APPLICATIONS OF ICT

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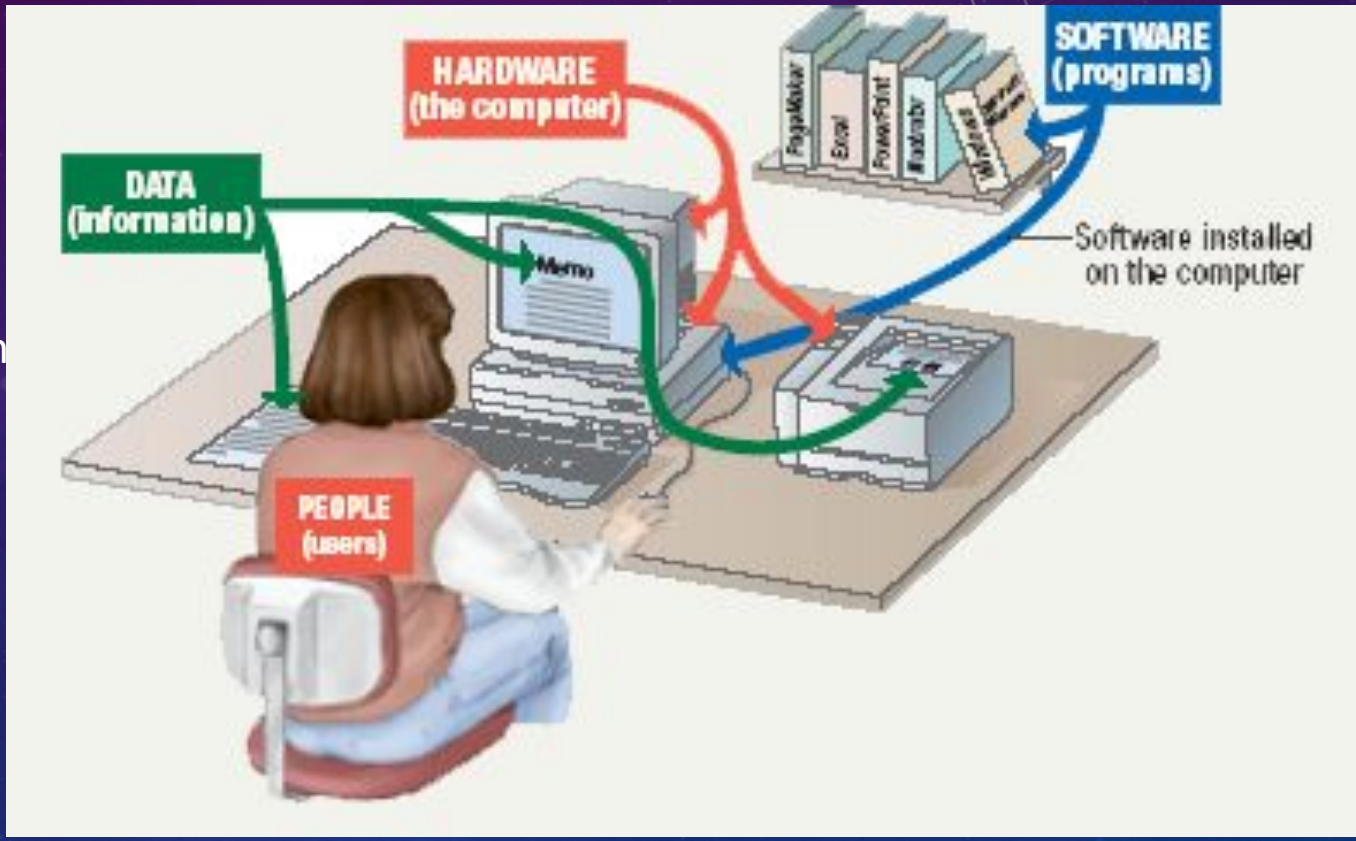
PARTS OF THE COMPUTER SYSTEM

PARTS OF THE COMPUTER SYSTEM

- Computer systems h
  - Hardware
  - Software
  - Data
  - User



PARTS OF THE COMPUTER SYSTEM

- Hardware
  - Mechanical devices in the computer
  - Anything that can be touched
- Software
  - Tell the computer what to do
  - Also called a program
  - Thousands of programs exist
    - Some for computer's own use
    - Some for the service of the user
  - Reason majority of the people would want to purchase a computer

PARTS OF THE COMPUTER SYSTEM

- Data
  - Pieces of information/individual facts
  - By themselves do not make much sense
  - Computer organize and present data
- Users
  - People operating the computer
  - Most important part
  - Tell the computer what to do
    - Userless computers?

INFORMATION PROCESSING CYCLE

- Steps followed to process data
  - Input
    - Computer accepts data from some source
  - Processing
    - Computers processing components perform actions on the data based on instructions from user or program
  - Output
    - Computer conveys result to user.
    - Text, numbers, graphic, image, video, sound
    - Optional
  - Storage
    - Permanently store result on some medium
    - Optional

INFORMATION PROCESSING CYCLE

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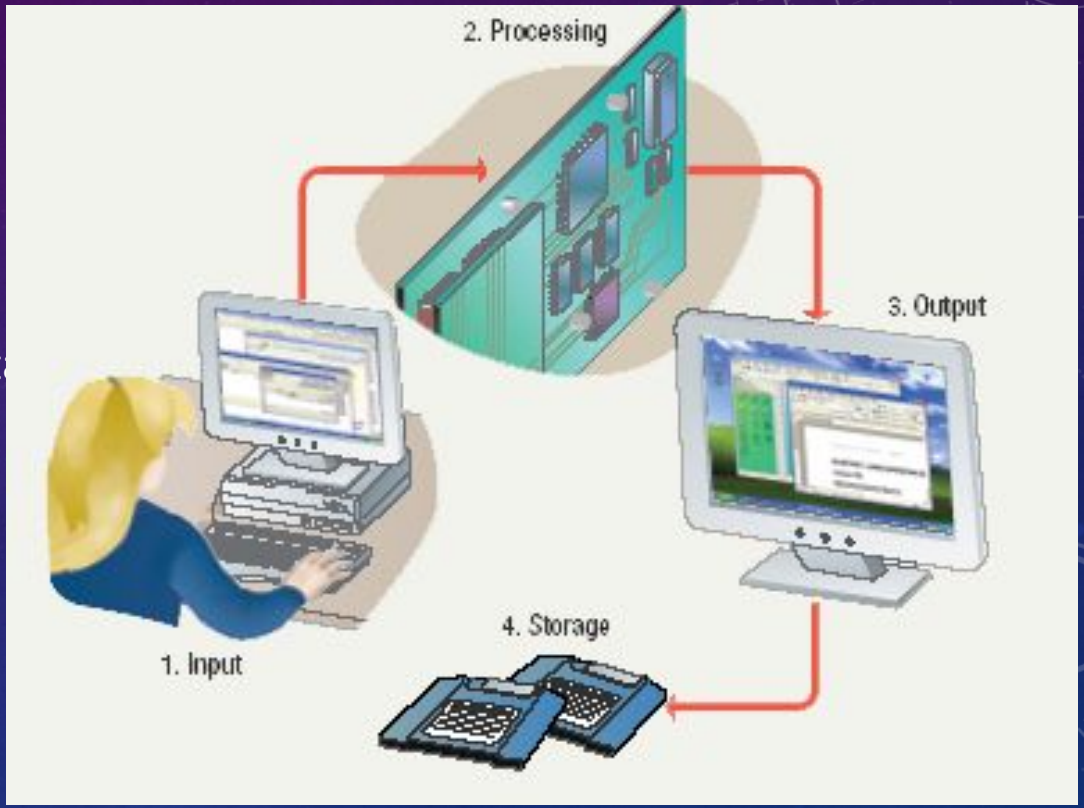


HOW COMPUTERS WORK
ALL COMPUTERS FOLLOW THE SAME FOUR BASIC OPERATIONS.

1. **Input**
2. Processing
3. Storage/Memory
4. Output

Keyboard

Mouse

HOW COMPUTERS WORK
INPUT

- Input hardware - devices that allow people to put data into the computer in a form that the computer can use
- Allows the user to interact
- Input devices accept data
- Keyboard: an input device that converts letters, numbers, and other characters into electrical signals readable by the processor
- Mouse: Select options from onscreen menu

HOW COMPUTERS WORK
INPUT

Other Input devices?

- Scanners
- Microphone
- Webcam
- Digital Camera

HOW COMPUTERS WORK
ALL COMPUTERS FOLLOW THE SAME FOUR BASIC OPERATIONS

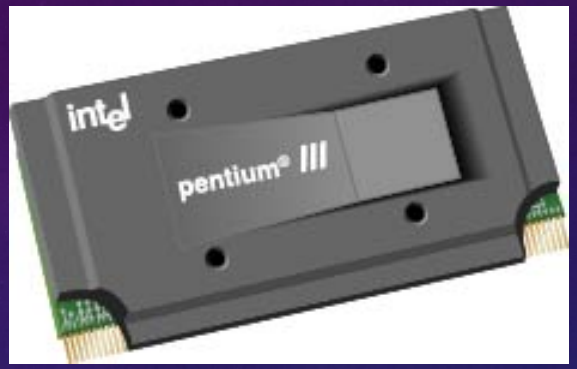
1. Input
2. **Processing**
3. Storage/Memory
4. Output

Case or system cabinet

How Computers Work

- Processing devices
  - Brains of the computer
  - Carries out instructions from the program
  - Manipulate the data
  - Most computers have several processors
  - Central Processing Unit (CPU)
  - Processors made of silicon and copper

HOW COMPUTERS WORK



Processor chip

- Processor chip - A tiny piece of silicon that contains millions of mini electronic circuits.

HOW COMPUTERS WORK
ALL COMPUTERS FOLLOW THE SAME FOUR BASIC OPERATIONS

1. Input
2. Processing
3. **Storage/Memory**
4. Output

- Primary storage (memory) - RAM
- Computer circuitry that temporarily holds data waiting to be processed
- Secondary storage (storage) - ROM
-
- The area in the computer where data or information is held permanently

HOW COMPUTERS WORK

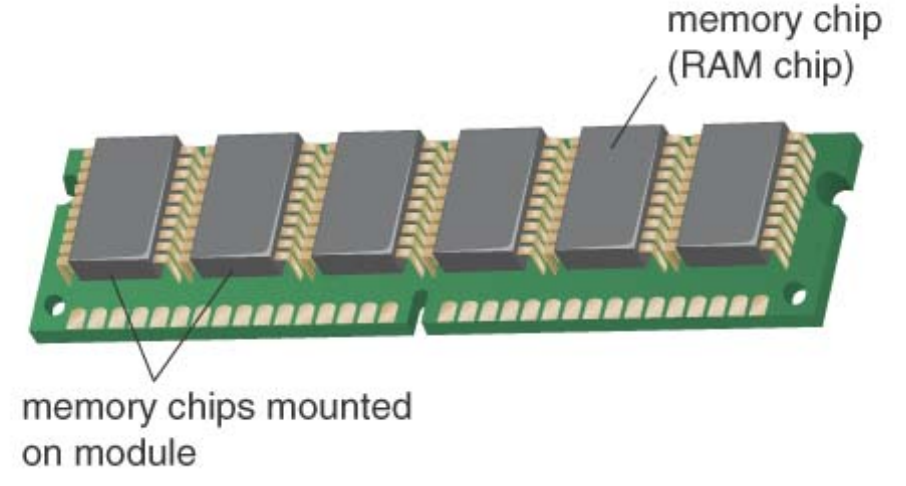
- Storage capacity is represented in:
  - 1 byte - 1 character of data.
  - 1 kilobyte – 2^{10} bytes/char; 1,024 characters.
  - 1 megabyte - 2^{20} bytes/char 1,048,576 characters.
  - 1 gigabyte - more than 1 billion characters.
  - 1 terabyte - more than 1 trillion characters.

HOW COMPUTERS WORK

Random Access Memory

- Also known as RAM or memory
- Represent primary storage or temporary storage.
- Hold data before processing and information after processing.
- Volatile
- More RAM results in a faster syste
- In Mega/Giga Bytes

RAM



HOW COMPUTERS WORK

Read Only Memory

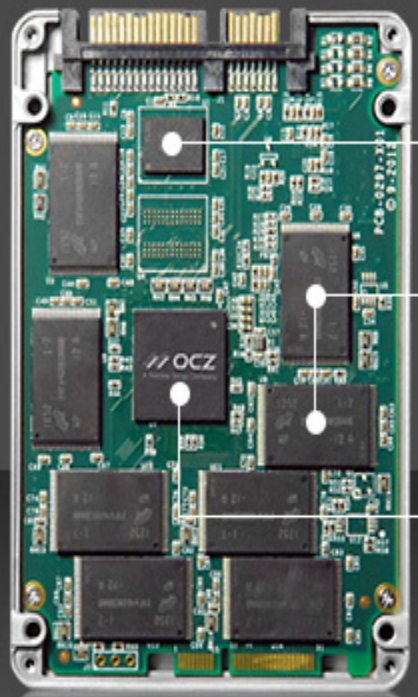
- Also called ROM
- Permanent storage of programs
- Holds the computer boot directions
- Typically in KiloBytes

ROM

HDD
3.5”

Shock resistant up to 350g/2ms

SSD
2.5”



Shock resistant up to 1500g/0.5ms

HOW COMPUTERS WORK

- Storage devices
  - Hold data and programs permanently
  - Different from RAM
  - Magnetic storage
    - Floppy and hard drive
    - Uses a magnet to access data
  - Optical storage
    - CD and DVD drives, Blue-Ray
    - Uses a laser to access data

How Computers Work

Storage

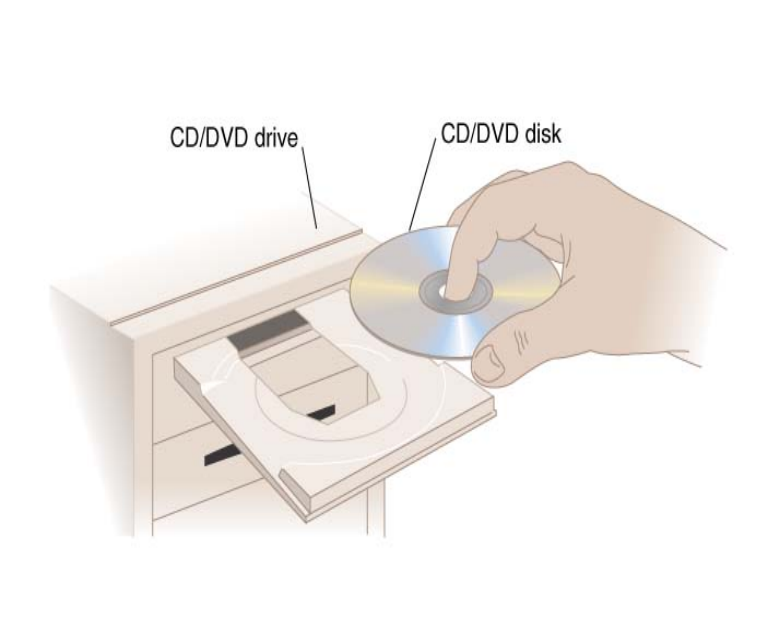
Hard-disk drive

- a storage device that stores billions of characters of data on a nonremovable disk platter.
- Capacity 40GB-1TB or even more

Hard-disk drive

HOW COMPUTERS WORK
STORAGE

- CD (Compact Disk) drive or DVD (Digital Video Disk) drive
  - a storage device that uses laser technology to read data from optical disks.
  - 700MB for CD
  - 1.4 to 17 GB for DVD
- Blue Ray
  - optical disc storage
  - high-definition video and data storage.
  - same physical dimensions as standard DVDs and CDs.
  - Currently Upto 50GB capacity



CD Drive

HOW COMPUTERS WORK
ALL COMPUTERS FOLLOW THE SAME FOUR BASIC OPERATIONS

1. Input
2. Processing
3. Storage
4. Output

Output hardware

devices which translate info processed by the computer into a form that humans can understand

HOW COMPUTERS WORK
OUTPUT

Sound Card

- Coverts audio signal from digital to analog and vice versa
- Both Input and Output device

Sound card

Speakers

- the devices that play sounds transmitted as electrical signals from the sound card.

Speakers

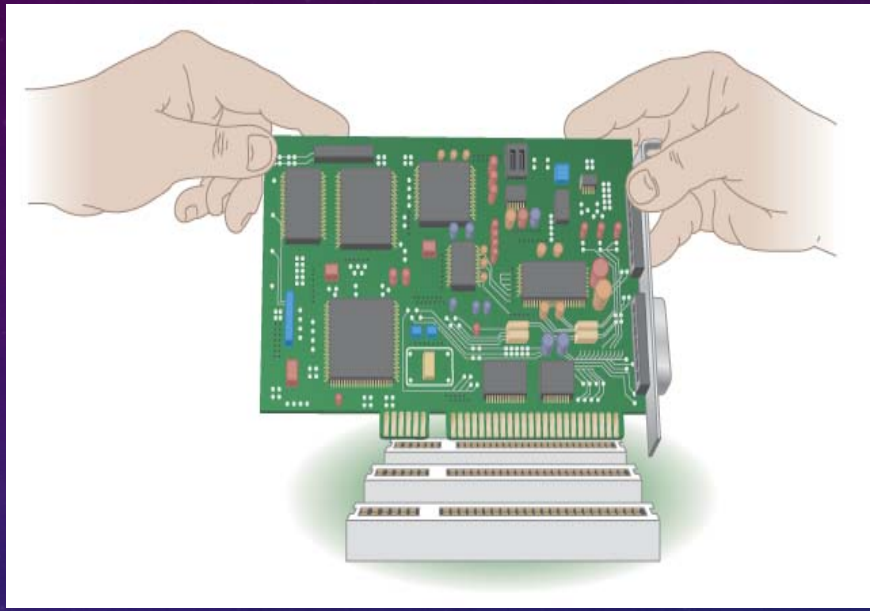
How Computers Work
Output

Video card

- converts the processor's output information into a video signal that can be sent through a cable to the monitor

Monitor

- the display device that takes the electrical signals from the video card and forms an image using points of colored light on the screen



Video card

Monit

HOW COMPUTERS WORK
ALL COMPUTERS FOLLOW THE SAME FOUR BASIC OPERATIONS

1. Input
2. Processing
3. Storage
4. Output

Printer - an output device that produces text and graphics on paper.

HOW COMPUTERS WORK COMMUNICATION ..?

Modem - a device that sends and receives data over telephone lines to and from computers.

Modem

NIC – Controls the flow of data on a network link

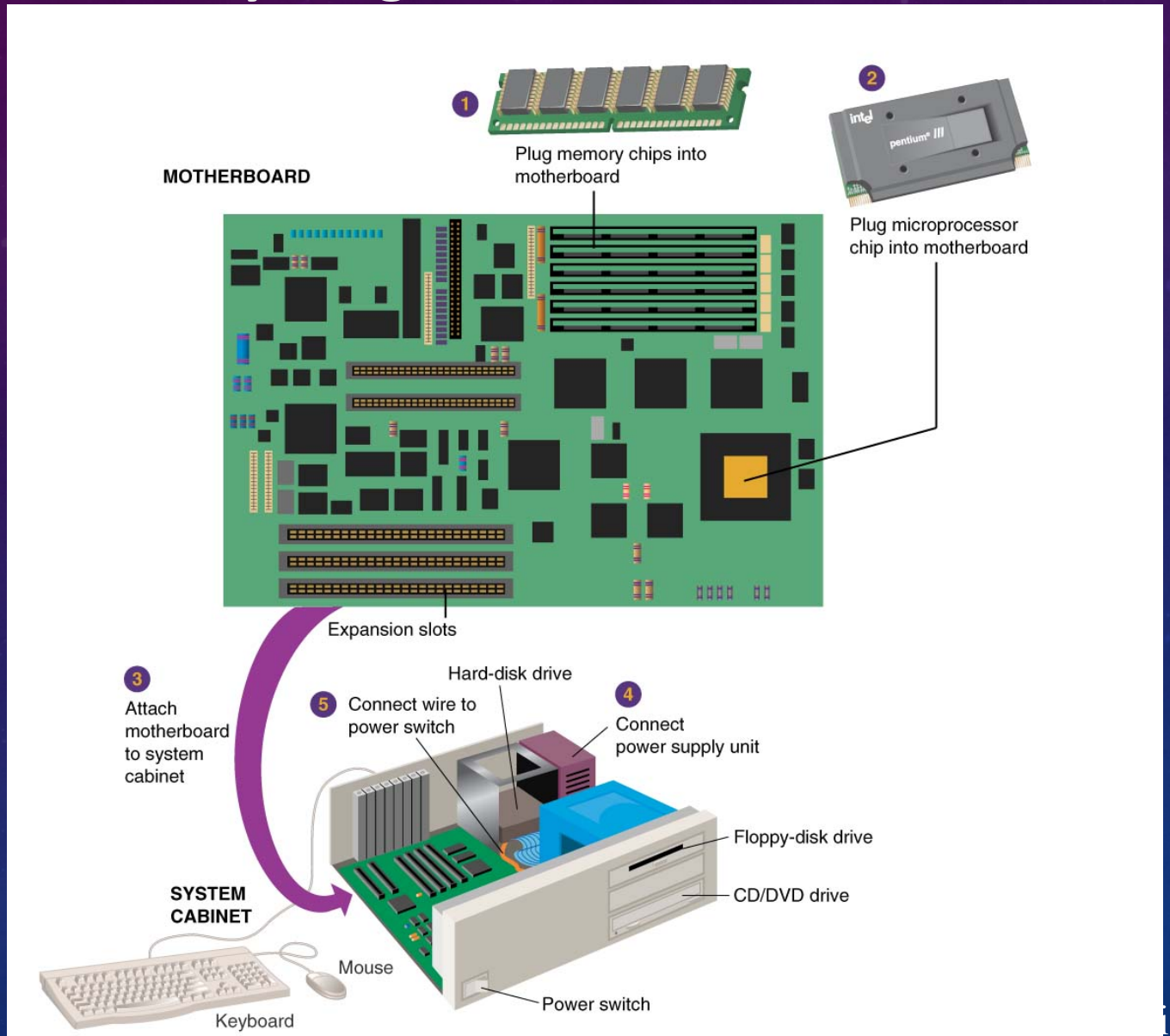
Network Interface Card

HOW COMPUTERS WORK
HOW DOES EVERYTHING CONNECT?

Motherboard

- the main printed circuit board in the computer
- Everything connects to the motherboard
- Expansion slots - “plugs” on the motherboard for expanding the PC’s capabilities via additional circuit boards

How Computers Work
How does everything connect?



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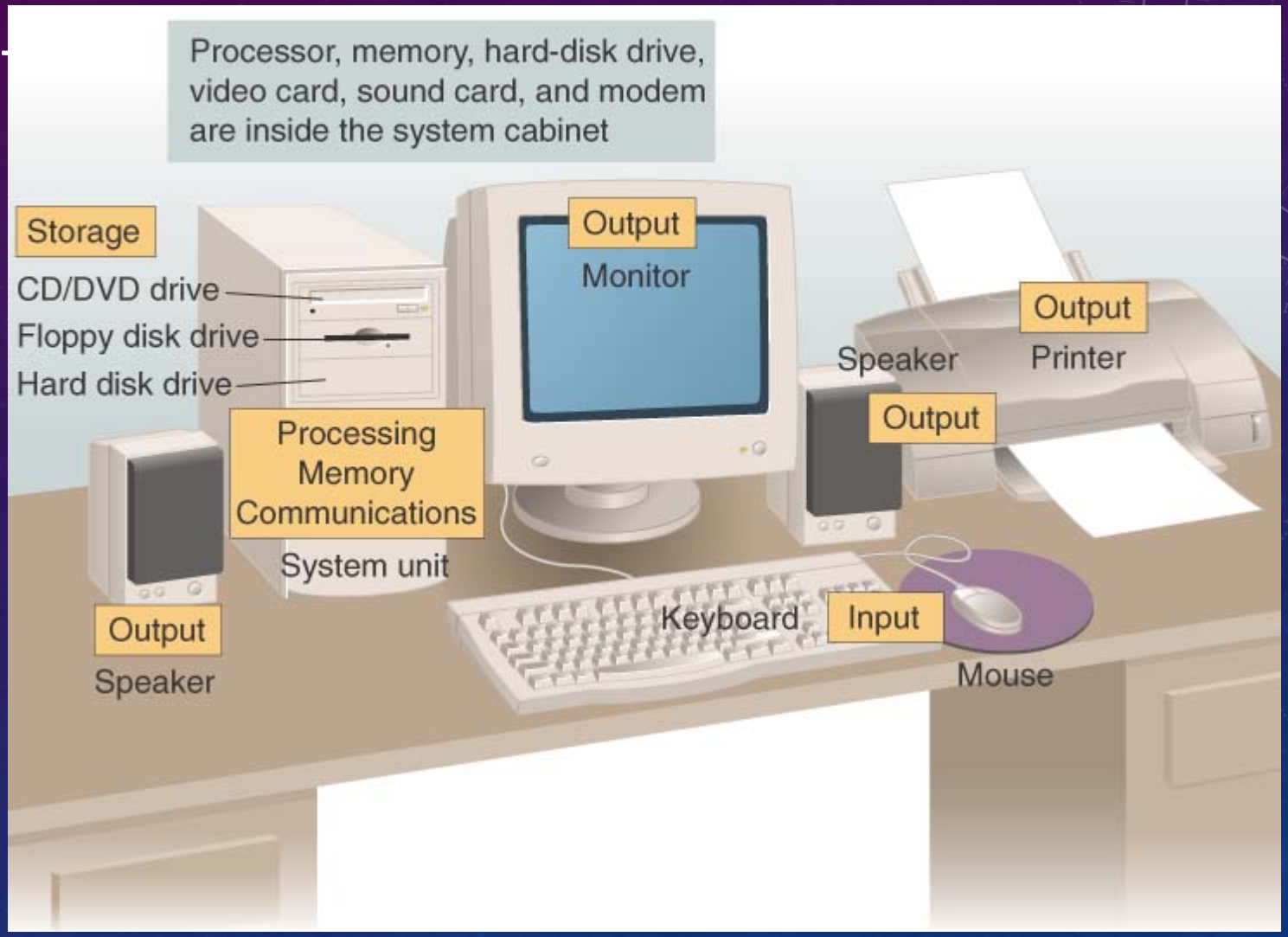

PUT ALL THE HARDWARE TOG

- What is Left?
- Power
  - Inside system cabinet

SOFTWARE RUNS THE MACHINE

- Tells the computer what to do
- Reason people purchase computers
- Two types
  - System software
  - Application software

SOFTWARE RUNS THE MACHINE

- System software
  - Most important software
  - Operating system
    - Windows XP
  - Network operating system (OS)
    - Windows Server 2003
  - Utility
    - Symantec AntiVirus

SOFTWARE RUNS THE MACHINE

- Application software
  - Accomplishes a specific task
  - Most common type of software
    - MS Word
  - Covers most common uses of computers

COMPUTER DATA

- Fact with no meaning on its own
- Stored using the binary number system
- Data can be organized into files

COMPUTER USERS

- Role depends on ability
  - Setup the system
  - Install software
  - Mange files
  - Maintain the system
- “Userless” computers
  - Run with no user input
  - Automated systems

CONCEPT CHECK

- What are the five basic operations that computers have in common?

- Input, processing, storage, output, and communications

CONCEPT CHECK

- Which type of storage is composed of computer circuitry that temporarily holds data waiting to be processed?

- Primary storage (memory)

CONCEPT CHECK

- What computer device consists of electronic circuitry that executes instructions to process data?

- CPU (Central Processing Unit)

CONCEPT CHECK

- What is the name of the main circuit board in the computer, to which everything else is attached via connections called ports?

- Motherboard

CONCEPT CHECK

- How many characters can be represented by a byte? A kilobyte?

- One character in a byte; 1024 in a kilobyte

CONCEPT CHECK

- What is the name for the unit of storage capacity representing one billion characters?

- One gigabyte