LAPTOPS
• Laptop
• Hardware
• Input
• Power
• Display
• Motherboard
• CPU
• Hard Drive
• Memory
• Optical Drives
• Wireless NIC
• Laptop Expansion
  • PC Card
  • Express Card
  • Mini PCIe
  • Docking Station
• Laptop Locks
• Laptop Cooling
• A portable computer with a clamshell form designed for mobile use
• Has hardware that is similar to desktop and server computer
• Typically integrates a display, keyboard, touch pad/pointing stick, speakers, microphone, and web cam in one unit
• Can be powered by AC electricity or battery power
• Generally smaller than desktop computers
Smaller devices are called notebooks, subnotebooks, netbooks, and ultrabooks.

Keyboards are generally smaller with less keys and keys closer together.
• Touchpads – replace mouse,
• used to move the mouse,
• includes R and L “mouse buttons”
• and scroll bar

• Trackpoint – eraser like head to
• move mouse
• Speakers integrated into the laptop case, various locations

• Battery – rechargeable Li-Ion, various sizes and capacities, usually inserted underneath or to the rear of the laptop case, DO NOT OPEN
• DC Jack – connects to laptop power
• supply to power the laptop and charge
• the battery, jacks vary between manufacturers

• Power supply – converts AC power
• to DC power, power supplies vary
• between manufacturers
• Displays
  • Inverter DC to AC
  • Backlight
    • LCD
    • LED
    • OLED
    • Plasma
  • Wifi Antenna
• Resolution, size, clarity, energy efficiency is important
• Motherboard – very similar, much smaller, increased integration of components (USB, Firewire, Wifi, Bluetooth)

• Low power consumption

• Few expansion slots

• May have to replace motherboard to add functionality
• CPU
  • Designed to use less power
  • Decreases CPU and bus speed
to save power and maximize battery life

• Some are designed to be used with
• passive cooling

• Some may be soldered onto the motherboard
• Hard Drive
  • Use smaller 2.5 inch drives
    • Less storage capacity
  • Slower due to rotational speed
  • May be hard to access, varies
  • Use PATA and SATA
  • May have to use external storage (USB, Firewire, eSATA) to expand storage
• SO-DIMM
  • Small outline. ~1/2 size of DIMM
  • Decreased power consumption
• Some laptops use proprietary memory
• Some laptops allow RAM to be expanded/replaced
• Flash memory can be used
Laptop Optical Drives

- Similar to full size
- Smaller
- Some laptops do not have an optical drive, such as Netbooks and Ultrabooks
- USB, Firewire external drives can be used
• Most laptops include a Wifi NIC

• Antenna for Wifi NIC is usually routed around the display

• Can be upgradable, varies

• May be integrated on the motherboard
Laptop Expansion - PC Card

• Aka PCMCIA – Personal Computer Memory Card International Association

• Credit card size

• Type 1: 16 bit, memory

• Type 2: 16/32 bit, use a dongle

• Type 3: 16/32, external hard drives
Laptop Expansion - Express Card

- Replaces PC Card
  - Lower power
  - Increased bandwidth
  - PCI Express and USB capability

- Smaller than PC Card

- Size: 34mm / 54mm
Laptop Expansion- Mini PCIe

- Internal

- Used to increase communication capability

- Wifi cards are commonly connected via Mini PCIe

- USB capability
Laptop Expansion- Docking Station

- Connects to laptop to provide additional connection ports and hardware capability
- Used when a laptop replaces a desktop
- Some allow expansion cards to be installed on the docking station
- Usually powers the laptop and charges the battery
- Connection port and features for docking station vary by manufacturer
- Not all laptops can connect to a docking station
• Due to portable nature, laptops are easily stolen

• Locks are usually attached to cables that attach the laptop to a large or hard immovable object

• Kensington lock port – the standard port that locks attach to on the laptop
• Laptops are designed to run cooler

• Active cooling by internal fans

• Cooling pads – sit under the laptop to protect the user from heat and to improve cooling
  - Active – fans
  - Passive – heat absorbing
THANK YOU