**Overview of computer components**

**CPU**

Central Processing Unit (CPU) is the brain of the computer. It is responsible for interpreting and executing most of the commands from the other computers hardware and software.

The clock speed of a processor is the number of instructions if can process in any given second (measured in GHz). E.g. 1Hz can process one piece of instruction every second. 3.0GHz can process 3 billion instructions per second.

Some devices have a single core processor while others may have dual core or even quad-core processors.

Neither clock speed nor the number of CPU cores is the sole factor determining whether one CPU is ‘better’ than another. It generally depends on what software the user will be using. For example; one CPU may have a low clock speed but is a quad core processor, while another has a high clock speed but is only dual core. A CPU demanding video-editing will generally function best on multiple CPU cores.

CPU cache is like a temporary holding place for commonly used data – instead of calling on RAM for the items, the CPU determines what data you seem to keep using.

**Motherboard**

The motherboard (AKA system board) serves to connect all of the parts of a computer together; e.g. CPU, memory, hard drives etc…It is easy to locate as will be the largest PCB (Printed Circuit Board) in devices. The motherboard is hardware but also comes with a software component (BIOS or UEFI) which allows the user to tweak settings for optimal performance.

Components on a motherboard include, but are not limited to: power, IDE connectors (for old hard drives and CD ROMS), SATA connectors, PCI slots, PCI-E slots, front-panel, USB ports, communication ports, audio ports, microphone port, headphone-jack, ethernet port, DVI port, VGA port, HDMI port, memory sockets for RAM, processor socket, heatsink etc…

**RAM**

RAM (Random Access Memory) is like the short-term memory of a computer. It is very quick compared with hard drives (HDD & SSD), however, they are low in storage in comparison. When you turn on your PC, applications load data into the RAM e.g. browser tabs, programmes open or background operations you have open. If the RAM fills up, all applications slow down significantly. However, having more RAM than necessary will not improve overall performance, so you only need as much as necessary.

RAM speed is measured in mega-transfers per second. DDR = Double Data Rate. ‘Double’ as two transfers happen per clock. E.g. DDR3 RAM running 800mhz is called DDR3 1600 because it can pull off 2 transfers per clock cycle.

Voltage refers to how much power is consumed and how much heat RAM produces. Standard voltage for DDR3 RAM is approximately 1.5v.

Using multiple RAM sticks instead of 1 will give a 2-3% performance increase (using 2x4gb RAM instead of 1x8GB). If you have 2 x RAM at different speeds, your RAM will run at the slowest of the 2 speeds.

**Hard Drive**

Hard drives are data storage devices. The primary characteristic of a hard drive are its capacity and performance. Capacity is size e.g. 2TB (2,000GB – where 1GB = 1 billion bytes).

In Hard Disk Drives (HDD), performance is specified by the average access time, average latency and data rate (the speed at which data is transmitted).

**SATA cable**

Serial Advanced Technology Attachment is an IDE (Integrated Drive Electronics) for connecting devices like optical drives and hard drives to the motherboard.

SATA cables are attached to hard drives and SATA ports in the motherboard. The power supply to the hard drive comes from the PSU.

**IDE**

IDE is a standard type of connection for storage devices in a computer.

**Power Supply Unit (PSU)**

The power supply converts mains AC (Alternating Current) to low-voltage regulated DC (Direct Current) power for the internal components of a computer.

**PCI**

Peripheral Component Interface (PCI) has now been replaced with PCI-Express (or PCI-E). PCI is used to attach hardware to a computer – e.g. modem, network card, sound card, video card.

It is also called a PCI bus. A bus is a term for a path between the components of a computer.

**Front-panel cables**

The front panel is where the hard drive activity lights, case speaker, restart button, on/off button, power light LED etc… are normally located.