Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 6.8
Binary

Key Learning

- To examine how whole numbers are used as the basis for representing all types of data in digital systems.
- To recognise that digital systems represent all types of data using number codes that ultimately are patterns of 1s and 0s (called binary digits, which is why they are called digital systems).
- To understand that binary represents numbers using 1s and 0s and these represent the on and off electrical states respectively in hardware and robotics.

Key Resources

purple mash

2Dos

2Connect

2Question

Free code gorilla

Key Vocabulary

Base 2
A number system in which there are two separate integers that can be used to make all numbers. This is also called the **binary** system.

Words used to describe numbers of bits and the computer memory space used:

Nibble - 4 bits

Byte - 8 bits.

Kilobyte (KB) - 1024 bytes

Megabyte (MB) - 1024 KB

Gigabyte (GB) - 1024 MB

Tetrabyte (TB) - 1024 GB

Bit
A single 0 or 1 is called a bit. This word comes from '**B**inary Dig**it**'.

Digit
A single integer used to show a number.

Integer
Any whole number. This includes negative and positive numbers but not fractions or decimals.

Switch
An act of changing to or adopting one thing in place of another.

Base 10
A number system in which there are ten separate integers that can be used to make all numbers. This is also called the **decimal** and the **denary** system.

Transistor
A transistor is a tiny switch that is activated by the electronic signals it receives.

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Key Vocabulary

Machine code
The code that signals to a computer which transistors should be on or off. Machine code is written in binary.

Megabyte (MB)
1024 KB.

Nibble
4 bits.

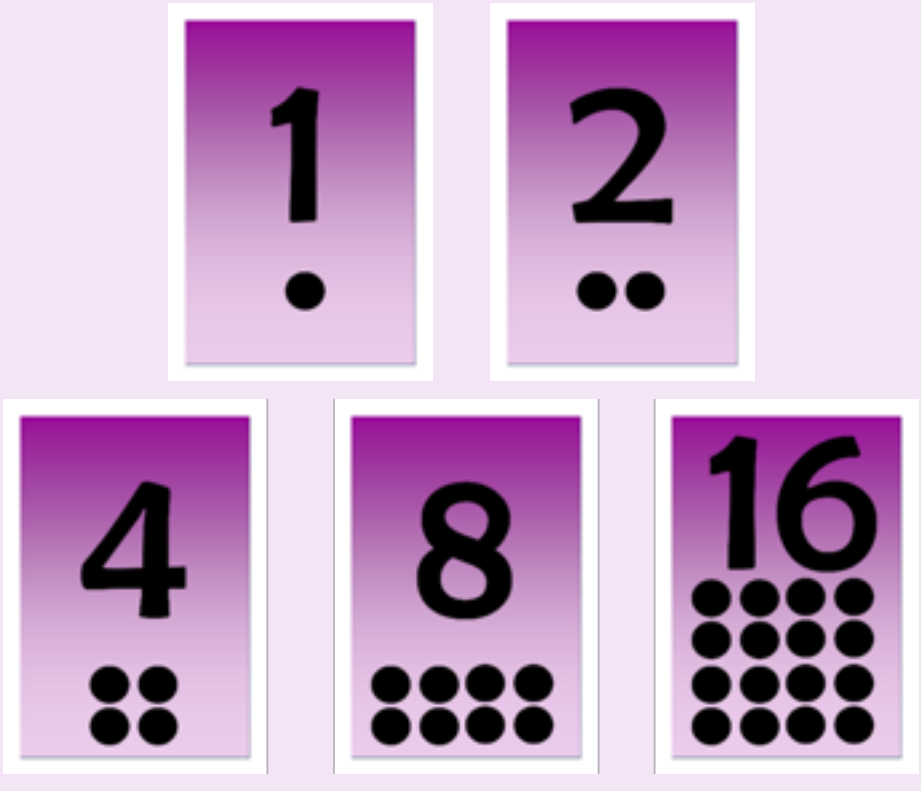
Switch
A component that can be one of two states at any time: on or off.

Terabyte (TB)
1024 GB

Transistor
A tiny switch that is activated by the electronic signals it receives.

Variable
A variable is used in programming to keep track of things that can change while a program is running. A variable must have a name. The value of the variable is the information to store.

Key Images



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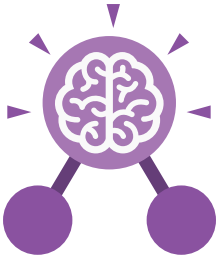

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Key Questions

How does binary relate to the programs that you use or create?

In a computer, everything is translated into binary stored by on and off switches that pass electronic signals that the computer interprets. It can then pass the correct signals to the components of the computer such as the sound card to make the requested sound. Or graphics card to make images appear on the screen.

How does binary relate to computer memory?

A single 0 or 1 is called a bit. The word comes from Binary Digit. The bigger the program, the more bits are used so more memory space is taken up. For example, 1 byte is 8 bits, 1 megabyte (Mb) or 8,388,608 bits, 1 gigabyte (GB) is 8,589,934,592 bits!

How would you write the numbers 0 to 10 in binary?

0, 1, 10, 11, 100,101,110,111,1000, 1001, 1010.