**Overview:**

Students work individually to understand and establish the specifications for a PC dedicated to a specific task or function. (The specific task or function will be assigned to the student from the list below.) The function and features of various hardware components are researched to develop a general understanding. Specific components and features are then selected based on appropriate need for the assigned task or function. The final product is a brochure that will be shared with other classmates during a tradeshow event.

**Objectives:**

* Use correct terminology to describe computer hardware, speed measurements, and size

measurements

* Describe the functions of the internal components of a computer
* Describe the functions of common computer peripheral devices
* Assess user computing needs and select appropriate hardware components for different

situations

**Getting Started:**

1. You will be required to design a “dream machine” personal computer (PC) for one of the tasks assigned to you from the list below.
2. To get started, develop a general understanding of what will be important features and what will be less important features of our dream machine. Consider the following:
   1. Operating system software
   2. Special application software
   3. Processor & motherboard speed
   4. Main memory speed and size
   5. Secondary storage speed and size
   6. Graphics and display speed and resolution
   7. External devices (e.g. keyboard, pointing devices, joysticks, etc.)
   8. Network connectivity
   9. Power and data backup
   10. Printers, scanners, and similar equipment
   11. Portability and durability
   12. Budget (cost) considerations

Specific Tasks & Functions

1. ***Game Computer***: Dedicated to playing PC games in a home environment
2. **Photo Editing & Organization**: Dedicated to editing and producing photographs and images in a home or professional environment
3. ***Business Office Computer***: Dedicated to producing documents and presentations and communicating with other people in a professional office environment
4. ***Student Home Computer***: Dedicated to completing homework, paying bills, communicating with friends and other similar tasks in a home environment
5. ***Factory Floor Computer***: Dedicated to reading documents, filling in forms, processing orders, etc. in a factory or warehouse environment.
6. ***Media Production and Streaming Computer***: Dedicated to production and distribution of video and/or music media in a semi-professional environment
7. ***Web Surfing Computer***: Dedicated to surfing the web, streaming media, and communicating through on-line services in a home environment

**Level 1: Processor & Memory**

1. Research and summarize the main features and function of a CPU processor chip. Consider the following:

a. Physical packaging shape and size

**The size of the actual CPU processor chip is 4.1 x 4.1 x 0.8 cm**

b. Processing speed and power

**The processing speed could be around 2.9 or 3 GHZ with at least 35 watts. The cores should be around 2-4 cores and have also 6 GPU cores.**

c. Memory speed and size

**At least 2MB cache memory, with around 8 gigs of ram or more. The memory size should be 64 bits and should be 2400G or above.**

2. Research and summarize the history of how a CPU processor chip has changed over the years. Consider the following:

a. Typical processor speed, size, model numbers in the early 1990’s

**The typical processor at 1990 was the AM386 microprocessor. The memory size of the chip was 32-bit and the processor can clock from 20Mhz-40Mhz. Furthermore, the technology of the chip was powered by CMOS.**

b. Typical processor speed, size, model numbers in the early 2000’s

**The typical processor in the early 200’s was the Pentium 4 with a decent speed of 1.3Ghz and a size of 64 bit.**

c. Typical processor speed, size, model numbers in the current time

**The typical processor at this time which is considered to be very powerful could be the i7 8700k in which could be a little bit powerful for media production but could be very powerful to produce any type of media as it has 3.70 Ghz speed and 6mb cache speed.**

3. Research and summarize the main features of motherboards. Consider the following:

a. Physical packaging shape and size

b. Speed and size

**Currently, most desktops or laptops contain an ATX motherboard in which is the layout, design and size of the motherboard. However, motherboards do not form any sorts of speed due to its main function is to hold each of the ports, cables, processor and ram together. The motherboard does not form any kind of speed. However, the size can be 4.1 x 4.1 x 0.8 cm as most typical motherboards have it around this particular size.**

4. Research and summarize the history of how motherboards have changed over the years. Consider the following:

a. Typical speed, size, model numbers in the early 1990’s

b. Typical speed, size, model numbers in the early 2000’s

c. Typical speed, size, model numbers in the current time

**The motherboard which was firstly known as the Planar Breadboard was brought into the technology world at 1981 by IBM. The Planar had chips which was only used to connect the CPU and RAM of the computer together. They were connected by cassette tapes and supplier parts. The Planar motherboard was also called the “IBM compatible” standard like many other modern-day motherboards. Present day motherboards are significantly different from the IBM motherboard due to the immense features of the newer motherboards like adding integrated circuit packaging in 1990 and including peripherals like the mouse and keyboard. Furthermore, including the mouse and keyboard with the motherboard gave both devices lower power consumption so it would not consume the power of the desktop. Most monitors now come in various sizes and perform many different functions/features. Higher grade motherboards can now help boost performance in any sorts of tasks. In the early 2000, the ETX motherboard was also created in which it was significant to becoming an absolute improvement compared to the old ones.**

5. Research and summarize the main features and function of RAM memory. Consider the following:

a. Physical packaging shape and size

b. Speed and size

**Patriot Viper Steel DDR4-4400 (2x8GB) Capacity: 16 GB (2x 8GB)**

**Corsair Vengeance RGB Capacity 32GB (4x 8GB)**

**G.Skill Trident Z DDR4-3000 Capacity 32GB (2x16)**

6. Research and summarize the history of how RAM memory has changed over the years. Consider the following:

a. Typical speed, size, model numbers in the early 1990’s

b. Typical speed, size, model numbers in the early 2000’s

c. Typical speed, size, model numbers in the current time

**Back in the 1980’s RAM Memory didn’t have the best speed and capacity. Also something like**

**4-5MB were somewhat a lot. the prices were also different because the prices in 1980 were**

**$150 to $250.**

7. Research and summarize the main features and function of Hard Disk Drives (HDD). Consider the following:

a. Physical packaging shape and size

**The physical packaging is rectangle shaped and is as big as the size of an adult hand.**

b. Speed and size

**Hard Disk Drives range from 5400 rpm to 7200 rpm. These drives can also expand from 500GB to 6 TB.**

8. Research and summarize the history of how Hard Disk Drives (HDD) have changed over the years. Consider the following:

a. Typical speed, size, model numbers in the early 1990’s

b. Typical speed, size, model numbers in the early 2000’s

c. Typical speed, size, model numbers in the current time

**Since the 1980’s many components have been changed by having expandable storage. At the start of the** **1980’s a common hard disk drive will be around 10 MB with very slow speeds which is unnoticeable with today’s technology. Later on in the 1990’s, hard drives have varying sizes which each computer can then put into the hard drive slots.**

9. Explain and justify the processor and memory requirements for your ‘dream machine’ task. Discuss thefollowing:

a. Minimum and “would be nice” requirements for the CPU chip

b. Minimum and “would be nice” requirements for the Motherboard

c. Minimum and “would be nice” requirements for the RAM memory

d. Minimum and “would be nice” requirements for the HDD

**The minimum requirement could be the Ryzen 5 2400G Processor with Radeon RX Vega 11 Graphics. This could be a budget processor as its around $150. A “would be nice” requirement for a CPU chip could be an INTEL Core i9-9900K Processor which is a very powerful processor in which it contains 16mb smart cache with 8 cores and has a processor base frequency of 3.60Ghz. It has 16 threads which can make processes go easily through each of the 8 cores.**

**Level 2: Display & Peripherals**

1. Research and summarize the main features and function of Computer Display Monitor. Consider the following:
   1. Physical construction (CRT, LCD, etc)
   2. Display Standards (CGA, VGA, SVGA, XGA, etc.)
   3. Resolution & Colour depth

**Monitor whenever packaged the display of a monitor is mostly used for output device on a computer.The display provides instant feedback by showing you text and graphic images as you work or play. XGA (Extended Graphics Array) = 1024x768 SXGA (Super XGA) = 1280x1024**

1. Research and summarize the main features and function of a Computer Graphics Card. Consider the following:
   1. Physical packaging (e.g. On the motherboard, expansion card, etc.)
   2. Speed and frame rate (2D vs 3D)
   3. Resolution, colour depth, and memory size

**The GeForce RTX™ 2080 has a great speed, power, efficiency, and immersion. This Graphic Card is great for gaming with maximum overclocking, dual-axial 13- blade fan coupled with a new vapor chamber for ultra-cool and quiet performance.**

1. Research and summarize the history of how Computer Display Technology has changed over the years. Consider the following:
   1. Display standards and capabilities in the late 1980’s
   2. Display standards and capabilities in the late 1990’s
   3. Display standards and capabilities in the 2000’s

**1980: By the late 1980s, color CRT monitors were capable of a 1024 x 768 resolution display.**

**1990: One of the first LCD monitors for desktop computers was the Eizo L66, manufactured and released by Eizo Nanao Technologies in the mid-1990s.**

**2000:BenQ PD3200U Screen size: 32-inch | Aspect ratio: 16:9 | Resolution: 3,840 x 2,160. AOC Agon AG352UCG6 Black Edition Screen size: 35-inch | Aspect ratio: 21:9 | Resolution: 3,440 x 1,440. Asus ROG Swift PG27UQ Screen size: 27-inch | Aspect ratio: 16:9 | Resolution: 3,840 x 2,160.**

1. Research and summarize the main features and function of External Storage and Backup. Consider the following:
2. Removable media (e.g. floppy disks, CD/DVD-RW, CompactFlash, etc.)
3. USB media (e.g. Memory Stick, External HDD, etc.)
4. Cloud based storage

**Buffalo MiniStation Extreme NFC external hard drive Wireless security Capacity: 2TB | Interface: USB 3.0. An external hard drive you can buy without breaking the bank, Buffalo's MiniStation Extreme NFC could be your match made in heaven.**

1. Research and summarize the history of how External Storage and Backup has changed over the years. Consider the following:
2. Typical speed, size, model numbers in the early 1990’s
3. Typical speed, size, model numbers in the early 2000’s
4. Typical speed, size, model numbers in the current time

**1990: Western Digital introduces its first 3.5-inch Caviar IDE hard drive.**

**2000:Maxtor buys competitor Quantum's hard drive business. At the time, Quantum is the number-two drive maker, behind Seagate; this acquisition makes Maxtor the world's largest hard drive manufacturer.**

**2019:WD Orange My Passport (4 TB). If the hard drive is damaged, it’s possible to save your games.**

1. Research and summarize the main features and function of Network Connectivity. Consider the following:
2. Connection technology (e.g. Dial-Up, Ethernet, WiFi, BlueTooth, Fibre, etc.)
3. Upload and download speed
4. Security

**Techopedia explains Network Connectivity Network connectivity is also a kind of metric to discuss how well parts of the network connect to one another. Related terms include network topology, which refers to the structure and makeup of the network as a whole.**

1. Research and summarize the history of how Network Connectivity has changed over the years. Consider the following:
2. Typical speed, size, model numbers in the early 1990’s
3. Typical speed, size, model numbers in the early 2000’s
4. Typical speed, size, model numbers in the current time

**1990: A person named Kalpana has a united state network hardware. This person also developed and introduced the first network.**

**2000: 2000 had a improvement with network.The connection speed has improved with 20 Mbps.**

**2019: Wi-Fi has improved even more with better connection and overall the whole network.**

1. Research and summarize the main features and function of Printer Technology. Consider the following:
2. Printing Technology (e.g. Dot Matrix, Ink Jet, Laser, etc.)
3. Connection Technology (e.g. Parallel Port, USB, WiFi, Network, etc.
4. How printing has changed over the years

**printing in 2019 is a very important equipment. Printer in the 19s are very slow for printing. Dot matrix, Ink jet, Laser. These printers are very old for printing wise.**

1. Explain and justify the processor and memory requirements for your ‘dream machine’ task. Discuss the following:
2. Minimum and “would be nice” requirements for the Computer Display
3. **ASUS ROG Swift PG279Q The best gaming monitor with G-Sync Screen size: 27-inch | Panel type: IPS | Aspect ratio: 16:9 | Resolution: 2560 x 1440 | Response time: 4ms | Refresh rate: 144Hz (overclocks to 165Hz) | Weight: 15.4 lbs.**
4. **Acer XR382CQK The best widescreen gaming monitor Screen size: 37.5-inch | Panel type: IPS | Aspect ratio: 24:10 | Resolution: 3840 x 1600 | Response time: 5ms | Refresh rate: 75Hz | Weight: 23.61 lbs.**
5. Minimum and “would be nice” requirements for External Storage and Backup
6. **Adata SD700 External SSD A terabyte in the palm of your hand Capacity: 256GB, 512GB or 1TB | Interface: USB 3.0.**
7. **Buffalo MiniStation Thunderbolt external hard drive Best Thunderbolt external hard drive Capacity: 1TB, 2TB | Interface: Thunderbolt, USB 3.0.**
8. Minimum and “would be nice” requirements for Network Connectivity
9. **Xfinity Internet $29.99–$299.95^ 15–2000 Mbps**
10. **Frontier FiOS Internet $40–$200† 50–1000 Mbps**
11. Minimum and “would be nice” requirements for Printer Technology

**A printer I would used is Ink Jet printer. Its very common and its has very cheap price**

**Level 3: Building Your Dream Machine**

1. Identify the minimum requirements for each component of your dream machine as follows::
   1. **Intel Core i5-8600K Base clock: 3.6GHz | Boost clock: 4.30GHz**
   2. **ASUS ROG Maximus XI Hero Wi-Fi**
   3. **Patriot Viper Elite 8GB DDR4-2400MHz Speed: DDR4-2400MHz**
   4. **WD Blue 5400 RPM 8/16 MB**
   5. **ASUS ROG Swift PG279Q size: 27-inch**
   6. **The GeForce RTX™ 2080**
   7. **Asus PCie 7.1 Gx2.5 Audio Engine 192K/24Bit**
   8. **Logitech G560**
   9. **Buffalo MiniStation Extreme NFC external hard drive Wireless security Capacity: 2TB | Interface: USB 3.0**
   10. **Xfinity Internet $29.99–$299.95^ 15–2000 Mbps**
   11. **Mouse: ASUS ROG Pugio Aura RGB USB Keyboard: RGB mechanical gaming keyboard Mousepad: A rollable, silicone-based mouse pad**
2. Prioritize you list of components from question #1 from those that are essential down to those that would be nice.
3. Establish a target budget (cost) for your dream machine.
   1. Justify your cost based on your projected component needs.
   2. Justify your cost based on a realistic assessment of your application and target user
4. Build your dream machine or locate a ready to buy machine using on-line vendor web sites.
   1. Find at least two sources for your dream machine

* **ASUS**
* **Bestbuy**
  1. Provide a copy of the cost and feature list summary for each source
  2. Explain how the machine from each source matches (or is different) from your ideal configuration.

**Most of the equipement are from ASUS. This parts are will work and help each other.**

Suggested on-line computer sources:

* [www.bestbuy.ca/](http://www.bestbuy.ca/)
* [www.dell.com/en-ca](http://www.dell.com/en-ca)
* [www.staples.ca](http://www.staples.ca)
* [www.tigerdirect.ca/](http://www.tigerdirect.ca/)
* [www.canadacomputers.com](http://www.canadacomputers.com)

**Level 4: Sharing Your Dream Machine**

1. Prepare a brochure documenting your dream machine options and choices.
   1. The target audience is other students in the class
   2. You should explain your target task (e.g. game computer) and how this affects configuration choices.
   3. You should explain your configuration choices in greater detail
   4. Your two purchase options should be explained and compared
2. Share your brochure
   1. By uploading it to your repository
   2. By presenting it during the in-class tradeshow (date TBD)
3. Visit and report on other trade show presentations / brochures
   1. Complete the Passport Template (TBD) as you participate in the in-class tradeshow.

**Task & Function Signup**

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| **Task** | **Student Name** |
| ***Game Computer*** |  |
| **Photo Editing & Organization** |  |
| ***Business Office Computer*** |  |
| ***Student Home Computer*** |  |
| ***Factory Floor Computer*** |  |
| ***Media Production and Streaming Computer*** |  |
| ***Web Surfing Computer*** |  |
| ***Game Computer*** |  |
| **Photo Editing & Organization** |  |
| ***Business Office Computer*** |  |
| ***Student Home Computer*** |  |
| ***Factory Floor Computer*** |  |
| ***Media Production and Streaming Computer*** |  |
| ***Web Surfing Computer*** |  |
| ***Game Computer*** |  |
| **Photo Editing & Organization** |  |
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| ***Student Home Computer*** |  |
| ***Factory Floor Computer*** |  |
| ***Media Production and Streaming Computer*** |  |
| ***Web Surfing Computer*** |  |
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