

PETER NORTON'S

Introduction to Computers





- Self-assessments to reinforce main concepts
- Online Resource: www.mhhe.com/peternorton



McGraw-Hill Technology Education Copyrigh

Copyright © 2006 by The McGraw-Hill Companies, Inc. All rights reserved.

Chapter 6A

Types of Storage Devices

McGraw-Hill Technology Education

Copyright © 2006 by The McGraw-Hill Companies, Inc. All rights reserved.

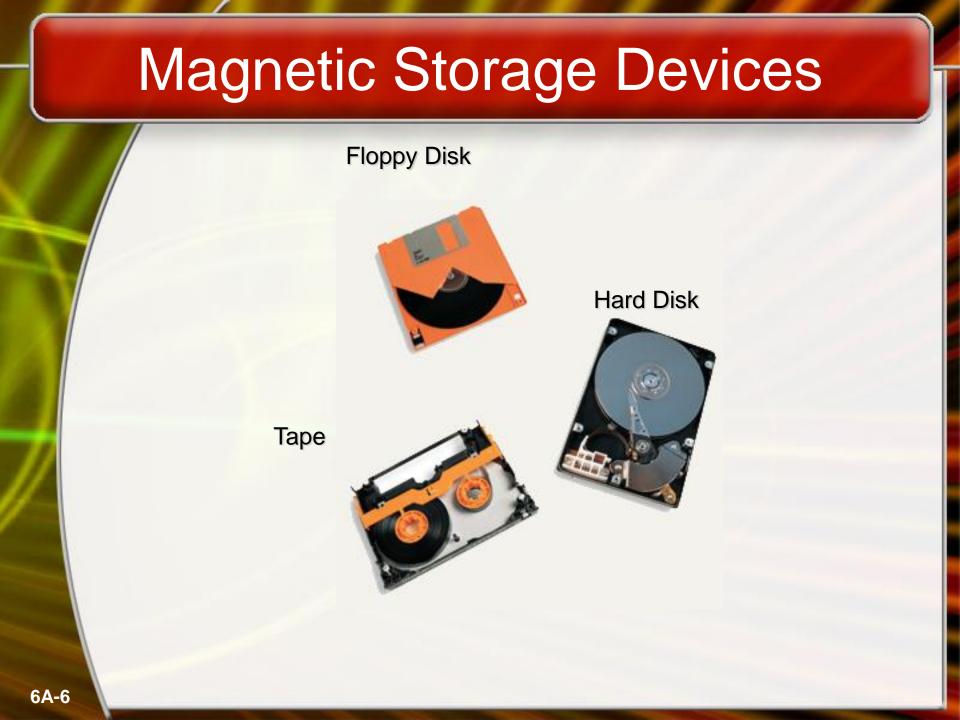
Describing Storage Devices

- Store data when computer is off
- Two processes
 - Writing data
 - Reading data

Describing Storage Devices

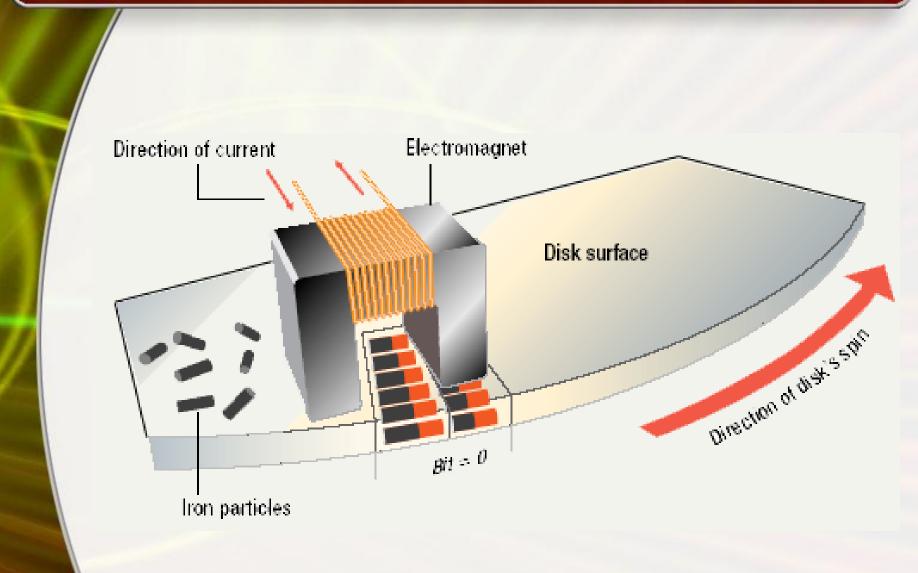
- Storage terms
 - Media is the material storing data
 - Storage devices manage the media
 - Magnetic devices use a magnet
 - Optical devices use lasers
 - Solid-state devices have physical switches

- Most common form of storage
- Hard drives, floppy drives, tape
- All magnetic drives work the same



- Data storage and retrieval
 - Media is covered with iron oxide
 - Read/write head is a magnet
 - Magnet writes charges on the media
 - Positive charge is a 1
 - Negative charge is a 0
 - Magnet reads charges
 - Drive converts charges into binary

Data Retrieval



- Data organization
 - Disks must be formatted before use
 - Format draws tracks on the disk
 - Tracks is divided into sectors
 - Amount of data a drive can read

Tracks and Sectors



- Finding data on disk
 - Each track and sector is labeled
 - Some are reserved
 - Listing of where files are stored
 - File Allocation Table (FAT)
 - FAT32
 - NTFS
 - Data is organized in clusters
 - Size of data the OS handles

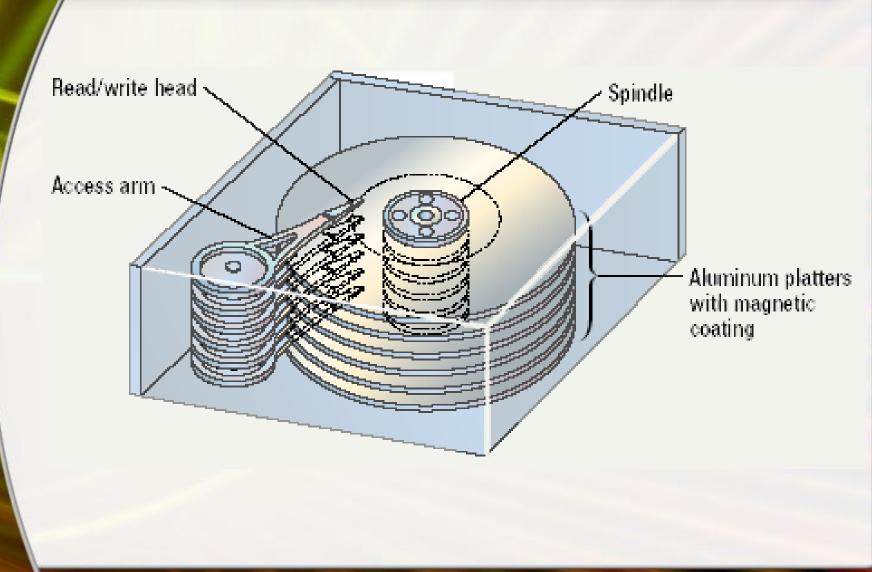
Diskettes

- Also known as floppy disks
- Read with a disk drive
- Mylar disk
- Spin at 300 RPM
- Takes .2 second to find data
- 3 ¹/₂ floppy disk holds 1.44 MB

Hard disks

- Primary storage device in a computer
- 2 or more aluminum platters
- Each platter has 2 sides
- Spin between 5,400 to 15,000 RPM
- Data found in 9.5 ms or less
- Drive capacity greater than 40 GB

Illustrated Hard Disk



- Removable high capacity disks
 - Speed of hard disk
 - Portability of floppy disk
 - Several variants have emerged
 - High capacity floppy disk
 - Stores up to 750 MB of data
 - Hot swappable hard disks
 - Provide GB of data
 - Connect via USB

- Tape drives
 - Best used for
 - Infrequently accessed data
 - Back-up solutions
 - Slow sequential access
 - Capacity exceeds 200 GB



Optical Storage Devices

CD-ROM

- Most software ships on a CD
- Read using a laser
 - Lands, binary 1, reflect data
 - Pits scatter data
- Written from the inside out
- CD speed is based on the original
 - Original CD read 150 Kbps
 - A 10 X will read 1,500 Kbps
- Standard CD holds 650 MB

Optical Storage Devices

DVD-ROM

- Digital Video Disk
- Use both sides of the disk
- Capacities can reach 18 GB
- DVD players can read CDs

- CD Recordable (CD-R)
 - Create a data or audio CD
 - Data cannot be changed
 - Can continue adding until full

- CD Regrettable (CD-RW)
 - Create a reusable CD
 - Cannot be read in all CD players
 - Can reuse about 100 times

- Photo CD
 - Developed by Kodak
 - Provides for photo storage
 - Photos added to CD until full
 - Original pictures cannot be changed

- DVD Recordable
 - Several different formats exist
 - None are standardized
 - Allows home users to create DVDs
 - Cannot be read in all players

DVD-RAM

- Allow reusing of DVD media
- Not standardized
- Cannot be read in all players

- Data is stored physically
- No magnets or laser
- Very fast

- Flash memory
 - Found in cameras and USB drives
 - Combination of RAM and ROM
 - Long term updateable storage

- Smart cards
 - Credit cards with a chip
 - Chip stores data
 - Eventually may be used for cash
 - Hotels use for electronic keys

- Solid-state disks
 - Large amount of SDRAM
 - Extremely fast
 - Volatile storage
 - Require battery backups
 - Most have hard disks copying data