**Design Document: Streaming Media Basics**

Class Description

**Curriculum Track**

**Audience**

Teens, College students, and Adults

**Course Length**

90 minutes

**Training Method**

Lecture

**Purpose**

To inform customers on how to purchase parts for a new computer

Equipment Requirements

Projection screen, projector, computer

Software Requirements

PowerPoint

Material Requirements

Handout

**Learning Objectives**

At the end of the session, learners will be able to:

1. Problem solve easy computer issues.
2. Implement easy solutions to solve problems
3. Determining what part needs to be replaced or repaired
4. Know how to properly purchase a replacement
5. Know how to properly install the new part
6. Know how to properly dispose of the broken part

**Assessment Technique(s)**

Question and answer

Content Outline

(🡪) Designates to move to the next power point slide

***Prep (5-10mins.)***

* Start up the PowerPoint
* Set up computers to work on removing and replacing parts.

***Agenda (2-3 mins.)***

* Solving Common Problems
* Diagnosing the problem part
* Should I upgrade?
* How to purchase a new part
* Installing the new part
* Properly disposing old parts 🡪

***Solving Common Problems (10 mins.)***

* **Diagnosing a problem 101**
  + Explain to the class that no matter how good you are everyone makes mistakes and over looks things. Always check the simplest solutions first.
  + If the problem is not solved by a simple solution try as a last resort to replace a computer part to reduce costs. If you do have to replace something do so only one part at a time after you diagnose the problem fully 🡪
* **My computer will not turn on!**
  + These are the most common reasons for this problem try all problems before trying to diagnose and replace a part.
    - Is your computer plugged in?
    - Was your PSU switch bumped into the off position?
    - Did someone move your voltage switch off of 115v?
    - Is your outlet or power strip working?
      * Can your outlet handle the voltage and wattage draw?
      * Is your wiring old?
      * Try plugging it into another outlet in the house
      * Did it trip your breaker?
    - If your computer is newly built or has been moved or banged around, make sure that all internal connections are still secure.
      * Make sure that your power button is functioning by trying to jump your computer with a screw driver 🡪
* **My Computer turns on but Windows does not boot!**
  + Is your hard drive still plugged in?
  + Log into Bios and make sure your computer still recognizes your hard drive
    - If it does not try using a different SATA port and/or cord
  + Try starting with a Windows disc and doing a Windows repair
    - This also works if Windows starts booting but fails. 🡪
* **My computer turns on but I get no image**
  + Make sure you monitor is on the right input
  + Is your monitor turned on?
    - Is it plugged in?
  + Is the plug still in your monitor and computer?
  + Is the cord bad? Try a new cord
  + Is your graphics card still plugged in correctly into your motherboard?
    - Try a different PCI express slot if possible
    - Are your graphics card power cords plugged in if applicable?
  + If your computer has more than one graphics port is it plugged into the right one?
    - If you have a graphics card installed plug it into the graphics card not the motherboard graphics slot. 🡪

***Diagnosing the Problem Part (10 mins.)***

* If you have tried all the easy solutions and they did not solve your problem, then it is likely that you have a bad piece of hardware. If this is the case it is time to replace parts. If possible, use extra parts lying around or in other computers to diagnose the problem without new parts to test. 🡪
* **Problem: The computer turns on but Windows does not boot**
  + Your SATA cord has gone bad try replacing it with another cord know to work
  + Your SATA port went bad. Fear not Motherboards have multiple ports try another one
  + Your Hard Drive went bad.
    - For SSDs there is nothing you can do but replacing it data recovery is impossible
    - For a Mechanical hard drive you can take it into a shop to recover data or you can try the freezer trick. 🡪
* **Problem: The computer turns on, but will not stay on or Windows crashes with a blue screen or black screen**
  + Most of the time if a computer is crashing it is overheating and turning itself off to avoid damaging hardware.
    - If your ambient temperature is too high, then your computer will be hotter. Turn up the air conditioning, turn on a fan, open a window, or take the side of your computer case off.
    - Check your fans with the computer running maybe one stopped spinning from dying or being disconnected
    - If your computer is old, it is likely your Thermal Paste went bad and needs to be replaced on your CPU/APU/GPU. Replace every 4-5 years.
    - You can check the temperatures with a heat gun, or by download speedfan or MSI afterburner.
  + If the problem is not a heat issue, then it is likely you are having a hardware problem. Most likely the issue is a bad RAM or PSU, but could also be your mother board or CPU/APU 🡪
* **Problem: Your computer turns on and runs, but no image is present**
  + The most likely problem is a bad cable or graphics card. If that does not solve the problem, it could be almost anything. Check your items in the following order only after you weed out the cord and graphics card
    - Monitor
    - RAM
    - CPU/APU
    - PSU
    - Mother board 🡪
* **Problem: Your computer does not power on at all. No LED lights, no fans, etc.**
  + This means that only one of two things could have went bad. It is either your PSU or your motherboard have gone bad. Test your PSU first it is more likely to go bad. 🡪
* **Narrowing down culprits**
  + Visually inspect the item for burn marks, or leaking/bulging capacitors.
    - Point out the images and explain how each type of damage could happen and how to notice it on your hardware. 🡪
  + If possible always test your item, you presume to be bad. Go in order of the list.
    - Try the “bad” part in another computer
    - Try a good par in its place
    - Try the “bad” pat in other slots
    - For “bad” RAM remove one at a time to determine the bad stick. 🡪

***Should I Upgrade (10 mins.)***

* **Reasons to Upgrade**
  + There are many reasons to want to upgrade your computer. Most of the time you can speed up your computer with just software and optimization. Shamelessly advertise the Care and Feeding of your PC class. If you have done this or one of the following is a problem, you should upgrade
    - Computer is too slow
    - Cannot run a new program
    - Ran out of Hard drive space
    - Want to increase the life of your computer to avoid buying a new one
    - Fun/Bragging rights/You have too much money 🡪
* **Upgrade your CPU**
  + Upgrading your CPU can drastically increase your speed especially if you can get one with more cores. Check passmark.com to see how significant your upgrade will be.
  + If you have a good motherboard that can overclock you can often get up to a 20% increase in speed by investing in a better CPU cooler and overclocking it.
    - Remember to check if your Motherboard supports overclocking
    - Remember to check if your CPU supports overclocking. All AMD CPUs can overclock and Intel K series processors can overclock. 🡪
* **Upgrade RAM**
  + Upgrading RAM will not make your computer faster it will only allow you to run more programs at once.
  + Before investing in more RAM consider having less tabs, windows, and programs running first.
  + Open up Windows Task Manager during your computers slowdowns. If your Physical memory is below around 90% then it is likely you don’t need more RAM. If your CPU usage is near 100% consider upgrading that instead. 🡪
* **Upgrade your Hard Drive**
  + If your computer starts slowly or programs and apps open slowly consider purchasing an SSD hard drive to install them on. This will speed up things by 2-3 times. If you purchase a Hybrid drive it will decrease boot times by about 30-50%.
  + If you are running out of space consider purchasing another hard drive
    - External if you have lots of files you do not often access
    - Internal if you have extra SATA ports and you often use those files 🡪
* **Upgrade GPU**
  + Only replace your GPU if you have problems running certain resolutions or are having frame rate issues.
  + If you are going to increase your monitor resolution or add multiple monitors, then you may need to upgrade your GPU to handle it.
  + If you play video games and you want to achieve better frame rates, resolutions, and settings consider upgrading your GPU. 🡪

***How to Purchase a new part (15 mins.)***

* **Do your Homework first**
  + Unless you want to upgrade replace with the same exact part to avoid problems with compatibility
  + If you are not using the same part make sure your motherboard is compatible with it
  + If you are upgrading, make sure that your power supply can handle the more powerful hardware.
  + If you are upgrading to a larger more powerful part make sure that you can fit that part in 🡪
* **Where to buy parts**
  + Fry’s electronics in Downers Grove at 3300 Finley Road
    - They have staff that can help you find exactly what you need and make sure that your parts will all work together
    - They price match from physical and online retailers
    - They often have test products sitting out to try before you purchase
    - Their selection is massive and close to that of an online store. 🡪
  + Amazon and Newegg
    - These online venues offer item reviews to checkout even if you are not buying from them. Especially Newegg.com that often has very experienced tech users reviewing items.
    - Fast and usually free shipping
    - Lower prices
      * Lower or no taxes
    - Both of these companies offer great return policies and usually have good customer support. 🡪
  + Best company’s brands to look out for
    - Asus: One of the best hardware manufacturers if not the best. They make motherboards, graphics cards, peripherals, wireless cards, sound cards, and more
    - Gigabyte: In the top 3 best hardware manufacturers. They make motherboards, graphics cards, peripherals, and more
    - MSI: My personal favorite brand. Is comparable to Asus in quality, but usually a bit cheaper. They make motherboards, graphics cards, peripherals and more.
    - Kingston: One of the top memory companies. They make moderately priced and long lasting RAM, and Hard drives.
    - Corsair: Great over all company with good products and warranties. They make hard drives, RAM, peripherals, and PSUs. I highly recommend their PSUs and keyboards.
    - Adata: They make some of the cheapest RAM, and SSDs for a major company. They are slower and less powerful than most, but they last a long time.
    - Western Digital: One of the most trusted names in mechanical hard drives.
    - EVGA: Very good middle to high range company. They make motherboards, GPUs, PSUs and much more. I highly recommend their PSUs and GPUs.
    - XFX: Middle of the road company. Competitive prices good products. They make graphics cards, and PSUs.
    - Zotac: Middle of the road company. Competitive prices and good products. They make graphics cards, SSDs, and mini computers.
    - If you have trouble picking a brand choose the product with the best price, reviews and warranty. 🡪
  + Brands to Avoid
    - The following brands are very low end budget brands and have a bad reputation for having high failure rates for their hardware. Unless the specific product is getting a good review I advise avoiding them
    - Advise customers to avoid any brand not listed today or one they have never heard of before. It is better safe than sorry.
      * Patriot
      * ECS Elite Group
      * Biostar
      * Lepar
      * Logisys
      * Super Talent 🡪
  + Buying used parts from Craigslist/Ebay/Amazon
    - You can get lightly used or sometimes brand new items on these sites for a reduced price.
    - Make sure the item is in good condition before you purchase or bid on it.
    - If the item is from craigslist do not purchase without testing it.
    - Computer hardware can be expected to last 5 years, so if you are buying a 2 years old part expect to get 3 years out of it.
    - When buying used avoid hard drives. People sometimes install viruses on hard drives before they sell them. If you do buy a used hard drive make sure to format it, but I recommend avoiding this.
    - Newegg.com often has refurbished parts for low prices that still come with a short warranty. This is often a good way to save money and still get a quality product. 🡪

***Installing a New Part (5 mins.)***

* Remember to follow these tips when installing new parts
  + Turn off the computer fully and unplug it
  + Remember to discharge the static from your hands before touching computer parts or use an anti-static bracelet.
    - Touching the computer case or any metal before touching parts works great
  + Be careful and Gentle. Computer hardware has small parts that were not designed for pressure or abuse. If a part will not come out figure out how to properly remove it do not use force!
  + Before you close up your computer always test it first to avoid having to reopen it up later if things to not work. 🡪

***Properly Disposing of Old Parts (5 mins.)***

* Computer hardware often contains mercury, lead, and other minerals that need to be properly disposed. Bring these to a proper recycling center and avoid throwing them out in the trash.
  + Locations in Kane County include
    - St. Charles Public Works
    - West Dundee Public Works
    - MRK group Event
    - Elgin Recycling
    - Or sell the items on eBay Craigslist
      * People often buy broken or used items to refurbish them
      * Working electronics can be donate to Good will or the Salvation Army 🡪

***Questions (2-10 mins.)***

***Free time (? mins.)***

* If there is time left over encourage the class to work with the computers by taking parts out and trading with another computer group to get practice installing new parts in your computer.