

# TECHNOLOGY IN ACTION

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## Chapter 2

Looking at Computers:  
Understanding the Parts

# *Understanding Digital Components*

- Understanding Your Computer
- Input Devices
- Output Devices

# Understanding Digital Components

## Objectives

- 2.1 Describe the four main functions of a computer system and how they interact with data and information.
- 2.2 Define bits and bytes, and describe how they are measured, used, and processed.
- 2.3 List common types of computers, and discuss their main features.

# Input Devices

## Objectives

- 2.4 Identify the main types of keyboards and touch screens.
- 2.5 Describe the main types of mice and pointing devices.
- 2.6 Explain how images, sounds, and sensor data are input into computing devices.

# Output Devices

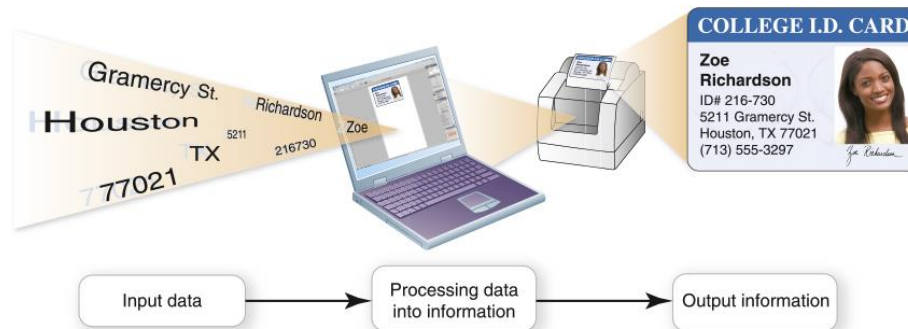
## Objectives

- 2.7 Describe options for outputting images and audio from computing devices.
- 2.8 Describe various types of printers, and explain when you would use them.

# Understanding Your Computer

## Computers are Data Processing Devices (Objective 2.1)

- Perform four major functions
  - Input: Gathers data, allows entering data
  - Processing: Manipulates, calculates, or organizes data
  - Output: Displays data and information
  - Storage: Saves data and information



# Understanding Your Computer

## Bits and Bytes: The Language of Computers (Objective 2.2)

- Bit

- Binary digit
- 0 or 1



**Figure 2.2** Water faucets can be used to illustrate binary switches.

- Byte

- Unique combinations of 8 bits of 0s and 1s

- Kilobytes, megabytes, gigabytes, terabytes, and petabytes

# Understanding Your Computer

## Types of Computers (Objective 2.3)

- Smartphones
- Tablets
- Laptops and their variants
- Choosing a portable device
- Stationary computers





# Input Devices

## Physical Keyboards and Touch Screens (Objective 2.4)

- Used to enter data and instructions
- Examples
  - Keyboard
  - Touch screen
  - Stylus
  - Virtual keyboard



# Input Devices

## Mice and Other Pointing Devices (Objective 2.5)

- Mouse
- Touch pad (trackpad)
- Game controllers



# Input Devices

## Image, Sound, and Sensor Input (Objective 2.6)

- Popular for images
  - Digital cameras
  - Camcorders
  - Mobil device cameras
  - Flatbed scanners
  - Webcams
- Popular for sound
  - Microphone with voice recognition software
- Sensors

# Output Devices

## Image and Audio Output (Objective 2.7)

- Send data out of the computer in the form of:
  - Text
  - Pictures
  - Sounds
  - Video
- Examples
  - Monitors
  - Printers
  - Speakers and earphones



# Output Devices

## Image Output (Objective 2.7)

- Types of display screens
  - Liquid crystal display (LCD)
  - Light-emitting diode (LED)
  - Organic light-emitting diode (OLED)
- How they work
  - Pixels
  - Aspect ratio
  - Resolution



# Output Devices

## Sound Output (Objective 2.7)

- Speaker
  - Output device for sound
  - Surround-sound speakers
  - Wireless speaker systems
- Headphones or earbuds
  - Keep from distracting others

# Output Devices

## Printers (1 of 2) (Objective 2.8)

- Inkjet

- Affordable
- High-quality color
- Quick and quiet



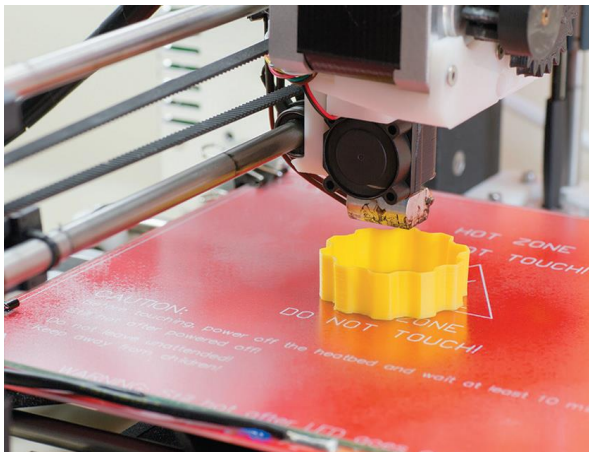
- Laser

- Faster printing speed
- Higher-quality printouts
- More expensive

# Output Devices

## Printers (2 of 2) (Objective 2.8)

- All-in-one printer
  - Printer, scanner, copier, and fax
- Large format printer
  - Prints oversize images
- 3D printer





# Processing, Storage, and Connectivity

- Processing and Memory on the Motherboard
- Storing Data and Information
- Connecting Peripherals to the Computer
- Power Management and Ergonomics

# Processing and Memory on the Motherboard

## Objectives

2.9 Describe the functions of the motherboard and RAM.

2.10 Explain the main functions of the CPU.

# Storing Data and Information

## Objective

2.11 Describe the various means of storing data and information with computing devices.

# Connecting Peripherals to the Computer

## Objective

2.12 Describe common types of ports used today.

# Power Management and Ergonomics

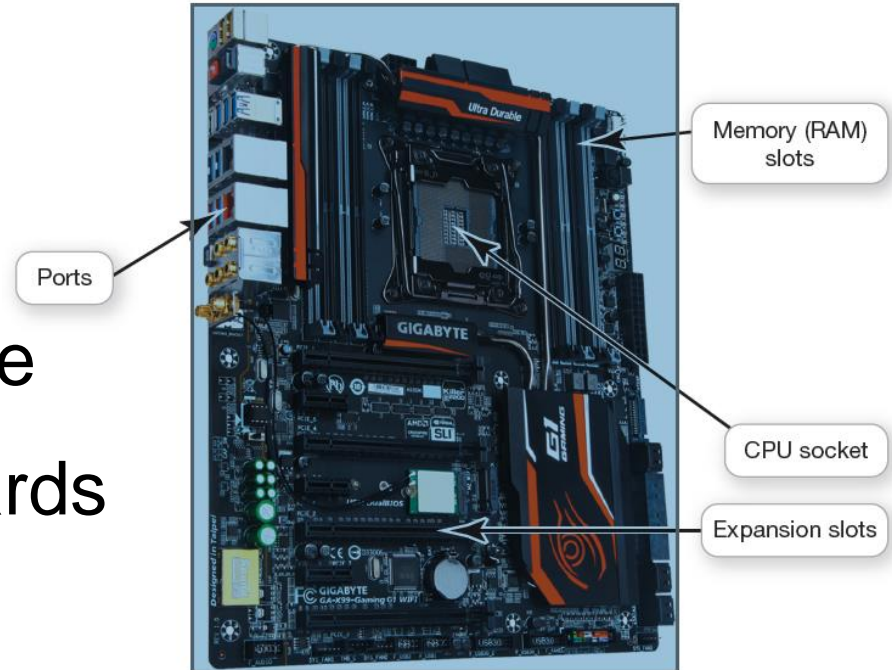
## Objectives

- 2.13 Describe how to manage power consumption on computing devices.
- 2.14 Define ergonomics, and discuss the ideal physical setup for using computing devices.

# Processing and Memory on the Motherboard

## The Motherboard and Memory (Objective 2.9)

- Motherboard
  - CPU
  - ROM, RAM, and cache
  - Slots for expansion cards
  - Sound/Video cards
  - Network interface cards (NIC)



# Processing and Memory on the Motherboard

## Processing (1 of 2) (Objective 2.10)

- Central Processing Unit
  - CPU or processor
  - “Brains” of the computer
  - Controls all functions of the computer’s components
  - Processes all commands and instructions
  - Billions of tasks per second

# Processing and Memory on the Motherboard

## Processing (2 of 2) (Objective 2.10)

- CPU Performance Measures
  - Processor speed measured in hertz (Hz)
    - Megahertz (MHz) or gigahertz (GHz)
  - Number of cores
    - Single
    - Dual
    - Quad
    - Ten



# Storing Data and Information

## Storage Options on Computing Devices (1 of 4)

(Objective 2.11)

- Local Storage Devices

- Hard disk drive

- Primary storage device
    - Nonvolatile storage
    - Internal drive
    - External hard drive

- Solid-state Drive (SSD)



# Storing Data and Information

## Storage Options on Computing Devices (2 of 4)

(Objective 2.11)

- Portable Storage Options

- Flash drive
- Flash memory card



# Storing Data and Information

## Storage Options on Computing Devices (3 of 4)

(Objective 2.11)

- Cloud storage
  - Files stored on the Internet
  - Some amount is free
  - Can purchase additional storage

# Storing Data and Information

## Storage Options on Computing Devices (4 of 4)

(Objective 2.11)

- Compact discs (CDs)
- Digital video discs (DVDs)
  - Store more data than CDs
- Blu-ray discs (BDs)

**Figure 2.39** Optical Storage Media Capacities

Medium Type	Typical Capacity
Blu-ray (dual layer)	50 GB
Blu-ray	25 GB
DVD DL (dual layer)	8.5 GB
DVD	4.7 GB
CD	700 MB

# Connecting Peripherals to the Computer

## Computer Ports (Objective 2.12)

- Thunderbolt
  - Transfer speeds up to 20 Gbps
- Universal serial bus (USB)
  - Transfer speeds of 10 Gbps
- Connectivity port
  - Ethernet port
  - Up to 10,000 Mbps
- HDMI port



# Power Management and Ergonomics


## Power Controls and Power Management

(Objective 2.13)

- Battery drain
- Power supply
- Sleep mode
- Warm / Cold boot
- Hibernate






Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes you make to the settings on this page apply to all of your power plans.

 [Change settings that are currently unavailable](#)

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Power and sleep buttons and lid settings

	 On battery	 Plugged in
 When I press the power button:	Sleep ▾	Sleep ▾
 When I press the sleep button:	Sleep ▾	Sleep ▾
 When I close the lid:	Sleep ▾ Do nothing Sleep Hibernate Shut down	Sleep ▾

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Shutdown settings

☒ Turn on fast startup (recommended)  
This helps start your PC faster after shutdown. Restart isn't affected. [Learn More](#)

☒ Sleep  
Show in Power menu.

# Power Management and Ergonomics

## Setting It All Up: Ergonomics (Objective 2.14)

- Ergonomics
- Guidelines
  - Monitor position
  - Adjustable chair
  - Proper position while typing
  - Take breaks
  - Adequate lighting
- Assistive (adaptive) technologies





# Questions

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