A+ Unit Seven: Portable Devices

Student Name		Member of Team		Team Lead		AM/PM
A+ Test	Essentials 701					
A+ Certification Objectives Covered			• 1.10 Install, configure and optimize laptop components and features • 3.3 Explain the process and steps to install and configure the Windows OS • 2.4 Given a scenario, explain and interpret common laptop issues and determine the appropriate basic troubleshooting method			

Turn in for this unit	**Time Allotted**	**8 Days**
Labs	Team Lead Check Off	Teacher Check Off

Unit Project (one per group)

✓ Customer Overview	
✓ List of current needs	
✓ List of future needs	
✓ List of questions asked of customer	
✓ Written (at least 2 full page, double spaced) proposal that describes, in clear English, your solution.	
✓ Diagram of computer components	
✓ Worksheet from lab	
✓ Printout of spreadsheet showing complete cost of ALL computers and hardware and software	

Portable Devices vs Desktops

Portables

- _____ and lighter
- Run on _____power
- Built to withstand more wear _____tear
- Built to save power, to save _____life
- Less _____ (sometimes _____at all)

Desktops

- More _____
- Run on _____
- Use _____power
- More _____

Types of Portable Devices

- Laptops
- Netbooks
  - Meant to be used on _____network
  - No _____drive
  - _____hard drive
    - *Often* _____
- Tablet Device
  - Like a _____with a touch screen or
  - _____or other _____device meant to do one thing at a time
- PDA—_____Digital Assistant
  - More and more are being integrated directly into _____

Parts of the Notebook

- Processor
  - _____power consumption
  - Can be configured to run even _____when on _____
  - Usually has a subset of the _____that a full CPU has
- Memory
  - _____aka _____
    - *SDRAM*
    - *DDR/DDR2/DDR3*
    - *RAMBUS*
- Keyboard
  - Notebooks and Mac Netbooks (_____) have full sized _____
  - Netbooks have _____keyboards (one of the _____)

Parts of the Notebook

- Pointing Devices
  - _____—Use your finger
  - Pointing "_____"
  - _____pads—Use a _____
  - External mice (USB, bluetooth—_____not standard on all devices)
- Video
  - _____—Standard 4:3 aspect ratio
  - _____—Widescreen
  - Most video is _____on mobo
  - Some have separate _____that allow you to upgrade video
  - Most have an _____port for attaching to a monitor or projector.

Parts of a Notebook

- Networking
  - Most have _____built in (802.11g or n)
  - If a "card" is used, it is connected through _____-pci
  - Many have _____ports
  - If you don't have built in, or the wireless dies, you can get a _____card for networking
- Internal hard disks

- 2.5 inch _____, SATA (more _____), or SSD
- _____most common interface

- Docking Station
  - To dock device to a full size _____, keyboard, _____, and external _____with ease
- Other stuff
  - _____ports
  - IEEE _____ports
  - Removable _____bays (floppy, optical drive)
  - _____and _____Card slots

SODIMMs

- Small Outline Dual _____ _____Module
- Available in different sizes
  - 32 bit transfer rate (old)
    - *72 Pin*
    - *100 pin*
  - 64 bit transfer rate
    - _____*pin*
    - _____*pin*
    - _____*pin*
- Just a different form of SDRAM. It is not different from _____in function, just size.

Replacing a SODIMM

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

Ground _____

Open Case

Remove _____

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

Remove the screws and put them in a _____PLACE

Open access door

Set aside door. You'll see the _____under the door.

Each laptop can handle one or two modules (_____usually one, _____two)

Make sure your RAM is compatible

Big bummer if it is not.

Remove old SODIMM by releasing _____on either side.

Install New RAM

Hold RAM by _____ (do not touch the leads)

Insert at an _____and snap down into place

Restart and check for New RAM

Right click on my computer and select _____

Shown above in XP

Test RAM

Shown above in Windows 7

Expansion Cards

- A PC Card is a _____card sized expansion bus that conforms to _____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 _____, network cards for _____or wireless networks, CD-ROMs, _____cards, _____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 _____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 _____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
    - _____
    - *Were used for expanding* _____
  - Type II
    - _____*used for I/O*
    - _____, _____, _____
  - Type III
    - *Usually used for* _____*storage*
      - _____drive
      - _____drives
  - You can put Type I, II, or III into a Type_____ slot.

Express Cards

- slots connected directly to the PCIe or USB bus. _____ offers up to 2.5 Gbps on the _____ bus, or 480 Mbps on the USB bus.
- ExpressCard slots are either _____or _____wide.
- There are two card form factors:
  - ExpressCard/34 are _____cards that are _____wide. These cards fit into either 34mm or 54mm slots.
  - ExpressCard/54 are L shaped cards that are _____wide at the connector end, but 54mm wide on the outside edge. These cards fit only into _____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 _____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

POWER!!!!!!!!

- Notebooks are designed to save power by
  - Turning off _____that aren't in use
  - Going into sleep or _____mode after a period of time
  - Stepping down the _____bus
  - Turning off the _____after a period of time
  - Shutting off _____ (if designated) after a period of time.
- Connect to wall power using a cord with a "brick"
  - Power from the wall _____the battery
  - Power powers the _____
  - The "brick" is responsible for _____ DC to AC
    - *Also provides DC to the backlight on an LCED monitor*

Batteries

- Ni-Cad
  - Nickel _____Batteries
  - Stores _____power as it goes through _____cycles (called developing a memory)—completely discharge before recharging to expand life

- Takes up more _____than lithium
- Very _____to heat
- No longer used in new _____
- Very _____

- NiMH
  - Nickel _____Hybrid
  - Does not _____a memory
  - Lasts 40% _____than Ni-Cad
  - More expensive than Ni-Cad
  - Less _____

Batteries

- Li-Ion
  - _____Ion
  - Does not develop a _____
  - Twice the capacity of _____-Cad
  - Shorter lifespan than _____
  - Smaller—good for _____and tablets
  - Used in _____and MP3 players as well
- Fuel Cell
  - Not really a _____, but being used more
  - Offers instant power
  - Rather than being recharged, the fuel is _____
  - Uses _____crystals and a flux capacitor
  - No…not _____

Disposing of Batteries

- It is _____for a company to _____of toxic waste in the garbage
- Most _____and some stores have repositories for batteries
- You _____throw away any battery in the trash

- Take to _____Waste dump, or stores like Staples or Best Buy
- Toxins leach into _____, poisoning the ground and the water we drink and fish live in.

Power Management

- On a _____many things keep running, even when they are not being used.
- This is a battery _____on a laptop
- Used to use APM (_____Power Management) to manage power on a laptop
  - Integrated into _____
  - Will turn off devices after a _____amount of time when it hasn't been used
  - Problems
    - *OS and BIOS don't _____communicate (BIOS may turn off HD and OS tries to write to it)*
    - *Every BIOS manufacturer implements it differently…come you can configure, some not*
    - *Didn't _____PnP*

Power Management

- ACPI (_____Configuration _____Interface) is a better solution
  - Created by _____, _____, and Toshiba to replace _____
  - _____and _____and Devices all work together
  - Supports _____
  - Requires both OS and BIOS to be _____
    - *Windows 98 on*
    - *Linux*
    - *Mac*
  - BIOS gathers _____about how much power is being used by devices and sends that to the OS
  - OS determines how to use that _____
    - _____*down CPU*

- *Shut off* _____
- _____*monitor*

- Based on how user defines specs.

ACPI States

- On
  - Everything is on and running at _____power—no _____management
- Enabled
  - _____management on
  - All devices running at _____power
- Standby
  - _____shut down
  - _____On (storing data)
  - _____shut down
  - Restores the computer quickly, more quickly than _____
- Suspend
  - Everything off except _____ (holds data)
  - Restores the computer _____, more quickly than hibernation
- Hibernate
  - Before system shuts off, contents of Ram is stored to _____drive in a _____
  - All devices _____off (no power)
  - Restores desktop _____as it was

Important Things

- BIOS must support _____
- If you do not see the _____tab, either:
  - BIOS does NOT _____it, or
  - It is turned _____in BIOS
- You can edit a device in _____manager to NOT include it in ACPI

- You can allow devices to WAKE the computer using Wake on LAN (_____)

Configuring Power Options

- Saves _____life on laptop
- Get to it by right _____on the battery icon
- Or Control panel→_____options
- Balance between _____and performance
- On battery—more _____
- On AC—more _____

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 _____overnight.

Advanced Power Setting

- Can also set what to do with _____buttons, depending on AC or _____

Power issues with a laptop

- Laptop requires what kind of power, AC or DC? _____
- The DC has to be _____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 _____get that directly from power cable

- _____
- **Drives**

- **Won't turn on**
  - **Check the obvious**
  - **70% of problems are with the _____**
    - ***Make sure it's _____in (a light will indicate if it is)***
    - ***Make sure the _____aren't broken***
  - **Battery**
    - ***Drained***
    - ***_____too fast***
      - If it's less than 3 years old, _____the battery sensor using the utility that came with the laptop.
  - **Rarely the _____Adapter**

Video issues

- **Dead pixels**
  - **There will _____be a few**
  - **If more than a few, the LCD _____must be replaced**
  - **Depending on the system, it might be cheaper to get a new laptop, or purchase a system with other dead _____but a good screen**
- **Flicker**
  - **_____going bad**
  - **_____going bad**
- **No picture**
  - **Connect _____source**
  - **Check your _____key**
  - **Restart without _____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 _____switch**
  - **Check cable _____between the screen and body.**

Other Troubleshooting

- **Keyboard**
  - **Plug in _____keyboard. If it works, the**

_____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 _____key that enables the 10key
- Mouse or touchpad
  - Check _____
  - _____ (should be a utility that comes with laptop)
- No wireless
  - Did the _____switch get turned off?

Maintenance

- Keep food and drink AWAY!
  - If drink _____on it
    - *Remove* _____
    - *Remove* _____
    - *Turn upside down and* _____
    - *Use* _____*alcohol to clean off keyboard if sticky*
    - *DO NOT USE for at least two weeks.*
- Clean screen with _____alcohol sprayed on lint free rag
- Do not leave in a _____or cold _____
- Remove _____Cards from laptop before transporting
- Keep cool!

Smart Phones

- The _____revolution really started with PDAs.
- _____, Sony, and _____made some of the first PDAs
  - Palm Pilot caught on
  - Clie and Newton not so much
- The first smartphone was called _____and was released in _____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 _____. The iPhone blew the _____out of the water for regular users. Blackberry was more for _____.

IBM Simon

What would a Tech do with a smartphone

- Configure it to work with the _____server
- Program them for specific _____
- _____out features
- Install apps used in _____
- Transfer _____books and mailboxes

Tablets

- Works much like a _____, but has a touch screen
- Most tablets use a _____
- Most can _____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:
  - _____
  - _____
  - _____storage
  - _____ (on 3g version)
- New tablets
  - _____processor
  - _____battery life
  - Larger _____
  - Higher screen _____
  - _____devices can connect to them

  - Used less for business, although that is definitely changing.

Cloud Computing

- Cloud computing is the act of having things hosted _____ _____and accessible through the Internet.

- A business may have their own “cloud” or may _____space from another business (usually considered an B2B solution; business 2 business).

- Central server _____the traffic from your business to the “cloud” and back.

- Your business may still have their own _____on site, but some servers will be “cloud servers” and accessed through the Internet. (You can even manage those servers from the Internet.)

- The cloud server uses a type of software called “_____” that handles the interaction between the front end and the back end.

Front end and back end of cloud computing

Front End

- _____computer

- Application required to _____the cloud

- May use your _____ (email is usually done that way)

- May use a _____client program

Back End

- Servers at _____site

- _____systems

- _____ (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 _____with an SSD and save data in the cloud.

- Can have _____from the company accessible from anywhere there is Internet.
- Company doesn't have to invest in lots of _____and hardware.
- Saves money on _____support.

Problems

- If no _____, you may not have your data accessible.
- Have to weigh the ongoing _____cost with the cost of hardware over time.
- _____concerns with data
- What happens if the _____company goes out of business?

Lab 7-1 Configuring Power Options

Have Tory Check Off the Lab

Task	Done
Configured laptop in Labsim	
Set up power configurations in Windows XP	
Set up power configuration in Windows 7	
Set up power configuration in Windows 8	
Answered all questions	
Lab report	

Power options are very important in laptops and netbooks because of the use of batteries. They aren't as important in desktops as most computers and monitors purchased now are "green".

Configuring a Laptop

1. Log into Labsim
2. Click on Section 8.0 Portable Devices
3. Click on 8.2
4. Click on 8.2.4 Edit Power Options
5. Read the directions.
6. Click Start
7. Complete the task 100%. (Hint, when you go to change the password settings, there is a link above that says "Change settings that are currently unavailable".)

Configuring Windows XP

1. Using the Display control panel, set the following:
    a. Select the power scheme you would use if you were using the computer to give a presentation.
    b. Show the power icon in the taskbar
    c. Turn off the sleep button (set it to do nothing)
    d. Enable hibernation
2. Show me these settings

Configure Windows 7

1. Log into Windows 7
2. Locate Power Management (under System Maintenance)
3. Select the High Performance power plan.
4. Change the plan settings.
    a. Never turn off monitor, hard disk, etc.
    b. Advanced settings
        i. Set start menu power button to sleep
        ii. Turn on the background slide show every 20 minutes
        iii. Choose three other things to change and list them below

Option	What it does	Why you chose it

5. Save the power plan as your first name.

Configure Windows 8

1. Log into Windows 8
2. Locate Power Management (under System Maintenance)
3. Select the High Performance power plan.
4. Change the plan settings.
    a. Never turn off monitor, hard disk, etc.
    b. Advanced settings
        i. Set start menu power button to sleep
        ii. Turn on the background slide show every 20 minutes
        iii. Choose three other things to change and list them below

Option	What it does	Why you chose it

5. Save the power plan as your first name.

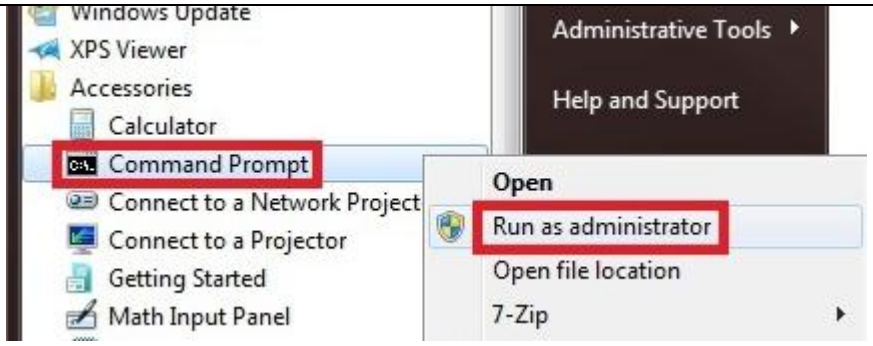
Lab 7-2 Evaluating Power Options in Win7

Check	Task
	Elevate command prompt
	Run report
	Read report
	Three findings

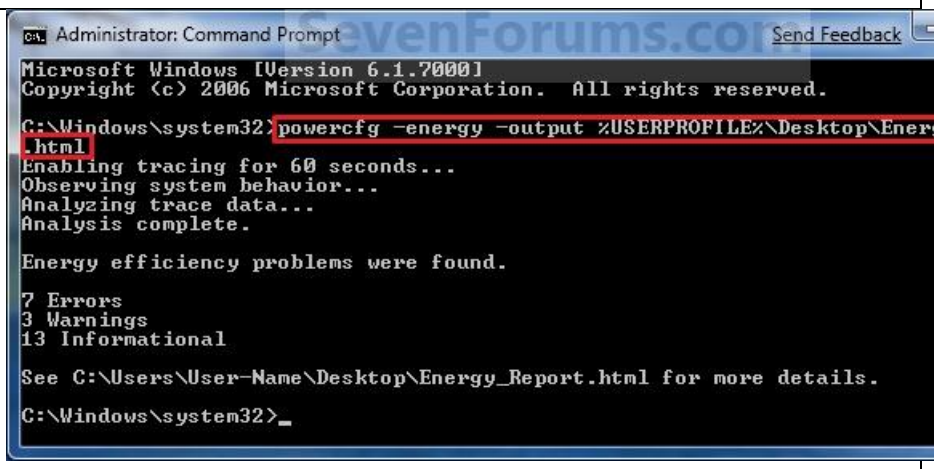
You can create a Power Efficiency Report in Windows 7. Why would you do this? If you're using netbooks or laptops, you want them to be as efficient as possible. You also want to do the best you can to preserve energy both for the bottom line of your company or home, and for the environment.

Creating a Power Efficiency Diagnostics Report

1. Open your command prompt elevated.
    a. Right click on Command Prompt
    b. Select run as administrator
    c. Tell it yes, you want to run it as an administrator.
    d. This is called "running a program in elevated mode.



2. You're going to run the powercfg command.
3. When you open the command prompt, you will be in System32.
4. Type powercfg -energy –output %USERPROFILE%\Desktop\Energy_Report.html (if that doesn't work try powercfg –energy –output c:\energy_report.html)
    a. Powercfg is the program you're going to run
    b. –energy –output are the switches that tell it to create a report on the energy output
    c. %USERPROFILE% is a wildcard that tells the computer to save the report into YOUR user profile (the folder that stores all your user information). This way you don't need the entire path to your user profile. Adding \desktop says save it on the current user's desktop
    d. Energy_Report.html is the name of the report.
5. When you're done you should find the report on your desktop.



6. Go to your desktop and double click on the report.

7. In the box over there → tell me three things your report tells you	

Lab 7-3 Export and Import Power Settings

Check	Task
	Export power plan to desktop
	Delete old plan
	Import plan
	Answer questions

Your company has 100 laptops and you want to set them all to a specific power setting, and then lock them so they can't be changed. (There are security reasons to do this that we'll get into later.) Rather than going to each computer and manually setting the plan, you can create a plan on one computer, export it, then import it on the other computers either manually or through a script.

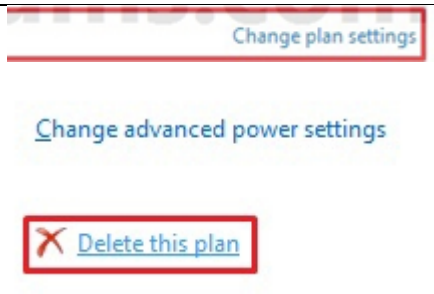
NOTE: You must have done the first two labs for this lab to work.

List all current power plans

1. Log into Windows 7 2. Open your command prompt elevated (see last lab if you don't remember how). 3. At the command prompt type powercfg list 4. Press enter 5. You will see: a. The GUID (Globally Unique Identifier is the ID number for each "container" in a computer) b. Name of plan c. You should see one that is *yourname.pow*. That's the one we're going to export.	 Yeah…you have to type that ENTIRE GUID number, but you can try this. • Highlight the GUID of YOUR power plan you created by clicking and dragging with the left mouse button. • Hit the ENTER key. It is now copied to the clipboard (in Win Vista and 7) When you're ready to paste, type POWERCFG –EXPORT and right click→paste
6. The syntax of this command is POWERCFG –EXPORT *whereyou'regoingtosavtheplan\nameofplan.pow* GUID	So if I were doing the custom plan above I would type **Powercfg –export %userprofile%\Desktop\tory.pow 11eb7d0f-207d-455e-b86b-f0de0122ba90**

7. Save your custom plan you created as your name (firstname.pow) on your desktop. 8. Check your desktop to make sure it's there.	

Delete a Power Plan using the GUI

9. Log into Windows 7 10. Go into power options. 11. Select "Balanced Plan" (or any other plan than your custom one). 12. Next to your custom plan click "Change plan settings" 13. Go into the plan and down below Change advanced power settings, click Delete this plan. 14. Sayonara plan! We loved you!	

Import a Power Plan

1. Log into Windows 7 2. Elevate your command prompt. **3.** Use the syntax **POWERCFG –IMPORT %userprofile%\desktop\yourname.pow** 4. (Remember how you saved your plan with your first name, make sure that you name it that.) 5. It should say "Imported power plan successfully."	Go into your power control panel and check to see that this setting is there. Answer questions Have me check off your lab.

Questions:

1. What does %userprofile%\desktop mean?

2. What is a GUID?

3. How does exporting power plans save an administrator time?

Lab 7-4 Configuring Power Options for a Presentation

Check	Task
	Labsim Lab
	Configure the power system

	Get 100% on the lab
	Answer questions

You have a user at work who has a presentation in front of a large crowd of people. Last time he presented, the laptop kept going to sleep when he'd stop and talk (his words). He wants it set up so that doesn't happen, even if he's not on power. However, we don't want it set up so it NEVER goes to sleep on battery.

Configuring a Laptop

1. Log into Labsim
2. Click on Section 8.0 Portable Devices
3. Click on 8.2
4. Click on 8.2.5 Create a Power Plan
5. Complete the lab
    a. Note: It took me three times to do this one right because I didn't read the directions completely. You're going to START by creating a new power plan!
6. Answer the questions

Questions

1. Why was your user frustrated at first?

2. What did you do so this doesn't happen again?

3. How long, on battery, before the monitor turns off?

4. How long before it goes to sleep? (On battery).

Lab 7-5 Power Configuration in Windows 8

Have Tory Check Off:

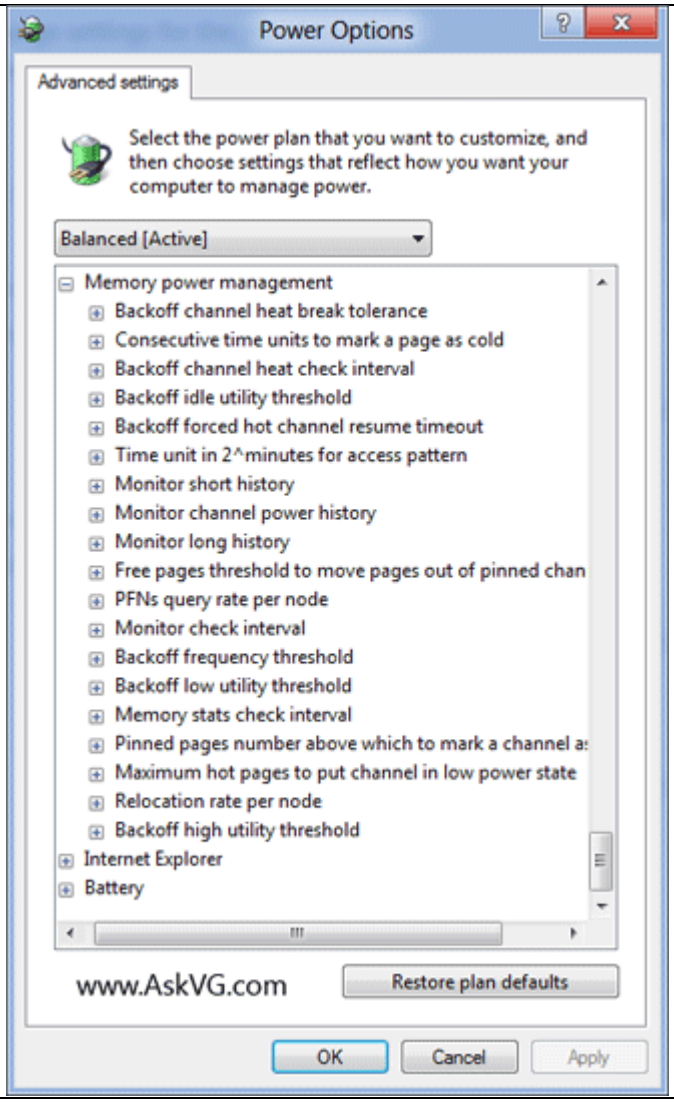
Check	Task
	Open Power Configuration from run
	Access advanced settings
	Set up your own power plan.
	Answer ALL questions

Windows 8 has the same features, plus a few more, available in Windows 7. Play with the Windows 8 features. Note that when you are on a laptop, you will have even more options because power configurations on a laptop are more important to preserve battery life.

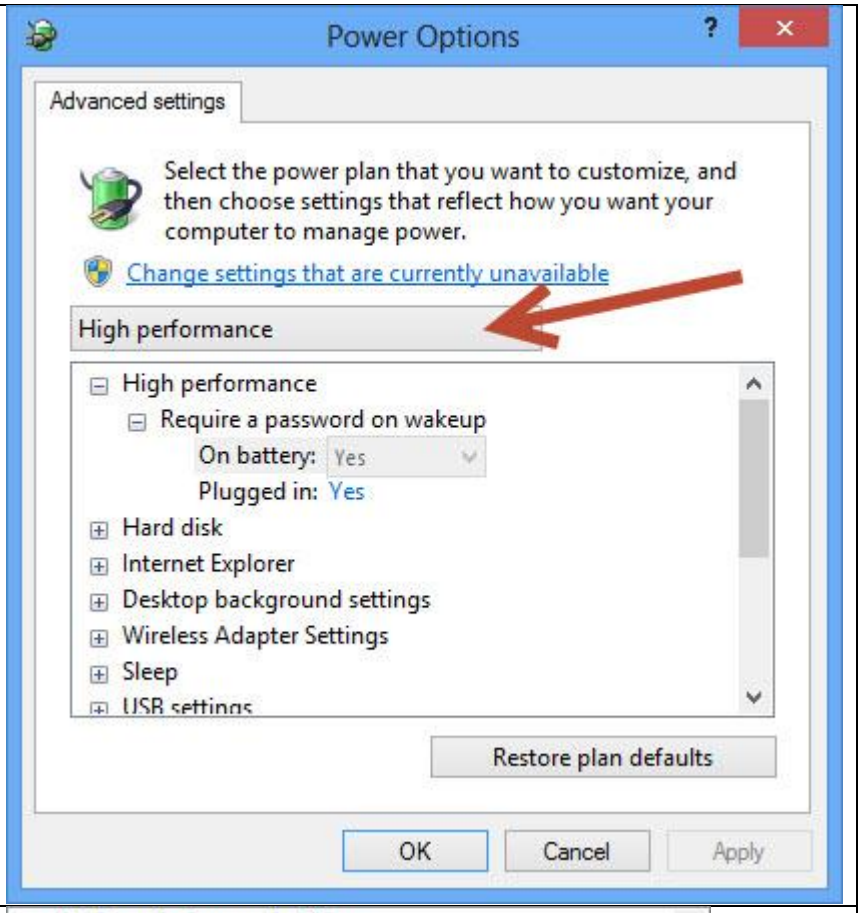
Open Windows 8 Power Configuration

8. From Metro hit Windows key-r to open RUN
9. Type powercfg.cpl
10. .cpl stands for control panel.
11. Click on "Change Plan Settings" next to your current plan.
12. Click "Change advanced power settings"
13. You will get access to all of the power configurations.
14. Some may be greyed out if you're not using a laptop.
15. As you look at the list, notice that there are things related to MEMORY in the power settings. Why do you suppose this is?

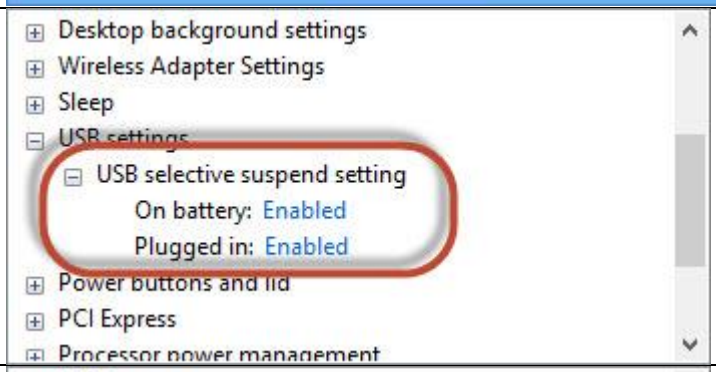
16. You will also notice hard drive settings. Again, why does this matter?



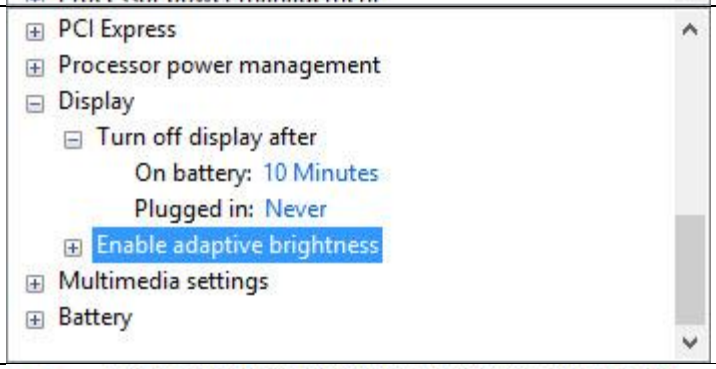
17. What are the four options for power plans on your computer?



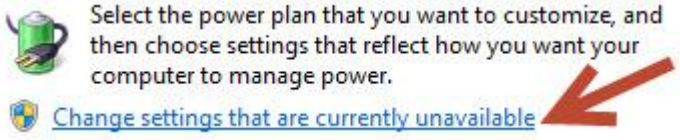
18. Select the high performance plan.
19. Scroll down and maximize USB settings.
20. Maximize (expand) USB selective suspend settings.
21. Disable it on battery, if you have that option.



22. Select Display and expand. Set it so that the display never turns off.
23. Turn off adaptive brightness.

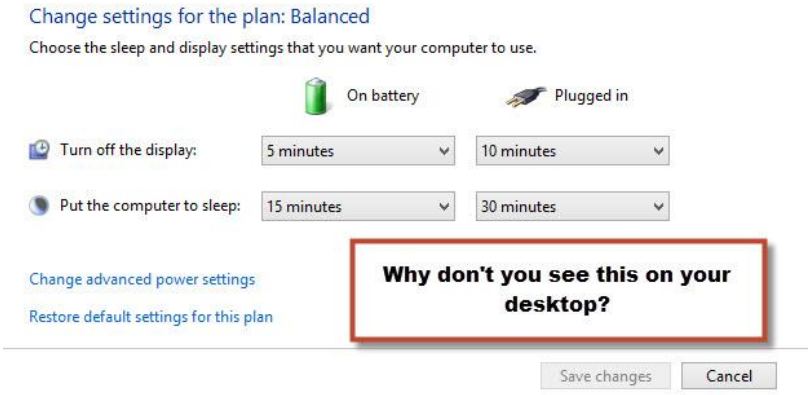


24. Click on “change settings that are currently unavailable.
25. Why are these things unavailable (do you think)?



26. Expand PCI Express and note that it has Link State Power Management. Look that up. What does that mean?	PCI Express Link State Power Management On battery: Maximum power savings Plugged in: Moderate power savings Processor power management
27. Expand processor power management. What is the difference between active and passive cooling?	
28. Now go in and create your own power plan. Change at least four things and document what you changed.	
Changed	**What the purpose was**

1. Look at the power plan options and tell me why you don't see this on your desktop?



Portable Device Project

A tech savvy personal trainer has come to you asking you to set up a mobile training suite for her. She has contracted with someone to set up the fitness gear, but needs the technical gear set up by you. She definitely has some ideas, but above all she wants her computing needs to be met with things that are:

1. Portable
2. High performance/quality
3. Work well together
4. Can be used all over the US

She has a custom built “motor home” type vehicle that contains the gear, a small area for a consultation office. She must travel from place to place in order to work with clients, and wants to be 100% self sufficient. In other words, she does NOT want to have to depend on the client’s wireless connection, power, etc. While she may USE those things, she doesn’t want to depend on them.

You sit down with her to ask her specific questions about her needs.

You need to gather information on what she has, what she wants to work with (types of computers/ devices), how she wants to set up networking, how she wants to set up storage, etc.

Task one:

Email her a list of questions asking her what she’s currently using, and determine her current and future needs. Be sure to ask her if there is anything she wants to have available to customers as well as use herself. Ask her about different technologies she might be aware of that you’re not. (Almost every industry will have technology that is solely used by them. Fitness is no different.)

Remember services as well. She’s not going to travel with a server and routers, etc. She’s going to want to be lean and mean, but she probably still wants a website and needs storage that is offline.

Don’t forget security! What if someone steals her mobile unit? What happens to the data?

Task two:

Create a list of current needs.

Task three:

Create a list of future needs. Email both of these lists to her to ensure you are meeting her needs. Since you are building something “new” and exciting, there isn’t going to be a package out there. You get to build it!

Task four:

Research items that will fulfill her needs.

Put together a mobile fitness technology package where all devices integrate together and talk to each other that meets all of her current needs and addresses her future needs.

Task five:

Type up a CLEAR description in paragraph form. Describe:

- The needs you determined together
- The devices you chose for her and how each one works. Include a picture of each device.
- The services your client will subscribe to.
- How each thing fulfills her needs
- Plans for the future
- Training plans

Task six:

Create a spreadsheet with all of the devices listed, all services, and include 4-5% on top of that for installation.

Task seven: You realize while you're doing this that you could potentially package and sell this service to other trainers! Create a poster-sized advertisement with pictures of the devices, descriptions (bulleted points) and a total cost.

Rubric:

Task	Excellent!	Very good	Pretty okay	Sad	Not included (zero on project)
Emailed a list of questions to the client. Ensured that you met all of her needs by emailing your list of future and current needs back to her for clarification.	10	8	7	5	0
Created a list of current needs. Created a list of future needs. Lists are complete	10	8	7	5	0
Cover page	5	4	3	2	0
Proposal written in paragraph form, completely describing each need and how each need is met	20	16	14	10	0
Proposal includes description of how all devices work together. For example "The Bodybugg work with the Bluetooth on the iPad to communicate the current calorie burn to the user"	20	16	14	10	0
Pictures of all devices	10	8	7	5	0
Poster advertising the package	10	8	7	5	0
Spreadsheet of total cost, including installation	10	8	7	5	0
Presentation given in an appropriate manner	5	4	3	2	0
Total					100