**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 online. 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”)

2. Clearly label the following components (using arrows) on your image of the PC case internals:

a. Motherboard

b. Power Supply

c. Hard Disk Drive

d. Optical Disk Drive (e.g.DVD)

e. USB Expansion Ports

f. Monitor Port

g. Audio Ports

h. Ethernet Port

i. Cooling Fan

3. Research more in-depth about “Motherboards”. Make notes on the following:

a. What different versions are currently available (speed and capacity)

AT(advanced technology), ATX(advanced technology extended), LPX(low profile extension), BTX(balanced technology extended)

b. How the component has changed since the 1980’s

At first the motherboard itself did not include many components. Many components were added in through expansion slots.

The first motherboard was developed in 1981 by the International Business Machines. At that time it was referred to as a ‘planar’. It contained the CPU and the RAM. ICs (single Integrated Circuits), proficient of sustaining low-speed peripherals such as mouse, keyboards, serial ports, etc., were added in the early 1990s. In the late 1990s, they included full series of audio, video, networking and storage functions on them. Advanced end functions for graphic cards and 3D gaming were added later.

4. Research more in-depth about “Hard Disk Drives”. Make notes on the following:

a. What different versions are currently available (speed and capacity)

Parallel Advanced Technology Attachment (PATA), Serial ATA (SATA), Small Computer System Interface (SCSI), Solid State Drives (SSD).

b. How the component has changed since the 1980’s

The size has decreased a lot since then. They can also hold much more memory. Hard Disc Drives were very expensive at the time. In the beginning of the decade there were about 80 active manufacture. However by the end in 1989, the number decreased but the units increased to 22 million bringing 23 billion dollars in revenue. In 1980 Seagate released its first 5.25-inch hard disk. Later in 1983 Rodime released the first 3.5-inch hard drive , which included two platters and 10MB of storage. In 1988 a 2.5-inch drive was released by Prairie Tek which held up to 20MB. Mainly the size has decreased and the amount of storage has increased throughout the years.

**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”)

2. Clearly label the following components (using arrows) on your image of the PC motherboard:

a. CPU (and fan)

b. RAM Memory

c. Disk Drive Interface (IDE or SATA)

d. GPU Graphics Processor (either on-board or Graphics Card)

e. Sound Processor (either on-board or Sound Card)

f. Wi-Fi / Ethernet Network Interface (either on-board or Graphics Card)

3. Research more in-depth about “CPU Processor Chip”. Make notes on the following:

a. What different versions are currently available (speed and capacity)

AMD Ryzen 7 2700X, AMD Ryzen Threadripper 2950X, AMD Ryzen 5 2600X, AMD Ryzen 3 2200G, Intel Core i5-8600K, are some of the best CPU Processor Chips available in the market today at a reasonable price.

b. How the component has changed since the 1980’s

CPU Processor Chips now have wider registers and can address more memory. In the 80’s an 8-bit CPU was used, whereas now 64-bit CPU are installed into computers. Processors have speed up a lot. The have also gotten smaller in size.

4. Research more in-depth about “RAM Memory”. Make notes on the following:

a. What different versions are currently available (speed and capacity)

Corsair Vengeance LED (3,466 MHz speeds, capacity of 16GB), G. Skill Trident Z RGB (speeds between 2,400MHz and 4,266MHz, capacity of 16-32 GB), Kingston HyperX Predator (speeds between 1866MHz to 2666MHz, upto 32 GB of capacity), Kingston HyperX Fury (speeds between 2,133 and 2,666MHz, capacity of 32-64 GB ), Corsair Dominator Platinum (4,000MHz speed with extra cooling fans, capacity of 16GB), ADATA Spectrix D80 (gaming) (5,000MHz speed, liquid cooling, capacity of 16GB)

b. How the component has changed since the 1980’s

Ram memory has obviously increased since the 1980’s. Approximate numbers would be;

'82 to '84 - 1KB to 16KB, '85 to '89 - 512KB to 640KB, '89 to '92 - 1MB to 2MB, '93 to '94 - 4MB to 8MB, '95 to '99 - 32MB to 128MB, '00 to '01 - 256MB to 512MB, '02 to '04 - 1GB to 2GB, '05 to '09 - 3GB to 4GB, '10 to today - 6GB to 48GB.

1984- Fujio Masuoka invented flash memory

1996-DDR SDRAM began being sold

1999- RDRAM became available for computers

2003- DDR2 SDRAM began being sold

2003- XDR DRAM began being sold

2007- DDR3 SDRAM began being sold in june

**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”)

2. Clearly label the following components (using arrows) on your image of the back of a typical PC tower case:

a. Power cord and power switch

b. Monitor Interface (VGA or DVI or HDMI)

c. Mouse Interface (USB or PS/2)

d. Keyboard Interface (USB or PS/2)

e. USB Ports

f. Audio Inputs / Outputs

g. Ethernet Interface

3. Research more in-depth about “Monitor Technology”. Make notes on the following:

a. What different versions are currently available (e.g. VGA / DVI, Flat Panel Technology))

The 3 main types of monitors are CRT (Cathode Ray Tube), LCD (Liquid Crystal Display), and LED (Light-Emitting Diodes).

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

Monitors today are flat screens, take up much less space. Modern monitors are built using LCD technology. Older monitors were built using CRT (cathode ray tubes). This was what caused them to be big and heavy. Modern displays also consume less electricity and generate better graphics. They now have a greater number of pixels.

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

a. Floppy Disks

Sony was the first to release 3 ½-inch floppy drives and diskettes in 1981. However, Hewlett-Packard was the first significant company to adopt it for general use in 1982. In 1983, The Bernoulli Box was released. This was a removable type of storage. The Bernoulli Box allowed large files to be moved between computers when few alternatives (such as a network) existed.

b. CD-ROM / DVD / Recordable CD/DVD

The CD was developed by Sony and Philips in 1982 for distributing music. The first general-interest CD-ROM product released after Philips and Sony announced the CD-ROM format in 1984 was *Grolier´s Electronic Encyclopedia*, which came out in 1985. The 9 million words in the encyclopedia only took up 12 percent of the available space. The same year, computer and electronics companies worked together to set a standard for the disks so any computer would be able to access the information.

The Digital Video Disc (DVD) was introduced in 1995. The storage capacity was much larger than the common compact disc (CD). DVDs came two formats, read-only and read-write. They were then mostly used by the film industry for consumer film releases. DVDs have better audio and video quality. They were later on replaced by the Blu-ray disc in 2003 when it was released. It was designed to store high definition video at 1080p, beating DVD which could only store 480p. The disc had short wavelength blue laser that could read higher density data on the disc, unlike the red laser used to read DVDs. This inspired its name. In 1997, the Compact Disc-ReWritable (CD-RW) was introduced. This optical disc was used for data storage. It also backed up and transferred files to various devices. It could only be re-written roughly 1,000 times.

c. USB Memory Drives

In the year 2000, USB Flash drives were introduced. They are also called memory sticks These drives consisted of flash memory in a small container with a USB interface. They are used for data storage and to backup and transfer files.They are fairly fast and have a greater capacity. Damage is very limited, they cannot be scratched like disc drives and are resilient to magnetic erasure, unlike floppy disks. USBs replaced floppy disks and optical discs.

d. Compact Flash Memory

In 1984, Fujio Masuoka invented flash memory. He was working for Toshiba at the time. It was capable of being erased and reprogrammed multiple times, flash memory quickly gained popularity.

e. Cloud Based Storage

Cloud based storage is when data is stored on servers that can be accessed via the internet, ‘cloud’. Cloud based storage is very accessible, one can pull it up whenever as long as they are connected to the internet. It can also be accessed on various devices.They were originally designed for small and medium sized businesses in addition to general consumers. With these services, servers could automatically back up data to remote servers. They were designed for data protection, and along with backup capability it also provided a data recovery solution. Examples would be Apple’s iCloud and Google Drive.