



PETER NORTON'S®

Introduction to Computers



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

 **Technology
Education**

Chapter 6A

Types of Storage Devices

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

Magnetic Storage Devices

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

Magnetic Storage Devices

Floppy Disk



Hard Disk



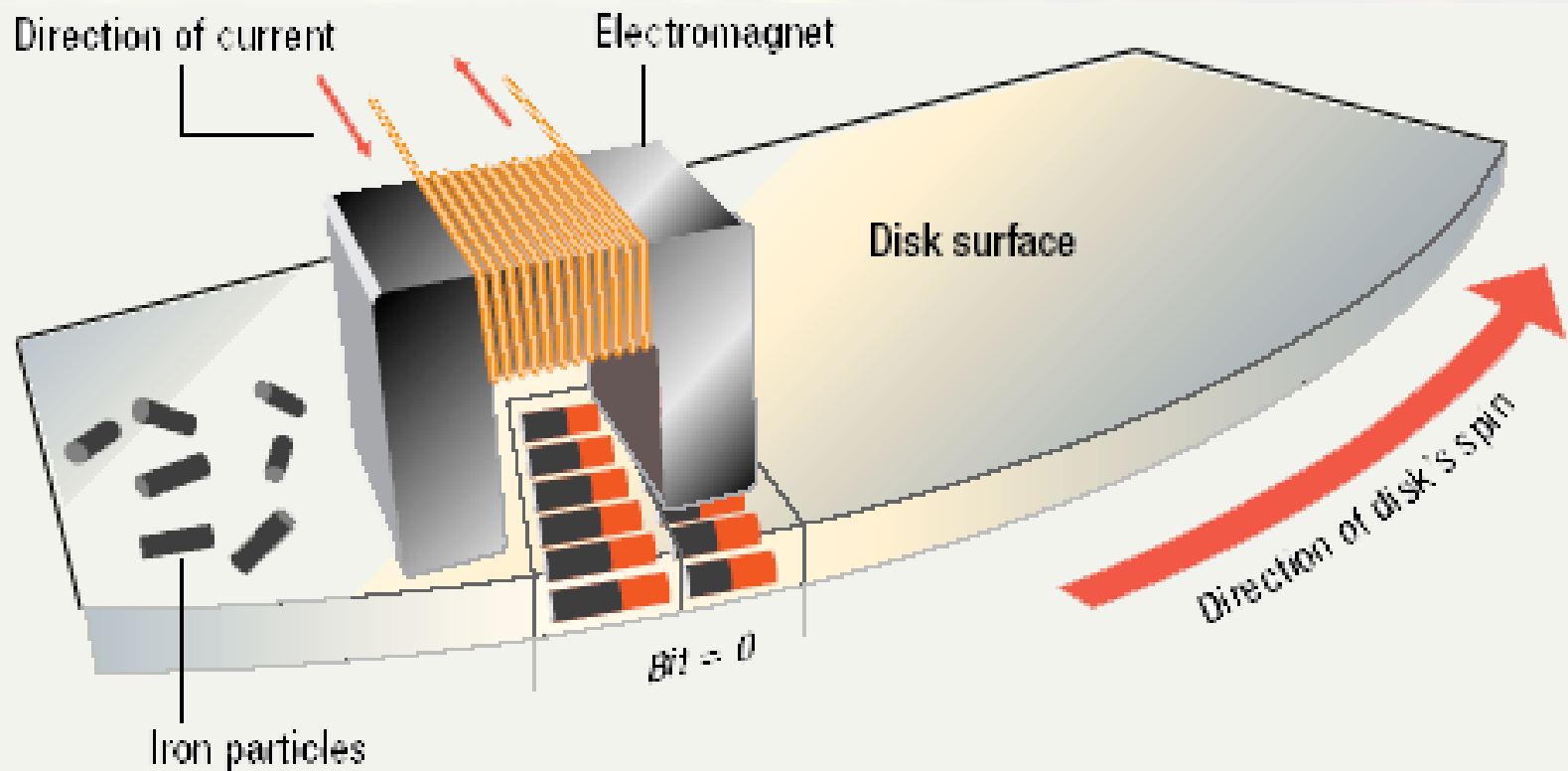
Tape



Magnetic Storage Devices

- 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

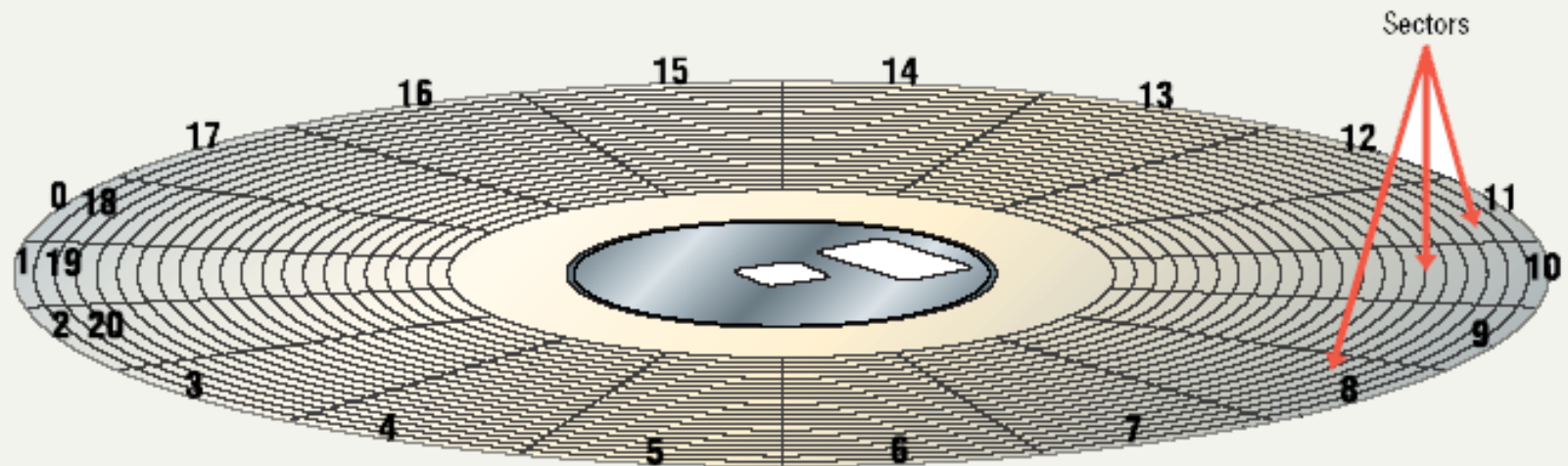
Data Retrieval



Magnetic Storage Devices

- 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



Magnetic Storage Devices

- 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

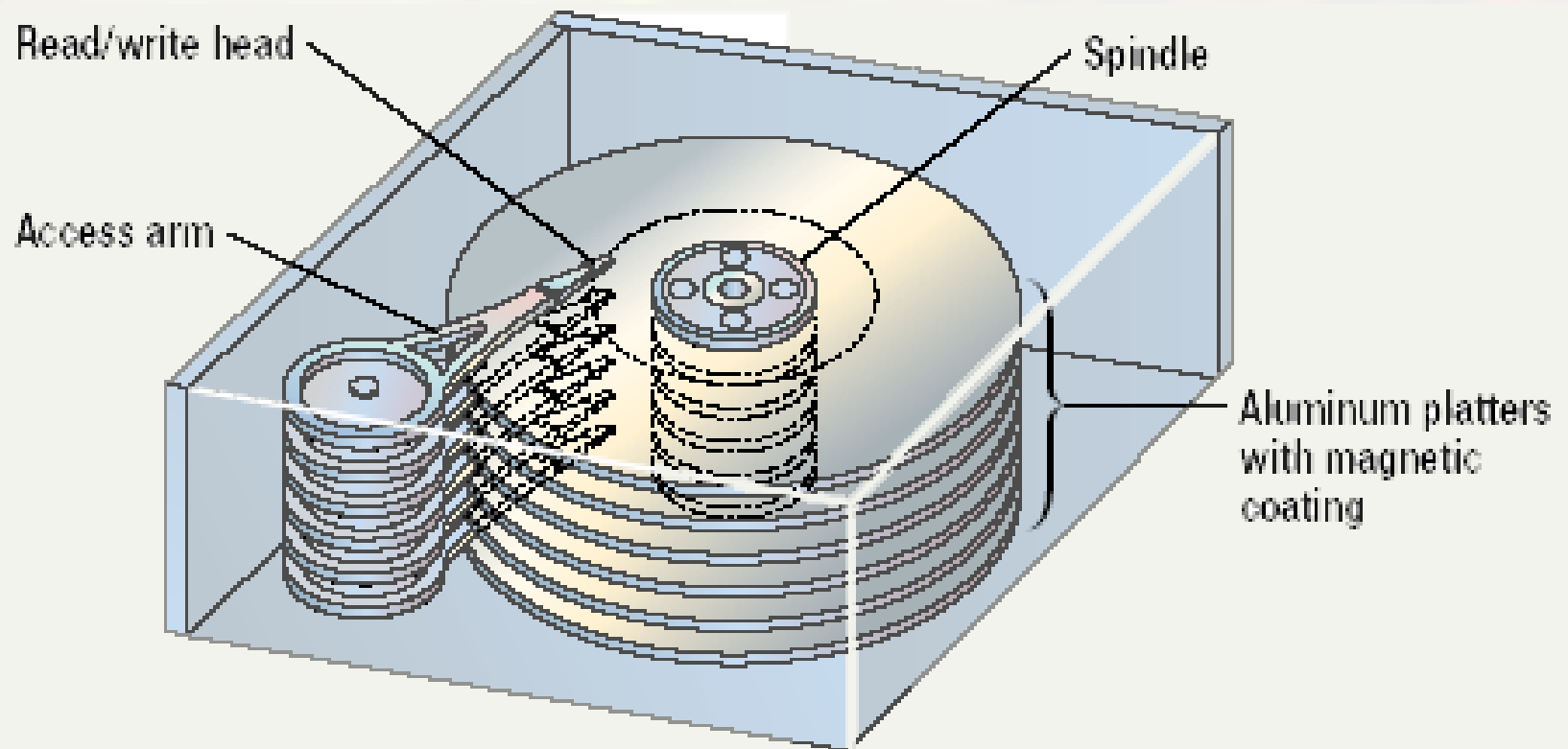
Magnetic Storage Devices

- Diskettes
 - Also known as floppy disks
 - Read with a disk drive
 - Mylar disk
 - Spin at 300 RPM
 - Takes .2 second to find data
 - 3 ½ floppy disk holds 1.44 MB

Magnetic Storage Devices

- 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



Magnetic Storage Devices

- 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

Magnetic Storage Devices

- 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

Recordable Optical Technologies

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

Recordable Optical Technologies

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

Recordable Optical Technologies

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

Recordable Optical Technologies

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

Recordable Optical Technologies

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

Solid State Devices

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

Solid State Devices

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

Solid State Devices

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

Solid State Devices

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