ICT – Internal Components of a Computer – Part 1

1 of 20 – Welcome

Welcome to this session on the internal components of a computer (part 1).

By the end of this session, you will:

* Know what is meant by internal and external components
* Know the main internal components of a computer by name
* Understand what job each internal component performs

2 of 20 – Introduction to internal components

**What is meant by internal components?**

Computers are designed with internal and external components, both of which perform a function that helps the computer to run.

When we talk about external components, we’re talking about anything that can be added or connected to your machine, for example: a keyboard, a mouse, speakers, or a webcam.

When we talk about internal components, we’re talking about things that are built into the machine itself, like the hard drive, for example. We’ll look at more internal components in the sections that follow.

There are many internal components that help a computer to function properly. However, some of these components perform larger jobs than others, making these the main components. These are things such as:

* Motherboard
* Central processing unit
* Arithmetic and logic unit
* Control unit
* Registers
* Memory
* Graphics card
* Sound
* Heat dispersal
* Storage devices
* Optical drive

3 of 20 – Motherboard: what is it and what does it do?

The **motherboard**, sometimes known as the mainboard or the logic board, is the main printed circuit board (PCB) inside your computer.

All of your other internal components are connected to your motherboard – including the central processing unit, RAM expansion slots, and USB ports.

The motherboard is also the home to a number of controllers, which are connected to your hard drive, DVD drive, and a number of other areas of your computer.

While it performs a number of different jobs, the main purpose of the motherboard is to make sure that your computer works, by ensuring that different internal components are able to work properly together.

4 of 20 – Central processing unit: what is it and what does it do?

A **central processing unit** (CPU), sometimes called a microprocessor, is something that all computers have at least one of. It is made up of many parts – including the arithmetic and logic unit, the control unit, and the registers.

The main job of the CPU in a computer is to run any instructions that are given by the computer’s installed programs (i.e. the operating system and any applications).

In real life practice, input is the information given to the unit by either the computer user or the instructing program.

The unit then processes this information until arriving at an output, which will either be stored by the relevant application or sometimes displayed on the screen.

5 of 20 – Arithmetic and logic unit: what is it and what does it do?

The **arithmetic and logic unit** (ALU) inside a computer is a purpose built circuit that is designed to perform basic calculations for the user – this being the arithmetic side of the unit – and also to make comparisons – this being the logic side.

All computers come with an arithmetic and logic unit built within them, but the units themselves can vary from one computer, or processor, type to another.

6 of 20 – Control unit: what is it and what does it do?

From previous sections we have seen how different instructions are processed by different internal parts of a computer. The **control unit** (CU) is the component that ensures these instructions are properly followed by the individual pieces of hardware.

While the arithmetic and logic unit is processing calculations, and the registers are processing and storing data, the control unit provides timing and control signals that further instruct these other components.

The central processing unit as a whole works to run instructions through your computer, and the control unit individually makes sure that instructions are completed and the correct final result is displayed, or stored, somewhere on the computer.

7 of 20 – Registers: what are they and what do they do?

Registers are part of the central processing unit, and their main purpose is **to provide storage space for small** **amounts of data**, which is stored in the form of bytes.

Registers typically include an **instruction** register, a **memory buffer** register, a **memory data** register, and a **memory address** register.

These components are useful in different ways, but their key role inside the machine is to store data – this could be an instruction, an address, or any number of other things saved to your computer – and hold that data securely until another part of the computer needs access to it.

For example, a register might store an address that is relevant to a particular program, meaning the central processing unit will have access to details of any instructions or previously completed calculations associated with that particular program.

8 of 20 – Random access memory: what is it and what does it do?

**RAM** (random access memory) is the memory space where your data and programs are stored on your computer.

If a program has been started, or a document has been opened, then **RAM ensures that these are available for the central processing unit to access them**, and then retrieve relevant information or instructions.

There are **two different types of RAM** available to computer users and the memory comes in different sizes, too. A large amount of RAM means that a **user can have multiple computer applications running at any given time**, and it also makes editing things easier – like music, for example, or videos – because the RAM can properly process the size of the files.

9 of 20 – Graphics card: what is it and what does it do?

A **graphics card** – sometimes called a video card, a graphics controller, or even a graphics board – is a device that is inserted into your computer when it is built. This card allows your computer to create visual images which are then displayed on the computer’s monitor.

The graphics card typically controls the:

* Clarity
* Colour
* Definition
* Overall appearance of everything and anything that you see on your screen

10 of 20 – Sound: what is it and what does it do?

Your motherboard is typically built with the necessary **hardware to push sound signals through** to your speakers.

The speakers themselves can be either **internal** or **external** components of your computer, as some speakers are in-built whereas others are added or connected after the main computer has been constructed.

There are other ways in which you can transmit sound from your computer – such as **headphones**, for example – but these would also be classified as external devices, as they are something that must be connected.

11 of 20 – Heat dispersal: what is it and what does it do?

**Heat dispersal** is an important element of keeping your computer up and running. The central processing unit – and one or two other core elements of the computer – are at risk of burning out if they aren’t kept cool enough.

The best way to ensure that heat dispersal happens inside the computer is to have a **computer fan**, or **heatsink**, inside the machine.

Fans can be used in a number of different ways, such as:

* They may pull cool air into your computer
* They may push out warm air from inside your computer
* They may redirect cool air towards a heatsink, to cool down a particular part of the machine

A heatsink is another device that works by swallowing up heat, thereby keeping the computer cool.

12 of 20 – Storage devices: what are they and what do they do?

Your computer needs a large amount of **internal storage space** to keep your data safe, both when the computer is turned on and when it is turned off. This internal storage is **responsible for all of your programs, applications, and documents**, and so, depending on how much data you are storing on your computer, you may need a particularly large amount of internal storage to keep it safe.

Whatever it is that you are saving to your computer, it will be saved on either a **solid state drive** or a **magnetic drive**, as these are the two types of internal storage that can be found in the machine.

Both of these drive types are designed to hold huge amounts of data. The key difference between them is how they run (solid state drives do not have moving parts), but their function inside any machine is largely the same.

13 of 20 – Optical drive: what is it and what does it do?

The **optical drive** is a disk drive that is built into your computer. The drive uses laser light technology to both read and write data to different types of discs, such as CDs or DVDs, amongst others.

This drive is also the device that users need when they are trying to install new software – which typically has to be read from a disc – or if they are trying to make a back-up of something, by writing the data to a disc rather than transferring it onto another device.

While the optical drive is an important internal component of the computer, many laptops are now being constructed without this drive, as changes in technology mean users can complete similar actions without this drive in place.

14 of 20 – Question 1

Computers have both internal and external components that help them to run.

Categorise the devices below, according to if they are an **internal** or an **external** component.

Graphics card

Webcam

Speakers

Registers

Mouse

Keyboard

Heatsink

Motherboard

The correct answers are:

Graphics card, registers, heatsink and motherboard are examples of **internal** components.

Webcam, speakers, mouse and keyboard are examples of **external** components.

15 of 20 – Question 2

Indicate whether the following statements are true or false.

All of the internal components of a computer are connected to the motherboard.

True

False

The correct answer is: True

The main job of the central processing unit is to block instructions from installed programs.

True

False

The correct answer is: False

The arithmetic unit is the calculator application on your computer.

True

False

The correct answer is: False

The control unit’s main job is to provide timing and control signals to other components.

True

False

The correct answer is: True

16 of 20 – Question 3

Which elements of visual imagery does the graphics card control?

Choose all that apply:

1. Clarity
2. Sound
3. Colour
4. Video storage
5. Definition
6. Overall appearance

The correct answers are A, C, E and F, clarity, colour, definition and overall appearance.

17 of 20 – Question 4

What function does a computer fan perform?

1. It prevents your central processing unit, and a number of other areas, from burning out by keeping them cool
2. It blocks off any ducts in your computer so dust and other particles can’t get into your system

The correct answer is A, it prevents your central processing unit, and a number of other areas, from burning out by keeping them cool.

18 of 20 – Question 5

Using the following choice of words; **storage**, **state**, **data**, **magnetic**, **moving** and **installed software**, fill in the blanks for the paragraph below:

Your computer needs a large amount of **blank** if it is going to properly manage your data and any **blank** that you might have added. The two main types of internal storage in computers are solid **blank** drives and **blank** drives. Both of these drives are useful for storing huge amounts of **blank**, but they work in slightly different ways to each other; solid state drives do not have **blank** parts whereas magnetic drives do.

The correct paragraph should read:

Your computer needs a large amount of **storage** if it is going to properly manage your data and any **installed software** that you might have added. The two main types of internal storage in computers are solid **state** drives and **magnetic** drives. Both of these drives are useful for storing huge amounts of **data**, but they work in slightly different ways to each other; solid state drives do not have **moving** parts whereas magnetic drives do.

19 of 20 – End

Well done. You have completed this session on the internal components of a computer (part 1).

In this session we have covered:

* What is meant by internal and external components
* The main internal components of a computer
* What job each internal component performs

If you have any questions about any of these topics, make a note and speak to your tutor for more help.