**Level 1: PC Tower Case**

**Outline**

Learn about the internals of a standard PC case by examining physical samples and selecting and labeling images found on-line. Gain deeper knowledge by researching and reporting on specific components.

**Questions**

1. Find one (or more) images that clearly show the internals of a PC Tower Case.   
   (i.e. Google images using keywords “PC Case Internals”)



1. Clearly label the following components (using arrows) on your image of the PC case internals:
   1. Motherboard
   2. Power Supply
   3. Hard Disk Drive
   4. Optical Disk Drive (e.g. DVD)
   5. USB Expansion Ports
   6. Monitor Port
   7. Audio Ports
   8. Ethernet Port
   9. Cooling Fan



1. Research more in-depth about “Motherboards”. Make notes on the following:
   1. What different versions are currently available (speed and capacity)?

There are 4 different versions of the motherboard. One being the AT Motherboard with a speed of 100MHz and a capacity of 16GB. Another is the ATX motherboard with a speed of 200MHz and a capacity of 32GB. Also, the BTX motherboard which is faster than the ATX and has a greater capacity. Another Motherboard is the mini ITX.

* 1. How the component has changed since the 1980’s  
     Before the invention of the microprocessor, the cup contained many different motherboards indifferent functions. Overtime one motherboard ewes able to perform more and more functions. The AT motherboard was able to perform many functions. When new motherboards were invented, they were become faster and faster, they also had more capacity. Newer motherboards are becoming smaller with the same speed.

1. Research more in-depth about “Hard Disk Drives”. Make notes on the following:
   1. What different versions are currently available (speed and capacity)?

There are 4 types of Hard Disk Drives. One of the dives is the IDE drive with a speed of 133MB/s and a capacity of 2.1GB to 137GB. Another drive is the SATA with a speed of 600MB/s and a capacity of 500GB to 8TB. The third drive is the SCSI with a speed of 640MB/s and a capacity of 300GB. The last drive is the SAS drive with a speed of 6GB/s and a capacity of 6TB.

* 1. How the component has changed since the 1980’s  
     Hard Disk Drives started out very big and very slow. The speed was not that fast compared to the Drives of today. The older drives were physically very large. Drives started to become faster and they could hold more data. The invention of the Microdrive changed the hard disk drive market, this drive was small but had the speed and capacity of some older drives. The latest hard disk drives today can hold more than 5TB of data and are very fast to transfer data.

**NOTE:**

* Download the on-line version of this module (from the class GitHub repository)
* Questions for Level 2 and Level 3 are in the on-line version of this module
* Provide your answers in a MS Word, PowerPoint, or equivalent format
* Upload your answers to your personal GitHub repository

**Level 2: PC Motherboard**

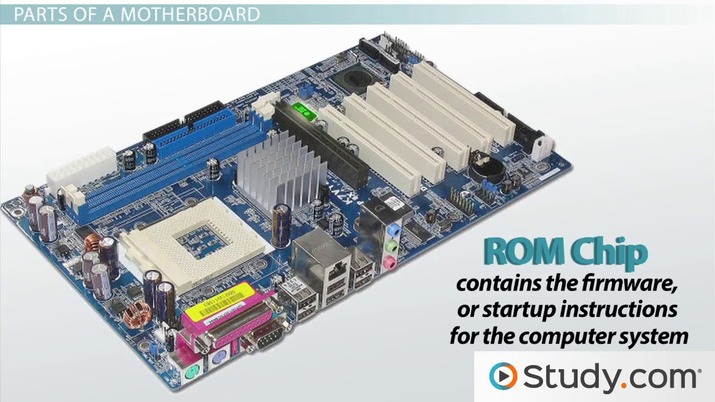
**Outline**

Learn about the structure of a standard PC motherboard by examining physical samples and selecting and labeling images found on-line. Gain deeper knowledge by researching and reporting on specific components.

**Questions**

1. Find one (or more) images that clearly show the layout of a PC Motherboard.   
   (i.e. Google images using keywords “PC Motherboard”)

Hard Disk Drive



Sound Processor on Sound Card

Ethernet Ports

GPU

RAM Memory Slot

Fan Mounting Points

CPU Socket

1. Clearly label the following components (using arrows) on your image of the PC motherboard:
   1. CPU (and fan)
   2. RAM Memory
   3. Disk Drive Interface (IDE or SATA)
   4. GPU Graphics Processor (either on-board or Graphics Card)
   5. Sound Processor (either on-board or Sound Card)
   6. Wi-Fi / Ethernet Network Interface (either on-board or Graphics Card)

1. Research more in-depth about “CPU Processor Chip”. Make notes on the following:
   1. What different versions are currently available (speed and capacity)

There are 2 main manufacturers of CPUs which are Intel and AMD and they lead the market in terms of speed and quality. The main CPUs for Intel are Celeron, Pentium, and the i9. The Celeron speed can range from 1.6 GHz to 2.44 GHz while the capacity depends on the motherboard. The speed of the Pentium is 3.5 GHz while the capacity depends on the motherboard. The speed of the i9 can range from 3.6 GHz to 5 GHz while the capacity depends on the motherboard. The main CPUs for AMD are Sempron, Athlon, and Phenom. The speed of the Sempron can range from 1.0 GHz to 2.9 GHz while the capacity depends on the motherboard. The speed of the Athlon can range from 2.2 GHz to 2.4 GHz while the capacity depends on the motherboard. The speed of the Phenom can range from 1.8 GHz to 2.6 GHz while the capacity depends on the motherboard.

* 1. How the component has changed since the 1980’s

These complex units are considered the brain of the computer and they are constantly being improved. Overtime, engineers are able to cram more of these transistors in CPUs in the same amount of space. There was and still is a huge demand for making CPUs that are faster, smaller, heat up less, and more affordable to the public. The problem with old CPUs was that they were really big, not powerful, heated up very quickly and most of the public couldn’t afford it. Now, they are many different companies that are competing to take the lead in this ever-growing market.

1. Research more in-depth about “RAM Memory”. Make notes on the following:
   1. What different versions are currently available (speed and capacity)

The different versions that are currently available are Static RAM (SRAM), Dynamic RAM (DRAM), Synchronous Dynamic RAM (SDRAM), Single Data Rate Synchronous Dynamic RAM (SDR SDRAM) and Double Data Rate Synchronous Dynamic RAM (DDR SDRAM). The system memory for SRAM is around 20-40ns while the capacity can vary. The system memory for DRAM is around 80-100ns while the capacity can vary. The speed of the SDRAM can range from 100 MHz to 166 MHz while the capacity can vary. The speed of the SDR SDRAM is around 133 MHz to 200 MHz while the capacity can vary. The speed of the DDR SDRAM is around 133 MHz to 200 MHz while the capacity can vary.

* 1. How the component has changed since the 1980’s

Initially, RAM was very slow and it took very long to access files. The different versions used to be very large and slow. But the demand for products that were faster, smaller and cheaper resulted in the creation of different RAM. These were faster and had a lot more capacity while having smaller sizes and being more compatible. RAMs took a lot of space but now that it has evolved, the sizes of the versions of RAMs have decreased in centimeters.

**Level 3: Peripheral Devices**

**Outline**

Learn about how peripheral devices are connected to the back side of a typical PC tower case. Examine physical samples, select and labeling images found on-line and gain deeper knowledge by researching and reporting on specific components.

**Questions**

1. Find one (or more) images that clearly show the layout of the back of a typical PC tower case.   
   (i.e. Google images using keywords “Back Of PC Tower”)

Mouse and Keyboard Interface



Ethernet Interface

Audio Inputs/Outputs

USB Ports

Monitor Interface VGA

Power Cord and Power Switch

1. Clearly label the following components (using arrows) on your image of the back of a typical PC tower case:
   1. Power cord and power switch
   2. Monitor Interface (VGA or DVI or HDMI)
   3. Mouse Interface (USB or PS/2)
   4. Keyboard Interface (USB or PS/2)
   5. USB Ports
   6. Audio Inputs / Outputs
   7. Ethernet Interface

1. Research more in-depth about “Monitor Technology”. Make notes on the following:
   1. What different versions are currently available (e.g. VGA / DVI, Flat Panel Technology))

The main types of monitors are CRT monitors, LCD monitors, and LED monitors. CRT monitors used to be commonly used but are not being used often now due to better monitors such as LCD and LED. CRT monitors have an intense stream of electron to form images on the fluorescent screen. But these are heavy, cost a lot, and take up a lot of energy. A VGA connected to this CRT monitor can produce resolutions up to 2048x1536. LCD and LED monitors are usually Flat Panel Technology because they are thinner, lighter and more portable. This means they use thin panel design instead of the old CRT design.

* 1. How the component has changed since the 1980’s (e.g. Display Resolution, Technology)

The old CRT monitors used to be bulky and dull coloured. Due to increasing consumer demand for more and for less cost, companies continue to improve their technologies and improve the experience of the consumers. There are now monitors with 4k quality and curving displays. Old monitors and TVs used to be very large in-order to accommodate the cathode ray tubes in CRT. LCD monitors were then developed and they didn’t need to be as big as CRT monitors. They also created sharper images and used less energy. But they were very expensive and not affordable by everyone. Now, there are even more types of monitors and TVs such as LED, QLED, OLED by different companies. They are now sharper, smaller in width and bigger in display, and they cost less.

1. Research more in-depth about “External Portable Storage”. Make notes on the following:
   1. Floppy Disks

A Floppy Disk is a soft magnetic disk used for storage. It was called floppy because we could wave it. They were made up of thin magnetic storage material. Floppy disks have limited uses and their capacity is not that much. They were first available in the 1960s and 1970s and they were one the ways to store data.

* 1. CD-ROM / DVD / Recordable CD/DVD

A CD-ROM is a CD that can be read using an optical drive. The data in the disk is read only and this means that is cannot be altered or erased. Due to this feature and their large capacities, they were great for media format. They are used today and can store different kinds of data.

* 1. USB Memory Drives

Also known as USB Flash Drive, it is a data storage device that includes flash memory with USB interface. It is lightweight, easily transportable, high storage capacity with a low price. USB Memory Drives were first introduced in the early 2000s are still in use today.

* 1. Compact Flash Memory

Compact flash memory is a mass storage device used in mainly portable electronic devices. It is one the first and most successful memory cards. They are very small, lightweight, transportable, and have huge storage capacities. They are used in cameras with companies such as Canon and Nikon.

* 1. Cloud Based Storage

It is a model of computer data storage but where digital data is stored and can be shared. There are cloud storage providers and this makes the data available and accessible and it is safe. Cloud based storage could be used to store user, organization or application data.

**Level 4: PC Component Presentation**

**Outline**

Explore the development and features of a specific PC hardware component through deeper research and investigation. Work in partners to create a short presentation. Deliver the presentation to the class.

Each group will research a unique PC hardware component. Your specific topic will be assigned from the list provided below.

**Presentation Structure**

1. Explain what the PC component does and how it fits together with other components to make up a fully functioning PC.
2. Explain how the PC component works. Provide a diagram (image) showing the main parts of the component.
3. Research the current state of the art of the component in terms speed, capacity (size), and other related factors.
4. Research on-line suppliers that sell the PC Component. List the specifications for the available products and the cost (price).
5. Research how the PC component has changed and evolved since the early days of PCs in the 1980’s. Cover each of the following topics separately:
   1. Component Speed
   2. Component Size / Capacity
   3. Two other specifications specific to the PC component (ask Mr. Nestor)

**PC Component Topics**

|  |  |  |
| --- | --- | --- |
| **Topic** | **Partner 1** | **Partner 2** |
| CPU Microprocessor Chip |  |  |
| Motherboard Layout |  |  |
| Computer Graphics |  |  |
| Sound & Audio |  |  |
| Hard Disk Drives |  |  |
| Removable Disk Storage |  |  |
| Network / Internet Connectivity |  |  |
| Mouse / Pointing Devices |  |  |
| Monitor & Display Technology |  |  |
| Printers & Output Technology |  |  |