboard, add transitions between clips, insert titles, and zoom in and out to direct the viewer's attention.

C. Music-Editing Software

Music-editing applications such as Apple Garage Band, Music Maker Jam, and Finale are designed for people who want to record and edit their own music. You can use these applications to compose and record songs; change the volume, speed, and sound quality of recordings; add sound effects, and mix voices and instruments.

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8. Database Software

A *database* is a collection of data organized into tables, such as a collection of baseball cards, an inventory of movie and TV show DVDs, or an address book of contacts. You use database software such as Microsoft Access, FileMaker Pro, or MySQL (pronounced "my sequel") to enter, organize, update, retrieve, and produce reports on the electronic data in a database.

All data in a database is stored in one or more tables composed of rows and columns, similar to spreadsheets.

II. Using Software Tools

Utility programs are tools you use to maintain your data files, software, and hardware *File utilities* include software that helps you manage files, convert files from one format to another, and thoroughly delete files. *Disk management utilities* include software that helps the operating system store files efficiently on a disk and removes unnecessary files. *Software utilities* include software updating tools, virus, and other malware scanners, and system monitors.

1. File Compression Software

File compression software is a type of file utility that reduces the size of a file by removing redundant data. You compress files before attaching them to an e-mail message, for example, so they can be transferred more quickly. When you receive a compressed file, you use the file compression software again to expand the file to its original size. Although operating systems provide file compression software, you can install separate utilities that perform the same tasks and include additional features such as encrypting the compressed files for extra security. **Figure ##** shows WinZip, a popular file compression utility for iOS.

        File compression software determines which redundant data to remove according to sophisticated *algorithms*, which are sets of rules a program follows in calculations or other

problem-solving steps. The algorithm for compressing a text file identifies patterns in the text, including certain characters or words that often appear together, such as "the" or "is the." The file compression software keeps track of this pattern in a log and substitutes the text for code. For example, instead of storing the words "is the" 25 times in a file, the software uses "1" as the code for "is the," which stores only one character instead of six. When the file is extracted, the software reverses the operation and substitutes "is the" for each code of "1." This type of compression is called *lossless compression* because it reconstructs the original file without losing any data. Lossless file compression methods can reduce text files by 50 percent or more. Files containing graphics or music do not include many redundant data, so file compression software does not use this kind of algorithm for compressing media files. Instead, it uses a *lossy compression* method, which removes data identified as unnecessary in the file. For example, suppose you want to compress a graphic with a white background. Although the background seems to be the same shade of white at normal size, when you use graphics-editing software to zoom into the background, you'll see that each pixel is a slightly different shade of white. Instead of retaining thousands of shades of white, file compression software changes the color value of some pixels, so the background is composed of only hundreds or dozens of shades, reducing the size of the file significantly. However, when you extract the graphic, the lost colors are not restored, meaning the graphic is not exactly the same as the original file because some data has been lost. You are unlikely to notice the difference in a graphics file, which is why these programs use lossy compression methods for graphics.

2. Disk Management Software

You use disk management software to maintain your hard disk by keeping it free of problems that could prevent you from accessing your data. A hard disk failure can be an inconvenience if you have backups of your data and a disaster if you don't. Disk management software helps you prevent disk failure from occurring in the first place by removing corrupted files and unnecessary files, blocking access to damaged parts of the disk, and arranging data for efficient retrieval.

You should use three disk management utilities regularly. One is a *disk cleaner*, which identifies files you can safely delete to free up disk space. Another is a *disk scanner*, or error-checking tool, which scans for disk errors, such as parts of corrupted files and damaged sections on the disk, and then repairs them. The third tool is a *defragmenter*, which can optimize the way files are stored on the disk. Desktop operating systems provide these utilities by default; you can download and install apps that perform these tasks on mobile operating systems.

In addition to cleaning, scanning, and defragmenting a disk, you can use compress it, which is similar to compressing files. A disk compression utility increases the amount of data you can store on a hard disk by compressing all of its files. Instead of selecting files to compress, as you do with a file compression utility, a disk compression utility works in the background whenever you store files on the hard disk.

In Windows 8, the disk cleaner utility is called Disk Cleanup, which you use in Step-by-Step 8.2. When you start Disk Cleanup, it searches your hard disk for unnecessary files, such as temporary Internet files and those in your Recycle Bin, and then lists the types of files. You can select each type of file to learn its purpose and determine whether you want to permanently delete those files from your hard disk.

To understand how an error-checking tool and a defragmenter work, recall that the surface of a hard disk contains concentric circles called tracks. Tracks are divided into blocks of 512 bytes, and each block is called a *sector* of the disk. The operating system assigns the file to one or more sectors to save a file on a disk. Each part of a file stored in a sector is called a *cluster* of data. Because most files are larger than 512 bytes (the size of one sector), the data in a file is usually divided among several clusters. A file system error known as a *lost cluster* occurs if the operating system loses track of which clusters contain the data that belong to a particular file. An error-checking tool identifies file system errors and can repair them if necessary. In addition, it can scan for and repair physical errors on the hard disk itself, including *bad sectors*, which are areas of the disk that do not record data reliably.

After correcting any errors on your hard disk, you can run a defragmenter to improve the disk's performance so that applications start and files open more quickly. (Most operating systems run a defragmenter according to a schedule, so you can also wait and let the operating system start the defragmenter for you.) When an operating system breaks a file into clusters, it attempts to place the data in adjoining sectors and usually does so successfully on a relatively new hard disk. When you delete a file, the operating system frees the sectors that contain the file's data. The next time you save a file, the operating system searches for the first available sector, stores a cluster of data, and then searches for the next available sector, which might not be next to the first one. The more files you save and delete, the more scattered the clusters for a file become. A disk that contains files whose clusters are not contiguous or next to each other is said to be fragmented. See **Figure ##**.
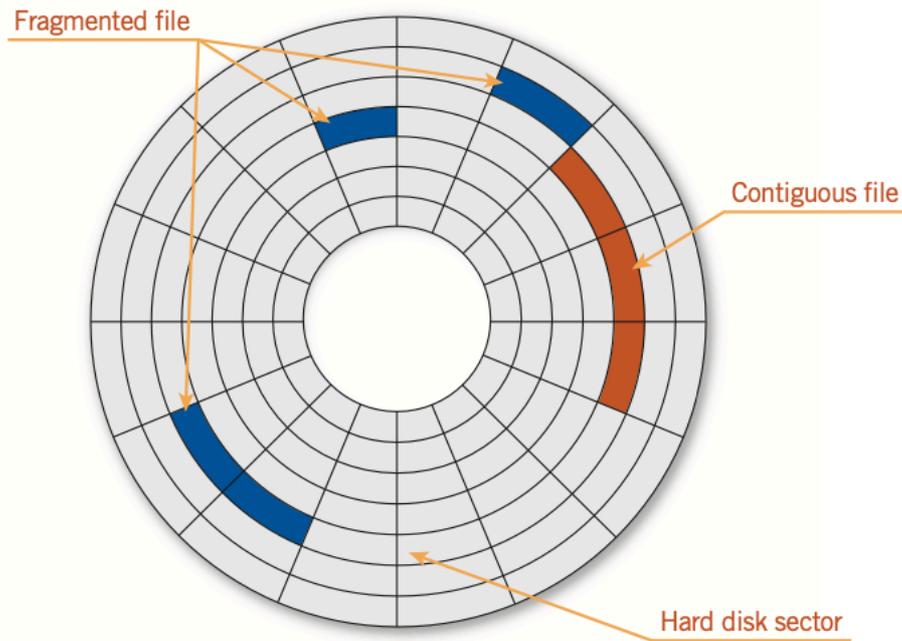
The more fragmented the disk, the longer the operating system takes to retrieve the file, and the more likely you are to have problems with the file. When an application tries to access a file on a fragmented disk, file retrieval takes longer than necessary because the application must locate clusters that aren't adjacent. Defragmenting rearranges the clusters on the disk, so each file's clusters are adjacent to one another. When a disk is in this state, it is said to be optimized.

3. Malware and Antivirus Software

When you connect to the Internet, receive an e-mail message, or share your computer or files with others, your computer is vulnerable to harm from people who might attempt to access confidential information or damage your files. They can do so through *malware*, which is short for malicious software. Malware includes computer viruses, worms, Trojans, bots, and spyware. By copying itself and triggering computer code, a *virus* can infect your computer and damage your files and system settings. Viruses are often transmitted through e-mail attachments or downloaded files, but they don't spread until you open the infected attachment or file.

In contrast, a *worm* is harmful computer code that spreads without your interaction. A worm slips from one network connection to another, replicating itself on computers. As it does, a worm consumes network resources and overwhelms computers until they become slow or unresponsive.

Another type of malware is a *Trojan*, also called a Trojan horse, which is malware that hides inside another program, such as a browser toolbar you download from the Web. When you install the toolbar, the Trojan infects the operating system, allowing a hacker to access your computer. If attackers access your system through a Trojan, they might install a *bot*, short for robot, which is a program that runs repetitive tasks. Bots can control your computer without

your knowledge to perform illegal activities such as sending massive amounts of spam (electronic junk mail).

Spyware can also install itself or run on your computer without your consent or control. As its name suggests, the spyware monitors your computing actions, usually while you are online, to collect information about you. Sometimes, spyware passes information about your Web browsing habits to advertisers, who use it to improve their products or Web sites. Other times, a special type of spyware called adware changes your browser settings to open pop-up ads, which are windows that appear while you are viewing a Web page and advertise a product or service. Pop-up ads interrupt your online activities and can be difficult to close; they can also be vehicles for additional spyware or other types of malware.

Common symptoms of malware are when your computer runs much slower than normal, messages appear unexpectedly, programs start or close on their own, or the operating system shuts down suddenly.

To defend against malware, you should install and run antivirus software on your computer and then keep it up to date because new malware is released frequently. Antivirus software blocks potential malware, scans your computer and safely removes viruses, worms, Trojans, and bots. Some antivirus software also scans for spyware. **Table ##** lists some popular antivirus software for Windows, Mac OS X, iOS, and Android. Mobile operating systems are well protected against malware because they exclusively use online stores to distribute apps, and developers can tightly control the software offered at online stores.

OPERATING SYSTEM	SOFTWARE	DETAILS
Windows	Norton Antivirus	Also available for Mac OS X and mobile operating systems
	McAfee Antivirus	Also available for Mac OS X and mobile operating systems
	Windows Defender	Runs automatically if no other antivirus software is installed
Mac OS X	Sophos Anti-Virus for Mac	Freeware; also scans for Windows malware you might send via e-mail
	Avast! Free Antivirus for Mac	Freeware; scans only for Mac malware
	XProtect	Included with Mac OS X; scans downloaded files for malware
iOS	VirusBarrier	Scans files on a Mac or PC before transferring them to an iPhone or iPad
Android	Lookout Security	Comes preinstalled on Samsung devices
	Kaspersky Mobile Security	Also available for all other operating systems except iOS

📖 Summary

- You use productivity applications to perform work and other activities effectively. Productivity applications are often bundled together in a software suite.

- You use word-processing software to produce written documents such as reports, letters, memos, research papers, and flyers. Features in word-processing software help you reduce the number of errors in a document and improve the quality of your writing. They also provide formatting features so you can make documents look professional and appealing, and include collaboration features for working with other users.

- Desktop publishing software is similar to word-processing software because you use it to arrange text and graphics on a page. In addition, it includes tools for producing and printing typographic-quality documents and for sending files to a commercial printer.

- You use presentation software to organize and present text, graphics, and other media as a slide show. Layouts in presentation software guide you to arrange text and graphics on a slide. Presentation software also includes features to engage the audience and clarify ideas during a slide show, such as slide transitions and animations.

- You use spreadsheet software to organize numeric data so that you can calculate, analyze, interpret, and present it. You insert a formula to display the results of a calculation. If you use cell references in a formula, recalculation is automatic when data changes. The ability to update automatically makes spreadsheets especially useful when you need to perform what-if analysis.

- To help you visualize numeric data, spreadsheet software includes tools for creating charts (also called graphs). Charts show trends or relationships in data that you might not notice when examining columns or rows of numbers.

- You use database software to enter, organize, update, retrieve, and produce reports on the electronic data in a database. All of the data in a database is stored in one or more tables, which are composed of rows and columns, similar to spreadsheets. Each column in the table represents a field, and each row represents a record.

- A database file can contain objects, including tables, forms, queries, and reports. You use a form to enter data into a table. You use a query to request specific information that meets set criteria from the database. A report provides data as a formatted printout or display.

- Both spreadsheets and databases are designed for organizing, managing, and tracking data that is stored in columns and rows. If your focus is on using numerical data to make calculations or a quick analysis, create a spreadsheet. If your focus is on storing other types of data for the long term and manipulating it efficiently, create a database.

- Entertainment software includes applications that let you download and listen to music or the radio, watch movies and television shows, and play games.

- You use media-editing software to edit digital media such as photos and other pictures, music, and videos.

- You use graphics software to create, edit, and print graphics, including pictures, drawings, photographs, clip art, icons, and other images. The three major types of graphics software are paint, photo editing, and drawing software.

- Music-editing applications are designed for people who want to record and edit their own music. Video-editing applications are designed for people who want to create and edit videos. You import and then organize video clips, music clips, and other media clips and then publish them together in one video file.

- Utility programs are tools you use to maintain your data files, software, and hardware. File utilities include software that helps you manage files, convert files from one format to another, and thoroughly delete files. Disk management utilities include software that helps the operating system store files efficiently on a disk and removes unnecessary files.

- To defend against malware, you should install and run antivirus software on your computer and then keep it up to date because new malware is released frequently. Antivirus software blocks potential malware, scans your computer and safely removes viruses, worms, Trojans, and bots. Some antivirus software also scans for spyware.

Lesson 42

Computer Troubleshooting

Introduction:

In this lesson, you learn how to solve computer problems by following common troubleshooting steps, and then apply those steps to software and hardware problems. You use troubleshooting tools to identify and solve operating system and application software problems, and learn about resources for troubleshooting problems with computer components and peripheral devices.

after completion of this lesson, you should be able to:

- ✓ Describe typical software problems.

- ✓ Use troubleshooting tools provided by an operating system.

- ✓ Get help from online resources. n Describe symptoms of problems with hardware components. Identify common solutions to problems with peripheral devices.

In this lesson you will learn:
- I.   Approaches to Troubleshooting
- II.   Troubleshooting Software
- III. Troubleshooting Hardware
- IV.   Troubleshooting peripheral Device

Lesson 42 Computer Troubleshooting

I. Approaches to Troubleshooting

Suppose you are using your computer to complete a major project, and the deadline is fast approaching. As you work on the project, you're creating content in word processing, spreadsheet, and graphics applications and then combining the content into a presentation. As you copy and paste a chart onto the last slide, the presentation application closes suddenly. When you open the application again, a message appears indicating that the presentation you were working on is corrupt and cannot be recovered. Now, what do you do? If you are experiencing a computer problem like this example, you need to troubleshoot to solve the problem. Troubleshooting means taking a logical, systematic approach to identifying the source or cause of the problem and then applying a solution so that the computer normally works again. Troubleshooting typically involves the following four steps:

- ✓ **Define the problem**: Describe the trouble that you are having, being as specific as possible. For example, to define the presentation problem, you should note the name and version of the presentation application, the type of content you were trying to paste onto a slide, and the source of that content. Also, note the other applications you were running at the time the problem occurred and any system tasks the computer might have been running in the background.

- ✓ **Identify possible causes**: Consider obvious causes first, such as the original presentation file being damaged. Next, determine the last time you successfully performed the same steps with the software. Have you installed or uninstalled any software since then? If so, those actions are also possible causes.

- ✓ **Determine the most likely cause**: Work through a process of elimination to determine the most likely cause. Test each cause. For example, does the presentation software close unexpectedly each time you try to paste a chart from the spreadsheet software? If not, eliminate pasting a chart as the cause of the problem. If the presentation software does close each time, however, you have found the most likely cause.

- ✓ **Apply solutions**: As you test causes, keep track of possible solutions, and then apply each solution systematically. If pasting a chart from a spreadsheet application caused the problem, does updating one of the applications solve the problem? What about updating both applications? Try your task again to confirm that the solution restores the software to a reliable working state.

When you define the problem in Step 1 of the troubleshooting steps, you determine whether you are trying to solve a software or hardware problem. If the problem seems to involve only applications or the operating system, troubleshoot the software. If the problem occurs as the

computer starts, troubleshoot the operating system first. For other computer problems and those where software troubleshooting does not solve the problem, troubleshoot the hardware and peripheral devices.

1. Getting Help from Online resources

When you have any computer problem, you can find valuable troubleshooting information on the Web. The best sources are knowledge bases and online forums. A knowledge base is a collection of articles, videos, and other sources containing information about a product or topic. Software developers and hardware manufacturers provide knowledge bases to their users to help them solve problems. Typically, a technical support professional writes a knowledge base article to answer common questions or to explain how to work around a known flaw in the software. Knowledge base articles are often part of or linked to software Help topics. They are also available online at the support Web site of a software developer or hardware manufacturer. For example, to access the Microsoft knowledge base, you visit support.microsoft.com/kb. To access the Apple knowledge base, you visit kbase.info.apple.com. On the knowledge base Web site, your search for a topic by keyword the same way you search for any information on the Internet. Operating system knowledge bases include information about third-party software and their own software.

An online forum is a Web site where people conduct conversations by posting messages about a specific topic. Software developers and hardware manufacturers often host online forums where users can post questions or report problems they are having with the product. Other users or technical support people working for the software developer or hardware manufacturer answer the questions or help to troubleshoot the problem. The original message and all the responses to it are grouped together sequentially by topic. This group of related messages is called a thread. Threads are saved in an archive that you can search to determine if your problem has already been solved before you post a new message.

The Apple online forum is called the Apple Support Communities, which you can access from the Apple Web site. In Windows Help and Support, you can click the Microsoft Community website link to display the online forum for Microsoft software. See Figure ##
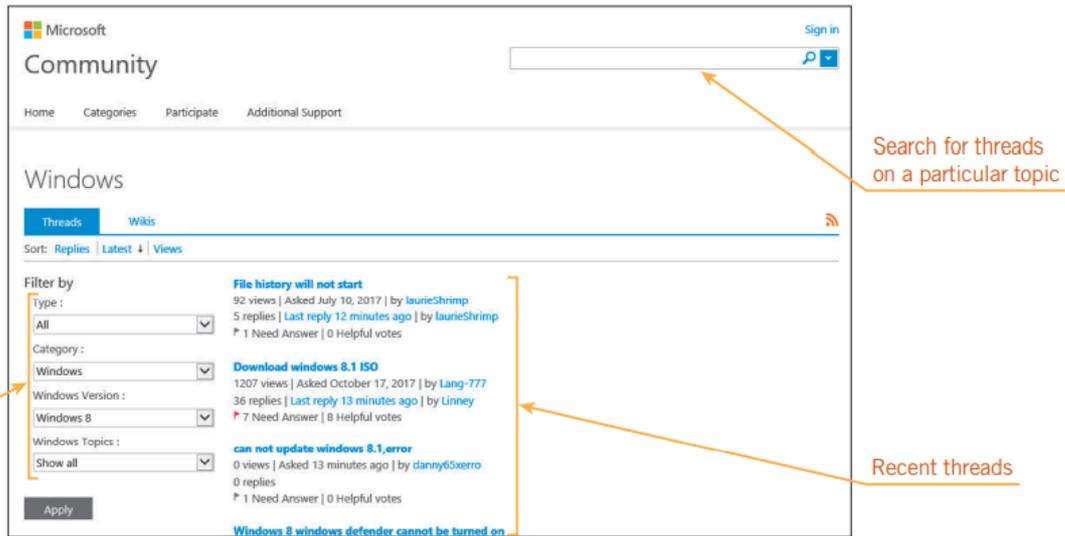
As you work through the four troubleshooting steps to define and solve computer problems, take advantage of online resources so you can learn from the experience of other users and from support professionals.

II. Troubleshooting Software

Software trouble ranges from minor difficulties, such as a feature that doesn't work as it should, to major problems, such as the operating system failing to start. Table ## describes the most common general software problems, their possible causes, and suggested solutions.

| PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Operating system does not start or starts and then freezes	Necessary file fails to load; background process starts before operating system starts completely	Restart the computer, and then update the operating system.
Newly installed software does not start	Corrupted or missing software files	Uninstall and then reinstall the software.
Newly installed software starts, but doesn't run correctly	Operating system might not be aware of changes in system settings	Restart the computer, and then restart the software.
Other software does not start or runs with errors	Software bug or conflict with other software	Check the software publisher's Web site for an update or setting change that can solve the problem; otherwise, uninstall one of the programs in conflict.

The following sections describe other solutions you can try when you are troubleshooting more specific software problems.

1. Using Troubleshooting Tools

Operating systems include diagnostic tools that help you troubleshoot software problems, including those with the operating system itself. If a Windows application starts but runs slowly or fails to respond to your commands, you can troubleshoot the problem with Task Manager. You can also troubleshoot Windows software problems using the Action Center, a Control Panel tool that helps you manage security and maintenance settings.

A. Managing Application Resources

You have already learned to use Task Manager to track the system resources (including CPU and memory) that applications, background processes, and Windows processes consume. You can also use this information to troubleshoot application problems. For example, suppose five applications are open and running on your computer, including Internet Explorer, Microsoft Excel, Microsoft PowerPoint, Microsoft Word, and File Explorer (shown as "Windows Explorer"). As you edit and format text in Word, the changes are very slow to appear in the document. To find the possible cause of this problem, open Task Manager, which might appear as in Figure ##, which shows the resource usage of the running applications on the Processes tab.
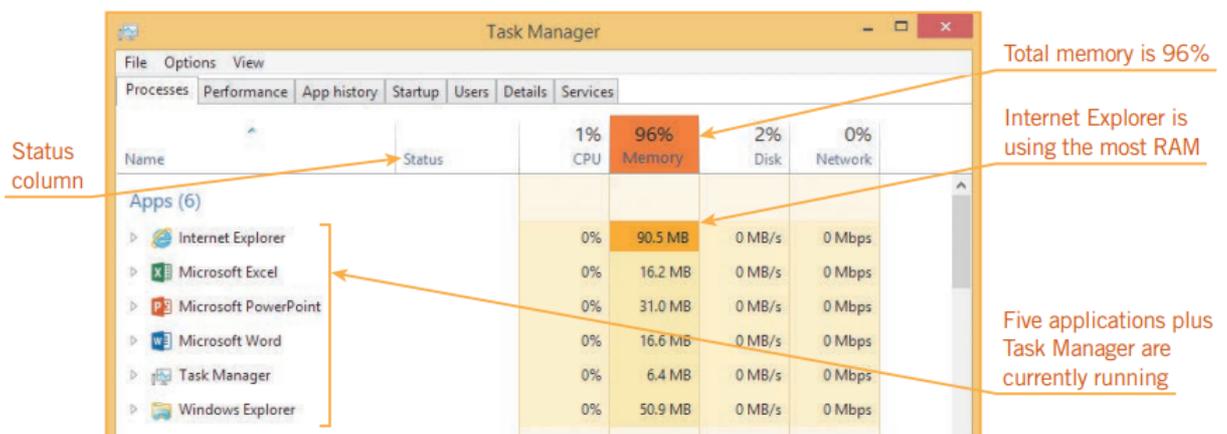
Total memory is 96%, which is very high, indicating that the open applications are using almost all of the available RAM. To free RAM for Word, close the application using the most RAM, which is Internet Explorer in this case. If Word is still running slowly, close the other applications until Word can access the RAM it needs to work more efficiently.

You also use Task Manager to close an application that does not respond to any of your actions, including clicking the Close button (or equivalent command) to close the application. In such a case, you can open Task Manager and then check the Status column, which might display a status of "Not responding." Select the unresponsive application, and then click the

End task button to close the application. Unfortunately, with this method, you lose any work you completed since the last time you saved the open files in the application.

2. Using Problem-Reporting Tools

Operating systems also keep track of software errors, often in logs, which are text files stored in a system folder. When you have a serious software problem, such as an application closing without warning, Windows display a dialog box asking if you want to send a problem report to Microsoft. A problem report is a copy of the error data, which includes details about the problem, such as the name and version of the application, when the error occurred, and technical information about the state of the system at that time. If you agree to send a problem report, the operating system submits the information to help diagnose or solve the problem. These solutions are often provided to you in software updates or patches.

Windows also checks for solutions when an application fails to respond or closes unexpectedly. In those situations, a dialog box might open, similar to the one in Figure ##, indicating that Windows is checking for a solution to the problem.
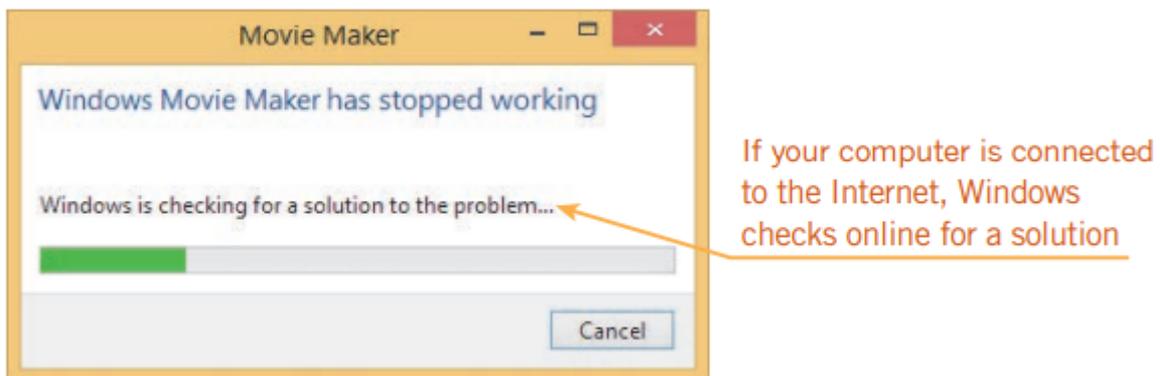
3. Removing Malware

Malware, such as viruses and spyware, can infect your computer any time you visit a Web site or open an e-mail attachment. Because malware can download, install, and run on your computer without your knowledge or consent, it's often difficult to know if it is infecting your computer.

Your best protection against malware is to use the current version of your antivirus and antispyware software to scan e-mail messages, attachments, and other files on your computer for viruses, worms, and other types of malware. Antivirus software locates a virus by comparing identifying characteristics of the files on your computer to the characteristics of a list of known viruses, which are called virus definitions. When it finds malware, antivirus software notifies you and takes action to protect your computer from harm. Because new malware is being

released daily, you need to keep the virus definitions up to date through the antivirus software's update feature. The same is true of antispyware software, though it refers to a list of known spyware as spyware definitions.

Windows include antivirus software among its operating system tools, though you can install antivirus software from other developers (called third-party applications) such as Norton Antivirus and McAfee Antivirus. Windows computers come with Windows Defender. On either type of computer, if you install a third-party antivirus application, you should disable Windows Defender because multiple antivirus applications running simultaneously can conflict with each other. Only one antivirus application should be running on your computer at any time.

You can use Windows Defender to scan for both viruses and spyware. (If an application scans for both viruses and spyware, it is sometimes called an antimalware application.) You can run a quick scan, a full-system scan, or a custom scan. A quick scan checks the locations on your computer that viruses and spyware are most likely to infect. With a custom scan, you select the locations you want Windows Defender to check. In the following steps, you perform a quick scan.
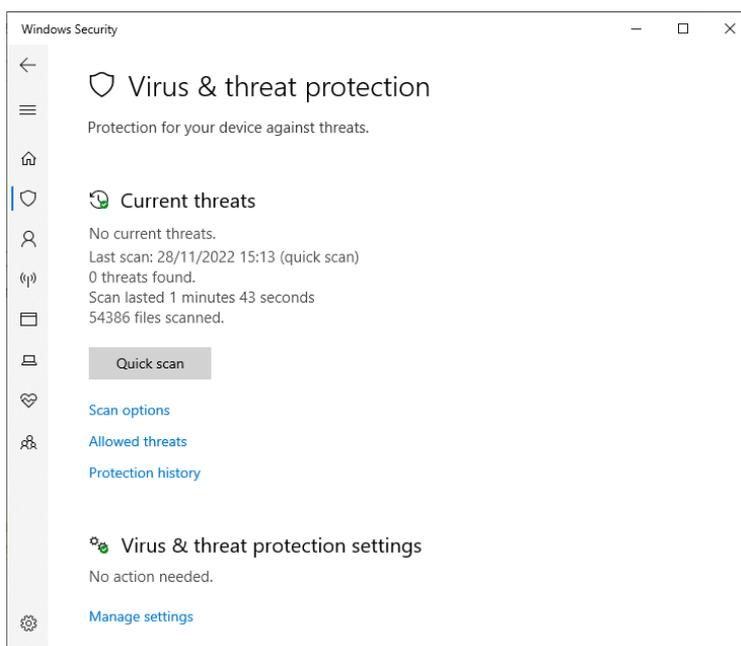
If antivirus or antispyware software finds suspicious files when it scans your computer, it usually places them in **quarantine**, which means it moves the files to another location to segregate them from other files safely. Quarantined files cannot run, so they cannot harm your computer. Most antivirus and antispyware software allow you to delete or restore quarantined files. If the quarantined files are safe, your computer needs to keep the files in quarantine for a few days. If you don't have any computer problems since the files were quarantined, you can remove them to free disk space. If you continue to have computer problems, research the filenames of the quarantined files online to determine whether they are safe to restore.

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4. Using Safe Mode

If the operating system doesn't normally start when you turn on your computer, it might restart in Safe mode so you can resolve or troubleshoot the startup problem. *A safe mode* is a troubleshooting option for operating systems that starts your computer with only basic services and functionality. If the computer doesn't automatically restart in Safe mode, you can start it in Safe mode manually.

On a Windows computer, you start in Safe mode by performing the following steps:

1. Display the Charms bar, click the Settings charm, and then click Change PC settings to display the PC settings screen.

2. Click Update and recovery in the left pane to display options for updating and recovering the operating system, and then click the Recovery category in the left pane.

3. In the Advanced startup section in the right pane, click the Restart now button to display the Choose an option screen.

4. Click the Troubleshoot button to display the Troubleshoot screen, and then click Advanced options to display the Advanced options screen.

5. Click the Startup Settings button to display the Startup Settings screen.

6. Click the Restart button to restart the computer and display the Startup Settings screen instead of the usual screen that appears when you start the computer.

7. Press the 4 key to select Enable Safe Mode, and then enter your password if prompted to display the desktop in Safe mode, shown in Figure 9–13. Windows Help and Support opens to display the Safe mode Help topic in case you need help with Safe mode.
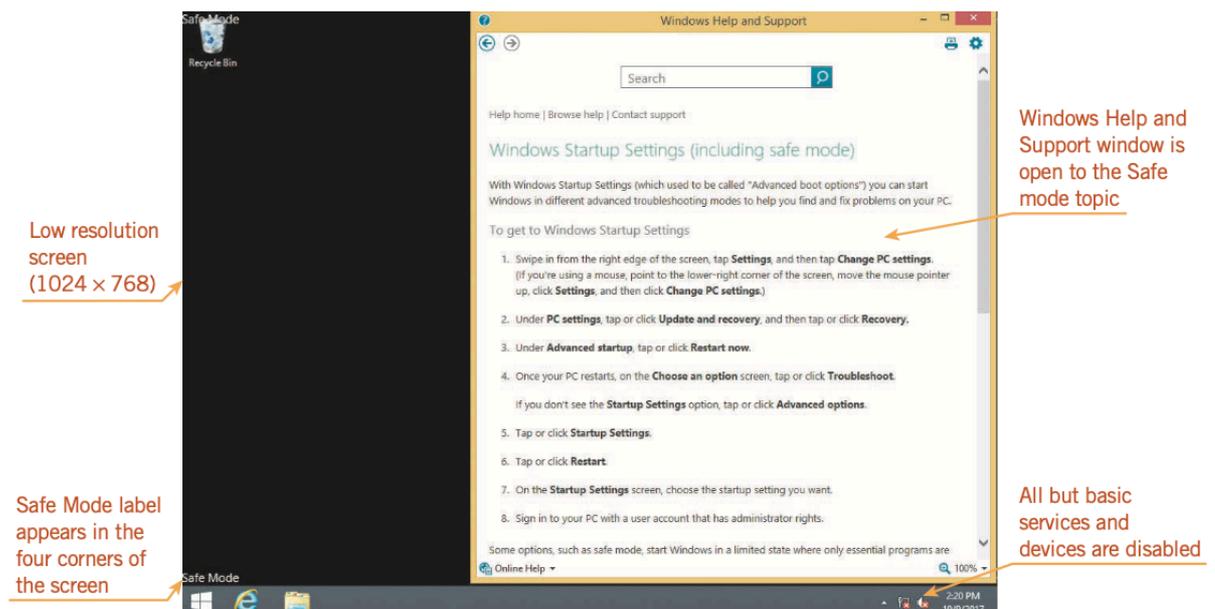
Because Safe mode uses only the most basic settings and drivers, the screen appears in its lowest resolution with no background image, the computer is not connected to the Internet,

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and peripheral devices such as speakers are disabled. "Safe Mode" also appears in the four corners of the screen to indicate that Windows is in Safe mode.

Often, starting in Safe mode alone resolves a startup problem, which might be the result of a background program not loading correctly. Try restarting the computer immediately after starting Safe mode to see if the problem recurs.

If the problem recurs in normal mode but not in Safe mode, you can eliminate the default settings and basic device drivers as possible causes. Next, start each application you normally use to see if it opens in Safe mode. On a Windows computer, start Task Manager and then click the Startup tab to display a list of software that starts and runs in the background after Windows loads. Start as many of these programs as possible. If an application does not open in Safe mode, reinstall it to see if that solves the problem.

If you have recently installed software on a Windows computer, the software might not be compatible with your version of Windows or might introduce other problems that are difficult to track. You can restore your computer to an earlier point using the ***System Restore*** feature. This system utility helps you restore system files to an earlier state, usually one during which the startup problem did not occur. You use System Restore to undo system changes without affecting your data files.

If you have recently installed new hardware, the driver might be incompatible with the operating system on your computer. Try uninstalling the hardware and restarting the computer. If it starts normally, the new hardware was most likely the cause of the problem. Check the device manufacturer's Web site to make sure the device is compatible with your version of your operating system. If it is, reinstall the device, and then use the operating system's update tool, such as Windows Update, to check for and install the most recent driver.

After resolving a problem in Safe mode, you must restart your computer to return to normal operations.

1. **Troubleshooting Hardware**

Problems with a computer's internal hardware affect the computer's ability to start **and** run, so they are major problems that need to be addressed as soon as you notice them. Symptoms of internal hardware trouble include the following:

- ***Beeps during POST***—Recall that when you start a computer, it performs the power-on self-test (POST) to check critical system components and make sure they are running properly. These components include the processor, RAM, and video card. Some computers beep if these components are working normally or do not beep at all. Other computers use flashlights on the keyboard instead of using beeps. Search the computer

manufacturer's Web site to learn what these codes or their absence signal. An error during POST usually means one of the critical system components is damaged or failing and needs to be replaced. After a POST error, the operating system might start in Safe mode or display a message indicating you should start in Safe mode so you can troubleshoot the problem.

- *Hard drive makes unusual sounds*—If you use your computer often, you are probably aware of the normal sounds it makes as it saves files on the hard drive, which might include whirring or spinning sounds. If a mechanical hard drive makes an unusual sound, such as grinding, clicking, or prolonged spinning, it might have a problem that will eventually cause it to fail. If it suddenly takes a long time to save files, your hard drive is on the brink of failure. Back up your data (see Lesson 10 for instructions), use a disk-checking utility to scan the drive for errors, and plan to replace the drive soon.

- *Display screen is blank, garbled, or includes blank areas*—These are all symptoms of a damaged video card, which can be affected by power surges. A *power surge* or spike is a boost to the electrical charge that powers the computer and can occur during lightning storms, power outages, short circuits, and other disruptions to a computer's power source. Power surges can also damage hard drives and RAM. You can test for video card failure by attaching a different monitor to your computer. If the new monitor does not display information correctly, replace the video card.

- *Frequent software crashes, unusual messages, or deteriorating performance*—If the operating system crashes or displays messages that don't seem to relate to your current activities, suspect a problem with RAM. Also, suspect RAM failure if the computer performs a task normally shortly after starting but takes much more time to perform the same task later in the session. Use tools such as Task Manager to track how much memory is installed on the computer. If the tool reports less RAM than was originally installed, you need to replace a memory module.

- *Computer does not start at all*—If the computer does not even complete POST or fails shortly after POST, the power supply, processor, or motherboard might need to be replaced. Considering that the processor is the most expensive component in your computer, you might consider replacing the entire computer in this case.

All of the troubleshooting methods you can use with software also apply to hardware, including operating system options such as troubleshooters, Safe mode, knowledge base articles, and online forums. In addition, on a Windows computer, you can use Device Manager to check the status of hardware, uninstall and reinstall drivers, disable and enable the device, and scan for hardware changes.

5. Checking Cables and Connections

Before replacing any internal components or the computer itself, follow the troubleshooting steps to try the easiest fixes. For example, if your computer doesn't start or stops running suddenly, check the power cords leading to your computer, especially if you recently moved the computer or bumped it, which could have loosened connections. If the display screen is blank on a desktop computer, first make sure the cable from the monitor is securely attached to the system unit. If you are using a mobile computer, make sure the battery has enough charge to run the computer. As you recharge the battery, check the power adapter cable and its connection to the device to ensure it is securely connected to the device and to the power outlet.

If you decide to work with a PC specialist to repair a computer, ask the specialist to check the internal cables and connections before replacing the components. Because system components are connected to the internal circuitry and depend on each other for basic operations, reseating or reconnecting a component such as the CPU, ROM, or memory module might solve a seemingly serious problem. See **Figure ##**
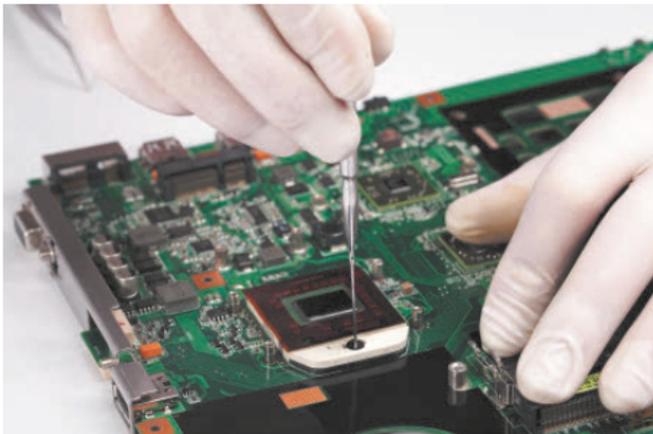
III. Troubleshooting Peripheral Devices

In some ways, problems with peripheral devices are easier to troubleshoot than problems with internal computer hardware because you can access the devices more easily. However, peripheral devices can experience a wider range of problems than internal components, so it can take longer to find the right solution. In general, check the following information as you troubleshoot any peripheral device:

- *Cables and connections*—As with internal components, make sure peripheral devices are properly and securely connected to your computer. The operating system might not recognize a device if it is loosely connected to a port on the computer.

- ***Compatibility***—Determine whether the device is designed to run with the version and operating system installed on your computer. Compatibility information is included on the packaging of a device and on the Web site of a device manufacturer. If you are using the most recent version of Windows and try to install a device designed only for Windows XP and earlier, the device probably will not work correctly.

- ***Drivers***—The operating system needs a compatible driver to interact with a peripheral device. Recall that in most cases, drivers are provided with operating systems and are updated as necessary. If a peripheral device is not working correctly, you can try updating the driver yourself from an optical disc provided with the device or from the manufacturer's Web site.

- ***Firmware***—To update firmware for a peripheral device, you typically connect the device to your computer and then connect the computer to the Internet, if necessary. Visit the Web site of the device manufacturer, navigate to the support page for your device, check the model number, and then follow the instructions for updating the firmware.

📖 Summary

- Troubleshooting means taking a logical, systematic approach to identifying the source or cause of the problem and then applying a solution so that the computer normally works again.

- Troubleshooting typically involves the following four steps: define the problem, identify possible causes, determine the most likely cause, and apply solutions.

- When you have any type of computer problem, you can find valuable troubleshooting information in knowledge bases and online forums. A knowledge base is a collection of articles, videos, and other sources containing information about a product or topic. At an online forum, users and technical experts conduct conversations to solve computer problems.

- Common problems with the software include not starting, not running, and causing problems with other software. These problems can be solved by reinstalling the software, restarting the computer, and updating the software.

- Operating systems include diagnostic tools that help you troubleshoot software problems, including those with the operating system itself. These tools include Task Manager or Activity Monitor, problem reports, and automated troubleshooters.

- Operating systems keep track of software errors in logs, which are text files stored in a system folder. When you have a serious software problem, you can send a problem report to Apple or Microsoft. The problem report contains a copy of the error data, including details about the problem, such as the name and version of the application, when the error occurred, and technical information about the state of the system at that time.

- Solutions to Windows and application problems include links to Help articles, files to download, and steps to perform. When a solution is available, Microsoft sends a message to the Action Center on your computer so you can access the information.

- For some software and hardware problems, operating systems offer automated troubleshooters, which take you through a series of dialog boxes to check settings and then change them as necessary so you can perform certain tasks.

- Your best protection against malware is using updated versions of antivirus and antispyware software to scan your computer for malware and then remove or quarantine it. This type of software locates malware by comparing identifying characteristics of the files on your computer to the characteristics of known malware, which are called virus definitions and spyware definitions.

- If antivirus or antispyware software finds suspicious files when it scans your computer, it usually places them in quarantine, segregating the suspicious files from the rest of your file system. Quarantined files cannot run, so they cannot harm your computer.

- Safe mode is a troubleshooting option for operating systems that starts your computer with only basic services and functionality. If the operating system doesn't normally start when you turn on or restart your computer, it might start in Safe mode automatically. You can also start in Safe mode manually to resolve or troubleshoot the startup problem.

- Problems with a computer's internal hardware affect the computer's ability to start and run, so they are major problems that need to be addressed as soon as you notice them. Symptoms of internal hardware trouble include beeps and flashing lights during POST, unusual sounds from the hard drive, blank areas on the display screen, frequent crashes, and failure to start.

- For hardware problems involving smartphones and tablets, check the manufacturer's Web site for firmware updates, which are often issued to fix bugs. The firmware in peripheral devices might also need to be updated to resolve compatibility errors.

- To troubleshoot problems with peripheral devices, start by checking cables and connections to make sure the device is properly and securely connected to your computer. Determine whether the driver is compatible with your operating system and that you have the most recent driver installed.

Questions

1. Describe the four steps typically included in the troubleshooting process.
2. If an operating system does not start or starts and then freezes, what are the possible solutions?
3. What is the downside of using Task Manager to close an unresponsive application?
4. What is the easiest way to solve the problem of an unsuccessful software update? What should you do if you suspect the updating tool itself is damaged?
5. How does Windows handle incompatible applications?
6. How does antivirus software identify potential viruses?
7. What is Safe mode, and when should you use it?
8. What should you do if the hard drive makes an unusual grinding sound and suddenly takes a long time to save files?
9. Why should you ask a PC specialist to check internal cables and connections before replacing components

Lesson 43

Data and Hardware Protection

Introduction:

In this lesson, you learn about backing up and restoring files. You examine the types of backups and explore your options for how to create and where to store backups. You investigate two methods for backing up files, and learn the importance of following a backup plan. Besides using backups to protect data, you also learn about ways to protect computer hardware.

after completion of this lesson, you should be able to:

- ✓ Understand types of backups.
- ✓ Select a backup method.
- ✓ Determine a schedule for backing up data.
- ✓ Backup and restore files and folders.
- ✓ Protect a computer from theft and physical damage.

In this lesson you will learn:

I.   Backing Up and restoring file
II. Pretecting hardware

Lesson 43 Data and Hardware Protection

I. Backing Up and Restoring Files

If you have inadvertently deleted a file or folder, overwritten a version of a file you meant to save, or lost data after a hard drive crashed or a virus-corrupted file, you know how important it is to back up your computer files. A ***backup*** is a duplicate copy of a file that you use if the original file is lost, damaged, or destroyed. (When written as two words, *backup* means to create a copy of a file.) To use a backup copy of a file, you first need to ***restore*** it, which means copying the file to its original location on your computer.

Before you back up files, you need to make two major decisions: the type of backup to create and which backup method to use. Depending on which backup method you choose, you might also need to determine where to create and store the backup and how often to back it up. Each of these decisions is discussed in the following sections.

1. Understanding Types of Backups

The four most common types of backups for individual computer users are full system backups, differential backups, incremental backups, and selective backups. As shown in **Figure ##**, a ***full system backup*** (also called a system image or a disk mirror) is an exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system. If your hard drive is destroyed, you could remove it, install a new hard drive, and then restore your files from the full system backup to have the same setup on the new hard drive as you had when you created the backup.
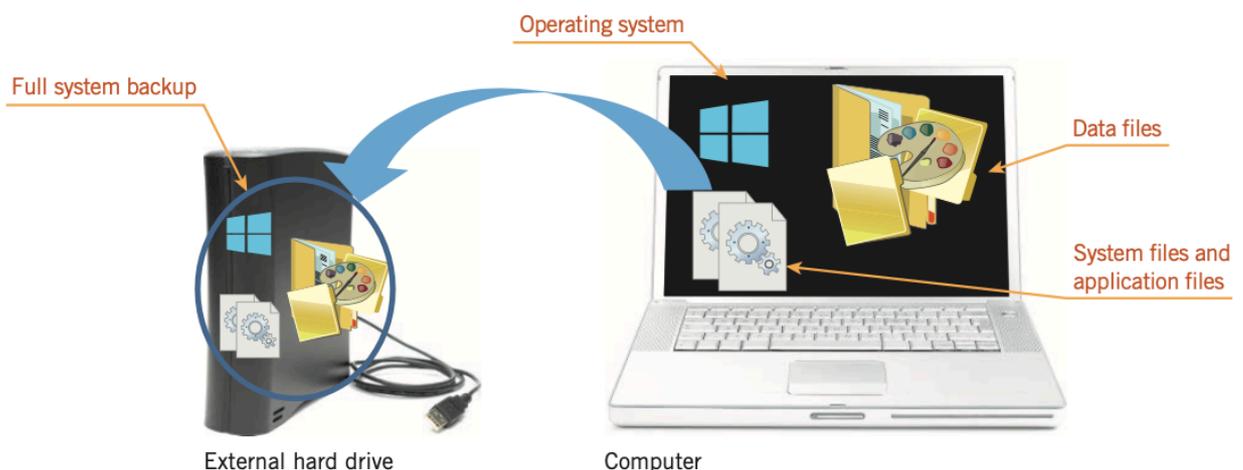
As you add and modify files on the hard drive, you also need to back them up. Instead of creating another full system backup to include those files, you can perform a differential backup or an incremental backup. A ***differential backup*** contains copies of the files that have changed since the last full system backup. An ***incremental backup*** contains copies of the files

that have changed since the last full system backup or the last incremental backup. See **Figure ##**.
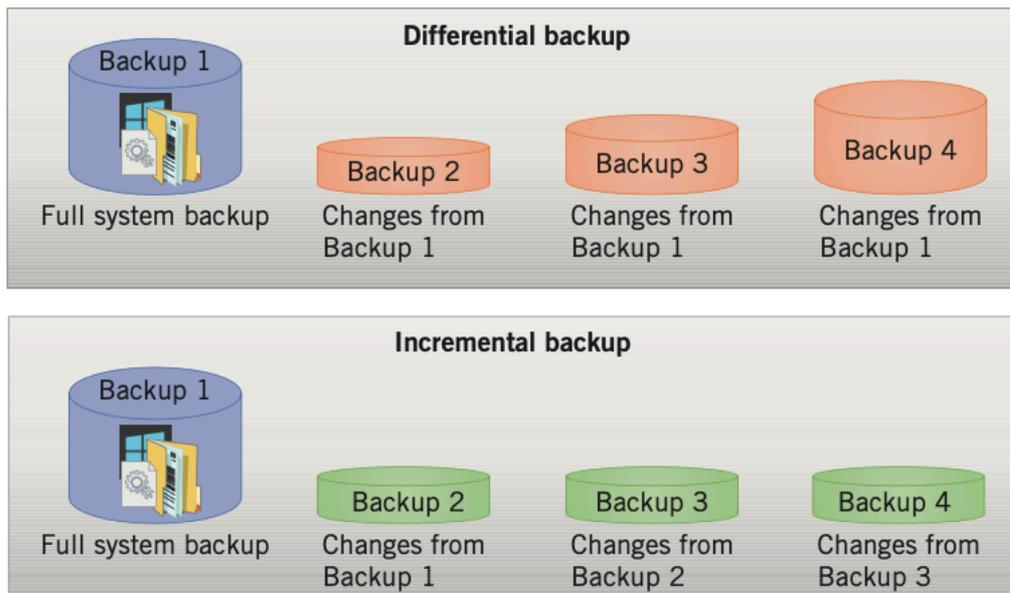
When you perform a ***selective backup*** (also called a partial backup), you select the folders and files you want to back up. Typically, these include the folders containing the documents, pictures, financial records, and other data files you have created or saved. You can also back up data that would be difficult or time-consuming to restore, such as contact records, which might be stored in an e-mail application, and browser favorites or bookmarks. **Figure ##** shows a selective backup.

You can perform incremental backups to keep a selective backup current. For example, if you create a selective backup of your Documents folder on Monday, you can perform an incremental backup on Tuesday to include any new or modified files from the Documents folder in the backup.

Each of the backup types has advantages and disadvantages, which are summarized in **Table ##.**

BACKUP TYPE	ADVANTAGES	DISADVANTAGES
Full system	■ Creates a complete backup you can use to restore a computer	■ Can take a long time to back up a complete system ■ Each backup requires a lot of storage space
Differential	■ Can restore a computer with a full system backup and the latest differential backup ■ Requires less storage space than multiple full system backups	■ Takes longer than an incremental backup ■ Requires more storage space than an incremental backup
Incremental	■ Takes less time than a differential backup ■ Requires less storage space than full system and differential backups	■ Requires multiple steps to restore a computer; you first must restore the full system backup and then restore each incremental backup in order
Selective	■ Can back up and restore files and folders quickly ■ Backs up only data files, not software, which you can reinstall	■ Depending on the data selected for backup, you might not be able to restore a full system

As Table ## indicates, incremental backups require careful organization so you can use them to restore a computer. Creating a full system backup and updating it with incremental backups means you need the full system backup and all the incremental backups to restore a computer. In addition, you must restore the incremental backups in the same order they were created, so you need to identify the incremental backups correctly to keep track of their sequence. If you create only one full system backup and update it indefinitely with incremental backups, restoring could take a very long time. To make it easier to restore a computer, you can create full system backups periodically, such as every Friday evening, and then per- form incremental backups from Saturday to Thursday. To restore the computer, you would need the most recent full system backup and only six incremental backups.

For Windows computers, the terms "**system recovery disk**," "**system repair disk**," and "**system image**" are often confused. You use a system recovery disk to restore the computer to its factory settings, the state it was in when you purchased it.

A system image produces a similar result, except that you can use it to restore the computer to the state it was in when you created the system image. If the computer doesn't start, you can use a system repair disk to load the essential files Windows needs to start, and then use the system recovery disk or the system image to restore your computer.

2. Selecting a Backup Method

To create a backup, you can use software installed on your computer, or you can use an online backup service provider. Most experienced computer users employ a combination of these methods to make sure they have backups that can reliably restore their files.

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Using Backup Software

To create any type of backup, you can use ***backup software***, which is a set of system utilities for creating and updating backups and for restoring files from a backup. Operating systems, third-party software developers, and manufacturers of backup media such as external hard drives provide backup software. Backup software compresses all the files selected for a backup into a single large file; along with the compressed files, backup software stores an index of file details, including their original locations, to restore the files when necessary.

Windows 11 provides the following backup and restore software:

- ***File History***—Makes incremental backups of files that have changed in specified folders. Instead of writing over versions of the same file, File History keeps copies of each saved version of a file, so if you need a chart you painstakingly created in a document two hours ago but accidentally deleted the last time you saved and closed the document, you can restore the earlier version of the document containing the chart. File History does not create full system backups.

- ***System Image Backup***—Creates a full system backup.

- ***Recovery***—Restores files from a system image backup.

When you select a location for backups, be sure to select one other than your hard drive so you can access the backup files in case of a hard drive failure or other major computer problems. You typically can choose one of the following locations for creating backup files:

- ***External hard drive***—Because of its portability, capacity, and ease of use, an external hard drive is where most experienced computer users create backups. Small external hard drives have a few hundred gigabytes of storage capacity, making them suitable for selective backups. In contrast, larger external hard drives with at least 1 TB of storage space are ideal for maintaining full system backups.

- ***USB flash drive***—If you are creating a selective backup of a limited amount of data, you can use a USB flash drive, which is inexpensive and convenient for backing up documents and other personal files. However, a single USB flash drive does not have enough capacity to store a full system backup and its updates.

- ***Optical disc***—You can use recordable CDs, DVDs, and Blu-ray discs as backup media. Selecting a type of disc that can be read many times but recorded only once is an advantage because it does not allow the data to be changed after it is backed up. However, that means you need a new optical disc for each backup you create. If you want to back up more data than a single optical disc can hold, as you would for a full system backup, most backup software can extend the backup across multiple optical discs. The disadvantage of optical discs is that they are slow to save and access data, so

backing up and restoring large files from optical discs takes longer than using an external hard drive.

- **Network folder**—If your computer is on a network, you can create backups to a network folder. You need to have permission to save files in the folder and set sharing options so that unauthorized users cannot access the backup. The network administrator also needs to provide enough storage space for the backups, which might not be practical for large full-system backups.

After creating backups using media attached to your computer—one of the first three options—you can store the medium close to the computer, which is considered a *local backup,* or takes it to an off-site location for safekeeping. Creating and storing a backup on a network folder is also considered a local backup if you are using a local area network, which is a network that links computers within a building or group of adjacent buildings.

In addition to setting schedules and selecting locations, backup software usually allows you to select the following options:

- **Backup type**—You can choose whether to perform a full system, differential, or incremental backup. To create a selective backup, you can select the folders and files to store in a new backup file.

- **Encryption**—*Encryption* is a security method that encodes data so that only authorized people can access it. Some backup software can encrypt the files in a backup and then decrypt or reverse the encryption when it restores the files.

- **Media spanning**—If the backup file grows very large, this feature allows you to use more than one drive to store the backup file. The backup software keeps track of the files stored on each drive and requests the correct drive when you restore selected folders and files.

- **Verification**—After backing up the files, backup software compares every file in the backup location to the corresponding file on your hard drive to make sure it did not skip a file. In addition, you should restore a file or two after creating a full system backup to make sure the restore process works correctly.

3. Synchronizing Files

You can use software and online services to **synchronize** your files stored in the cloud with the version of those files stored on your computer's hard drive by comparing files on the two drives and then updating files as necessary, so the drives contain the same versions of the files. Some cloud storage services, such as Google Drive, synchronize more than one computer with the files you store in a cloud folder. For example, suppose you work on a project on your home computer and then save the project files in your cloud folder. You use a school computer to

download the files and continue working on the project, and then save the updated project files in your cloud folder. Now the files in the cloud folder contain more recent data than the files on your home computer. When you arrive home and connect to the Internet, the cloud storage service provider synchronizes the files so that you have the most recent versions on your home computer.

Although synchronizing is a convenient way to keep copies of files in various locations up to date, it is not the same as backing up files and is not recommended as an alternative to creating backups. You can perform both actions—synchronizing and backing up on the same files, though you do so for different reasons. If you want to use files in two locations, such as a laptop and a handheld device, you synchronize the files. For example, you synchronize the music files on a laptop and portable music player so you can listen to the same music on either device. On the other hand, you back up files when you want to store a copy of the files as a safeguard in case something goes wrong. You usually access the backup files only if you need to restore them to their original location.

II. Protecting Hardware

Backups are the best protection for digital data, and software tools such as antivirus software are designed to protect your operating system and other files. You also need to consider protecting your hardware—the computer and its peripherals—from theft and physical harm. Protecting computer data, software, and hardware is part of your responsibility as a computer owner.

1. Protecting Against Environmental Damage

Computers and peripheral devices can be harmed by environmental hazards, including temperature extremes, humidity, electrical fields, and power fluctuations. Apply the following guidelines to protect your computer against environmental hazards in the places where you use the computer:

- *Temperature*—Computer components work best in a temperature range of 68 to 75 degrees (F). If the temperature in a room exceeds 85 degrees, internal computer components can overheat, which can make a computer unstable. Set the heating and cooling system to maintain a temperature in the optimal range for computers.

- *Humidity*—High humidity can damage internal computer components. If water vapor penetrates a system unit, it can collect and eventually cause a short circuit, which could destroy electronic components. Extreme dryness can also cause problems, especially those related to static electricity. A static charge to an open system unit can zap an entire motherboard. Take precautions to keep the humidity between 30 and 50 percent.

- *Water and other liquids*—Water or other liquids in the system unit or any other hardware receiving power can cause a short circuit, which is why you should not keep beverages near your computer. Suppose a computer is turned off and water seeps into the system, such as during a flood. In that case, you have a good chance of salvaging the computer by taking it to a repair professional who can open the case and dry everything before restoring power.

- *Physical damage*—Current mobile computers are designed to withstand shock from moderate drops and bumps. (A desktop computer has less shock-absorbing material.) The most likely component to be affected by physical jarring is the hard drive, and recovering a hard drive is time-consuming, even if you have a full system backup— transport mobile computers with care, such as in padded cases.

- *Power fluctuations*—Lesson 9 described the hazards of power surges and failures. To protect against fluctuations in power, you can plug a computer into a surge protector (also called a surge suppressor) when the computer is running on power from a wall outlet. A surge suppressor traps short, fast bursts of power before they can harm a computer. To protect against loss of power to a desktop computer or a recharging mobile computer, you can use an ***uninterruptible power supply (UPS)***, which contains a battery that provides power if the normal current is interrupted. As with a surge protector, you plug a computer's power cord or a power adapter cord into the UPS and plug the UPS into a power outlet. **Figure ##** shows a surge protector and a UPS.

Surge protector   UPS

2. Protecting Against Theft

Because computer equipment and the data stored on it are valuable, they are vulnerable to theft. Basic precautions such as locking doors, especially in rooms containing computers, can be a

deterrent. You can also use a cable lock to secure a mobile computer to a desk or table, as shown in **Figure ##**, or attach an alarm that sounds when a computer or drive is unplugged.

Installing tracking software increases the chances of recovering a stolen computer. You can trigger the tracking software remotely, so it sends its location and identifying information to another specified computer. For example, Apple provides tracking software for its mobile computers; the one for the iPhone is called Find My iPhone. If the iPhone is turned on and connected to the Internet, you can use another computer to track the location of the iPhone using GPS technology. If you've lost your iPhone, you can use Find My iPhone to beep and display a phone number where you can be reached along with a message such as "This iPhone has been lost. Please call me." Find My iPhone also locks the device so no one can access your data. Other features to look for in computer tracking software include the following:

- *Alarm*—An alarm feature repeatedly plays an urgent sound to help locate a device or alert others that an unauthorized person has your device.

- *Data removal*—Besides locking the device, this feature lets you erase your data remotely. This option is the most useful if you have backed up your data first.

- *Unauthorized user notification*—If your computer includes a camera, this feature lets you set the camera to take a photo of anyone who enters an incorrect password three times. You can also have the computer send you an e-mail message displaying the photo and location of the unauthorized user.

- *Battery control*—After using GPS to find a lost mobile device, you can use the battery control feature to turn off GPS to conserve battery power.

📖 Summary

- A backup is a duplicate copy of a file that you use if the original file is lost, damaged, or destroyed. To use a backup copy of a file, you first need to restore it, which means copying the file to its original location on your computer.

- The four most common types of backups for individual computer users are full system backups, differential backups, incremental backups, and selective backups. Each of these types has advantages and disadvantages.

- A full system backup (also called a system image or a disk mirror) is an exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system.

- A differential backup contains copies of the files that have changed since the last full system backup. In contrast, an incremental backup contains copies of the files that have changed since the last full system backup or the last incremental backup.

- When you perform a selective backup, you select the folders and files you want to back up.

- To create a backup, you can use backup software installed on your computer.

- Backup software is a set of system utilities for creating and updating backups and restoring files from a backup. Operating systems, third-party software developers, and manufacturers of backup media provide backup software. Backup software compresses all the files selected for a backup into a single large file, and stores an index of file details, including their original locations, to restore the files.

- After installing backup software, you set a schedule and select a location for the backups. The backup software follows the schedule to create backups in the background. Backup locations typically include an external hard drive, USB flash drive, optical disc, or network folder.

- Backup software features include backup type options, encryption, media spanning, and data verification.

- An online backup service automatically creates backups on a secure server. When you create a backup on a server, you are creating an online backup or a remote backup.

- You can use software and online services to synchronize your files stored in the cloud with the version of those files stored on your computer's hard drive by comparing files on the two drives and then updating files as necessary, so the drives contain the same versions of the files. Synchronizing is not the same as backing up files and is not recommended as an alternative to creating backups.

- Environmental hazards, including temperature extremes, humidity, electrical fields, and power fluctuations, can harm computers and peripheral devices. It would be best if you took precautions to prevent damage from these environmental factors.

- To protect computer hardware from theft, you can use locks, alarms, and computer tracking software.

Questions

1. What two major decisions do you need to make before creating backups?
2. What is the difference between a full system backup and a selective backup?
3. What is a backup plan?
4. What is the difference between a differential and incremental backup?
5. How can extremes in humidity harm a computer?
6. What is the purpose of computer tracking software? How does it work?