Chapter 9: Other Peripherals

Complete CompTIA A+ Guide to PCs, 6e
To identify the components of the video subsystem
The various display types including laptop displays
Basic display terminology
To install a video card
Basic video troubleshooting techniques
How each type of printer operates
The steps required to install a printer
Preventive printer maintenance
How to control printers from Windows and make printer adjustments
To solve common printer problems
Techniques for ethical and professional behavior
CompTIA A+ Exam Objectives Covered in This Chapter

801-1.4: Install and configure expansion cards.
801-1.10: Given a scenario, evaluate types and features of display devices.
801-1.11: Identify connector types and associated cables.
801-1.12: Install and configure various peripheral devices.
801-3.1: Install and configure laptop hardware and components.
801-3.2: Compare and contrast the components within the display of a laptop.
801-4.1: Explain the differences between the various printer types and summarize the associated imaging process.
801-4.2: Given a scenario, install and configure printers.
801-4.3: Given a scenario, perform printer maintenance.
802-4.4: Given a scenario, troubleshoot common video and display issues.
802-4.8: Given a scenario, troubleshoot and repair common laptop issues while adhering to the appropriate procedures.
802-4.9: Given a scenario, troubleshoot printers with appropriate tools.
Video Output Technologies

- CRT (Cathode Ray Tube)
- LCD (Liquid Crystal Display)
- LED (Light-Emitting Diode)
- OLED (Organic LED)
- DLP (Digital Light Processing)
- Plasma
**Video Terminology**

- **Electron beam**
- **Shadow mask**
- **Dot triad**

The beams hit the back of the phosphor-coated screen.

The three energized phosphor dots converge to a single location on the front of the monitor.
Video Output Technologies

• CRT (Cathode Ray Tube)
  • How are they made?
  • How do they work?
  • Three primary colors, red, green, blue (RGB)
  • Electron beam directed at phosphorous backed tube
  • Pixel (picture element) illuminated by electron beam
  • Resolution:
  • Dot pitch: distance between corresponding pixel elements, measures picture sharpness
  • Refresh rate: the number of times that the image on the display is drawn each second.
  • Measured in Hertz. 60 Hz – All pixels, top to bottom refreshed 60 times/second
LCD/LED Terminology

• Viewable Size
• Native Resolution
• Response Time or Synchronization Rate
• Pixel Response Rate
• Viewing Angle
• Aspect Ratio
• Contrast Ratio
• Portrait/Landscape Mode
• Luminance or Brightness
• Lumen
• Dead Pixel
• How it works.
Touch-Screen Technologies

- Four-wire Resistive
- Five-wire Resistive
- Capacitive
- Surface Wave
- Infrared
- Capacitive vs. Resistive
Video Ports

- HDMI (High-Definition Multimedia Interface)
- VGA (Video Graphics Array)
- DVI (Digital Visual Interface)
- Thunderbolt
- DisplayPort
Multiple Displays

- Use the two video ports on the motherboard (not common).
- Use the integrated motherboard port and buy a video card with one video port. (This is the cheapest solution, but the motherboard might disable the integrated video port automatically.)
- Buy a video card that has two video ports (best option).
- Buy two video cards.
Memory chips on the video adapter can be regular DRAM chips (including DDR2 and DDR3).

The amount of video adapter memory determines the number of colors available at a specific resolution.

See pages 399 & 400.
Printer Subsystems

- Paper Transport
  - Moves paper
- Marking (engine)
  - Puts image on paper
- Print Engine (SW/Firmware)
  - Controls motion
Printer Ports

- Parallel (IEEE 1284)
- Serial
- Infrared
- FireWire (IEEE 1394)
- Ethernet
- USB
Printer Categories

- Impact
- Inkjet
- Laser
- Thermal
Laser Printing Process Steps

1. Processing
2. Charging
3. Exposing
4. Developing
5. Transferring
6. Fusing
7. Cleaning
Employers want employees who possess high ethical standards. This means they want people who are honest, trustworthy, and dependable.

IT technicians are exposed to many personal things—passwords, private data, and visited Internet sites.

Employers do not want to worry about their technicians taking things that belong to others, looking at data that does not relate to the computer problem at hand, and taking or giving away things from the office.

The best ruling factor in ethics is to always be professional.

One of the biggest assets an IT professional can have is his or her reputation. Being ethical at work goes a long way in establishing a good reputation.
Study the differences between CRT and LCD monitors.

Know the difference between using CCFL or LEDs in an LCD monitor.

Know how a laptop display connects to the rest of the laptop.

Know that there is commonly a cable that connects from the inverter/backlight to the top of the laptop display.

Be able to describe how to connect an external monitor to a laptop, and make adjustments for various combinations of laptop only, external monitor only, and laptop along with the external monitor. Also know how power options might need to be adjusted.

Be able to configure monitor properties, including resolution, refresh rate, native resolution, and power settings.

Be able to describe the purpose of an accelerometer and gyroscope.

Study the video slots, ports, and cables. Know the particulars.

Know how impact (dot matrix), inkjet, laser, and thermal printers work.

Be able to configure printer options, including paper trays.

Know how to review and control the print driver and print spooler.

Know the ports on a projector and how lumens influence where a projector might be used.

Review all the troubleshooting sections before taking the CompTIA 220-802 exam.
Chapter Summary

• Common video ports for monitors and computing devices include VGA, DVI, DisplayPort, and HDMI. Other types of video ports seen on adapters or projectors include Thunderbolt, S-video, component/RGB, and composite.

• CRT monitors are large and bulky. LCD monitors are thin.

• LCD monitors can use CCFL or LEDs for the backlight.

• Pixels on LCD monitors that do not illuminate are called dead pixels.

• LCD monitors are designed for a specific resolution, called the native resolution. The display should be configured for this resolution and not changed.

• With an LCD monitor, the viewable size is the true size of the display that can be seen.

• The aspect ratio is a monitor's ratio of width to height.

• The contrast ratio is a value that describes the difference in light intensity between the brightest white and the darkest black. The greater the difference between the two values, the more contrast the monitor can display.

• Use a specific key along with the [Fn] key to output a laptop display to an additional external display or for use instead of the internal display.

• Never apply liquid directly to a display.
Chapter Summary

• Video adapters commonly use AGP or PCIe slots and contain a GPU, fans/heat sinks for the GPU, and memory. Some motherboards/chipsets support installing two video adapters that work cooperatively. These adapters commonly require more power and a separate Molex (AGP) or 6-/8-pin (PCIe) power connector from the power supply.

• If you are not using the onboard video port for dual displays, disable the port in BIOS. Note that some adapters will not work when you disable the onboard port and that a BIOS may automatically disable the port.

• Video memory can be separate from motherboard RAM, can be shared system memory, or can be a combination of both. The amount of available memory affects the maximum resolution and the number and depth of colors that can be seen.

• A KVM switch can be used to allow multiple computers to use one display, mouse, and keyboard.

• A privacy screen can help protect information on a screen from those passing by the display.

• When a computer shows a blank screen, check power, power cables, and the surge protector/UPS. Try booting to Safe Mode.

• Four types of printers commonly seen in businesses are impact, inkjet, laser, and thermal printers. Laser and inkjet printers do high-quality printing. A laser printer's supplies cost more than other printers' supplies but last longer and work out to a lower cost per page.
Chapter Summary

- Printers can be shared using the operating system and a computer connected to a network. A printer can also have its own wired or wireless networking connectivity. With wired networking, the printer has a direct connection to the network. Wireless networking includes 802.11 and Bluetooth technologies. A hardware print server can be attached to a printer to allow sharing, too.

- Impact printers use printwires to impact a ribbon. Inkjet printers use pressure or heat to squirt ink dots onto paper. A laser printer works like a copying machine to produce output.

- The laser printer printing steps include processing and rasterizing the data followed by conditioning (charging), writing (exposing), developing, transferring, fusing, and cleaning.

- Impact printers can use normal-sized paper and fan-folded paper with pin holes that are fed by a tractor. Laser printers can have extra drawers for paper. A duplexing assembly option can be attached to allow a printer to print on both sides of the paper without intervention. Impact printers use special heat-sensitive paper.

- Print drivers must match the Windows version.

- A printer uses a print spooler or hard drive space that keeps data flowing to the printer in large print jobs. The print spooler can be stopped and started using the Services window (services.msc).

- A computer technician needs to show ethical work behavior around customers and peers.