The System Unit

Chapter 5
Competencies (1 of 2)

• Describe the four basic types of system units.
• Describe system boards, including sockets, slots, and bus lines.
• Discuss microprocessors, including microprocessor chips and specialty processors.
• Discuss memory including RAM, ROM, and flash memory.
Competencies (2 of 2)

• Discuss expansion slots and cards.
• Describe bus lines, bus widths, and expansion buses.
• Describe ports, including standard and specialized ports.
• Discuss power supply for desktop, notebook, tablet, and handheld computers.
• Discuss how a computer can represent numbers and encode characters electronically.
Introduction

• Speed, capacity, and flexibility determine the power of microcomputers.
• Knowledge of a computer’s power allows you to make good buying decisions and to determine if your current system will run new applications.
• Competent end users need to understand the basic principles of how microcomputers are put together.
System Unit Types

• Desktops
  – Tower Unit, All-in-one

• Notebooks
  – Laptops
  – Netbooks

• Tablets

• Handhelds
Making IT Work for You ~ Keeping Your Computer Cool

- Computer components generate a significant amount of heat
- Can damage your system
- Notebooks present a special challenge
System Board

- Main board or motherboard
- Controls communications
- Components connect to the system board
- Data path
- Traffic monitor
System Board Components (Page 1 of 2)

• Sockets
  – Connection point for chips

• Chips
  – Tiny circuit boards etched onto squares of silicon
  – Silicon chip, semiconductor, or integrated circuit
  – Mounted on carrier packages
System Board Components (Page 2 of 2)

• Slots
  – Provide a connection point for specialized cards or circuit boards

• Bus lines
  – Provide pathways that support communication among the various electronic components
Microprocessor

• Central Processing Unit (CPU)
  – Contained on the microprocessor chip
  – Brains of the computer

• Two Basic Components
  – Control unit
  – Arithmetic-logic unit (ALU)
Microprocessor Chips (Page 1 of 2)

- Chip capacities expressed in word size
- **Word**
  - The number of bits that can be processed at one time
  - 64-bit standard
- **Clock Speed**
  - Processing speed
  - The number of times the CPU fetches and processes data or instructions in a second
Microprocessor Chips (Page 2 of 2)

– Multi-Core Chip
  • Two separate and independent CPUs
  • Parallel Processing
  • Windows 8 and Mac OS X
Specialty Processors

• Coprocessors
  – Designed to improve specific computing operations
  – Graphics coprocessors / Graphics Processing Unit (GPU)
Expansion Slots and Cards

• Advanced graphics cards
• Sound cards
• Network interface cards (NIC)
• Wireless network cards
• Plug and Play
Bus Lines

• Also known as a bus
• Connect parts of the CPU to each other
• Pathway for bits
• Bus width
  – Number of bits that can travel at once
• Two basic categories
  – System buses
  – Expansion buses
Expansion Buses

• Connects the CPU to other components on the system board, including expansion slots
• Universal Serial Bus (USB)
  – Connects external USB devices onto the USB bus
• FireWire
  – Audio and video equipment
• PCI Express (PCIe)
  – Single dedicated path for each connected device
Cables

• Used to connect external devices to the system unit via the ports
• One end of the cable is attached to the device and the other end has a connector that is attached to a matching connector on the port
Making IT Work for You ~ TV Tuners

• Using Windows Media System as a DVR
• Install TV Tuner
Power Supply

• Computers require direct current (DC)
• DC power provided by converting alternating current (AC) from wall outlets or batteries
• Desktop computers use power supply units
• Notebooks and handhelds use AC adapters
Electronic Data and Instructions

• Digital electronic signals
  – Recognized by computers

• Analog signals
  – Created by voices

• Conversion must take place from analog to digital before processing can occur
Numeric Representation

• Binary System only two digits called bits
  – On = 1; positive charge
  – Off = 0; no charge
• Byte = 8 bits grouped together
• Hexadecimal system
Character Encoding

• Character encoding standards
• ASCII
  – American Standard Code for Information Interchange
  – Microcomputers
• EBCDIC
  – Extended Binary coded Decimal Interchange Code
  – Mainframe
• Unicode
  – Uses 16 bits
  – Recognized by virtually all computer systems
Careers In IT

• Computer technicians repair and install computer components and systems
• Employers look for:
  – Certification
  – Communication skills
• Continued education is required
• Computer technicians can expect to earn an annual salary of $31K to $46K
A Look to the Future

• Wearable computers
• Send and receive email while jogging
• Maintain your personal schedule book
• Remember the names of people at a party
Open-Ended Questions (Page 1 of 3)

• Describe the four basic types of microcomputers and microcomputer system units.

• Describe system boards including sockets, chips, carrier packages, slots, and bus lines.

• Discuss microprocessor components, chips, and specialty processors.
Open-Ended Questions (Page 2 of 3)

• Define computer memory including RAM, ROM, and flash memory.

• Define expansion slots, cards, Plug and Play, PC cards, PCMCIA slots, and Express-Card slots.

• Describe bus lines including bus width, system bus, and expansion bus.
Open-Ended Questions (Page 3 of 3)

• Define ports including standard and specialized ports. Give examples of each.

• Describe power supply including power supply units and AC adapters.

• Discuss electronic data and instructions.