Portable Devices

Sno Isle Skills Center

Portable Devices vs Desktops

Portables

- Smaller and lighter
- Run on battery power
- Built to withstand more wear and tear
- Built to save power, to save battery life
- Less expandable (sometimes not at all)

Desktops

- More powerful
- Run on AC
- Use more power
- More expandable

Types of Portable Devices

- Laptops
- Netbooks
  - Meant to be used on wireless network
  - No optical drive
  - Smaller hard drive
    - Often SSD
- Tablet Device
  - Like a notebook with a touch screen or
  - iPad or other touchscreen device meant to do one thing at a time
- PDA—Personal Digital Assistant
  - More and more are being integrated directly into Smartphones
- Smartphone

Parts of the Notebook

- Processor
  - Lower power consumption
  - Can be configured to run even lower when on battery
  - Usually has a subset of the commands that a full CPU has
- Memory
  - SODIMM aka MicroDIMMs
    - SDRAM
    - DDR/DDR2/DDR3/DDR4
    - RAMBUS
- Keyboard
  - Notebooks and Mac Netbooks (air) have full sized keyboards
  - Netbooks have smaller keyboards (one of the drawbacks)

Parts of the Notebook

- Pointing Devices
  - Trackpad—Use your finger
  - Pointing "stick"
  - Digitizer pads—Use a stylus
  - External mice (USB, bluetooth—bluetooth not standard on all devices)
- Video
  - XGA—Standard 4:3 aspect ratio
  - WXGA—Widescreen
  - Most video is integrated on mobo
  - Some have separate cards that allow you to upgrade video
  - Most have an external port for attaching to a monitor or projector.

Parts of a Notebook

- Networking
  - Most have wireless built in (802.11g or n)
  - If a "card" is used, it is connected through mini-pci
  - Many have Ethernet ports
  - If you don't have built in, or the wireless dies, you can get a PCMCIA card for networking
- Internal hard disks
  - 2.5 inch PATA, SATA (more likely), or SSD
  - SATA most common interface
- Docking Station
  - To dock device to a full size monitor, keyboard, mouse, and external drive with ease
- Other stuff
  - USB ports
  - IEEE 1394 ports
  - Removable drive bays (floppy, optical drive)
  - PCMCIA and Express Card slots
  - Thunderbolt

SODIMMs

- Small Outline Dual Inline Memory Module
- Available in different sizes
  - 32 bit transfer rate (old)
    - 72 Pin
    - 100 pin
  - 64 bit transfer rate
    - 144 pin
    - 200 pin
    - 204 pin

- Just a different form of SDRAM. It is not different from SDRAM in function, just size.

Replacing a SODIMM

Get proper tools—usually very small phillips head screwdriver, sometimes a specialty tool

Ground yourself

Open Case

Remove battery

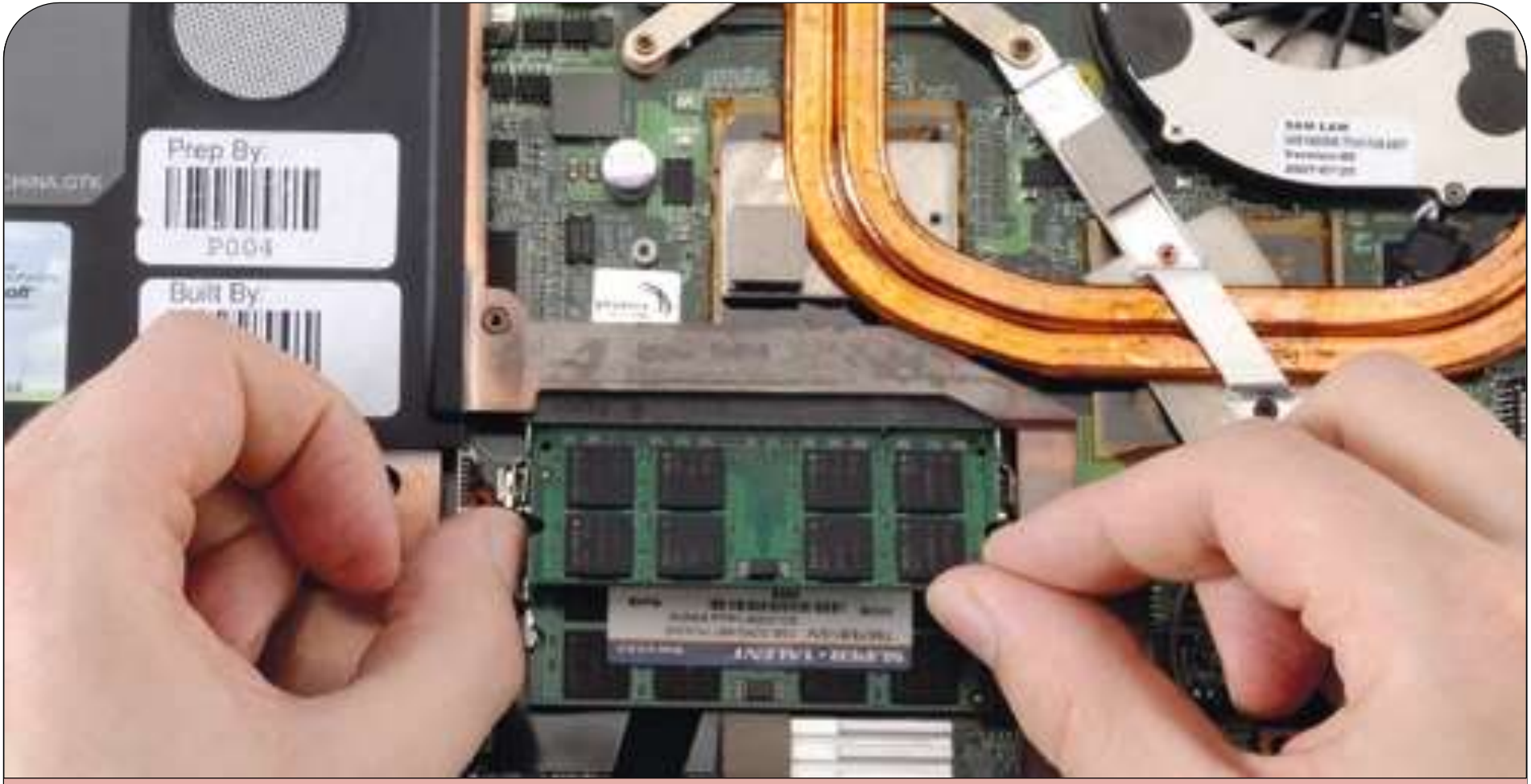
Lay upside down on a soft mat, unscrew all screws in access door.

Remove the screws and put them in a SAFE PLACE

Open access door

Set aside door. You'll see the RAM under the door.

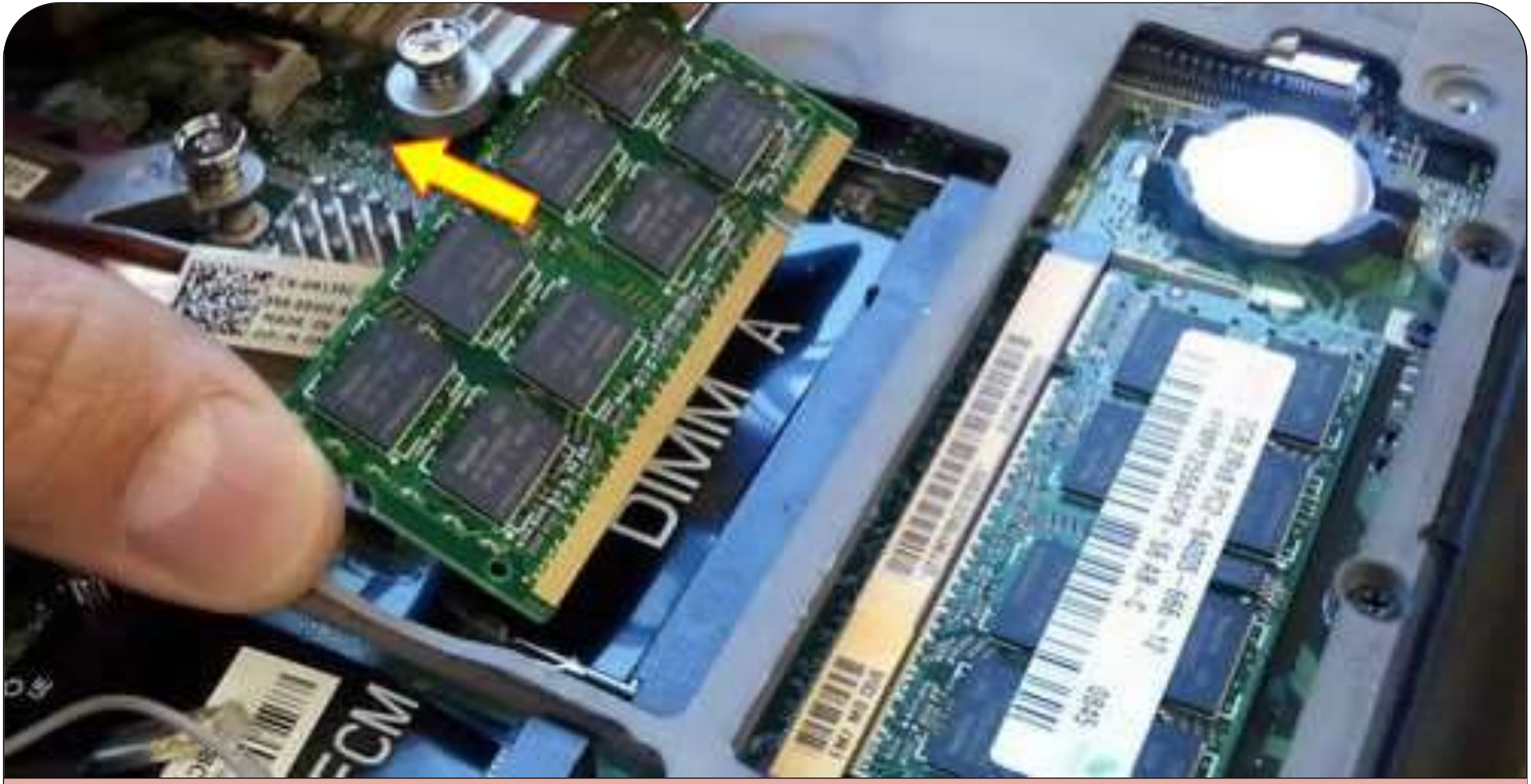
Each laptop can handle one or two modules (Netbooks usually one, laptops two)



Make sure your RAM is compatible

Big bummer if it is not.

Remove old SODIMM by releasing clips on either side.



Install New RAM

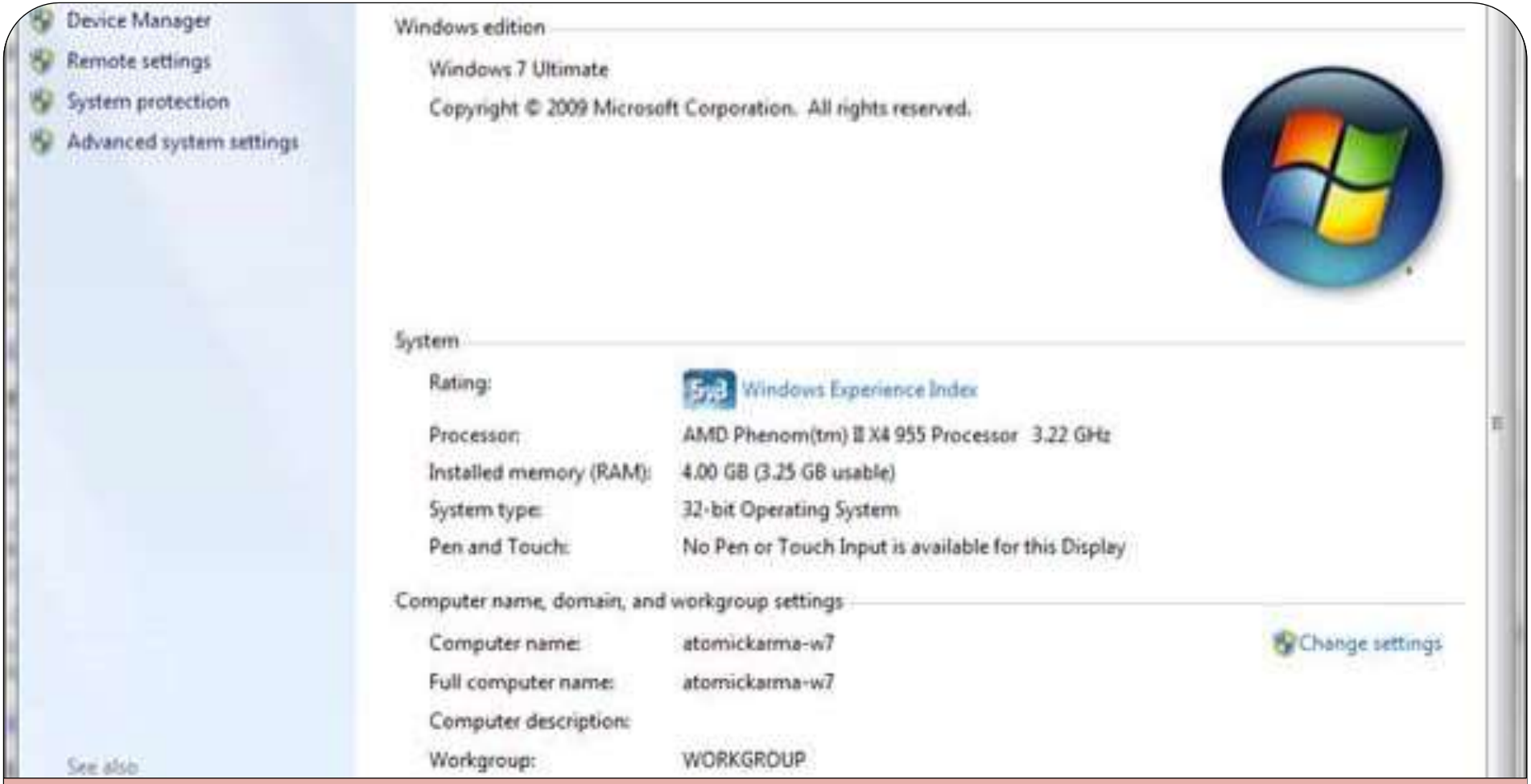
Hold RAM by edges (do not touch the leads)

Insert at an angle and snap down into place

Restart and check for New RAM

Right click on my computer and select properties

Shown above in XP



Test RAM

Shown above in Windows 7

Expansion Cards

- A PC Card is a credit card sized expansion bus that conforms to PCMCIA standards. PC Cards come in a number of configurations with varying characteristics and functions. You should know the following facts about PC Cards:
- PC Cards can be used by devices like modems, network cards for wired or wireless networks, CD-ROMs, sound cards, SCSI host adapters, IEEE 1394 controllers, USB controllers, and others.
- PC Cards connect to the 16-bit or 32-bit card host I/O bus on the laptop motherboard.

Expansion Cards

- PC Cards can also be categorized by physical standard, as is illustrated below: Card Type Description Type I Now obsolete, were typically used for memory (such as SRAM and Flash). Type II Typically used for I/O (such as modem and LAN). Type III Typically used for rotating mass storage (hard drives and optical drives).
- PCMCIA dimensions, excluding thickness, are the same for each type of card and each card type has a 68-pin connector. Thinner cards fit into the thicker ports, but not vice versa. For example, a Type I card will fit into Type II and III ports while a Type III card requires two Type II ports.

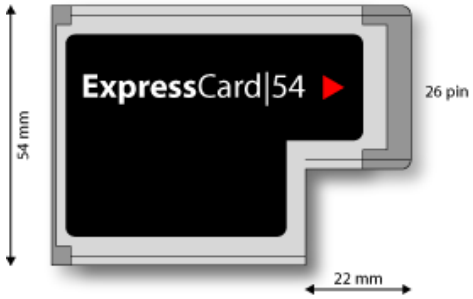
Expansion Cards

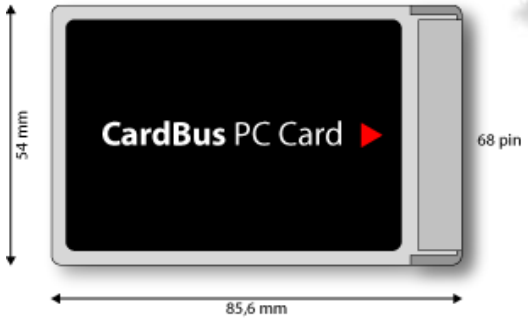
- PC Card Types
  - Type I
    - Obsolete
    - Were used for expanding memory
  - Type II
    - Usually used for I/O
    - Modem, LAN, Wireless
  - Type III
    - Usually used for mass storage
      - Removable drive
      - Optical drives
  - You can put Type I, II, or III into a Type III slot.

Express Cards

- ExpressCard slots connected directly to the PCIe or USB bus. ExpressCard offers up to 2.5 Gbps on the PCIe bus, or 480 Mbps on the USB bus.
- ExpressCard slots are either 34mm or 54mm wide.
- There are two card form factors:
  - ExpressCard/34 are rectangular cards that are 34mm wide. These cards fit into either 34mm or 54mm slots.
  - ExpressCard/54 are L shaped cards that are 34mm wide at the connector end, but 54mm wide on the outside edge. These cards fit only into 54mm slots.
- Cards use either PCI Express or USB 2.0 standards (the slot supports both).
- ExpressCards can be used for all types of devices, similar to PCMCIA. An ExpressCard can even be used for a graphics card to attach an external monitor.
- Many newer laptops have ExpressCard slots but not PCMCIA slots. Some laptops have both, while some have neither (assuming that all external devices will connect through the USB ports).

Cards Cards and More Cards





PC Card

Type III

Express Cards

POWER!!!!!!!!

- Notebooks are designed to save power by
  - Turning off devices that aren't in use
  - Going into sleep or hibernation mode after a period of time
  - Stepping down the CPU bus
  - Turning off the monitor after a period of time
  - Shutting off completely (if designated) after a period of time.
- Connect to wall power using a cord with a "brick"
  - Power from the wall charges the battery
  - Power powers the monitor
  - The "brick" is responsible for converting AC to DC
    - Also provides DC to the backlight on an LCD monitor

Batteries

- Ni-Cad
  - Nickel Cadmium Batteries
  - Stores less power as it goes through charge cycles (called developing a memory)—completely discharge before recharging to expand life
  - Takes up more space than lithium
  - Very susceptible to heat
  - No longer used in new laptops
  - Very toxic
- NiMH
  - Nickel Metal Hybrid
  - Does not develop a memory
  - Lasts 40% longer than Ni-Cad
  - More expensive than Ni-Cad
  - Less toxic

Batteries

- Li-Ion
  - Lithium Ion
  - Does not develop a memory
  - Twice the capacity of Ni-Cad
  - Shorter lifespan than NiMH
  - Smaller—good for netbooks and tablets
  - Used in smartphones and MP3 players as well
- Fuel Cell
  - Not really a battery, but being used more
  - Offers instant power
  - Rather than being recharged, the fuel is replaced
  - Uses dilithium crystals and a flux capacitor
  - No…not really

Disposing of Batteries

- It is illegal for a company to dispose of toxic waste in the garbage
- Most communities and some stores have repositories for batteries
- You canNOT throw away any battery in the trash
- Take to Toxic Waste dump, or stores like Staples or Best Buy
- Toxins leach into groundwater, poisoning the ground and the water we drink and fish live in.

Power Management

- On a desktop many things keep running, even when they are not being used.
- This is a battery killer on a laptop
- Used to use APM (Advanced Power Management) to manage power on a laptop
  - Integrated into BIOS
  - Will turn off devices after a specified amount of time when it hasn't been used
  - Problems
    - OS and BIOS don't always communicate (BIOS may turn off HD and OS tries to write to it)
    - Every BIOS manufacturer implements it differently…some you can configure, some not
    - Didn't support PnP

Power Management

- ACPI (Advanced Configuration Power Interface) is a better solution
  - Created by Intel, Microsoft, and Toshiba to replace APM
  - OS and BIOS and Devices all work together
  - Supports PnP
  - Requires both OS and BIOS to be compliant
    - Windows 98 on
    - Linux
    - Mac
  - BIOS gathers information about how much power is being used by devices and sends that to the OS
  - OS determines how to use that power
    - Slow down CPU
    - Shut off HD
    - Dim monitor
  - Based on how user defines specs.

ACPI States

- On
  - Everything is on and running at full power—no power management
- Enabled
  - Power management on
  - All devices running at full power
- Standby
  - CPU shut down
  - RAM On (storing data)
  - Peripherals shut down
  - Restores the computer quickly, more quickly than hibernation
- Suspend
  - Everything off except RAM (holds data)
  - Restores the computer quickly, more quickly than hibernation
  - You can put your computer into standby mode and the keyboard and trackpad/mouse are unresponsive. Bring it out with on or sleep button.
- Hibernate
  - Before system shuts off, contents of Ram is stored to hard drive in a file
  - All devices shut off (no power)
  - Restores desktop exactly as it was

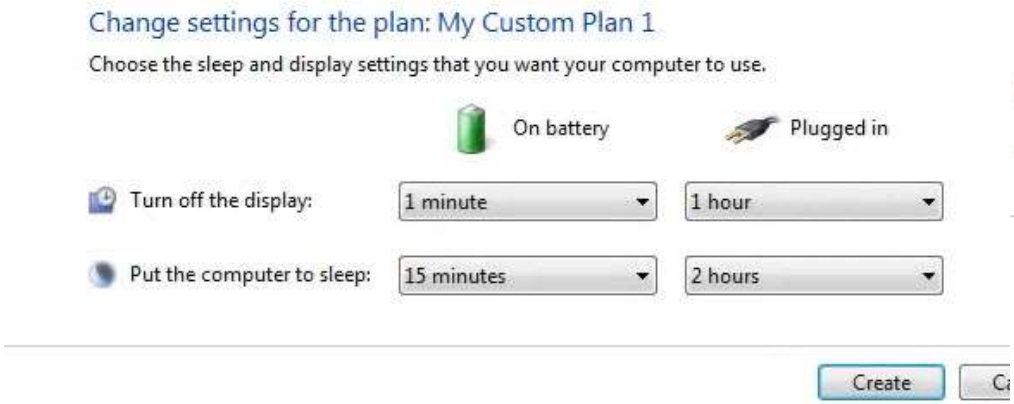
Important Things

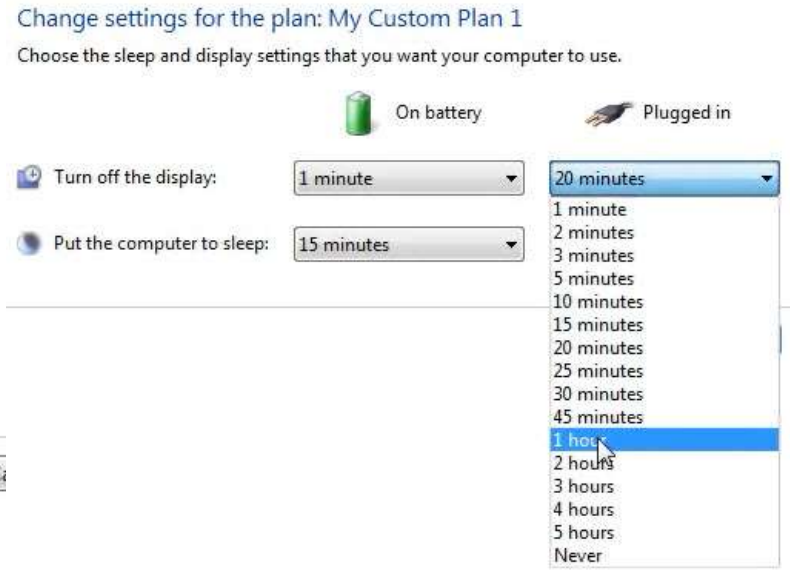
- BIOS must support ACPI
- If you do not see the hibernate tab, either:
  - BIOS does NOT support it, or
  - It is turned off in BIOS
- You can edit a device in device manager to NOT include it in ACPI
- You can allow devices to WAKE the computer using Wake on LAN (WoL)

Configuring Power Options

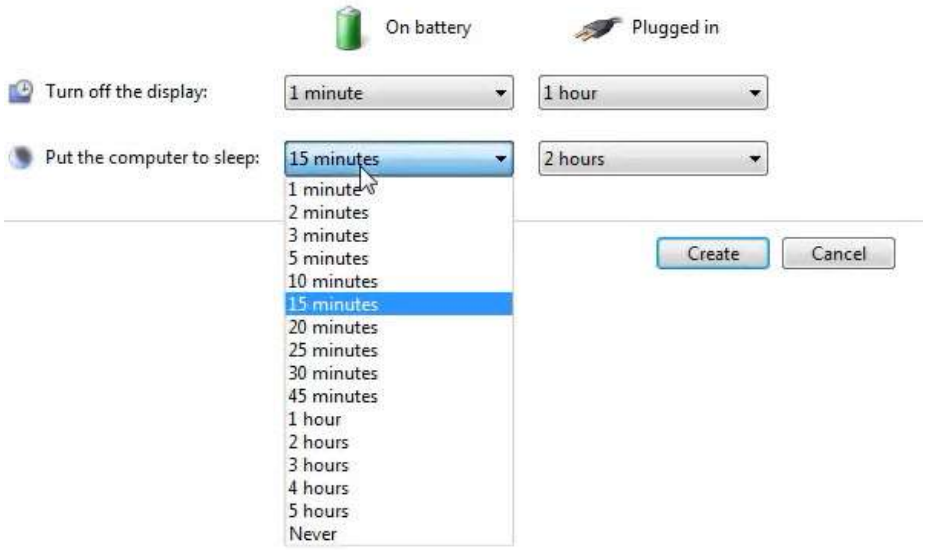
- Saves battery life on laptop
- Get to it by right clicking on the battery icon
- Or Control panel→power options
- Balance between battery and performance
- On battery—more battery
- On AC—more performance

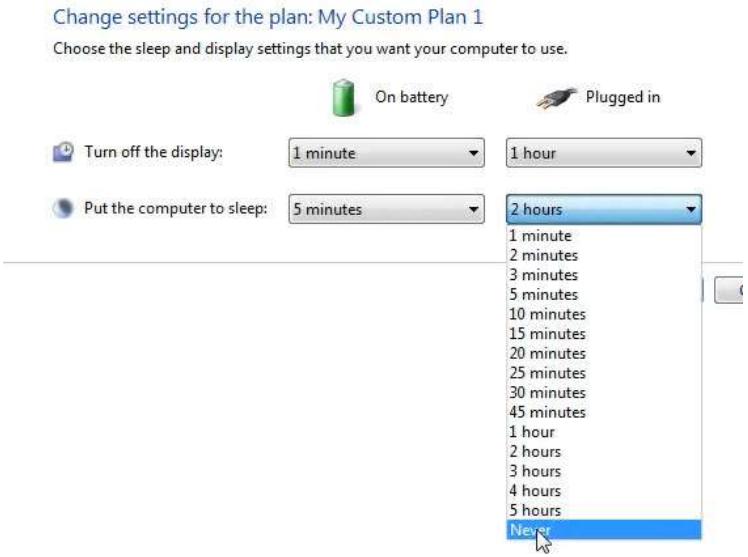
On AC vs On Battery



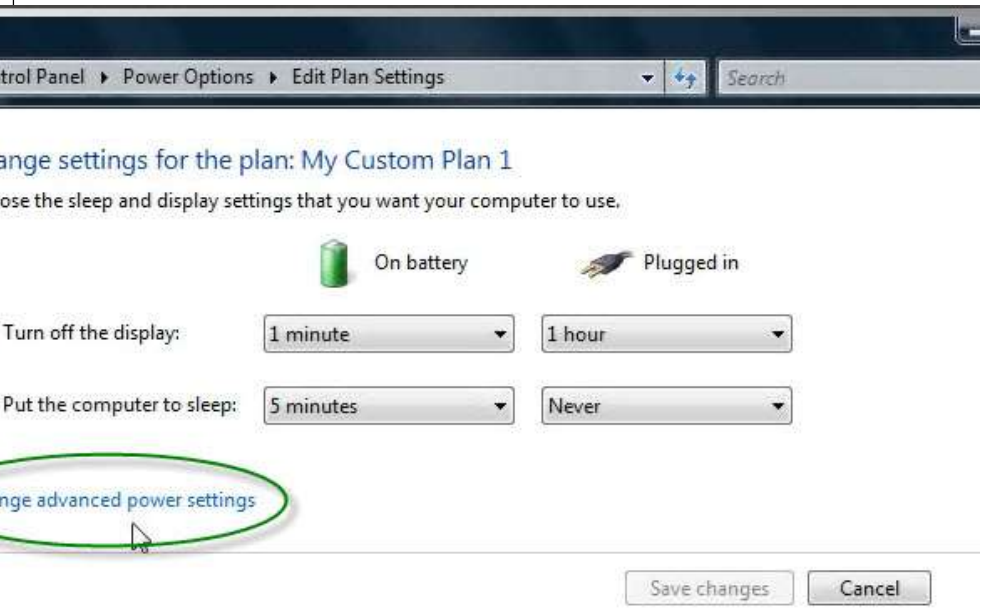


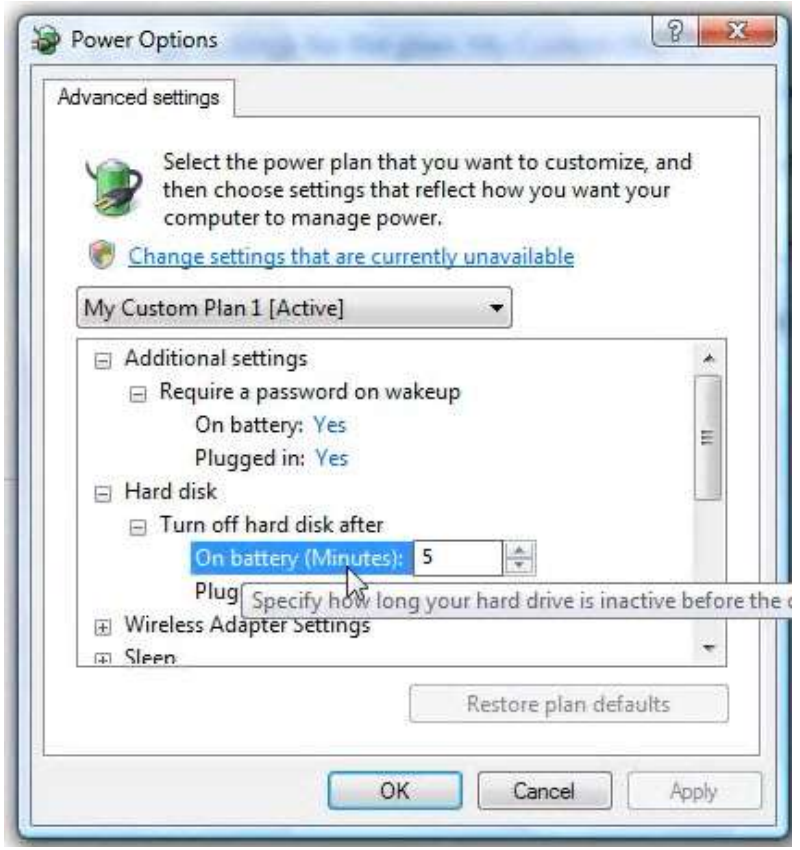
On AC vs On Battery





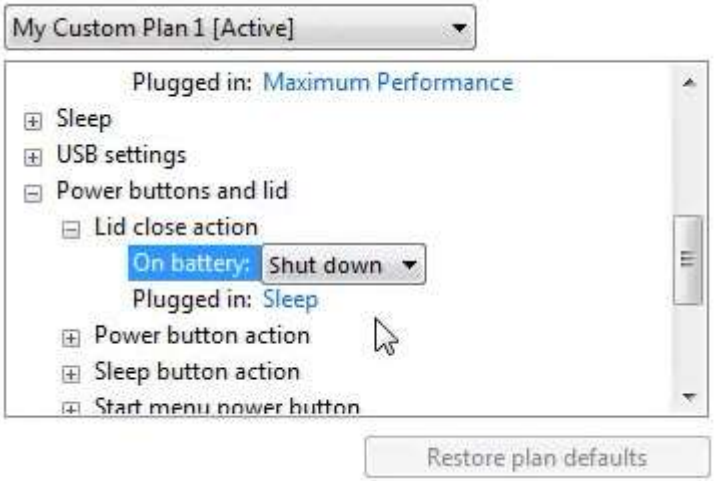
Advanced Power Settings





Advanced Power Settings

- You can choose other options as well, such as what happens when you close the lid
- You can set what happens in sleep, whether USB devices are still powered, etc.
  - Important if you plug in things that charge overnight.



Advanced Power Setting

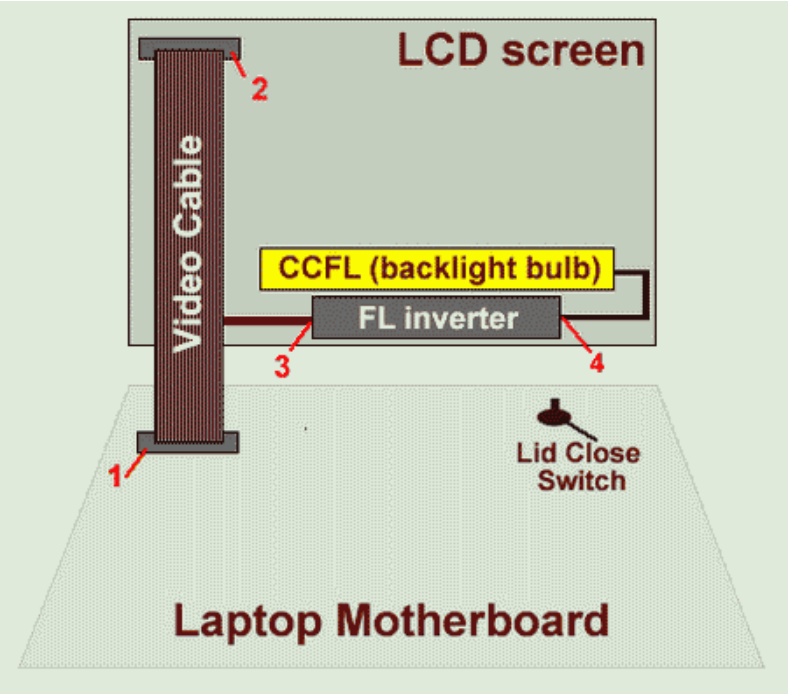
- Can also set what to do with certain buttons, depending on AC or battery

Power issues with a laptop

- Laptop requires what kind of power, AC or DC?
- The DC has to be converted as it comes out of the wall. In a desktop the power supply does that. The transformer or "brick" that comes on the power cord converts the power.
- Components that require DC get that directly from power cable
  - Battery
  - Drives
- Won't turn on
  - Check the obvious
  - 70% of problems are with the transformer
    - Make sure it's plugged in (a light will indicate if it is)
    - Make sure the cables aren't broken
  - Battery
    - Drained
    - Discharging too fast
      - If it's less than 3 years old, recalibrate the battery sensor using the utility that came with the laptop.
  - Rarely the AC Adapter

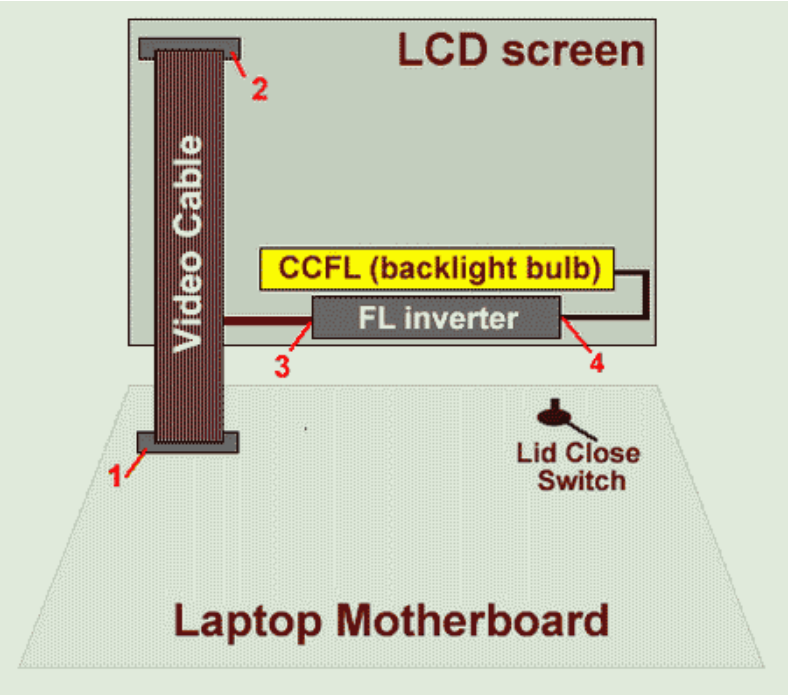
Video issues

- Dead pixels
  - There will always be a few
  - If more than a few, the LCD assembly must be replaced
  - Depending on the system, it might be cheaper to get a new laptop, or purchase a system with other dead components but a good screen
- Flicker
  - Backlight going bad
  - Inverter going bad



Video issues

- No picture
  - Connect external source
  - Check your function key
  - Restart without external monitor plugged in
  - If you restart and still can only get a picture on an external monitor, check to make sure nothing is depressing the LCD cutoff switch
  - Check cable bundles between the screen and body.



LCD Inverter

One of the two cable connectors to LCD screen

Other Troubleshooting

- Keyboard
  - Plug in external keyboard. If it works, the cable may be bad or the controller card.
- Numbers showing up when you hit letter keys with right hand
  - Check that you haven't turned on the function key that enables the 10key
- Mouse or touchpad
  - Check drivers
  - Recalibrate (should be a utility that comes with laptop)
- No wireless
  - Did the wireless switch get turned off?

Maintenance

- Keep food and drink AWAY!
  - If drink spills on it
    - Remove power
    - Remove battery
    - Turn upside down and drain
    - Use rubbing alcohol to clean off keyboard if sticky
    - DO NOT USE for at least two weeks.
- Clean screen with isopropyl alcohol sprayed on lint free rag
- Do not leave in a hot or cold car
- Remove Express Cards from laptop before transporting
- Keep cool!

Smart Phones

- The smartphone revolution really started with PDAs.
- Palm, Sony, and Apple made some of the first PDAs
  - Palm Pilot caught on
  - Clie and Newton not so much
- The first smartphone was called Simon and was released in 1992 for $899 and included a calendar, pager, phone, and PDA
- Blackberry (RIM) integrated the phone and the PDA to create the first one that caught on. Aka “crackberry”
- Then came Apple. The iPhone blew the Blackberry out of the water for regular users. Blackberry was more for business.

IBM Simon

What would a Tech do with a smartphone

- Configure it to work with the Exchange server
- Program them for specific configurations
- Lock out features
- Install apps used in business
- Transfer phone books and mailboxes

Tablets

- Works much like a notebook, but has a touch screen
- Most tablets use a stylus
- Most can swivel to be used either like a notebook or like a tablet.
- Requires a tablet OS to be able to decipher the handwriting and touch

New Tablets

- iPad was the first tablet without an external keyboard
- Includes:
  - Wireless
  - Bluetooth
  - SSD storage
  - Cellular (on 3g/4g version)

- New tablets
  - Dual to quad processor
  - Longer battery life
  - Larger screen
  - Higher screen resolution
  - External devices can connect to them
  - Used less for business, although that is definitely changing.

Phablets

- A smartphone that has a screensize that is intermediate between a smartphone between a typical smartphone and a tablet
- Examples 2014:
  - HTC One Max
  - Samsung Galaxy Mega
  - Huawei Ascend Mate
  - Sony Xperia Z Ultra
  - Nokia Lumia 1520
  - Samsung Galaxy Note 2 & 3

Others

- Netbooks
  - Smaller than notebooks
  - Usually no optical drive
  - Not very expandable
  - Lighter easier to carry
  - Often run off a CE version of Windows ofr a version of Linux

Cloud Computing

- Cloud computing is the act of having things hosted off site and accessible through the Internet.
- A business may have their own "cloud" or may lease space from another business (usually considered an B2B solution; business 2 business).
- A central server administers the traffic from your business to the "cloud" and back.
- Your business may still have their own servers on site, but some servers will be "cloud servers" and accessed through the Internet.
- The cloud server uses a type of software called "Middleware" that handles the interaction between the front end and the back end.

Front end and back end of cloud computing

Front End

- Client computer
- Application required to access the cloud
  - May use your browser (email is usually done that way)
  - May use a specialized client program

Back End

- Servers at remote site
- Storage systems
- Applications (think Google Apps—just pay a subscription for your company rather than buying licenses for everyone)

Cloud Computing

Benefits

- Can use a netbook or ultra-light notebook with an SSD and save data in the cloud.
- Can have programs from the company accessible from anywhere there is Internet.
- Company doesn't have to invest in lots of servers and hardware.
- Saves money on IT support.

Problems

- If no Internet, you may not have your data accessible.
- Have to weigh the ongoing subscription cost with the cost of hardware over time.
- Privacy concerns with data
- What happens if the cloud company goes out of business?