Knowledge Organiser: Computer Systems IT – KS3 – Unit 4

Digital Devices

It is easy to recognise that personal computers, laptops and mobile devices are computers, but computers are also hidden in many more devices. Because they are relied on so heavily, knowing what they are and how to use them is valuable. Digital devices may be input, output or storage devices, however on a basic level, they all operate through

Input Devices

An **input** device is any piece of computer **hardware used to provide data to a computer system**. Examples include:

- keyboard
- mouse
- scanner
- digital camera

Storage Devices

A **storage device** is a piece of computer equipment which can be **used to store data**. Examples

- Hard disk drive
- DVD disk
- USB stick
- Memory Card

Output Devices

An **output** device is any piece of computer hardware **used to communicate the results of data that has been processed.** Examples in-
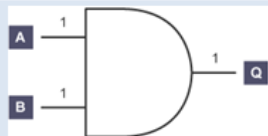
- monitor
- printer
- speaker

What is a Logic Gate

A circuit board can be found inside most digital devices. It is a flat, thin board that has tiny electrical **components** built onto it. Many electronic circuits have to make decisions. They look at one or more **inputs** and use these to determine the **outputs** from the circuit. The process of doing this uses electronic logic, which is based on digital switches called **gates**. Each input and output of the **logic gates** must be one of two states:

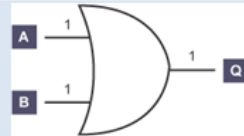**True or 1 or on**   **False or 0 or off**

AN

An **AND** gate usually has two inputs. **AND tells us that both Input A AND Input B have to be 1 (or ON) in order for the output to be 1.** Otherwise the output is 0.
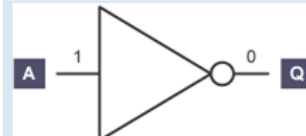
The Boolean expression can be written as Q = A AND B.

O

An **OR** gate has two inputs. **OR tells us that EITHER Input A OR Input B has to be 1 (or ON) in order for the output to be 1.** Otherwise the out- put is 0.

The Boolean expression can be written as **Q = A OR B.**

NO

A NOT gate has just one input. NOT tells us that Input A has to be 0 (or OFF) in order for the output to be 1. Otherwise the output is 0. A

The Boolean expression is written as Q = NOT A.

Key Vocabulary

Term	Definition
Binary	A number system that contains two symbols, 0 and 1. Also known as base 2.
Boolean	A data type in computing which only has two possible values, true or false.
Component	Working parts of a product or system.
Hardware	The physical parts of a computer system, eg a graphics card, hard disk drive or CD drive.
Input	Data which is inserted into a system for processing and/or storage.
Logic Gate	Circuit components which take several inputs, compare the inputs with each other, and provide a single output based on logical functions such as AND, OR and NOT.
Output	Data which is sent out of a system.
Truth Table	Used to assess possible results of a Boolean algebra statement.

Truth Tables

Input A	Input B	Input Q
0	0	0
0	1	0
1	0	0
1	1	1

AN

Input A	Input B	Input Q
0	0	0
0	1	1
1	0	1
1	1	1

OR

Input A	Input Q
1	0
0	1

NO

Knowledge Organiser: Hardware and Software

Summary

Hardware—This is the physical parts of the computer. Software—These are the programs that run on a computer.

Input Devices. This is any piece of computer hardware used to provide data to a computer system. For example, Keyboard, mouse, scanner, digital camera or webcam.

Output Devices. An Output device is any piece of computer hardware used to communicate the results of data that has been processed. Examples could include a Monitor, Printer, Speaker or Headphones.

Storage Devices. A Storage Device is a piece of computer equipment which can be used to store data. Exam- ples could include Hard Disk Drive, DVD Drive and USB sticks.

Logic Gates. Each input and output of logic gates must be one of two states. True or 1 or on. False or 0 or off. Logic Gates use Boolean operators, the most common are AND, OR and NOT.

Systems Software

Software makes hardware useful, it gives the computer the instructions they need to operate. When hardware runs software, it loads the software into its RAM.

There are two mains types of software. Systems software and Applications Software.

Systems software includes the Operating System, Drivers and Utility Software.

All computers must have an Operating System in order to operate.

The Operating System provides the User Interface, it manages the memory in the computer. It also looks after system security including user names and passwords.

Examples of Operating Systems include Windows, Linux, Mac OSX, Android and iOS.

Applications Software

Applications Software is used to carry out tasks on a computer. For example these could include a Word Processor, Spreadsheet, Database or Graphics Software.

This sort of software is called general purpose software because they can carry out many different tasks using those applications.

Applications are also used on Smart phones to to many different types of things. For example Social Media Applications, messaging or music and Video sharing applications.

The word 'App' is short for Application software. This is a piece of software that allows us to do an everyday task.

Key Vocabulary

Application	A software program that allows a user to perform a specific task.
Driver	A piece of software which controls a peripheral device.
Graphics Software	An application that assists a user in creating or editing images
Hardware	The physical parts of a computer system e.g. a graphics card, hard disk drive or CD drive.
Instruction	A single action that can be performed by a computer processor.
Operating System	The software that manages the hardware and software resources in a computer system.
RAM	Random Access Memory. Memory that is used for processing tasks. It is volatile, this means when the power supply is turned off the information stored in the memory disappears.
Smartphone	A mobile phone with a powerful processor that is capable of running applications and accessing the internet..
Software	The programs, applications and data in a computer system that aren't physical
User Interface	The means by which a user interacts with a computer or device.
Utility Software	These are known as utilities, e.g. virus protection or a firewall
Web Browser	Software that displays web pages
Word Processor	An application used to write, edit and format text.