ECDL/ICDL – Concepts of Information Technology (IT)

2065IGEE

ECDL/ICDL – Concepts of Information Technology (IT)

ECDL/ICDL – Concepts of Information Technology (IT)

Part Number: 2065IGEE
Course Edition: 1.0

ACKNOWLEDGMENTS

Project Team

Instructional Designer: Aarthi Janet Gunaseelan • **Development Assistance:** Cory Brown • **Content Development Manager:** Barbara Kruszewska • **Graphic Designer:** Srinivasan B • **Project Coordinators:** Arvind MV, Julie Cavallaro, Corey Listar, and Liz Timm • **Content Editor:** Laura Telford • **Project Technical Support:** Mike Toscano

NOTICES

ECDL/ICDL – Concepts of Information Technology (IT)

Lesson 1 - Getting Started with Computers

A. Familiarize Yourself with Computers 2
Computers 2
Hardware and Software 3
Information Technology 3
B. Identify the Parts of a Personal Computer 5

Lesson 2 - Exploring Computer Hardware

A. Identify the Functions of the Central Processing Unit 8
Central Processing Unit (CPU) 8
B. Determine the Different Types of Computer Memory 9
Computer Memory 9
C. Identify Input Devices 11
The Insertion Point 11
D. Identify Output Devices 13
E. Compare Different Kinds of Storage Devices 15

Lesson 3 - Exploring Computer Software

A. Examine Different Types of Software 20
Operating System Software 20
Application Software 20
Graphical User Interface (GUI) 20
B. Describe the Development Process of Computer-Based Systems 23

Lesson 4 - Describing Computer Networks

A. Define Types of Networks 26
Computer Networks 26
Client/Server Networks 27

Contents

B. Describe Information Networks 28
Intranet 28
Extranet 29
Internet 29
World Wide Web 29
Data Transmission 29
Modem 30

Lesson 5 - Describing the Use of IT in Everyday Life

A. Determine the Use of Computers Across Different Domains of Work 34
Teleworking 34
B. Define the Components of the Electronic World 37
Electronic Mail 37

Lesson 6 - Promoting a Healthy and Safe Working Environment

A. Practice Ergonomics to Resolve and Prevent Health Issues 42
Identify Health Issues 42
B. Promote Computer and Environmental Safety 44

Lesson 7 - Securing Information

A. Protect Information Security 48
Information Security 48
User ID and Password 49
B. Prevent a Virus Attack 51
Computer Viruses 51
Antivirus Software 52

Lesson 8 - Protecting Copyright and Personal Information

A. Identify Copyright Issues 56
Shareware and Freeware 56
End-User License Agreement 56
Copyright 56
B. Define Data Protection Legislation 58
Uses of Personal Data 58

GLOSSARY 61

INDEX 67

Notes

ABOUT THIS COURSE

In the 21st-century world, the influence of computers on society is immeasurable. Whether or not you realize it, computers affect most aspects of your professional and personal life. Understanding what a computer is—how it works and what it's capable of doing—can be a boon to all facets of your life. Furthermore, exploring how computers work with one another, and learning about their place in the world, can give you a better understanding of exactly what drives the Information Age that you're living in.

Have you ever written a letter to someone and it took quite a bit of time because it had to be formatted and neatly presented? Perhaps you needed to research a project, so you had to visit a local library a number of times to gather information? By using a computer, you can create letters quickly and gather information easily at work or at home. You will save time and be able to accomplish more tasks.

Course Description

Target Student

This course is designed for a professional who seeks ECDL certification.

Course Prerequisites

This course is designed for people who are completely new to computers and need to learn the basics of computer and information technology.

How to Use This Book

As a Learning Guide

Each lesson covers one broad topic or set of related topics. Lessons are arranged in order of increasing proficiency with *Concepts of Information Technology (IT)*; skills you acquire in one lesson are used and developed in subsequent lessons. For this reason, you should work through the lessons in sequence.

We organized each lesson into results-oriented topics. Topics include all the relevant and supporting information you need to master *Concepts of Information Technology (IT)*, and activities allow you to test your knowledge of this information through "minds-on" questions.

Through the use of minds-on activities and supporting background information, this book provides you with the foundation and structure to learn *Concepts of Information Technology (IT)* quickly and easily.

As a Review Tool

Any method of instruction is only as effective as the time and effort you are willing to invest in it. In addition, some of the information that you learn in class may not be important to you immediately, but it may become important later on. For this reason, we encourage you to spend some time reviewing the topics and activities after the course. For additional challenge when reviewing activities, try the "What You Do" column before looking at the "How You Do It" column.

As a Reference

The organization and layout of the book make it easy to use as a learning tool and as an after-class reference. You can use this book as a first source for definitions of terms, background information on given topics, and summaries of procedures.

Course Objectives

In this course, you will describe the basic concepts associated with computers and information technology.

You will:

- prepare to use a computer.
- explore the components of a computer.
- explore computer software.
- describe computer networks.
- describe the uses of IT in everyday life.
- promote a healthy and safe working environment.
- secure information.
- protect copyrights and personal information.

Course Requirements

Hardware

Although this course can be taught by instructors and taken by students without using a computer, the following computer hardware components will be necessary if the instructor wishes to open and display the course overhead slides:

- A CD-ROM drive.
- A mouse or other pointing device.
- A 1024 x 768 resolution monitor.
- A projection system to display the instructor's computer screen.

Class Setup

Overhead slides have been provided on the CD-ROM for this course. To access them, on the course CD-ROM, open the 084_767 folder, and then open the Overheads folder contained within.

Notes

LESSON 1

Getting Started with Computers

Lesson Time
45 minutes

In this lesson, you will prepare to use a computer.

You will:

- Distinguish between different types of computers by identifying their key characteristics.
- Identify the parts of a personal computer.

Introduction

If you've never worked with computers before, they may seem like confusing machines that hold vast amounts of inaccessible information. In this lesson, however, you will discover that this is not the case at all. By taking one small step at a time into the world of computing, you'll discover that there isn't much mystery at all—computers are there to make your life easier.

You have probably seen computers in many places, including libraries, banks, and schools. You may also have noticed that not all computers look the same. By understanding what a computer is, how it works, and what kinds of computers are available, you will know what tasks you can or cannot accomplish with one.

TOPIC A

Familiarize Yourself with Computers

Whether you realize it or not, you have been exposed to many different kinds of computers in your daily life. And, even with as much exposure as you may have had, there are likely even more types of computers that you have never used or encountered. In this topic, you will identify different types of computers and discover what makes each of them useful.

Computers come in different shapes and sizes. They are designed to cater to various needs. The computer you will use will depend on your needs and your budget. Before you can find the computer that best fits those needs, however, you need to understand what options are available to you.

Computers

Definition:

A *computer* is a device that takes some sort of input, processes it, and displays the output. *Input* is the information that goes into a computer. *Output* is the information that comes out of a computer. There are different types of computers designed to cater to different needs. Click each type to view information about it.

Type	Description
Mainframe	A *mainframe* is a large computer that might serve a large organization. It is used to process and store information for many different users at once, hence, it requires much more processing power and storage capacity than other computers. Users access the mainframe through terminals. Terminals consist of a typewriter-style keyboard and a video display. Mainframe computers cost hundreds of thousands of dollars.
Minicomputer	A *minicomputer* is a small free-standing computer that might serve a single office or department. It is a smaller and less powerful version of the mainframe computer. The lower processing power and storage capacity makes it more affordable than the mainframe computer.

Type	Description
Personal computer	A *personal computer*, or microcomputer, often called a PC, is designed for use by one person at a time. It requires far less processing power and storage capacity than either the mainframe or minicomputer. Generally, the PC is the cheapest type of computer you can buy.
Laptop	A *laptop* is a smaller, portable version of a PC. It weighs only about 10 pounds. It is designed to be carried and used in locations without electricity. It is more expensive than a PC.
Personal Digital Assistant	A *Personal Digital Assistant (PDA)* is a handheld computer that serves as an organizer of personal information. It generally provides access to notes, phone lists, and schedules. PDAs are pen-based. They use a stylus to tap selections on menus and to enter printed characters.
Network computer	A *network computer* is a low-cost version of PC, with lesser processing power and storage capacity than a PC. It is attached to a network and is managed by a central computer.

Hardware and Software

The physical components of a computer system are called *hardware*. Generally, you can think of hardware as any part of the computer that you can see or touch. The term *software* refers to the set of instructions that enable a computer to perform specific tasks. You cannot see or touch software, but you can see the packages that contain it.

Information Technology

Information technology (IT) revolves around the creation, exchange, processing, and storage of information using computers, communication networks, and other electronic devices.

ACTIVITY 1-1

Identifying Types of Computers

Scenario:

Your management has approved the plan to computerize your office. Your boss is ready to purchase the computers for the office, but he isn't sure what types of computers he should buy. He asks you to do some research on the different types, so that he can buy the appropriate computer for each employee in the office.

1. **The physical components of a computer system are called *hardware*.**

2. **You need a computer that you can use at the office and at home, when necessary. You want to be able to access word processing and spreadsheet applications using this computer. In this situation, which of the following computers would you choose?**

   a) Minicomputer

   ✓ b) Laptop

   c) Network computer

   d) Personal computer

3. **The marketing executive in your office needs a computer that he can take with him wherever he goes. As he does a lot of traveling, it needs to be lightweight and small enough to fit in his carry-on bag. He will use this computer for very basic tasks, such as accessing his calendar and phone list. In this situation, which computer should be used?**

   __ Laptop

   ✓ PDA

TOPIC B

Identify the Parts of a Personal Computer

Different types of personal computers may look different, but they all start out with similar essential components. These components are all required for a computer to work properly. In this topic, you will identify those common parts.

If you have been exposed to computer lingo in any detail, you've probably heard certain terms bandied about: hardware, software, memory, processing. To understand a computer, you need to know what makes it "tick." Knowing what each individual component does will help you get the most out of your computer.

How to Identify the Parts of a Personal Computer

Definition:

A PC consists of several basic parts, or components, that work together to perform basic tasks. A typical PC includes the system unit and input and output devices. The *system unit* contains disk drives, memory, and a central processing unit (CPU), also known as the microprocessor. Common disk drives include a floppy disk drive, CD-ROM drive, and a hard disk drive. There are two types of memory, namely random access memory (RAM) and read-only memory (ROM). The common input devices include the keyboard and mouse. The common output devices include the monitor, speakers, and printer.

Peripheral Devices

Devices that are attached to the system unit, such as the printer, keyboard, and mouse are referred to as *peripheral* devices.

Computer Performance

Computer performance is based on the speed of the CPU, the amount of RAM, the number of applications running, and the size of the computer's hard drive.

- The speed of the CPU: The CPU takes information from various input devices, the operating system, and software, and executes them. The higher the speed of the CPU, the better the processing speed, because more instructions get executed per second.
- The amount of RAM: For the CPU to process information efficiently, it needs to access information quickly. The computer stores data that it is currently working on in the RAM. The bigger the RAM, the more data can be stored in it. This helps increase the processing speed, which in turn increases the performance of the computer.
- The number of applications running: When there are a number of applications running on a system there are a number of input and output operations happening. This consumes memory and reduces the performance of the computer.
- The size of the computer's hard drive: The computer uses the hard drive to store information. As the hard drive begins to fill up, information retrieval gets slower, and the computer gets more sluggish.

DISCOVERY ACTIVITY 1-2

Identifying the Parts of a Personal Computer

Scenario:

Based on your research, it has been decided that personal computers need to be purchased for everyone in the customer service division. Now, you need to find out the components that are common to a personal computer.

---

1. **Identify the components of a system unit.**
   - ✓ a) Memory
   - b) Printer
   - c) Keyboard
   - ✓ d) CPU

---

2. **Identify the peripheral devices that would be needed.**
   - ✓ a) Printer
   - b) Hard disk
   - ✓ c) Keyboard
   - ✓ d) Mouse

---

3. **True or False? The amount of RAM will affect the performance of a computer.**
   - ✓ True
   - ___ False

Lesson 1 Follow-up

In this lesson, you explored some important computing basics. Now you know the differences between hardware and software. You can also identify the different types of computers.

1. **Identify the type of computer you work on and explain its characteristic features.**

   Answers will vary.

2. **What peripheral devices do you use? Why do you use them?**

   Answers will vary.

LESSON 2

Exploring Computer Hardware

Lesson Time
1 hour(s), 30 minutes

In this lesson, you will explore the components of a computer.

You will:

- Define the CPU and identify its functions.
- Distinguish between the different types of computer memory by determining their characteristics.
- Define input devices and identify the different types of input devices.
- Identify the different types of output devices and list their uses.
- Compare the different kinds of storage devices.

Introduction

You've entered the world of computing by taking a brief look at what computers can do and how they can affect your professional workflow and personal life. Now it's time to investigate how a computer is physically able to accomplish that. In this lesson, you will examine the inner mechanisms and devices that act as the computer's "brain"—the computer hardware.

When you bake cookies, you need specific ingredients. Without the proper ingredients, you won't get the results that the recipe intends. The same is true for a computer. Without the standard components of a computer or the knowledge of their purpose, the information you can obtain from a computer might not meet your needs.

TOPIC A

Identify the Functions of the Central Processing Unit

You have already investigated the various parts of a computer, so you know that every computer has something called a central processing unit (CPU). What you may not realize is just how important the CPU is; without it, a computer is useless. In this topic, you will discuss the components and functions of the CPU.

The CPU is the brain of the computer. It processes all information that is entered into the computer. To understand how the computer processes the information you feed into it, and why some computers can process information more efficiently than others, it's vital to grasp the function of the CPU.

Central Processing Unit (CPU)

The *central processing unit (CPU)* is a tiny electronic chip within the system unit. It is installed on the main circuit board of the computer, the *motherboard*, which carries signals to and from various parts of a computer. It is here that all computational, logical, and operational decisions are made. Hence, it is referred to as the brain of the computer.

How the CPU Works

Definition:

The CPU has three main components: the arithmetic and logic unit (ALU), control unit, and immediate access memory. The *arithmetic and logic unit (ALU)* performs all calculations and logical operations. The *control unit* decodes, synchronizes, and executes program instructions. The *immediate access memory* stores the data and programs on which the computer is currently working.

Information keeps flowing between the CPU and all other parts of a computer. The speed of the CPU tells you how fast it processes information. The higher the value, the better the performance and, generally, the more expensive the CPU. Speed is measured either in *megahertz (MHz)*, which measures millions of cycles per second, or *gigahertz (GHz)*, which measures billions of cycles per second.

Analogy:

If you think of the inside of the system unit as an airport, then the CPU functions as the air traffic controller. It receives all incoming data and instructions and directs information upon departure. Departing data goes to destinations such as a file on the hard disk, a monitor, or a printer.

DISCOVERY ACTIVITY 2-1

Identifying the Functions of a CPU

Scenario:

You need to analyze the CPU's functions based on its speed and suggest the CPU configuration that would best suit the needs of the computers in your office.

1. **CPUs are sold by model and speed. Examine the following CPU specifications and rank them in order, from 1 to 4, with the fastest at number 1.**

   4 Pentium/90 MHz

   2 Pentium/150 MHz

   1 Pentium/166 MHz

   3 Pentium/110 MHz

2. **Where does the computer store the data and information that it is working on?**

   a) Arithmetic unit

   b) Logic unit

   ✓ c) Immediate access memory

   d) Control unit

TOPIC B

Determine the Different Types of Computer Memory

You have already discovered that, like a human, a computer stores its information and data in its memory. Unlike a human, however, a computer's memory stores information only as long as it is needed. In this topic, you will identify the different types of memory and describe how they are used by a computer.

In working with a computer, you may notice that the more tasks you ask a computer to accomplish simultaneously, the more slowly it may perform them. This is usually because its memory is being taxed or split in multiple directions. To understand why your computer performs the way it does, and to determine when you may need to upgrade it, you need to understand how it uses its memory.

Computer Memory

Definition:

Memory is a device in which information can be stored and from which information can be retrieved when necessary. The hardware in which memory is stored is called an integrated circuit (IC), or chip.

Analogy:

Memory is like an office desk—it is where tasks are performed.

Determine the Different Types of Computer Memory

There are two types of memory: *read-only memory (ROM)* and *random access memory (RAM)*. ROM is used to load the operating system into RAM each time the computer is powered on. RAM is the computer's short-term memory that stores current data, applications, and the operating system so that the computer's processor can quickly access them. ROM retains data even when the computer is turned off. Data in RAM exists only as long as the computer is running. ROM is read-only, whereas information can be read from and written into RAM. ROM is more expensive than RAM.

Memory Measurement

Memory is measured in a small group of data called *bytes*. Each byte consists of eight *bits*.

A computer is powered by electrical impulses; it can recognize on or off signals. On and off are represented by the numbers 1 and 0, respectively. A bit of data, as processed or stored by a computer, equals either a 1 or 0. By putting eight zeros or ones together, you can represent any character or number the computer needs. For example, 01000001 is a byte that represents an uppercase A. Each 1 or 0 is a bit.

Because each byte is very tiny, other terms are often used to measure larger amounts of memory.

The values of kilobytes, megabytes, gigabytes, and terabytes are rounded off for convenience. A kilobyte is 1,024 bytes; a megabyte is 1,048,576 bytes; a gigabyte is 1,073,741,824 bytes; and a terabyte is 1,099,511,627,776 bytes.

Term	Meaning
Byte	One character (letter, number, space, or punctuation mark)
Kilo	Metric for "one thousand"
Mega	Metric for "one million"
Giga	Metric for "one billion"
Tera	Metric for "one trillion"
Kilobyte (K)	One thousand bytes
Megabyte (MB, Meg, or M)	One million bytes
Gigabyte (GB)	One billion bytes
Terabyte (TB)	One trillion bytes

One letter, or character, is made up of one byte. Since a file will usually have thousands of characters, its size will be in kilobytes or megabytes. An entire folder made up of several files can be several megabytes or gigabytes in size.

DISCOVERY ACTIVITY 2-2

Determining the Different Types of Memory

Scenario:

You have made your boss aware of the fact that the speed of the memory will in effect determine the effective speed of the computer system. Now, your boss has asked you to buy the largest size of memory that the budget allows.

1. **Identify the characteristic features of RAM.**
   - ✓ a) Short-term memory
   - ✓ b) Stores current data
   - c) Read-only memory
   - d) Loads operating system

2. **The word computer would need *8* bytes of memory to store it.**

TOPIC C

Identify Input Devices

Previously, you learned that computers accept information using input devices, such as a keyboard, mouse, or scanner. Each different input device has its own way of conveying information, and certain tasks to which it is best suited. In this topic, you'll learn about many different kinds of input devices—some of which you may have never even seen before—and what purposes they can serve.

To give yourself the best, most efficient computing experience you can, it's helpful to think about what type of work you'll be doing and what type of user you are, and choose input devices that will suit your needs. Just about every personal computer user will use a keyboard and mouse (although some may rely on one much more than the other). But there are many other options. If you're a computer gamer, you might choose a joystick. If you want to try your hand at digital art, you may be interested in light pens or digital cameras. The trick is finding out what's available, and then choosing the tools to fit your computing lifestyle.

The Insertion Point

Any information you input is displayed on the monitor. Whether the monitor displays a screen prompt or menu, you will see an *insertion point* on a computer's monitor that indicates where text or graphics will be inserted or erased on that screen. The insertion point is also referred to as the cursor.

Input Devices

Input devices accept information from the user and convert it to a format the computer can recognize. Click each input device to view information about it.

Input Device	Description
Mouse	A *mouse* is a pointing device that enables you to quickly move around on the screen and to select commands from menus rather than type the commands. A mouse is useful because it enables you to point at items on the screen and click to select that item. You can think of the mouse as an extension of your hand. A mouse is used by moving it across a mouse mat or other flat surface. This moves a ball on the bottom of the mouse, which in turn sends a signal to the computer. The software interprets this signal and performs the required operation, such as moving a cursor or drawing a line. On top of the mouse are buttons; usually there are two, but sometimes there are three. You use the buttons to activate objects on the screen.
Keyboard	The most common input device is the *keyboard*. It contains all of the keys required for typing letters and numbers, plus keys for entering commands and moving around on the screen. It is used for both text-based data input and command selection.
Trackball	A *trackball* is a pointing device that is often used with laptop computers. It works like an upside-down mouse. A trackball requires less desk space than a mouse. Instead of rolling it around the desk, you roll it in place to move the pointer.
Scanner	A *scanner* captures graphic images or printed text and converts them to digital form for editing and manipulation in a PC. It works by reflecting light off an image or object and converting it into 0s and 1s, a computer-readable format. The image or object is recorded pixel by pixel (dot by dot); generally, the higher the pixels or resolution, the better the quality of the resulting image or object.
Touchpad	A *touchpad* is a pressure- and motion-sensitive surface that is used as an input device to move the pointer. Because the surface of the touch pad is flat and does not require the pushing down of a specific key as with a keyboard or grasping it as with a mouse, it is often used as an input device by people with disabilities.
Light pen	A *light pen* is a pen-shaped, handheld device that either emits light or is light-sensitive. By touching the pen onto certain areas of a specially designed screen, the user can send information to the computer. Light pens are used sparingly because they require a lot of arm movement, making them tiring and uncomfortable to use.
Joystick	A *joystick* provides greater control in most game software: the control is more realistic than with a keyboard or mouse. You need to move the handle to provide information to the computer. Most joysticks come with one or two buttons used for special game functions. Joysticks are not used for business applications.
Digital camera	*Digital cameras* are increasingly popular as their quality improves, prices drop, and consumers become more computer- and web-knowledgeable. Unlike film cameras, the image is captured digitally and stored as a file on a floppy disk or removable memory card. Some printers accept digital files on memory cards directly.
Microphone	*Microphones* change sound energy into electrical energy. Sound cards in a computer can convert this electrical energy into digital information, which can be stored, manipulated, and played back. Microphones are useless without functioning sound cards.

DISCOVERY ACTIVITY 2-3

Identifying the Input Devices to be Used

Scenario:

The latest and most advanced input devices are required for the engineering department of your company. You have decided to write a report to the management on the suitable devices to be procured and justify your recommendations by listing out the advantages and disadvantages of each of your selections.

1. **Which of the following is the most common input device?**
   a) Mouse
   ✓ b) Keyboard
   c) Joystick
   d) Trackball

2. **Which of the following input devices would be the best suited for a laptop computer?**
   ✓ a) Trackball
   b) Joystick
   c) Scanner
   d) Touchpad

TOPIC D

Identify Output Devices

You just learned that you communicate information and commands to your computer through input devices. When your computer wants to communicate information to you, on the other hand, it does so through an output device. In this topic, you will identify the different types of output devices and their uses.

There are different types of output devices, such as monitors, printers, and speakers. All the output devices that you fit your computer with can work in conjunction to provide you with a complete audiovisual experience, and even with printed documentation of anything you create.

Output Devices

Output devices convert the computer language into a format the user can work with. They provide the means for a computer to get information back to the user. Click each output device to view information about it.

Output Device	Description
Monitor	*Monitors* display information held within a computer. Images displayed on a monitor are created by tiny dots called pixels. The more pixels, or resolution, a monitor has, the more detailed and crisp the graphics will be. It is the main source for output of information from the computer.
Touchscreen	A *touchscreen*, unlike the monitor, is a device that operates as both an input and an output device. Users convey instructions by touching designated areas on the screen. This ability for direct onscreen input is facilitated by a device, such as the light pen, which relays the X,Y coordinates to the computer. Touchscreen terminals can be used to display public information in information kiosks, tourism displays, and trade shows. They improve customer service at busy places by providing the option of self-service. Some examples of self-service stations that can benefit from touchscreen input include automated teller machines (ATMs) and airline e-ticket terminals. Touchscreens also aid people who have difficulties using other input devices such as the mouse or keyboard.
Printer	After a document is created on the computer, you can send it to a *printer* for a printout, or "hard copy." The printer takes data in electronic form, from the computer, and prints it onto paper. There are three common types of printers: laser, inkjet, and dot-matrix.
Plotter	*Plotters* are used to create large-scale printouts such as construction blueprints. They work by drawing lines onto a piece of paper, using pens held in a mechanical arm.
Speaker	*Speakers* are used to output audio information from a computer. While some users hook their computers up to stereo systems, others use smaller desktop speakers. Because speakers contain large electromagnets, specially shielded speaker cabinets need to be used for sound systems that are placed near monitors. The better the speakers, the better the sound, until you reach a quality that is limited by the sound card and the source.

DISCOVERY ACTIVITY 2-4

Identifying the Output Devices to be Used

Scenario:

The engineering division has placed a request for an output device that would allow them to take large scale hard copies of construction blueprints. You need to decide on the output device to be used to suit their needs.

1. **Based on the scenario given, which output device would you use?**
   a) Printer
   b) Scanner
   ✓ c) Plotter
   d) Touchscreen

2. **True or False? Touchscreens can be used as both input and output devices.**
   ✓ True
   ___ False

3. **The more *pixels* in your monitor, the better the resolution of the image being displayed.**

TOPIC E

Compare Different Kinds of Storage Devices

Earlier, you learned about memory—the place where a computer places information and data with which it is currently working. If it is not currently working with a piece of information, but still wants to retain the information (rather than purging it), the computer can store data permanently in a storage device. In this topic, you will learn about various storage devices and how they are most effectively employed.

The information contained in storage devices can be retrieved and used when needed. There are removable and nonremovable storage devices. You can choose the storage device you want to use based on your needs—how much storage you need, how often you'll need to add information to it, and how mobile you need your data to be.

Compare Different Kinds of Storage Devices

Definition:

A *storage device* is a piece of hardware that stores information permanently. In general, it refers to devices such as hard disks, floppy disks, and Zip disks. Click each storage device to view information about it.

Example:

Storage Device	Description
Hard disks	*Hard disks* are used by computers to store large amounts of information (2 GB or more) for later use. In particular, they are used to store the operating system software and other programs that you use to perform specific tasks. The price of hard disks varies considerably based on their speed and capacity. Generally, a hard disk drive is not removed from the computer, though removable hard disks are also available, which can be inserted and removed without opening the computer system. However, they are more expensive than fixed hard disks. Hence, fixed hard disks are preferred over removable hard disks.
Floppy disks	*Floppy disks* are removable media usually used to copy information between computers and install new software. Floppy disks store less information than hard disks and are relatively slow. However, they are cheap and can easily be removed from the disk drive and transported.
Zip disks	*Zip disks* are similar to floppy disks but can hold much more information. Zip disks can hold either 100 or 200 megabytes of data. A 100-megabyte Zip disk can hold the equivalent of 70 floppy disks. To use a Zip disk, you need to have a Zip drive installed in the computer. Zip disks tend to cover the middle ground in terms of price and storage capacity.
Data cartridges	*Data cartridges*, like floppy disks, are portable, removable drives. They are capable of storing large amounts of information. Because they are comparatively slower than other storage devices, they are used to store data that does not need to be accessed very often.
CD-ROM	*CD-ROM* is an acronym for compact disc read-only memory, a permanent storage device that is used by computers to read information. They are usually used to install new software. CD-ROM drives read programs and data that are stored on removable CD-ROMs. CD-ROM drives can be internal—installed inside the computer case—or external—a separate piece of hardware that can be attached to a computer by using a cable. CD-ROMs store approximately 650 MB of data. They are not as expensive as hard disks.

Formatting a Disk

The capacity of an individual disk is determined when the disk is formatted. Formatting prepares the disk's surface to hold information. When you format a disk, the disk drive divides the surface area of the disk into concentric tracks and wedge-shaped sectors. Tracks form rings around the magnetic disk. These tracks are split into sectors. You can buy unformatted disks or disks that are already formatted. The advantage of using unformatted disks is that you can use the operating system to format the disk, so that it will work with that particular operating system.

DISCOVERY ACTIVITY 2-5

Identifying the Different Types of Storage Devices

Scenario:

The finance and marketing teams have a large number of records that need to be stored in a permanent format. They want to be able to reuse them as needed.

1. **What are storage devices used for?**

   Saving and retrieving data.

2. **Why do you need to format disks?**

   Formatting prepares the disk's surface to hold information.

Lesson 2 Follow-up

In this lesson, you discussed in detail a computer's hardware. When you're ready to start using a computer, you'll be able to identify existing hardware and what it is used for.

1. **Will you use any of the storage devices discussed in this lesson? If yes, which ones will you use and for what will you use them?**

   Answers will vary.

2. **List the input devices that you use.**

   Answers will vary.

Notes

LESSON 3

Exploring Computer Software

Lesson Time
1 hour(s)

In this lesson, you will explore computer software.

You will:

- Distinguish between the operating system software and application software.
- Describe the steps involved in the development of a computer-based system.

Introduction

You have a working understanding of computer hardware components—the processor, memory, input and output devices, and storage devices—and how they work together to give a computer its powerful capabilities. All the capabilities in the world don't matter, though, without something to apply them to. In this lesson, you will familiarize yourself with computer software, the applications and programs on a computer that make use of all that valuable hardware.

To bake cookies, it's not enough to have the necessary ingredients. You need to follow the instructions provided in the recipe. Similarly, for computers to function properly, they need to follow a set of instructions. Computer software provides instructions to the computer hardware and controls the basic functions of a computer.

TOPIC A

Examine Different Types of Software

You now are well versed in computer hardware—what it is, what it's capable of, and how it affects your computing experience. Now you need to delve into the world of computer software. Computers operate by following instructions provided by software. In this topic, you will describe the different types of software and identify their uses.

Just about everything a computer does is governed by software of some sort. To perform different operations, such as writing letters, performing calculations, and drawing images, different software is needed. A computer even needs software to tell it how things should appear on screen. In order to customize a computer—to enable it to perform whatever tasks you need it to—you need to understand software.

Operating System Software

The *operating system* is the software package that allows a computer to function. It performs basic tasks, such as recognizing input from the keyboard, sending output to the display screen, and controlling peripheral devices such as disk drives and printers.

Application Software

Application software is a program that provides specific functionality such as word processing, graphics creation, or database management. It is written to run on a specific operating system. This means that the word processor you purchased for Windows 98 will not work with Macintosh.

Software Versions

Software versions provide information about the iteration of the software you are using. Software versions are changed every time the software is upgraded or newer features have been added to it.

Graphical User Interface (GUI)

A *graphical user interface (GUI)* is designed to provide easy interaction between a user and an application through a predominantly graphical rather than textual medium. It supports the use of the mouse or any other pointing device rather than the use of the keyboard.

Distinguishing Between Operating System and Application Software

Operating system software is written to work in the background to create the working environment for a computer. Application software is written to work on top of an operating system and is written for specific operating systems. Operating system software sets the rules for how a system and application work together, how security is handled, and in what format the data is stored in disk drives. Application software performs specific tasks such as writing a letter, tracking payroll information, drawing a chart, creating a presentation, writing an email, or playing a game. Some of the commonly used operating systems include Windows, DOS, OS/2, and Linux. Some of the more popular application software programs include word processing, spreadsheet, database, drawing and painting, presentation graphics, and accounting.

Common Software Applications

The table here describes the uses of some of the more commonly used categories of application software.

Application	Use
Word processing	Creating letters, memos, reports, and other typed documents.
Spreadsheet	Managing, calculating, and analyzing tables of numbers.
Database	Managing lists of information.
Drawing and painting	Creating graphic illustrations.
Desktop publishing	Composing publications.
Presentation graphics	Composing text-based and graphical representations of numbers in the form of 35mm slides and transparencies.
Accounting	Managing an accounting system.
Web browsing	Browsing the web.

DISCOVERY ACTIVITY 3-1

Identifying the Types of Software

Scenario:

The management team aims at enhancing sales productivity. They want software to be developed that would integrate all phases of the sales process. The software should also provide the tools required to collect, store, and analyze customer information in order to close a sale.

1. **Given the scenario, what type of software should be developed?**

   Application software.

2. **Identify the functions of operating system software.**

   ✓ a) Creates working environment.

   b) Performs specific tasks.

   ✓ c) Sets rules for how a system and application work together.

   ✓ d) Specifies how security is handled.

3. **A *graphical user interface* provides an attractive and easy-to-use user interface for a computer user to communicate with an application.**

4. **Which of the following software can be used for analyzing tables of numbers?**

   a) Word processing

   ✓ b) Spreadsheet

   c) Database

   d) Web browsing

TOPIC B

Describe the Development Process of Computer-Based Systems

In the process of learning about different types of software, you have likely noticed that many software programs are designed with a very specific purpose in mind. In this topic, you will discover that computer-based program is developed, there is also a very specific process that must be followed to ensure its success.

Computer-based systems can enhance your productivity and reduce the time it takes you to complete a particular task. Some systems, such as bank machines, hospital monitors, and the digital displays in your car, can affect your life without you even giving much thought to their computer-based nature. Whenever someone develops these systems, they follow a certain process to ensure that the system is designed to meet certain needs, built to effectively perform a specific function, and capable of carrying out that function without fail.

The Development Process of Computer-Based Systems

The different types of computer-based systems, such as automatic flight-landing systems, hospital patient monitoring systems, and business management systems, deployed within modern societies are in great demand because they improve many aspects of daily life. There are different phases involved in the development of a computer-based system. Click each phase to view information about it.

Phase	Description
Analysis	The analysis phase focuses on what is to be delivered. This phase documents in detail the scope, objectives, and requirements of the system. You need to generate and evaluate alternatives, and review the recommendations you have arrived upon with the management.
Design	The design phase focuses on how to deliver the proposed system. This phase is specific to the technical requirements the system is required to operate in. In this phase, you need to design and integrate the application architecture, the user interfaces, the network, and the database. You then need to develop a prototype of the proposed system.
Programming	The programming phase deals with the development and integration of the proposed system. You need to develop and maintain programs that link application programs to system software and subsequently to hardware.
Testing	The testing phase brings all the aspects of the new system's performance into a special testing environment. You need to ensure the accuracy of the code, the inclusion of expected functionality, and the interoperability of applications and other network components.

DISCOVERY ACTIVITY 3-2

Developing Computer-Based Systems

Scenario:

The management has asked you to coordinate with the software development team and help them build the software for the sales team.

1. **Arrange the phases of development in the sequence in which they are to be implemented.**

   4 Testing

   1 Analysis

   2 Design

   3 Programming

2. **True or False? The analysis phase focuses on how to deliver the proposed system.**

   __ True

   ✓ False

Lesson 3 Follow-up

In this lesson, you discussed computer software in detail. When you're ready to start using a computer, you'll be able to determine the software to use to accomplish the desired task.

1. **Will you use any of the software applications discussed in this lesson? If yes, which ones and how?**

   Answers will vary.

2. **What other types of application software will you use?**

   Answers will vary.

LESSON 4

Describing Computer Networks

Lesson Time
1 hour(s)

In this lesson, you will describe computer networks.

You will:

- Define local area and wide area networks.
- Identify the different methods in which telephone networks are used for computing.

Introduction

At this point, you understand how a computer works. You have identified the benefits of computing and how those benefits can be applied to your life. You have learned about computer hardware and software, and how they work in tandem to give a computer all its functionality. Now it's time to expand your scope beyond the single computer on which you may work. In this lesson, you will delve into networking—the ways in which computers connect to and communicate with one another.

Suppose you are a new parent and you join a parents group that meets on a monthly basis to share stories and tips or just socialize. Your participation in that group is beneficial to you and other members. Your computer can be a part of a similar group at work or home. Using a computer to connect to a network, you will be able to share information with others and gain access to a wealth of information you would not have access to otherwise. In addition, you can accomplish tasks you might not be able to on your own.

TOPIC A

Define Types of Networks

Up to this point, much of your focus in this course has been on the capabilities and uses of standalone computers. That's only a small part of the big picture—the networks of computers that criss-cross the globe. In this topic, you will examine various types of computer networks.

In order to truly understand the beneficial effects that computers can have in your life, you need to understand the ways in which your computer can communicate with other computers. There are many different types of networks, and computers can function in different roles within those networks. By connecting your computer to other computers in your place of work or at home, you will be able to access some of the information and resources in those computers without actually having to sit in front of those computers.

Computer Networks

Definition:

A computer *network* is a collection of hardware and software that enables a connected group of computers to communicate. A network is formed when two or more computers are linked together. Computers and other devices that communicate with each other in a computer network are called *nodes*, or *workstations*. Network traffic is the data that is sent through the network.

Computer networks have the following fundamental components:

- Two or more nodes.
- Network software that enables network nodes to communicate. This software is called the *network operating system (NOS)*. It organizes and controls the computers attached to the network.
- *Network adapters*, or *network interface cards (NICs)*, are expansion cards that transfer information to and from the network. Like other expansion cards, network adapters are installed inside the system unit. A cable connector extends out the back of a computer and connects to the network cabling.
- Cabling or some other medium through which network nodes can communicate.

Example:

An example of a network is the Internet. You and millions of other users around the world can connect to the Internet using a computer at work or home.

Client/Server Networks

Client/server networks are built around specialized computers, or *servers*, that run a network operating system. Servers perform a service on behalf of other network components. They contain information or computing resources that are shared.

Once the servers are set up, the workstations, or *clients*, running under normal personal computer operating systems, access either information stored on the server or resources attached to the server. These resources might be disk space, shared files, printers, modems, or other specialized hardware. In a client/server network, all the workstations share the resources of the server.

Types of Networks

There are two types of networks. A *local area network (LAN)* is a group of computers and associated devices that share the resources of a single processor or server within a small geographic area. A LAN may serve as few as two or three users or as many as thousands of users. A network set up between the computers at home would be an example of a LAN. A *wide area network (WAN)* is a network of computers that share a large geographic area. An example of a WAN would be a company that has offices in several different cities. Their computers would be connected by a WAN.

Uses of a Network

There are two important reasons for using a network: shared information and shared resources.

Shared Information: Networks allow you to share information easily with other users.

Shared Resources: Networks allow you to access other resources, such as files, applications, or hardware.

- *Files:* Files that are stored on one computer can be shared with other users through the network. Sharing files among users on a network saves disk space.
- *Application programs:* Multi-user application programs allow more than one person to work with the same application simultaneously. Using multi-user software, you can exchange or update programs and data through a network.
- *Hardware:* Networks allow everyone in an office to utilize the maximum amount of available equipment. For instance, by sharing one printer among several computers, you can reduce costs. If you have different types of computers in a work setting, networking allows more people to capitalize on each computer's strengths.

DISCOVERY ACTIVITY 4-1

Identifying Uses of a Network

Scenario:

A network has just been installed at work. Your boss hands you a list of tasks to be completed by the end of the day. You're not sure if you'll need access to the network or not to accomplish those tasks.

1. **Which of the following tasks require a network?**
   a) Creating a spreadsheet using the Excel software that is installed on your computer.
   ✓ b) Printing a spreadsheet using a printer that you share with the other members of your department.
   ✓ c) Sending an email to a group of co-workers regarding a department meeting.
   ✓ d) Saving a file so that others in your group can access the most updated copy of that file and make changes to it when needed.

2. **A network set up between the computers at home would be an example of a *LAN*.**

3. **If you are connected to a network, what will you use the network for?**

   Answers will vary, but may include sharing hardware, software, and files.

TOPIC B

Describe Information Networks

You have examined various types of computer networks. You learned that networks are categorized into different types based on their accessibility and the type of information to which they grant access. In this topic, you will identify the major types of information networks, as well as describe the devices that are used to connect a computer to a network.

If you've ever browsed the World Wide Web, you've actually connected to the world's largest network—the Internet. You may have also heard about intranets and extranets, two common types of information network that are utilized by many businesses. It helps to know how information networks like this work—how the content you see on them actually gets to you.

Intranet

An *intranet* is a private network. Its purpose is to share information and computing resources throughout an organization. While the Internet can be accessed by any user, the intranet can be accessed only by private employees. Unlike the Internet which holds information for the general public, intranets hold organization-specific, private, and proprietary information.

Extranet

An *extranet* is the portion of an organization's intranet that is made accessible to others outside the organization. For example, business customers may gain access to a company's extranet to place orders or view a parts catalog. Extranets differ from intranets in that extranets provide information to an authorized group of individuals outside of the organization while intranets are only accessible to internal employees of an enterprise.

Internet

The *Internet* is a global computer network that is composed of other computer networks. Once a computer on a smaller network is connected to the Internet, all other computers on that network may also be able to access the Internet.

Uses of the Internet

The Internet has revolutionized the way we live our daily lives. Many people use the Internet to perform their daily tasks—reading news, tracking stock investments, performing research, making purchases, transferring files, and so forth. Our society has changed from an industrial society to an information society. Information society is a term for a society in which the creation, distribution, and manipulation of information has become the most significant economic and cultural activity.

The Internet is an immense, ever-growing repository of information. Because of this, the Internet serves as a research tool. Many people use the Internet to communicate with friends and family all over the world. Since there is less cost involved in this, people are choosing this method of communication over traditional forms, such as telephone calls and letters.

Differences Between the Internet, Intranets, and Extranets

The differences between the Internet, intranets, and extranets are summed up in this table.

Internet	Intranet	Extranet
A global network.	A private network.	A private network shared between two or more organizations.
Anyone with Internet access.	Restricted to authorized employees.	Restricted to authorized individuals for collaborating organizations.
Information that is available to the general public.	Information that is specific to an organization. This data is often private and proprietary.	Information that needs to be shared between organizations; supply chain data; data for collaborating groups.

World Wide Web

The *World Wide Web (WWW)* is a vast collection of documents residing on different computers on the Internet. While the Internet focuses on the physical and technical networks, WWW focuses on the content available on the physical and technical networks.

Data Transmission

The movement of data from one place to another is referred to as data transmission. In computer terms, it is the movement of bits or bytes from one location to another. Information can be transmitted as digital or analog signals. *Digital signals* use binary data strings, 0 and 1, to transmit data. *Analog signals* use continuous variable electric current and voltages to transmit data. Data transfer rate is measured in bits per second (bps) or megabits per second (Mbps).

Modem

Modem is an acronym for *Mo*dulator/*Dem*odulator. It is a device that converts data in the form of digital signals to analog signals and vice versa. The signals that are thus converted can be transmitted over a telephone line. On the receiving end, they can again be converted to digital signals by the receiving modem.

Describe Information Networks

The term *Public Switched Telephone Network (PSTN)* refers to the world's collection of interconnected voice-oriented public telephone networks, both commercially and government owned. The Internet was built on the foundation created by the telephone networking system. Initially, most Internet connections were made using a modem that would dial into an *Internet service provider (ISP)* by using a phone line. Nowadays, *Integrated Services Digital Network (ISDN)* is being used. ISDN is an optical fiber network that enables an analog telephone network to transmit analog and digital data. Users who install an ISDN adapter in place of a modem often see higher transmission speeds.

Asymmetric Digital Subscriber Line (ADSL)

Digital Subscriber Line (DSL) is a technology that eliminates the need for the PSTN to handle high-speed data calls. With DSL, data calls are routed directly to the ISP or the corporate network. *Asymmetric Digital Subscriber Line (ADSL)* can achieve upstream or downstream data rates greater than 8 Mbps plus a full duplex rate of up to 1 Mbps over a single twisted pair. This is the type of DSL that is most familiar for home and small business users.

DISCOVERY ACTIVITY 4-2

Describing Information Networks

Scenario:

You need to do some research on the project you are working on. Your co-worker suggests you should use the network to gather some information.

---

1. **Which of the following networks would you use to gather the information you require?**

   ✓ a) Internet

   b) Intranet

   c) Extranet

---

2. **Intranet or Internet? Which network can be accessed only by private employees?**

   _✓_ Intranet

   ___ Internet

---

3. ***Extranet* is the portion of an organization's intranet that is made accessible to others outside the organization.**

---

4. **True or False? Analog signals use continuous variable electric current and voltages to transmit data.**

   _✓_ True

   ___ False

---

5. **The vast collection of documents residing on different computers on the Internet is referred to as*World Wide Web*.**

6. **Which of the following is the set of standards for digital transmission over ordinary telephone copper wire?**

   ✓ a) ISDN

   b) PSTN

   c) ISP

   d) ADSL

Lesson 4 Follow-up

In this lesson, you defined what a network is, distinguished between the different types of networks, and identified their uses. You can now use a network to accomplish your daily tasks.

1. **Do you think it is necessary for everyone to have access to the Internet? Explain your answer.**

   Answers will vary.

2. **List the advantages of connecting your computer to a network.**

   Answers will vary.

Notes

LESSON 5

Describing the Use of IT in Everyday Life

Lesson Time
45 minutes

In this lesson, you will describe the uses of IT in everyday life.

You will:

- Identify the uses of computers across different domains of work.
- Define e-commerce and identify where it can be put to efficient use.

Introduction

You have set foot into the world of computer networking, and examined the various ways through which computers "talk" to one another. In this global system of information exchange, there is a place for you. In this lesson, you will harness the power of this computer networking system and apply it to one of its most important uses: making your daily life easier.

You want to build a rooftop garden. You have not decided if it should be a vegetable, flower, or grass garden. You are not sure of the materials you would require to construct the garden. What do you do now?

All you have to do is log on to the Internet and perform a search for rooftop gardens. You would have a world of information. You can compare prices, decide where to get your materials, determine the advantages and disadvantages of the different types of roof gardens, and decide on the garden that would suit your setup. All these things can be done right at your desk.

TOPIC A

Determine the Use of Computers Across Different Domains of Work

You have examined the ways in which computers across the world can connect to and share information with one another. To truly grasp the importance of computer networking—be it in your home, your place of employment, your town, or the world you live in—you must examine the ways in which computers are used in many aspects of life. In this topic, you will analyze some of these uses.

Computers have revolutionized the way we perform our day-to-day tasks. You can see computers in almost all fields of work, be it education, banking, retail, or health care. You need to be aware of how computers are used across these domains, and how that directly affects your own life.

Teleworking

The concept of working away from the office, on an agreed upon schedule, by using a combination of information technologies, is referred to as *teleworking*. The advantages of teleworking include reduced or no commuting time, greater ability to focus on a single task, flexible schedules, and reduced company space requirements. The disadvantages include lack of human contact and less emphasis on teamwork.

Determine the Use of Computers Across Different Domains of Work

Computers can enhance productivity when they are used appropriately. Click each field of use to view information about it.

Field of Use	Description
Business	Computers are used to process data in commercial and financial institutions. This includes billing, reservation processing, inventory control, and claims processing in supermarkets, airline reservation systems, online banking, and insurance sectors.

Field of Use	Description
Government	The government uses computers to keep electronic records of public record systems. Activities such as census operations, renewing a driver's license, voting, filing taxes, reviewing police reports, paying parking violations, and vehicle registration can all be performed using a computer.
Hospitals	Large-scale computer applications are used in hospitals and health care institutes for maintaining patient records and controlling ambulances. The introduction of automated diagnostic tools, instruments, and specialist surgical equipment are aimed at guaranteeing surgical accuracy.
Education	Computers have made learning easier, by introducing the concept of computer-based training (CBT). This is an especially valuable tool that can be used to promote the language development of children and their problem-solving skills. Children can get a huge amount of information and knowledge by using computers and the Internet, more than they can get from textbooks and more traditional learning tools. They can do their homework online. Computers promote distance learning. They also make registration and timetabling systems more effective.
Science	Computers can be used in the field of science to gather and analyze data. They can be used to model complex natural phenomena such as weather and climate prediction, nuclear engineering, and thermodynamics.
Media	Computers can be used to compose, perform, and record music. They can also be used for editing film and video, and creating special effects and animations.

Uses of Computers

You can use computers to:

- Write documents
- Perform accounting tasks
- Produce and maintain lists of information
- Analyze numeric data
- Plan a budget
- Schedule and plan projects
- Create illustrations
- Search for information
- Communicate by using email
- Provide support to classroom-based learning
- Play games
- Work from home
- Keep track of household accounts
- Do projects and homework
- Access the Internet

While computers are making many everyday jobs easier there are still some jobs that are best done by an individual. Humans do better than computers with tasks which require judgement and subjective decision making, such as making a rapid diagnosis during a medical emergency, effectively handling irate customers, or social work. Journalism requires a human presence to capture the emotions and nuances of human behavior. Although much of customer service has become automated, many people still prefer dealing with humans rather than computers when they need to have a problem resolved.

DISCOVERY ACTIVITY 5-1

Describing the Uses of Computers

Scenario:

Now that you have equipped your office with computers, you need to train your personnel on the ways of using IT to enhance their day-to-day tasks.

---

1. **Name several places where you have seen computers.**

   Answers will vary, but may include libraries, banks, schools, stores, doctor and dentist offices, and other places of business.

---

2. **Identify several ways you have seen computers used.**

   Answers will vary, but may include scheduling appointments, casting votes, playing games, designing a home, paying parking violations, looking up information, creating a newsletter, or writing a form letter.

---

3. **What are some advantages of using a computer?**

   Answers will vary, but may include being able to work from home, perform large-scale calculations, and access a large repository of information (the Internet or a company network).

---

4. **The concept of working away from the office is referred to as *teleworking*.**

---

5. **Identify some situations where a person might be more appropriate than a computer for carrying out a task.**

   Answers will vary, but may include social work and journalism.

TOPIC B

Define the Components of the Electronic World

You have familiarized yourself with some of the ways in which computers are used in many aspects of life. Now, you will investigate two specific ways in which using computers can benefit you in your personal and professional life. In this topic, you will take a closer look at email and e-commerce.

The Internet has made the world a smaller place to live in by narrowing the boundaries. Now, you can communicate with people in distant places quickly and inexpensively. Where it may once have taken a week or two for a friend halfway across the world to receive a handwritten letter from you, that same message can now be conveyed in a matter of minutes. By the same token, your quest for certain goods or services is no longer limited to an area within walking or driving distance. Now, you can shop for and purchase those same goods and services from any part of the world, simply by connecting your computer to the Internet.

Electronic Mail

Electronic mail, or *email*, is an electronic form of physical mail. It is used to send messages through computer networks between individual users. It is hard to ignore a ringing phone, but with email, you do not have to respond to a message immediately. You can read a message when it is convenient to you, or you can choose not to read it at all. You can also send messages wherever you want, at whatever time you want, without interrupting the person at the other end.

Define the Components of the Electronic World

Electronic commerce, or *e-commerce*, is the buying and selling of goods or services on the Internet. Many people are finding shopping over the Internet more convenient than visiting malls or shops, since they never have to leave their house. Click each stage to view information about it.

Stage	Description
Select product or service	You browse a website, decide on the product or service you want to purchase, and place your order by selecting that product or service.
Submit personal details	After selecting the product or service, you need to enter personal information, such as your name and address. All information that you provide will be encrypted.
Pay for the product or service	You can choose to pay by using credit or debit cards, issuing a check or money order. The information you provide, in the case of credit or debit cards, will be processed by your bank and the merchant's bank and the transaction will be either accepted or rejected.
Complete transaction	If the transaction is accepted, the selected product or service will be delivered to you.
Retain/return product or service	If you find the product or service to be unsatisfactory, you can cancel your order and obtain a full refund within a stipulated time. If the product or service is satisfactory, you can start using it.

Advantages and Disadvantages of Purchasing Online

A few of the advantages involved in online purchasing include:

- Buying products or services from anywhere in the world.
- Buying products or services from the comfort of your home.
- Viewing a wide range of products or services before making your choice.
- Buying at anytime you want, because online businesses are open 24 hours a day.
- Comparing costs before making your choice.

A few of the disadvantages involved in creating an e-commerce business include:

- Lack of human touch.
- Risks involved in the insecure payment modes. There is the possibility of your credit card number being misused if the network is not secure.
- Risks involved in paying for shipping and waiting for delivery.
- Not being able to view or feel the product before you make the final decision, because it is a virtual store.
- Not being able to return the product easily, if it is found to be unsatisfactory.

DISCOVERY ACTIVITY 5-2

Describing the Electronic World

Scenario:

Now all the employees in your office are using their computers. Your boss wants individuals to be able to communicate with one another on official matters when they want to, without leaving their desks. Since you did a great job implementing the computers, he asks you to explore the communication tools available in a computer network.

1. **What is email?**

   Email is a communications tool that allows individuals to send, receive, and save messages on their computers.

2. **Arrange the following events in the order in which they occur.**

   2 Submit personal details

   4 Complete transaction

   1 Select product

   3 Pay for the product

3. **Identify the advantages of purchasing goods online.**

   ✓ a) Businesses are run 24 hours a day

   b) Virtual store

   ✓ c) Buying products from the comfort of home

   ✓ d) Can compare costs before buying

Lesson 5 Follow-up

In this lesson, you identified the uses of IT in everyday life. Now, you are ready to start using computers to accomplish your day-to-day tasks.

1. **Which payment mode would you choose if you were to perform some kind of an online transaction? Why would you choose it?**

   Answers will vary.

2. **How do you use computers to perform your day-to-day tasks?**

   Answers will vary.

Notes

LESSON 6

Promoting a Healthy and Safe Working Environment

Lesson Time
30 minutes

In this lesson, you will promote a healthy and safe working environment.

You will:

- List the steps to be followed to create a healthy working environment.
- Identify and list the safety measures to be followed when using computers.

Introduction

You're quickly learning how easy it can be to make computers work on your behalf. Understanding how computers work, and how you can use them in so many aspects of your daily life, can be extremely exciting. But in your excitement, it's important not to overtax yourself. In this lesson, you will familiarize yourself with the ergonomic and environmental safety precautions you should take while working on a computer.

When working with computers, you tend to stay at the same location for hours and perform many unnatural movements. This can result in body pain and stress. The repetitive motions you perform can cause damage to your muscles, nerves, joints, and bones. Adjusting your workstation to fit your needs can control risk factors and help increase your productivity.

TOPIC A

Practice Ergonomics to Resolve and Prevent Health Issues

If you are relatively new to using computers, your eyes have probably been opened to many of their uses and benefits—some of which, you may have never even considered before. It is important, however, to also be aware of some of the potential hazards that can result from prolonged computer use. In this topic, you will learn to incorporate proper ergonomics into your computing sessions.

Continuously working at a computer frequently means remaining in the same position for long periods of time. This may lead to strain on your eyes, your wrists, or your back. Practicing ergonomics will make your immediate workspace better suited to your individual needs and comfort, while simultaneously resolving or preventing health-related issues.

Identify Health Issues

The increase in computer use is resulting in major health issues. *Repetitive Strain Injury* is caused by staying in the same spot without moving or exercising for a long time. Eye strain is caused by screen glare. Back problems may result from a poor seating arrangement or bad posture. Injuries to wrists may be caused by prolonged typing. It is important to take precautions so that your health does not suffer.

Practice Ergonomics to Resolve/Prevent Health Issues

Ergonomics is an area of study concerned with products and practices that help you to work comfortably and avoid injury.

Guidelines:

Some ergonomic practices include:

- Using proper lighting to ensure the screen is free from glare or shadows.
- Using an anti-glare device to cover the screen.
- Using a fully adjustable chair that offers lower back support.
- Using a pad on which to rest your wrists as you type.
- Positioning the monitor so that the top of the monitor is not higher than your eye level.
- Positioning the keyboard so that your arms are parallel to the floor.

- Taking breaks to exercise your hands and fingers.
- Providing adequate ventilation.

Example:

While working with computers, you need to use a fully adjustable chair that offers lower back support. You need to position your monitor such that the top of the monitor is not higher than eye level. Your arms need to be placed parallel to the floor.

DISCOVERY ACTIVITY 6-1

Practicing Ergonomics

Scenario:

You've heard some news reports referencing ergonomics and problems related to non-ergonomic workstations. You want to make sure that the workstations in your company adhere to ergonomic practices. You start by looking at your own monitor.

1. **Which of the following causes back problems?**

   a) Screen glare

   ✓ b) Bad posture

   c) Prolonged typing

   d) Lack of exercise

2. **Your computer has been placed under a window. Is this a good working location?**

   This is not a good location. The intense light of the sun can cause glare on the screen. An open window may expose your personal computer to moisture.

3. **Your desk has more room on the left. Although you are right-handed, you place the mouse on the left side of the keyboard. Is this an ergonomic practice?**

   No. This is not a good location. The mouse needs to be placed on the left if you are left-handed or on the right if you are right-handed.

4. **You experience back pain from arching your neck to view the monitor. How would you resolve this ergonomic-related problem?**

   Place the monitor at eye level and at a minimum distance of 25 inches from your face.

5. **You're experiencing eye strain, because the area around the computer does not have the proper lighting. How will you resolve this problem?**

   Light should come from the ceiling. Use an appropriate light source. Consider using an anti-glare device to cover your screen, if necessary.

TOPIC B

Promote Computer and Environmental Safety

There are other potential hazards to computer use than just personal, health-related ones. You also need to be aware of the natural resources you consume while working on computers, and of the safety of the work environment that you likely share with others. In this topic, you will identify some of the precautions you can take to make your computing experience a safe one.

Being a responsible computer user means tailoring your workspace not only to suit your own safety, but also the safety of those around you. It also involves knowing what resources you consume through your work. This knowledge will help you efficiently use and conserve the materials made with those resources.

Computer and Environment Safety

You need to be aware of safety precautions and environmental issues associated with working on a computer to ensure a safe working environment. Always ensure that your computer's power cables are safely secured and that electrical outlets are not overloaded. Be sure that the computer is positioned in a well ventilated area. If the fan in the back of your computer is blocked, your computer may overheat. You need to recycle used printer paper and printer toner cartridges to reduce the need for printed materials. This could help conserve wood, which is the natural resource used to make paper. You can save electricity by using a monitor that consumes less power while the computer is inactive.

Electronic Document

Using a computer, you can store a vast amount of electronic information. An electronic document is a collection of information (or data) that is treated as a unit and stored under a single name. It can be a single report, letter, and so on.

A computer uses two types of electronic documents: data and program. *Data* documents are the documents you create and save. *Program* documents are the documents you get when you purchase a program.

The advantages of using electronic documents are:

- They reduce the need for printed documents.
- They can be distributed more effectively than printed documentation. They are also less costly.
- They eliminate the large amount of space usually taken by printed manuals.
- They present clear and precise information.
- They are easy to update.
- It is easy and fast to retrieve information from electronic documents.

DISCOVERY ACTIVITY 6-2

Ensuring Computer and Environmental Safety

Scenario:

You find that there are many one-sided printouts lying around the printer. You want to educate the personnel in your office on the advantages of reusing printed outputs. You also want to brief them on the advantages of using electronic documents and how it helps conserve the environment.

1. **True or False? You always need to ensure that your computer's power cables are safely secured.**

   ✓ True

   ___ False

2. **What is an electronic document?**

   An electronic document is a collection of information that is treated as a unit and stored under a single name.

3. **Why should you recycle printed output?**

   You need to recycle printed output to reduce the need for printed materials. This would in turn help conserve the natural resource, wood, used in making papers.

Lesson 6 Follow-up

In this lesson, you identified the practices that will help you work comfortably and avoid injury. You are now aware of the issues to consider before setting up your workstation. You also discussed in detail the safety and environment issues to be considered to promote a safe and healthy working environment.

1. **What are the work-stress problems you encounter in your workplace?**

   Answers will vary.

2. **Which of the ergonomic practices discussed here need to be implemented in your workplace?**

   Answers will vary.

Notes

LESSON 7
Securing Information

Lesson Time
30 minutes

In this lesson, you will secure information.

You will:

- List the steps to be taken to protect information from unauthorized access.
- List the guidelines to be followed to prevent a virus attack.

Introduction

Just as you have to take precautions for your own health and for the safety of your environment when using a computer, you must also take precautions to ensure the safety of the computer itself. In this lesson, you will familiarize yourself with the various threats to the information stored on your computer. You will also learn what steps you can take to ensure that these threats don't negatively affect your systems.

When you connect a computer to a network, you are making the information and the resources in it accessible to millions of unknown people with different motives. Not all are scrupulous. From a security perspective, this is a potential nightmare. You need to take proper steps to ensure the integrity of the information and resources in your computer.

TOPIC A

Protect Information Security

You now see the importance of keeping your computer workspace safe and secure, and how doing so can benefit you and the people around you. Computer safety and security is not limited to the physical space around your computer; it also extends to the information contained within the computer itself. In this topic, you will identify methods of protecting your data.

By connecting your computer to a network, you make the information and resources in it accessible to many other users. If someone with malicious intent accesses that information, they could potentially steal your personal files, your credit card information, or even your "virtual" identity. You need to take proper measures to secure the data in your computer to prevent others from misusing it.

Information Security

Information security is the process of protecting sensitive and essential information from unauthorized access, disclosure, destruction, or alteration. A *threat* is any circumstance or event with the potential to cause harm to an information system. A *security risk* is the possibility of a threat becoming a reality.

Hackers and Crackers

As with any society, ours has individuals whose intentions are less than good. Some individuals like to break into other people's computers as a hobby. Some do this for the challenge, much like a mountain climber looking to climb a mountain simply because it is there. In some cases, hackers claim that they don't intend to do any harm. They claim that they are performing a service by pointing out security leaks without performing any malicious acts to take advantage of those leaks. Hackers call those who break into systems with malicious intent crackers, and they make a distinction between the acts of hacking and cracking. The distinction, however, tends to be lost on those who are outside of the hacker community and who view any act of breaking into computer networks as criminal activity. Some individuals perform acts of vandalism, such as defacing websites by replacing the owner's content with their own content, often obscene or controversial.

User ID and Password

A *user ID* is the unique name provided to a computer user. This helps a computer network identify the user, every time the user logs in. User IDs are generally associated with a password. A *password* is a unique combination of characters that authenticates a user. Together, the user ID and password provide a user with access to information and resources on a computer network.

Access Rights

Access control is the assignment of *rights* and permissions for using local or network resources. It is important because it helps ensure the confidentiality, integrity, and availability of information and resources on a network. In most larger networks, rights and permissions are granted by network administrative personnel, but in workgroups, a resource's owner is responsible for providing the proper level of access.

Protect Information Security

Implementing security measures prevents security risks from happening.

Guidelines:

The proactive steps to be followed to prevent security risks from happening include:

- Adopting an information security policy with respect to handling sensitive data. A security policy is the basic set of rules and guidelines that an organization will use to define its operations in regards to securing electronic data. At times, in some companies, the security policy will go beyond the electronic systems into paper data as well. To practice a security policy properly, the management of the company needs to be involved in the creation and execution of the directives that are outlined in the policy.
- Implementing procedures for reporting security incidents.
- Keeping staff members informed of a computer's weaknesses—of who has been accessing the resources, and how they have been gaining access. This information can help them identify where the servers and network are vulnerable, and deal with such vulnerabilities prudently. One good source of information is the security bulletins that are posted by software and hardware vendors. These bulletins identify security leaks that have been found in their products, and typically provide a work-around or a software upgrade to plug up the leak.
- Practicing good password policies. The primary purpose of a password is to ensure that no other user can log on using your name. A strong password that is not easily guessed by others protects the information stored on your computer. You should never share your passwords or keep them stored in a document on your computer. Someone could hack into your system and steal your passwords. You should also create passwords that would be difficult for someone to guess.
- Backing up the data and software on your computer to removable storage devices such as Zip disks or CD-ROMs. Network backups are typically run on a regularly scheduled timetable. It is strongly recommended that you perform regular backups of your own. Frequent and adequate backups protect against costly data losses, that could occur due to a computer malfunction or security breach.

Example:

Consider the case of a low-security department intranet. To make the information on your computer secure, you need to practice the basic rules and guidelines outlined in the security policy. You could set the password for your user account to be made up of a combination of letters, numbers, and special characters. You could protect against data loss by backing up data on your hard drive to a Zip disk once every week. For a complete list of guidelines, click the Resources link below.

The Importance of Backing Up Data

The aftermath of a computer crash or a security incident may be disastrous. It could destroy all the data on a hard drive, including all files and folders. Therefore, it is critical that you back up information in your computer to a removable storage device so that you have another kind of access to that information. Backing up data provides a cost-effective, easily manageable, and safer computing option.

Implications of Theft of a Laptop, PDA, or Mobile

You have to be aware of the fact that your information is vulnerable to theft. The implications of theft of a laptop, PDA, or mobile phone include:

- Possible misuse of confidential files.
- Loss of files.
- Loss of important contact details if not available on a separate source.
- Possible misuse of telephone numbers.

DISCOVERY ACTIVITY 7-1

Protecting Information Security

Scenario:

Your employees occasionally need to access the data servers for the purposes of system troubleshooting and maintenance. You have to ensure that such access is granted only to those who have such needs. You also need to train staff periodically regarding security protection of their personal workstations.

---

1. **What is information security?**

   Information security is the process of protecting sensitive and essential information from unauthorized access, disclosure, destruction, or alteration.

---

2. **Identify the security measures to be followed to prevent security risks.**

   ✓ a) Keep staff members informed about your computer's weaknesses.

   b) Back up data to non-removable storage devices.

   ✓ c) Implement procedures for reporting security incidents.

   d) Share your password with your neighbor.

---

3. **You are traveling abroad and suddenly your laptop goes missing. What are the implications of the theft of your laptop?**

   Answers will vary, but may include the possible misuse of confidential files, loss of files, loss of important contact details (if they are not available on a separate source), and possible misuse of telephone numbers.

TOPIC B

Prevent a Virus Attack

You have identified some of the ways in which you can protect your computer and the data contained within it. One of the most well-known ways in which data can be attacked, altered, or even destroyed is through viruses. In this topic, you will differentiate between different types of viruses, and adopt strategies to keep them out of your computer.

Just as humans can catch viruses that can lead to many different types of sicknesses and symptoms, computers can fall prey to the same "illnesses." You have likely heard news reports about the damage that can be caused by quickly and widely spreading computer viruses. In order to avoid becoming a victim of such an attack, you need to identify techniques to prevent—and, if necessary, contain and recover from—the adverse effects of a virus.

Computer Viruses

Definition:

Viruses are small programs that attach themselves to files on the host computer. Viruses are typically spread when a file is copied from one computer to another. Because of the ease with which files are transferred across the Internet, the Internet has become a breeding ground for computer viruses. Some viruses do little more than replicate themselves. Others are designed to wreak havoc on the host computer, performing deeds such as erasing files or preventing important system functions from working properly. Viruses usually fall into one of three categories: boot-sector viruses, file infectors, and multipartite viruses.

Type	Description
Boot-sector viruses	Replace the code that normally resides in the master boot sector of a disk with their own viral code. They are spread by bootable floppy disks. When a system is booted with an infected disk, the virus loads into memory, and all subsequent disks used on that system will be infected by the virus. These viruses are no longer the primary source of infection. Symptoms of a boot-sector virus include receiving the message Missing Operating System or the message Hard Disk Not Found.
File infector viruses	Attach to executable files so that when the program is run, the virus is also run and loaded into memory. The virus then infects any other programs that are run on the system. There are two types of file infectors: macro viruses and worms. Macro viruses are encoded into a macro that's embedded into a document and are spread by sharing infected documents. The main access point for macro viruses is as an email attachment. Symptoms include not being able to open or save files. Worm viruses are also becoming rampant. Worms are viruses that can replicate themselves and use memory, but don't attach themselves to other programs.
Multipartite viruses	Have the characteristics of both boot-sector viruses and file infector viruses.

Antivirus Software

Antivirus software is a program that is used to detect and remove a virus. Removing a virus is also known as disinfecting. Antivirus software usually includes two components: a scanner that detects viruses before they can infect the computer, and a repair program that deletes viruses that have successfully infected the computer. If a virus has infected your computer, you can:

- Repair or delete the infected file, if it is a known piece of malicious code.
- Quarantine the infected file, if it is a piece of malicious code that you suspect is not yet known, so that it cannot be opened or executed.

Limitations of Antivirus Software

New viruses are released every day, but antivirus software is programmed to trap only known viruses. Vendors of antivirus software typically release periodic updates that allow them to deal with new viruses that have been discovered since the last release. One limitation of using antivirus software is that you have to keep updating it to prevent data loss. The second limitation is that even though you keep updating your antivirus, there are times when new viruses strike long before software vendors are aware of it.

Preventing a Virus Attack

Virus infection can be very expensive in terms of time, data loss, and money. The best way to deal with viruses is to put measures into place that avoid infection.

Guidelines:

To prevent a virus attack on your machine, you need to practice the following steps:

- Do not open any files attached to an email unless you know what it is, even if it appears to come from a friend, or someone you know. Some viruses can replicate themselves and spread through email. Better be safe than sorry and confirm that the person you know really sent it.
- Do not open any files attached to an email if the subject line is questionable or unexpected. If there is a need to open it, always save the file to your hard drive before opening it.
- Delete chain and junk emails. Do not forward or reply to them. These types of email are considered spam, which is unsolicited, intrusive mail that clogs up the network.
- Do not download any files from strangers.
- Exercise caution when downloading files from the Internet. Ensure that the source is a legitimate and reputable one. Verify that an antivirus program checks the files on the download site. If you are uncertain, do not download the file at all or download the file to a floppy disk and test it with antivirus software.
- Do not share floppy disks between computers.
- Do not boot a computer with a startup disk that has been used in another computer.
- Write protect all boot diskettes.

Example:

Imagine a case where you need to connect to the Internet to perform your job tasks. To prevent your system from being infected with a virus, you need to write protect all boot disks. You need to delete chain and junk mails. In case you need to open an email with a questionable subject line, you need to save it to your hard drive before opening. You need to run a virus check on files that you need to download from the Internet.

DISCOVERY ACTIVITY 7-2

Preventing a Virus Attack

Scenario:

Last week a couple of machines in your office were infected by a macro. You find that most of the personnel in your office are unaware of what a virus is and how it spreads. You are creating a presentation about viruses: how they infect, how to disinfect them, and how to prevent them.

1. **True or False? Viruses are typically spread when a file is copied from one computer to another.**

   ✓ True

   ___ False

2. **How can computer viruses be dealt with when they are detected?**

   You can delete, repair, or quarantine the infected file.

3. **List some general rules of safe computing.**

   Answers will vary, but may include using virus scanning software, not opening unrecognized email messages, and not opening attachments contained within unrecognized email messages.

4. **True or False? Antiviruses are small programs that attach themselves to files on the host computer and spread when a file is copied from one computer to another.**

   ___ True

   ✓ False

Lesson 7 Follow-up

In this lesson, you identified the different ways in which computer security and information security can be compromised. You also described the steps to follow to defend against such attacks.

1. **Which of the security measures discussed are already in place in your workplace?**

   Answers will vary.

2. **When developing a password for an online account, do you lean toward ease of remembrance or maximizing the security of your password?**

   Answers will vary.

Notes

LESSON 8

Protecting Copyright and Personal Information

Lesson Time
30 minutes

In this lesson, you will protect copyrights and personal information.

You will:

- List copyright issues with using and distributing information stored on computer hardware, software, and the Internet.
- Define how the Data Protection Act legislates the ethical use of data.

Introduction

You are now a capable computer user—someone who is well versed in the workings of computers and computer networks, and knowledgeable about the benefits and potential hazards of their use. Now that you are ready to use software and share data on your computer, you should be aware of the rules and laws that regulate the exchange of such information. In this lesson, you will study IT-related copyright laws and data protection legislation.

It is illegal to copy and distribute copyright reserved content created by someone else. You need to be aware of the terms and conditions involved in replicating and reusing creative content.

TOPIC A

Identify Copyright Issues

So far in this course, you have learned how the individual parts of a computer work, as well as how individual computers work and communicate with one another across networks. You identified many ways in which computers make the businesses and institutions that touch your life function more efficiently and effectively, as well as how they can bring similar efficiency and effectiveness to your own personal and professional life. You also discussed the steps you should take to keep yourself, others around you, and even your computer safe and secure. In this topic, you will investigate computer-related licensing and copyright issues.

An important part of being a responsible computer user is respecting the rights of other users. The "intellectual property" of computer software and applications belongs to the person or company that wrote or created them. Though you can legally buy software or procure it through other means, there are some limitations on how you use it.

Shareware and Freeware

Shareware is software that is distributed free on a trial basis. After a certain period of time, users must pay for the software if they intend to keep it. *Freeware* is software that is offered at no cost.

End-User License Agreement

The *end-user license agreement* lists the terms and conditions agreed upon by a user and a provider for the use of information, resources, or services. The user needs to accept the agreement before the provider provides him with that service.

Copyright

Software is expensive to produce, but cheap to reproduce. *Copyright* is the ownership of the intellectual property within the limits prescribed by law. The copyright law states that the owner of a property has the exclusive right to print, distribute, and copy the work, and permission must be obtained by anyone else to reuse the work in these ways. It helps contain plagiarism to some extent.

Copyright Issues

With the advent of the Internet, people are seeing a rise in the information that they can access. Many people feel that they can download any graphics, text, audio, or video they find on the Internet and use it as if it is their own. But they rarely realize that by copying a graphic from a person's website and placing it onto their own personal website, they are breaking

copyright laws. Similarly, it is illegal to copy and distribute content stored on removable media such as CD-ROMs, floppy disks, and Zip drives. For example, software you purchase in a CD-ROM is usually copyrighted and you would have to accept the license agreement before you can activate the software. This license agreement states that you will not illegally copy the software. When such software is replicated, it would become copyright infringement, and plagiarizers could face legal action if they were caught.

Product ID

All software you purchase has a unique product ID. It is an authentication mechanism designed to prevent software piracy. You can check the product ID by choosing the about the software submenu from the Help menu.

DISCOVERY ACTIVITY 8-1

Identifying Copyright Issues

Scenario:

You find that your competitor's website uses some of the images that you had posted on your site a week earlier.

1. **Define copyright.**

   Copyright is the ownership of intellectual property within the limits prescribed by law.

2. **Which of the following activities defies the Copyright act?**

   a) Writing a software program for a computer-based system.

   ✓ b) Downloading graphics from another site and using them on your own.

   ✓ c) Copying software from a friend's CD-ROM to your computer.

   d) Writing your program into a CD-ROM.

3. ***Sharewareis* software that is distributed free on a trial basis.**

TOPIC B

Define Data Protection Legislation

You are now familiar with terms such as shareware, freeware, and end-user license agreement, as well as with common licensing and copyright issues. There are rules in place to protect the intellectual property of software companies and developers. In this final topic, you will investigate one of the laws established to protect you, the computer user.

When accessing content or performing transactions on the Internet, you may need to divulge some information about yourself. There are laws that have been enacted to prevent the misuse of such personal information. Before venturing into the world of information exchange or online shopping, it would be helpful to know why these laws were established, and what kind of protection they offer.

Uses of Personal Data

Personal data includes information such as your name, password, address, phone number, and credit card number. This information is requested when you want to perform some transactions on the Internet. Your name and password are generally used to ascertain the fact that you are whom you claim to be. In case you do some online shopping, your address particulars will be used to deliver the product to you. Your credit card details would be used to transfer money from your account to the vendor's account to complete the transaction.

Define Data Protection Legislation

Data subjects are the people about whom personal information is held. The data holders are the people who hold information about data subjects. The *Data Protection Act* exists to legislate the ethical use of personal data. The original act, passed in 1984, has been replaced with a newer version, implemented in 1998. It allows individuals to have access to information held about themselves on computer networks. They are allowed, where appropriate, to have it corrected or deleted.

Guidelines:

The guidelines outlined in the Data Protection Act include:

- Fair and lawful processing of data.
- Limited purpose processing of data.
- Adequate and relevant usage of data.
- Accurate and updated maintenance of data.
- Limited time usage of data.
- Data subject's right maintained for processing of data.
- Prevention of unauthorized and unlawful processing of data.
- Secure cross country transfer of data.

Example:

If the vehicle that the data subject owns has been towed out of the parking lot, the data holder has the right to use information about the data subject to trace the data subject.

DISCOVERY ACTIVITY 8-2

Defining Data Protection Legislation

Scenario:

Your company has started selling goods online. There is a lot of personal information that is being collected. You want everyone in your office to be aware of the importance of securing personal information they've collected.

1. **Why do you require personal information to complete an online shopping transaction?**

   Your name and password are generally used to ascertain the fact that you are whom you claim to be. In case you do some online shopping, your address particulars will be used to deliver the product to you. Similarly, your credit card details would be used to transfer money from your account to the vendor's account to complete the transaction.

2. **The principles outlined in the Data Protection Act include**

   ✓ a) Fair and lawful processing of data

   b) Usage of data for an unlimited time

   ✓ c) Adequate and relevant usage of data

   ✓ d) Updated maintenance of data

Lesson 8 Follow-up

In this lesson, you identified the security concerns related to the use of personal information and downloading of content from the Internet. You also discussed the laws that have been passed to legislate those concerns.

1. **Do you think it is necessary for everyone to be aware of copyright issues? Explain your answer.**

   Answers will vary.

2. **In your work environment, do you use any personal data described in this lesson? If so, which ones and how?**

   Answers will vary.

Follow-up

In this course, you defined what a computer is, described its components, and identified its many uses. You also identified the health and safety issues and environmental factors involved in using computers. Now, you can continue on and use the knowledge you gained in this course to put computers to efficient use.

1. **Of all the information you gained from this course, what was the most important?**

   Answers will vary.

2. **How will the use of a computer change the way you work at your office?**

   Answers will vary.

What's Next?

If you wish to pursue ECDL/ICDL certification in other areas related to this one, New Horizons also offers the following courses: *ECDL/ICDL – Using the Computer and Managing Files* and *ECDL/ICDL– Information and Communication* .

In addition, there are ECDL/ICDL certifications in areas related to several Microsoft Office software applications. New Horizons offers preparatory courses for the following certifications: *ECDL/ICDL– Spreadsheets* , *ECDL/ICDL– Presentation* , *ECDL/ICDL– Word Processing* , and *ECDL/ICDL – Database* .

GLOSSARY

ADSL
(Asymmetric Digital Subscriber Line) A type of DSL that is most familiar for home and small business users.

ALU
(Arithmetic and logic unit) A component of the CPU that performs all calculations and logical operations of a program instruction.

analog signal
A continuous, variable signal (such as voice wavelengths of varying amplitudes) that possesses an infinite number of values.

antivirus software
Software that detects and destroys viruses.

application software
A program that provides specific functionality such as word processing, graphics creation, or database management.

bit
The smallest unit of information in a computer system. Bit is short for binary digit (either a 1 or 0).

boot-sector virus
A virus, spread by bootable floppy disks, that replaces the code that normally resides in the master boot sector of a disk with its own viral code.

byte
A unit of computer storage equal to approximately one character.

CD-ROM
(Compact disc read-only memory) A permanent storage device that uses a laser disk drive to read the information.

client
A network node that uses services provided by a server.

client/server network
A network design in which each node is a client or a server, which yields larger network size and more power.

computer
A fast-operating, versatile machine that can be used for home- and business-related tasks to enhance productivity.

control unit
A component of the CPU that decodes, synchronizes, and executes program instructions.

copyright
Legal protection for creative works.

CPU
(Central processing unit) The main computer chip that interprets and executes instructions.

data cartridges
Portable, removable drives that are capable of storing large amounts of information.

Data Protection Act
A piece of legislation enacted to protect data and personal information from theft and disclosure from unauthorized access.

digital camera
A device that captures images digitally and stores them as a file in a floppy disk or removable memory card.

digital signal
A representation that uses discrete mathematical values to represent an object or amount.

DSL
(Digital Subscriber Line) A high-speed network access service available from telephone service providers.

e-commerce
A way of conducting business transactions through computers and networks.

email
An electronic form of physical mail, used to send messages through computer networks between individual users. You must have an account on an Internet mail server and access to an Internet mail client to send and receive mail directly. However, many other electronic mail systems can communicate with Internet mail through the use of mail gateways.

end-user license agreement
The terms and conditions agreed upon by a user and a provider for the use of information, resources, or services.

ergonomics
An area of study concerned with products and practices that help you to work comfortably and avoid injury.

extranet
A portion of an organization's intranet that is made accessible to others outside the organization.

file infector virus
A virus that attaches to executable files. When the executable program is run, the virus is also run and loaded into memory. From there, the virus may infect any other programs that are run on the system. There are two types of file infectors: macro viruses and worms.

floppy disk
A disk that generally stores much less information than a hard disk. A floppy disk can be removed from the floppy disk drive and transported.

freeware
Software that can be copied and distributed without charge. Freeware is available at many sites on the Internet.

GHz
(Gigahertz) A measurement of a CPU's speed, in billions of cycles per second.

GUI
(Graphical user interface) A means of communicating with an operating system by using a mouse or other device to work with pictorial screen elements, instead of typing text commands at the keyboard.

hard disk
The fixed disk contained within the computer, which is used to permanently store information. Hard disks generally store large amounts of information.

hardware
The electronic and mechanical components of a computer system.

immediate access memory
A component of the CPU that stores the data and programs on which the computer is currently working.

information security
The process of protecting sensitive and essential information from unauthorized access, disclosure, destruction, or alteration.

input
The information that goes into a computer.

insertion point
The point on a computer's monitor that indicates where text or graphics will be inserted or erased. Occasionally referred to as the cursor.

Internet
A global network connecting millions of computers.

intranet
An existing network that uses Internet standards, or provides access to corporate information through a web server and browser.

ISDN
(Integrated Services Digital Network) A network of high-speed digital phone lines that companies can lease and use as an alternative to standard analog PSTN service.

ISP
(Internet service provider) An ISP will provide you with the equipment and lines necessary to connect your systems to the Internet.

IT
(Information technology) The technology involved in the creation, exchange, processing, and storage of information, through the use of computers, communication networks, and other electronic devices.

joystick
A pointing device used in computer games.

keyboard
It contains all the keys required for typing letters and numbers, plus keys for entering commands and moving around on the screen. It is used for both text-based data input and command selection.

LAN
(Local area network) A network that includes workstations and a server.

laptop
A smaller, portable version of a PC.

light pen
A pen-shaped, light-sensitive, handheld device that can be used to send information to the computer.

mainframe
A large-scale computer that typically functions as a host in a hierarchical network.

memory
A power-dependent area within the computer that temporarily stores information.

MHz
(Megahertz) A measurement of a CPU's speed, in millions of cycles per second.

microphone
A device that changes sound energy into electrical energy.

minicomputer
A mid-sized computer that can function as a workstation or multi-user system.

modem
A hardware device that converts digital computer information so that it can be transmitted over an analog telephone line, and receives analog data from a telephone line and converts it back to digital signals.

monitor
A display screen used to present output from a computer.

motherboard
The main circuit board of a computer, which carries electrical signals to and from various parts of the computer.

mouse
A handheld device used for data input. The mouse is rolled on a flat service next to the computer, and buttons on it are clicked or pressed to indicate the areas of the screen or the commands you want to work with.

multipartite virus
A virus with the characteristics of both boot-sector viruses and file infector viruses.

network
A collection of hardware and software that enables a connected group of computers to communicate.

network adapter
The physical hardware device installed in a computer used to connect to a network. Also called a network interface card.

network computer
A computer without certain hardware that is booted remotely over the network.

NIC
(Network interface card) An additional board that you can install and configure in a computer to facilitate network communication.

node
A network access point, such as a terminal or a computer.

NOS
(Network operating system) A collection of software that enables network nodes to communicate with other nodes.

operating system
Software that is considered the master-control program for the computer. An operating system manages the computer's internal functions and provides a means to control the computer's operations.

output
The information that comes out of a computer.

password
A specific, predetermined group of letters and numbers that is used to gain access to the operating environment and your user account.

PC
(Personal computer) A standalone, single-user desktop (or smaller) computer that can function independently. PC used to refer to any personal computer, but now refers to personal computers that follow the original design by IBM, use Intel or compatible chips, and usually have some version of Windows as an operating system. PCs are sometimes called IBM Compatibles.

PDA
(Personal Digital Assistant) A very small computer that can be handheld. Often used to keep an electronic calendar and address book, get email, send faxes, and take notes on the go.

peripherals
Devices that are attached to the system unit, such as the keyboard, mouse, monitor, or printer.

plotter
A device used to create large-scale printouts such as construction blueprints.

printer
A device that takes data in electronic form, in the computer, and prints it onto paper.

PSTN
(Public Switched Telephone Network) An international telephone system using copper wire and analog data.

RAM
(Random access memory) The short-term storage area in a computer, which operates only when there is electric power to the computer.

Repetitive Strain Injury
A bodily injury caused by staying in the same spot without moving or exercising for a long time.

rights
The privilege given to you by other users to access and use their resources.

ROM
(Read-only memory) A special type of memory that is permanent. It stores programs necessary to boot the computer and to diagnose problems.

scanner
A device that can convert printed images into a computer readable format.

security risk
The possibility of a threat becoming a reality.

server
A computer on a network that provides resources such as files and printers to client workstations.

shareware
Software that can be copied and distributed without prior licensing. The developer of the shareware program might request a registration fee from shareware users.

software
Instructions that tell your computer what to do.

software versions
Numbers that provide information about the iteration of the software you are using.

speaker
A device used to output audio information from a computer.

storage device
A piece of hardware that permanently stores information.

system unit
The part of the computer that contains disk drives, memory, and the CPU.

teleworking
Working away from the office, on an agreed-upon schedule, by using a combination of information technologies.

threat
Any circumstance or event with the potential to cause harm to an information system in the form of destruction, disclosure, adverse modification, or the denial of service.

touchpad
A stationary device that you slide your finger over to move the cursor on the screen.

touchscreen
An input/output device that responds to instructions as users touch the screen.

trackball
A mouse alternative with a ball mounted on top of a stationary base. Rotating the ball moves the pointer on the screen.

user ID
A unique name used to identify users on the system.

virus
A program that runs without your knowledge or permission, often causing damage to your computer or data, and then replicates so that it can be spread to other computers.

WAN
(Wide area network) A network whose computers are a great distance apart and, therefore, either are connected using expensive leased lines or communicate through the Internet.

workstation
In general, any end-user computer, particularly a computer that has more powerful hardware, a higher-end operating system (such as Windows NT or UNIX), and greater computational and graphics capabilities than a typical desktop PC.

WWW
(World Wide Web) The collection of multimedia information, linked through hypertext, made possible with the HTML markup language and the HTTP networking protocol. The World Wide Web is often used as a synonym for the Internet; however, the Internet includes FTP, Gopher, Usenet, and other information-sharing systems that are not considered part of the World Wide Web.

Zip disk
A disk that generally stores much more information than a floppy disk.

Notes

INDEX

A
access control, 49
ADSL, 30
ALU, 8
analog signals, 29
antivirus software, 52
  limitations, 52
application software, 20, 21
arithmetic and logic unit
    See: ALU
Asymmetric Digital Subscriber Line
    See: ADSL

B
backups, 49, 50
bit, 10
boot-sector virus, 51
business uses for computers, 34
byte, 10

C
CD-ROM, 16
central processing unit
    See: CPU
chip, 9
client/server networks, 27
clients, 27
computer-based system development, 23
computers, 2
  performance, 5
  safety precautions, 44
  types, 2, 3
  uses, 34, 35, 37, 38
control unit, 8
copyright, 56
CPU, 5, 8
  components, 8
  speed, 8
crackers, 48
cursor
    See: insertion point

D
data backups, 49, 50
data cartridges, 16
data documents, 44
data holders, 58
Data Protection Act, 58
data subjects, 58
data transmission, 29
digital camera, 12
digital signals, 29
Digital Subscriber Line
    See: DSL
disk drives, 5, 16
DSL, 30

E
e-commerce, 37
  advantages, 37
  disadvantages, 38
educational uses for computers, 35
electronic documents, 44
email, 37
  viruses, 52
end-user license agreement, 56
ergonomics, 42
extranets, 29
eye strain, 42

F
file infector virus, 51
floppy disks, 16
freeware, 56

G
gigahertz (GHz), 8
governmental uses for computers, 35
graphical user interface
    See: GUI
GUI, 20

H
hackers, 48
hard disks, 16
hardware, 3

health issues, 42
  preventing, 42
hospital-based uses for computers, 35

I
immediate access memory, 8
information security, 48, 50
  implementing, 49
information technology
    See: IT
input, 2
input devices, 5
  types, 11, 12
insertion point, 11
integrated circuit (IC)
    See: chip
Integrated Services Digital Network
    See: ISDN
Internet service provider
    See: ISP
Internet, the, 29
  uses, 29
intranets, 28, 29
ISDN, 30
ISP, 30
IT, 3

J
joystick, 12

K
keyboard, 12

L
LAN, 27
laptops, 3
license agreement
    See: end-user license agreement
light pen, 12
local area network
    See: LAN

M
macro viruses, 51
mainframes, 2
media-based uses for computers, 35
megahertz (MHz), 8
memory, 5, 9
  measurement, 10
  types, 10
microphone, 12
microprocessor
    See: CPU
minicomputers, 2
modems, 30
monitor, 14
motherboard, 8
mouse, 12
multipartite virus, 51

N
network adapters, 26
network computers, 3
network interface cards
    See: NICs
network operating system
    See: NOS
network traffic, 26
networks, 26
  components, 26
  types, 28, 29
  uses, 27
NICs, 26
nodes, 26
NOS, 26

O
operating system software, 20, 21
output, 2
output devices, 5
  types, 13, 14

P
passwords, 49
PCs, 3
  components, 5
PDAs, 3
peripherals, 5
permissions, 49
personal computers
    See: PCs
personal data, 58
Personal Digital Assistants
    See: PDAs
plotter, 14
printer, 14
product ID, 57
program documents, 44
PSTN, 30
Public Switched Telephone Network
    See: PSTN

R
RAM, 5, 10
random access memory
    See: RAM
read-only memory
    See: ROM

Repetitive Strain Injury, 42
rights, 49
ROM, 5, 10

S
safety precautions, 44
scanner, 12
scientific uses for computers, 35
security risks, 48
  preventing, 49
servers, 27
shareware, 56
software, 3
  copyright, 56
  end-user license agreement, 56
  types, 20, 21
  versions, 20
speakers, 14
storage devices, 15, 49
  types, 16
system unit, 5

T
teleworking, 34
theft, 50
threats, 48
touchpad, 12
touchscreen, 14
trackball, 12

U
user IDs, 49

V
viruses, 51
  disinfecting, 52
  macro, 51
  preventing an attack, 52
  types, 51
  worms, 51

W
WAN, 27
wide area network
  See: WAN
workstations, 26
World Wide Web (WWW), 29
worms, 51

Z
Zip disks, 16

Notes