**Chapter Six** 

## Output

# Discovering Computers 2012

Your Interactive Guide to the Digital World



## What Is Output?

Output is data that has been processed into a useful form

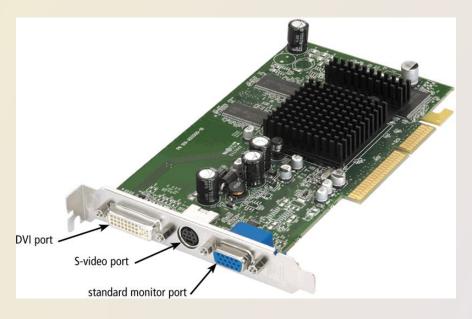


 A display device visually conveys text, graphics, and video information





- The graphics processing unit (GPU) controls the manipulation and display of graphics on a display device
- LCD monitors use a digital signal and should plug into a DVI port, an HDMI port, or a DisplayPort



 Plasma monitors are display devices that use gas plasma technology and offer screen sizes up to

150 inches

Thin & light



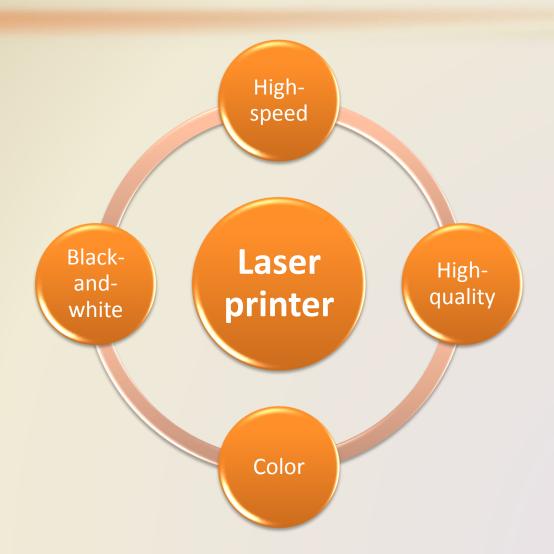
- A CRT monitor is a desktop monitor that contains a cathode-ray tube
  - Have a much larger footprint than LCD monitors
  - Not good for health



- A printer produces text and graphics on a physical medium
  - Printed information is called a hard copy, or printout
  - Landscape or portrait orientation



#### How an Ink-Jet Printer Works print heads / ink cartridges firing chamber bubble nozzle / paper Step 1 -Step 2 — Step 3 Step 4 A small resistor heats the ink, The vapor bubble forces Ink drops onto the paper. As the vapor bubble collapses, fresh ink is drawn into the firing causing the ink to boil and the ink through the form a vapor bubble. nozzle. chamber.



#### **How a Black-and-White Laser Printer Works** Step 1 -Step 2 After the user sends an A rotating mirror deflects a low-powered instruction to print a document, laser beam across the surface of a drum. SATTLER the drum rotates as gears and rollers feed a sheet of paper into the printer. Step 3 The laser beam creates a charge that causes toner to stick to the drum. 0 RATTLER Step 4 Step 5 As the drum continues to A set of rollers uses rotate and press against heat and pressure to the paper, the toner transfers fuse the toner from the drum to the paper. permanently to the paper.

 A thermal printer generates images by pushing electrically heated pins against the heat-sensitive paper

Thermal wax-transfer printer

Dye-sublimation printer



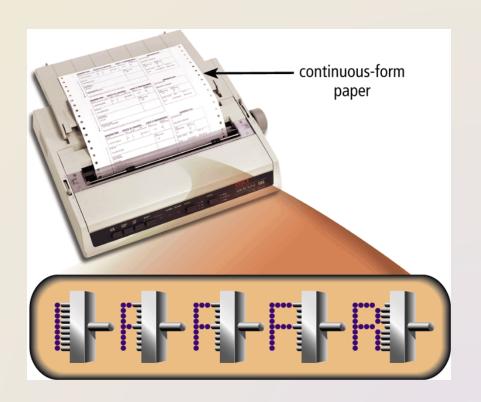
 A mobile printer is a small, lightweight, battery-powered printer that allows a mobile user to print from a notebook computer, smart phone, or other mobile device



- Plotters are used to produce high-quality drawings
- Large-format printers create photo-realistic quality color prints on a larger scale



- A dot-matrix printer produces printed images when tiny wire pins on a print head mechanism strike an inked ribbon
- A line printer prints an entire line at a time



## Speakers, Headphones, and Earbuds

 An audio output device produces music, speech, or other sounds



## Most computer users attach speakers to their computers to:

- Generate higher-quality sounds for playing games
- Interact with multimedia presentations
- Listen to music
- View movies

## Speakers, Headphones, and Earbuds

- Headphones are speakers that cover or are placed outside of the ear
- Earbuds (also called earphones) rest inside the ear canal



## **Other Output Devices**

- A data projector is a device that takes the text and images displaying on a computer screen and projects them on a larger screen
  - LCD projector
  - Digital light processing (DLP) projector



## **Other Output Devices**

 An interactive whiteboard is a touch-sensitive device, resembling a dry-erase board, that displays the image on a connected computer

screen



## **Other Output Devices**

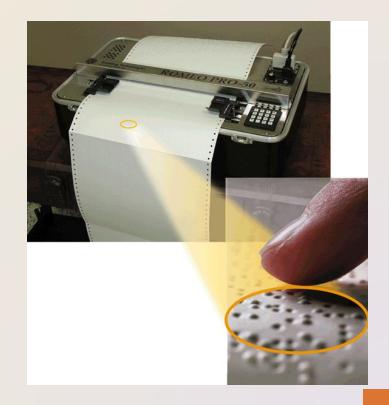
- Force-feedback sends
  resistance to the device
  in response to actions
  of the user
- Tactile output provides the user with a physical response from the device



# Output Devices for Physically Challenged Users

 Many accessibility options exist for users with various disabilities





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