

Knowledge Organiser: Computing Systems —Digital Devices

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 include:

- 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 include:

- 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**

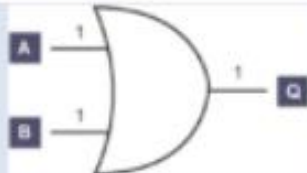
AND



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 $Q = A \text{ AND } B$.

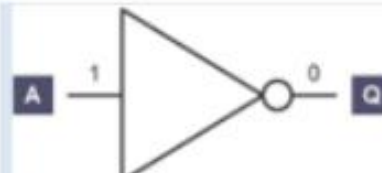
OR



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 output is 0.

The Boolean expression can be written as $Q = A \text{ OR } B$.

NOT



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 $Q = \text{NOT } A$.

Key Vocabulary

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

AND

OR

Input A Input Q

1	0
0	1

NOT