Computer Science – Year 8 – Knowledge Organiser

SPRING TERM – Binary, How a computer works and micro:bits

Everything you put into a computer is converted to binary to be processed. Binary code is made up of 1's and 0's. The binary grid is below.

128	64	32	16	8	4	2	1

STORAGE SIZES	
0 or 1	BIT
4 Bits	NIBBLE
8 BITS	BYTE
1024 BYTES	KILOBYTE
1024 KILOBYTES	MEGABYTE
1024 MEGABYTES	GIGABYTE
1024 GIGABYTES	TERABYTE

KEYWORD	DEFINITION
Algorithm	A set of instructions that tells a computer what to do.
Sequence	The order of steps in an algorithm.
Selection	A decision or IF statement in code.
Iteration	Instructions that cause some lines of code to be repeated multiple times.
Abstraction	Simplifying some complex details in order to focus on the main points of a problem.
Hardware	The physical components of a computer system; anything that can be seen or touched.
Software	The programs you use on the computer eg. Power point
CPU	Central Processing Unit of the computer containing the control unit, ALU and cache memory. Carries out calculations and instructions in Hertz. 1 Hertz = 1 instruction per second. 3GHz = 3 Billion instructions per second.
Input Device	A device that inputs real world data into a computer.
Output Device	A device that give out binary data that you can see, hear or touch.
RAM	Random Access Memory, the main memory. Stores data, applications and the operating system.
Storage Device	A device that stores data. Can be internal or external.

Logic Gate		Truth Table

AND Gate:
The output is 1 if **both** of the inputs are 1

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

OR Gate:
The output is 1 if 1 or both of the inputs are 1 eg. a fire alarm system, a light that has more than one switch controlling it

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

NOT Gate: The output is the reverse of the input eg. a night light, emergency stop button on machine tools

A	Q
0	1
1	0

Logic gates: Electronic circuits that operate one or more signals to produce an output signal
Truth tables: shows the output with differing inputs