

**Week 5: Build Your Own Computer**

For a class of 12 students, grades 6-9

**Materials Needed**

Check In Sheet

Student Nametags

Week 5 Slides displayed on projector

Post-Course Surveys

For classroom portion:

 1 ready-to-give computer, disassembled for use in parts/Ubermix demo

 1 long Ethernet cable to connect the demo computer to the Internet

12 pens or pencils

 12 sets of all instructions

For workshop portion:

 15 identical computers, blown out and with stickers removed (includes 3 spares)

Class handouts

Class will end in the classroom, not in the workshop.

**Review this outline for Cycle 3. For Cycle 2 graduation (2/24/16), be aware of the following:**

 **Class chronology**

**Class photo**

**Pre-review and kahoot quiz**

**Workshop-triage/cleaning/os load/final test**

 **Add a couple of programs? Run updates?**

**Back to classroom for review**

 **PIZZA?**

**Paperwork**

**Load up the van/bus and take them home!**

**2:45 - Volunteer Assistants Arrive (if any)**

* Volunteers should sign in to timeclock and wear name badges

**3:15 - 3:30 - Student Check In**

* Students sign in at front desk and pick up nametag, then go to classroom

**3:30 - Classroom Portion Begins**

Start Week 5 Slides presentation

Introductions - Instructors and Volunteers

Any questions about Week 4: Networks and Jobs in Technology?

This week we will review what we’ve learned and then you’ll build your own computers.

**Hardware Review**

* Computers are **digital devices** that use electronic components to do calculations.
* **Computers are all around us** and come in many shapes and sizes
* **Components** are the parts inside a computer
* Components need **power** connections to turn on and **data** connections to talk to each other
* Old computers and parts can often be **refurbished or reused**. Otherwise they should be **recycled**, not thrown away.

**>> Have parts out from a working computer and reassemble a computer. Have them identify the parts inside the case and then the parts that go into it.**

Use a different model of computer than the ones they took apart in Week 1.

**Ask them where each part does, where it goes, and what it connects to.**

* Motherboard - connects all the parts inside
* Power Supply - sends electricity to the motherboard and the components
* CPU / Heatsink+Fan
* Optical Drive
* Hard Drive
* RAM

**Connections Review**

* Motherboards have many **connections** for adding parts to a computer
* **Peripherals** are **input and output devices** connected to a computer
	+ Input is giving commands or sending information to a computer
	+ Output is the information the computer sends back to you

**>> Now plug peripherals in a computer**

>> Have the peripherals on a table and ask the students to group them by Input or Output (eg, all input on the left side of the table, output on the right)

Show the back of a computer and ask students to ID each important port, cable, and peripheral

* Power
* VGA - mention that is an Output peripheral
* USB - Keyboard and Mouse are input peripherals, mention that USB is extremely common and is used for both input and output (output would be
* Speakers/Headphones (output) and Microphone (input)
* Network

**>> Now that everything’s connected, turn on the computer and let Ubermix load**

Point out the steps of the computer loading: Post, OS, then ready to use programs

**Software Review**

* All computers think in **binary**, or ones and zeroes
* A computer **encodes and decodes** data to process and store it
* Software includes operating systems and programs (apps)
* There are many different Operating Systems. Ubermix is the one Kramden uses.
* The **BIOS** is a tiny OS that lets you change basic settings on a computer.

**You can load a new OS on a computer**

You install, or load, an OS onto a computer by using a simple program on a USB drive or CD/DVD.

This will replace any OS already on the computer’s hard drive!

**>> Once Ubermix has started, connect the computer to the Internet using a cable from the wall, a switch, and another cable**

Have the students name each item based on what they learned in the last class.

**Networks Review**

* A network is computers that are connected to each other.
* The Internet is a network of computers around the world.
* Final Test is how Kramden checks a computer to make sure it works correctly.

> Review OS interface items

* Favorites
* Window Switcher menu
* Volume, Settings, Shut Down (Reinforce the proper way to shut down the computer, not just turning it off)

> Review important programs installed on Ubermix.

> Instructor will install Periodic Table program from Ubuntu Software Center.

**Jobs in Technology**

* There are many different technology jobs you can do
* Technology jobs can be a well-paying career

**>> Ask students what tech jobs they wrote down on the papers they took home last time.**

**>> If you want to…**

 code the next #1 app, be a software programmer

 design the next awesome phone, be a hardware engineer

 create graphics for hit 3d movies, be a creative designer

And many more jobs in tech that are available

* **Refurbishing** is fixing up a computer to make sure everything works
* As you refurbish a computer, you may run into problems. Hardware or software may not work correctly. You have to figure out what’s wrong and fix it.
* **Troubleshooting** is figuring out and fixing problems in a logical way

**Review Kramden’s Refurbishing process Steps**

* **Triage**
* **(Cleaning)**
* **OS Load**
* **Final Test**

Explain to students that they will be completing their own computers and then have time to work on computers that will be given to other students.

**4:30 - Break time**

Snacks and Bathroom break

**4:45 - Workshop Portion begins**

Lead class to Warehouse Final Test area - Far left benches

**(5:00 - Wednesday Work Night volunteers will enter work area)**

**>> Each student should get a set of materials for Refurbishing**

**Instructions, CDs, OS Load USB stick, pen, tracking sheet, sticker**

Students will triage, clean (?), OS load, and final test their own computer.

When the student finishes their own computer, have them bring it to the classroom. Their name should be clearly written on the tracking sheet

Students who finish that early will triage additional computers.

**6:15 - Regroup in the classroom**

Take a class photo

Post-Course Survey

Fill out Equipment Receipts

Give out handouts and take-home forms

Final equipment check (make sure everyone has all their parts and peripherals)

**Each student takes home the following:**

 PC

 Monitor and VGA cable

 Mouse

 Keyboard

 2 power cables

 Take-home form

 Class Handouts