Swans - Year 6

Summer 2 (B)

Computing - Mars Rover 2

What I should already know: IN EYFS children learn how to represent data through sorting and categorising objects in unplugged scenarios and through physical pictograms. They Explore branch databases through physical games. In Year 1 they learn that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. and use software to explore and create pictograms and branching databases. In Year 2 children learn to collect and input data into a spreadsheet and how to interpret data from a spreadsheet. In LKS2 they learn that a database is a collection of data stored in a logical, structured and orderly manner and that computer databases can be useful for sorting and filtering data. They learn that visual representations of data can be made on a computer. They know that computers can use different forms of input to sense the world around them so that they can record and respond to data. This is called 'sensor data'. Children learn that a weather machine is an automated machine that responds to sensor data. and that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films. In their previous unit, they explained how the Mars Rover transmits the data back to Earth and the challenges involved in this.; read any number in binary, up to eight bits; identified input, processing and output on the Mars Rovers.; read binary numbers and grasped the concept of binary addition. & related binary signals (Boolean) to a simple character-based language, ASCII.

Enquiry Questions

How do bit patterns represent images as pixels?

How can the data for digital images can be compressed?

What is the the 'fetch, decode, execute' cycle?

How do you create a safe online profile and tinker with 3D design software?

How do you modify the design of a 3D object using CAD software?

Key Vocabulary

Algorithm - a precise list of operations that could be done by a Turing machine.
Binary code - binary code uses only two numbers, "0" and "1".
Binary Image - An image where the pixels are made up of only two colours, such as black and white.
CAD - Computer-aided design (CAD). It is used by professionals to help them visualise 3D objects before making them.
Compression - a technique that reduces file size.
Fetch, decode, execute' - the basic method used by the CPU to carry out a single instruction contained in a computer program.
CPU - an electronic machine that works on a list of computer things to do, called instructions. It reads the list of instructions and runs (executes) each one in order. A list of instructions that a CPU can run is a computer program.
Encode - to convert something into a different code, for someone or something else to understand it.
JPEG- a computer file format for the compression and storage of digital images
Input - information that is "put in" to something. When someone types on a computer, the thing that they type is input.
Memory - the component of the computer that holds data , programs and instructions that are currently in use.
Online community - a community whose members interact with each other primarily via the Internet.
Output - the signals or data sent from a system
Operating system - the name for a group of computer programs, device drivers, kernel, and other things that let a user work with a computer.
Pixels - a single point in a picture
RAM - Random-access memory (or simply RAM) is the memory or information storage in a computer that is used to store running programs and data for the programs.
RGB - (red, green and blue) refers to a system representing the colors used on a digital display screen.
ROM - Read-only memory (or simply ROM) is a type of computer memory.
Tinkering - to make changes to an ideas as you test it.

Computing Skills

Pupils will:

- Learn the difference between ROM and RAM.
- Recognising how the size of RAM affects the processing of data.
- Understand the fetch, decode, execute cycle.
- Learn how the data for digital images can be compressed.
- Recognise that computers transfer data in binary and understand simple binary addition.
- Understandi how bit patterns represent images as pixels.
- Usie logical thinking to explore software more independently, making predictions based on their previous experience.
- Independently learn how to use 3D design software package TinkerCAD.
- Learn about different forms of communication that have developed with the use of technology.

Links to other curriculum areas: Art & Design - To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials./ English - use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas/D&T - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design/ RSE - how to critically consider their online friendships and sources of information including awareness of the risks associated with people they have never met