Design Document: Youth Computer Take Apart

Class Description

From motherboards to graphics cards, kids will explore computer hardware basics in this hand-on class.

**Category**

Software & Apps

**Audience**

Grades 4 – 8, Adults welcome if accompanying a child

**Course Length**

90 minutes

**Training Method**

Lecture/Demo and Hands-On Instructor-Led

**Purpose**

To teach youth how to identify individual computer parts and take apart/reassemble a desktop computer

Equipment Requirements

Computers, screwdrivers, Band-Aids, goggles, non-latex gloves, cups (container to hold screws)

Software Requirements

None

**Material Requirements**

Handouts, pencils, scratch paper for students, and surveys

**Learning Objectives**

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

* Identify the main parts of a computer
* Identify sequential steps for taking apart and reassembling a computer

**Assessment Technique(s)**

* Successful completion of class activities

Preparation (20-25 mins.)

* Have one computer completely disassembled to allow students to see and handle individual parts
* Have a second computer open and available to show them how things are connected
* Have computers set up at different tables with screw drivers, pieces of paper, cups, pencils/pens, and activity sheets
* Create a circle with chairs for students to sit in; be sure they can see you as you hold up the parts as you talk

Content Outline

**Agenda (3 mins.)**

* Welcome students and review the agenda for the class:
  + Safety and care while handling computer parts as well as themselves
  + Parts of the computer and what they do
  + Taking a computer apart
  + Putting a computer back together

**Topics, Talking Points, and Activities (55 mins.)**

* Safety and Care While Handling Computer Parts
  + Go over the following basic safety guidelines with the students:
    - Some parts are sharp, so be careful when touching them and passing them to your neighbor
    - Try not to drop, bump, or remove any of the pieces so the parts don’t get damaged
    - Do not try any of this at home without your parents’ permission and help!
* Parts of the Computer and What They Do
  + Explain that you are going to tell them a little bit about each part and show them what it looks like before passing each one around. Be sure to keep a good pace… slow enough to be able to answer questions but fast enough to hold their interest!
  + Point to or hold up the following parts as you define them, based on what makes sense.
    - **Motherboard**: similar to your nervous system by connecting all of the computer parts. It allows all of the parts to send and receive information to each other.
    - **CPU (Central Processing Unit)**: similar to your brain; does all the “thinking” that allows the programs and apps to run.
    - **CPU Fan**: similar to sweating! Keeps the inside of the computer cool so it does not overheat.
    - **RAM (Random Access Memory)**: similar to your short-term memory; keeps things handy for your CPU to access then deletes it when it is not needed anymore.
    - **Hard Drive**: similar to your long-term memory; stores all your saved files, operating system (like Windows or Mac), and programs/apps. Share that they connect it with a SATA cable and show them how it is connected.
    - **Optical Drive**: similar to your eyes and ears; allows the computer to take in and receive information like movies and music. Share that they connect it with a SATA cable. Show the kids what an optical drive looks like, and again explain that it is connected using a SATA cable and show how it’s connected.
    - **PSU (Power Supply Unit)**: similar to your heart; feeds all the other computer parts with electricity.
      * Stress that this is the most dangerous part of the computer and can electrocute you.
      * Advise students to NEVER open this part or stick anything inside of it because they will be electrocuted. Advise them that it is safe to touch and handle the PSU from the outside.
    - **GPU (Graphics Processing Unit)**: similar to the eyes of the computer; displays everything on the screen, like graphics. Especially important for video games!
  + End this section by explaining that while parts often look similar they will rarely look the same
  + Stress that all the computers they are taking apart today are older, but newer computers will still have the same parts and the parts will look similar enough to be recognizable
* Take Apart the Computer
  + Tell students that you are going to move on taking the computers apart now. Break them off into teams or small groups and direct them to one of the computers
  + Be sure each of the tables has the appropriate handout for students to use as a guide as they take the machine apart
  + Again, remind the students of safety precautions and have them put on eye protection and gloves.
    - Stress again not to stick anything in the PSU
    - Finally remind the students that these computers will be used again for other classes and to treat everything with respect
  + Suggest that students follow the handout for help taking the computer apart if they’re nervous about getting started
  + Set the expectation that each team will have 40 minutes to take the computer apart. If they finish early, encourage them to try putting it back together.
  + Remind them to use the paper, cups, and pencils provided to label each part and the associated screws as they remove them from the tower.
  + Some students may have never used a screwdriver before so explain to the group for those that may not know what a screwdriver is how to properly use one.
  + Circulate through the classroom, answering any questions raised by students. As you walk around, quiz them on the parts they are handling to aid in retention.
  + Be sure to encourage them to keep trying if they get stuck. If they need help, try to direct them instead of taking it over unless to do so would result in equipment damage or injury.
* **Wrap Up (2 mins.)**
* Thank everyone for coming and congratulate them on taking apart their first computer
* Hand out the certificates of completion and class surveys; ask them to write down any ideas for future technology classes on the survey and give it to you before they leave