1

ICT FUND
VISUALLESSONGUIDE

Lesson 1

Word Watch

- Green Computing
- software
- data
- server
- Game Consoles
- motherboard
- mobile devices
- storage media
- mainframes
- email
- computer
- Information
- CPU

ICT Fundamentals

Learning Objectives

After completing this lesson, you should be able to:

- justify why computer literacy is an essential factor to success in today's world;
- explicate the five components of a computer;
- discuss the advantages and disadvantages a user can experience when working with computers;
- identify and discuss the elements of an Information System; and
- distinguish each of the computer categories.

Computers Around Us

Look around your surroundings. Have you noticed forms of computers? They are found at work, at school, and at home. One classification of computer is the Mobile devices (e.g.) cell phones. Computers are tools used in local and global communication for billions of people. To some extent, employees correspond with clients, students with classmates and teachers, and family with friends and other family members.

Because of the computers, society has an instant access to information from around the globe. The accessibility of local and national news, weather reports, sports scores, airline schedules, telephone directories, maps and directions, job listings, credit reports, and countless forms of educational material are always available. From the computer, you can make a telephone call, meet new friends, share photos and videos, share opinions, shop, book flights, file taxes, take a course, receive alerts, and automate your home.

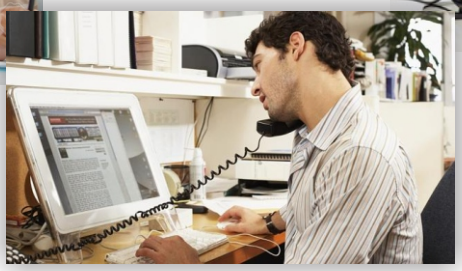
In the workplace, employees use computers to create correspondence such as e-mail messages, memos, and letters; manage calendars; calculate payroll; track inventory; and generate invoices. At school, teachers use computers to assist with classroom instruction. Students use computers to complete assignments and research. Some of the schools are implementing online classes, instead of attending class on campus, some students take entire classes directly from their computer.

Computer is not for work purposes alone, people also spend hours of leisure time using a computer. They play games, listen to music or radio broadcasts, watch or compose videos and movies, read books and magazines, share stories, research genealogy, retouch photos, and plan vacations.

It is then a proof to many that computer literacy is vital to success. Computer literacy, also known as digital literacy, involves having a current knowledge and understanding of computers and their uses. For you to be able to remain as a computer literate, you must achieve the requirements that determine computer literacy because there is a continuous change as technology changes.

Research & Collaboration

Computers in School



Computers in Work / Offices

Leisure time

Mobile Devices in Use

Computer Defined

A computer is an electronic device that accepts information and manipulates it for some result based on program or sequence of instructions on how the data is to be processed and stores the results for future use.

Personal Computer

Data and Information

Computer processes data into information. The collection of unprocessed items, which can include text, numbers, images, audio, and video, is called data. What conveys meaning and is useful to people is termed as information. Below is an example as the computer processes several data items to print information in the form of a cash register receipt.

2	Pork Belly	125/kilo
1	Spaghetti	80 each
1	Cedar Cheese	50 each
3	Bag of Chips	44 each
	Amount Received	1000.00

DATA

- Computes each item's total price by multiplying the quantity ordered by the item price (i.e., 2 * 125 = 250.00).
- Organizes data.
- Sums all item total prices to determine order total due from customer (512.00).
- Calculates change due to customer by subtracting the order total from amount received (1000.00 - 512.00 = 488.00).

PROCESS

INFORMATION

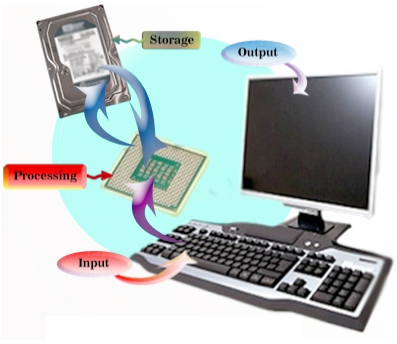
AnDesign Shop Mart
Divisoria, Cagayan de Oro City
(+63) 857-3044

QTY	ITEM	TOTAL
2	Pork Belly	250
1	Spaghetti	80
1	Cedar Cheese	50
3	Bag of Chips	132
Total Due		512.00
Amount Received		1000.00
Change		488.00

In this simplified example, the items ordered, prices, quantities ordered, and amount received all represent as data. The computer processes the data to produce the cash register receipt as information.

Information Processing Cycle

Computer processes data (input) into information (output) and carries out processes using instructions. These instructions are the steps that tell the computer how to perform a particular task. The term software is a collection of related instructions organized for a common purpose. A computer often holds data, information, and instructions in storage for future use.



Information Processing Cycle

Information processing cycle is being referred by some people as the series of input, process, output, and storage activities. Presently, communications have become an essential element of the information processing cycle.

The Components of a Personal Computer

Computer hardware is the collection of physical parts of a computer system that contains many electric, electronic, and mechanical components. These components include input devices, output devices, a system unit, storage devices, and communications devices. Pictures below shows some common computer hardware components.

Input Devices

An input device is a unit containing device that allows you to enter data into computer. This unit makes link between user and computer. The input devices translate the information into the form understandable by computer. Five widely used input devices are the keyboard, mouse, microphone, scanner, and Web cam.

- A keyboard is an input device that allows a person to enter symbols like letters and numbers into a computer that would serve as data. The computer mouse is considered an input device. With a click of a button, the mouse sends information to the computer. A mouse is an interesting device that offers an alternative way to interact with the computer beside a keyboard. It is a small handheld device that you control for movement over a small symbol on the screen, called the pointer, and you make selections from the screen.

Keyboard and Mouse

- A microphone is used for a variety of purposes, from recording audio, to conferencing and podcasting.

Microphone

- A scanner is a device that captures and converts images from photographic prints, posters, and magazine pages and displays into a form that the computer can interpret.

Scanner

- A Web cam is a digital video camera that feeds or streams its image in real time to or through a network. It also allows users to create movies or take pictures and store them on the computer instead of on tape or film.

Web Cam

Output Devices

An output device is a unit consisting of device that helps us to get the information from computer. Output device translates the computer's output into the form understandable by users. There are three commonly used output devices. These are printer, monitor, and speakers. A printer produces text and graphics on a physical medium such as paper. A monitor displays text, graphics, and videos on a screen. Speakers allow you to hear music, voice, and other audio (sounds).

Speakers

Monitor

Printer

Storage Devices

Storage is the process of holding data, instructions, and information for future use. For example, computers can store hundreds or millions of customer names and addresses. Storage holds these items permanently.

Card Reader/Writer & Memory cards

Storage media is a device of keeping data, instructions, and information. Examples of storage media are USB flash drives, hard disks, optical discs, and memory cards. A storage device records (writes), retrieves (reads) and extracts (processes) items to and from storage media. Storage device often functions as sources of input because it transfers items from storage to memory.

USB Flash Drive

A USB flash drive is sometimes called as keychain drive which is a portable storage device that is small and easily to be transported on a keychain or in a pocket. The average USB flash drive can hold about 4 billion characters.

Internal Hard Drive

Most internal hard drive are housed inside the system unit.

A hard disk provides much greater storage capacity than a USB flash drive. The average hard disk can hold more than 320 billion characters. Hard drives are enclosed in an airtight, sealed case. Although some are portable, most are housed inside the system unit.

Portable Hard Drive

Portable hard drives are either external or removable. An external hard drive is a separate, freestanding unit, where you insert and remove a removable hard drive from the computer or a device that is being connected to the computer.

Optical disc

A DVD in a DVD drive.

An optical disc is a flat, round, portable metal disc with a plastic coating. CDs, DVDs, and Blu-ray Discs are three types of optical discs. A CD can hold from 650 million to 1 billion characters. Some DVDs can store two full-length movies or 17 billion characters. Blu-ray Discs can store about 46 hours of standard video, or 100 billion characters.

Digital Camera with 4gb memory card

Some mobile devices, such as digital cameras, use memory cards as the storage media. You can use a card reader/writer to transfer stored items, such as digital photos, from the memory card to a computer or printer.

Communications Devices

A hardware component that enables computers to send (transmit) and receive data, instructions, and information to and from one or more computers or mobile devices is a communications device. Modem is a widely used communications device. Communications occur over cables, telephone lines, cellular radio networks, satellites, and other transmission media. Some transmission media, such as satellites and cellular radio networks, are wireless, which means they have no physical lines or wires.

Modem

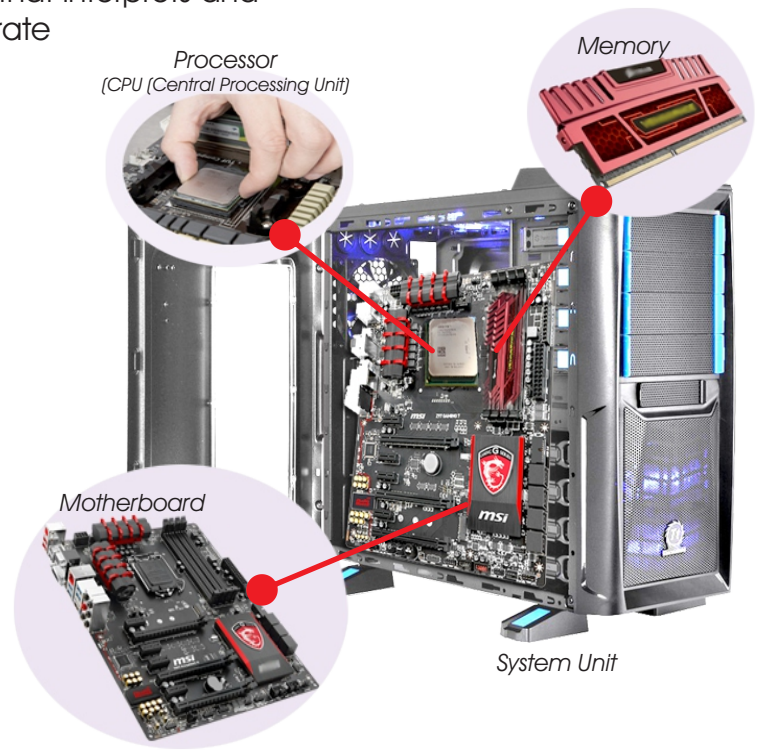
The System Unit

A system unit is an enclosure that contains the main components of a computer. The circuitry of the system unit usually is part of or is connected to a circuit board called the motherboard.

There are two main components of the motherboard. These are the processor and memory. The processor, also called the CPU (central processing unit), is the brain of the computer. It is an electronic component that interprets and carries out the basic instructions that operate a computer.

The electronic component that stores instructions waiting to be executed and data needed by those instructions is called a **memory**. Most memory keeps data and instructions temporarily, which means that when the computer is shut off, its contents are erased.

Known and branded memory sticks are Intel, Kingston and CorsAir.



Motherboard. A motherboard is the main circuit board of a computer inside a system unit that connects the different parts of a computer together. Sockets for the CPU, RAM and expansion cards (e.g. discrete graphics cards, sound cards, network cards, storage cards etc) are available and it hooks up to hard drives, disc drives and front panel ports with cables and wires. Motherboard is also known as a mainboard, system board, mobo or MB.

Below are logos of some popular motherboards available in many stores worldwide, namely: ASUS, GIGABYTE, ASROCK, MSI, INTEL, FOXCONN AND BIOSTAR.

Advantages and Disadvantages of Using Computers

For every discovery, advantages and disadvantages occur. Many benefits from using computers are being harvested by the society today. A user is anyone who communicates with a computer or utilizes the information it generates. Both business and home users can make well - informed decisions because they have instant access to information from anywhere in the world. Students, another type of user, have more tools to assist them in the learning process.

Advantages of Using Computers

Computers are beneficial because of the instant and fast advantages in terms of speed, reliability, consistency, storage and communications.

- **Speed:** The flow of data, instructions, and information along electronic circuits in a computer travels at incredibly fast speeds. In every single second, many computers process billions or trillions of operations.


Speed


Reliability

- **Reliability:** Seldom you hear failure from a computer if the inputs are correctly indicated. The electronic components in modern computers are dependable and reliable because they rarely break or fail.

- **Consistency:** Computers generate error-free results, provided the input is correct and the instructions work. Given the same input and processes, computer produces the same results - consistently.

Consistency

- **Storage:** Computer stores massive amounts of data and makes these data available for processing anytime it is needed for future use.


Storage

- **Communications:** Wireless communication nowadays is what computers can do. Computers allow users to communicate with one another internationally and globally.

Disadvantages of Using Computers

Apparently, violation of privacy, public safety, the impact on the labor force, health risks, and the impact on the environment are some of the disadvantages of computers.

Violation of Privacy

- **Violation of Privacy:** In many instances, personal and confidential records stored on computers were not protected properly and individuals have found their privacy violated and their identities were stolen.


Public Safety

- **Public Safety:** Because of the open – communication and access to internet around the world using computers to share publicly the photos, videos, journals, music, and other personal information, some of these unsuspecting, innocent computer users have been victimized by dangerous strangers.

Impact on Labor Force

- **Impact on Labor Force:** Since computers can do fast and efficient outputs, employees have been replaced by computers. Thus, it is crucial that workers must keep their education up-to-date. A separate impact on the labor force is that some companies are outsourcing jobs to foreign countries instead of keeping their homeland labor force employed especially if the applicants cannot pass the standards of the company and tax issues.

Health Risk

- **Health Risks:** Health injuries or disorders can be a result when there is prolonged or improper use of computer. To avoid having health risks problems, proper workplace design, good posture while at the computer, and appropriately spaced work breaks are the things a user needs to observe. Two behavioral health risks are computer addiction and technology overload. Computer addiction occurs when someone becomes obsessed with using a computer. Individuals suffering from technology overload feel distressed when deprived of computers and mobile devices.


impact on Environment

- **Impact on Environment:** Computer manufacturing processes and computer wastes are depleting natural resources and polluting the environment. **Green computing** involves reducing the electricity consumed and environmental waste generated when using a computer. Strategies that support green computing include recycling, regulating manufacturing processes, extending the life of computers, and immediately donating or properly disposing of replaced computers.

Elements of an Information System

To be valuable, information must be accurate, organized, timely, accessible, useful, and cost effective to produce. Generating information from a computer requires the following five elements:

- Hardware
- Software
- Data
- People
- Procedures

Together, these elements (hardware, software, data, people, and procedures) comprise an information system. The picture below shows how each of the elements of an information system in an enterprise might interact.

The hardware must be reliable and capable of handling the expected work load. The software must be developed carefully and tested thoroughly. The data entered into the computer must be accurate.

Most companies with mid-sized and large computers have an IT (Information Technology) department. Staff in the IT department should be skilled and up-to-date on the latest technology. IT staff also should train users so that they understand how to use the computer properly. Today's users also work closely with IT staff in the development of computer applications that relate to their areas of work.

Finally, all the IT applications should have readily available documented procedures that address operating the computer and using its programs.

The Role of each Element in an Information System

IT staff(people) follow process(procedures) for recording purchases (data) receive from customers.

Employees (people) use a program (software) to enter the purchased (data) in the computer.

The computer (hardware) performs calculations required to process the data and stores the result on storage media such as a hard disk (hardware).

Customer statements (information) printed on a corporate printer (hardware).

Categories of Computers

Industry experts typically classify computers in seven categories: personal computers (desktop), mobile computers and mobile devices, game consoles, servers, mainframes, supercomputers, and embedded computers. A computer's size, speed, processing power, and price determine the category it best fits.

Personal Computers

A personal computer is a computer that can perform all of its input, processing, output, and storage activities by itself. A personal computer contains a processor, memory, and one or more input, output, and storage devices. Personal computers also often contain a communications device.

Mobile computers and devices

A mobile computer is a personal computer you can carry from place to place. Similarly, a mobile device is a computing device small enough to hold in your hand. The most popular type of mobile computer is the notebook computer, tablet pc, smart phones, pda(personal digital assistant, ebook readers.

Game Consoles

A game console is a mobile computing device designed for singleplayer or multiplayer video games. Standard game consoles use a handheld controller(s) as an input device(s); a television screen as an output device; and hard disks, optical discs, and/or memory cards for storage.

Server and Mainframes

A server or mainframe controls access to the hardware, software, and other resources on a network and provides a centralized storage area for programs, data, and information. Servers and mainframes support from two to several thousand connected computers at the same time. A mainframe is larger than server when it comes to speed and storage capacity.

Super Computers

A supercomputer is the fastest, most powerful computer — and the most expensive. The fastest supercomputers are capable of processing more than one quadrillion instructions in a single second. Applications requiring complex, sophisticated mathematical calculations use super computers. Large-scale simulations and applications in medicine, aerospace, automotive design, online banking, weather forecasting, nuclear energy research, and petroleum exploration use a supercomputer.

Embeded Computers

An embedded computer is a special-purpose computer that functions as a component in a larger product. A variety of everyday products contain embedded computers:

- Consumer electronics
- Home automation devices
- Automobiles
- Process controllers and robotics
- Computer devices and office machines

1

Laboratory

ICT Fundamentals

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Manual

Laboratory Manual

Lesson 1 ICT Fundamentals

Computer is all around us. ICT fundamentals will equiped you with the basic and essential knowledge of computers and its related devices including the concept of data processing.

Objectives

After completing this Laboratory, you should be able to:

- discuss the concept of processing data into information;
- Identify the essential parts of a Personal Computer and its use and functions.

Score

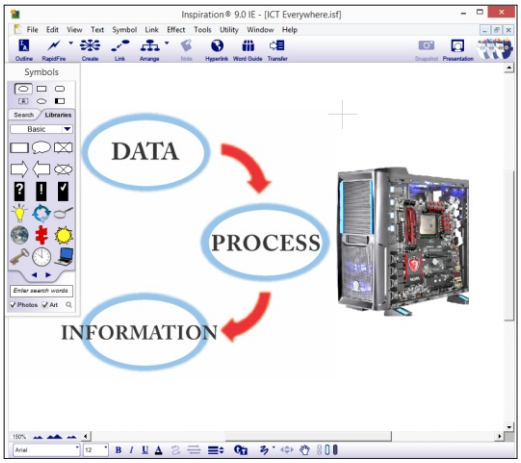
Lab. 1.1 ICT Everywhere

Estimated Completion time: 15 - 20 Minutes

Directions:

1. Launch Inspiration.
2. Open and answer the activity **ICT Everywhere**.
3. Follow and read the directions.
4. Save the activity as **ICT Everywhere done** in your own folder.

Preview:



Score

Lab. 1.2 Essential Components

Estimated Completion time: 15 - 20 Minutes

Directions:

1. Launch Inspiration.
2. Open and answer the activity **Essential Components**.
3. Follow and read the directions.
4. Save the activity as **Essential Components done** in your own folder.

Preview: