



Be the best that we can be.

EBJ Knowledge Organiser Computing Year 5

Spring 2
Skills Showcase:
Mars Rover 2



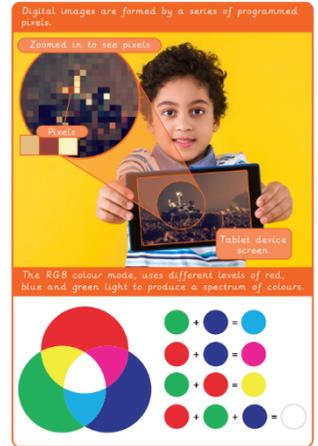
Overview

In this unit, pupils explore how computers represent and process digital images and commands. They will learn how images are stored using pixels and binary, how data can be compressed, and how computers follow the fetch-decode-execute cycle to process instructions. Pupils will also begin using 3D design tools to create models, such as designing a functional tyre for a Mars Rover using Tinkercad.



Pixels

Pixels are the tiny building blocks of a digital image. Each pixel is a small square that has a colour, and when thousands or millions of pixels are combined, they form pictures that we see on screens. The colour of each pixel is stored using binary, a system of 0s and 1s, which computers can understand. By adjusting the number, colour, and brightness of pixels, digital images can be made sharp, colourful, or realistic. Understanding pixels helps pupils see how computers store and display pictures, and why changing just a few pixels can affect an image's quality.



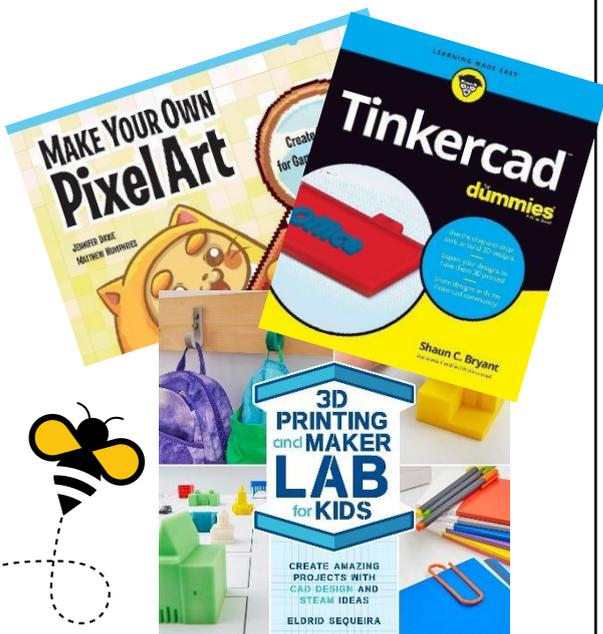
Key vocabulary

algorithm, binary image, bit, bit pattern, CAD, compression file, CPU, data, digital image, encode, image, JPEG, memory computer, operating system, pixels, RGB

Fetch-Decode-Execute Cycle

The fetch-decode-execute cycle is the process that all computers follow to run instructions. First, the computer fetches an instruction from memory. Next, it decodes the instructions to understand what needs to be done. Finally, it executes the instruction by performing the action, such as displaying a picture or moving a robot. This cycle happens thousands or millions of times every second, allowing computers and devices—like the Mars Rover—to complete complex tasks quickly and accurately.

Read all about it. Can you find these books in the local library?



Tinkercad

Tinkercad is a beginner-friendly 3D design tool that lets pupils create models on a computer. Users can combine simple shapes like cubes, cylinders, and spheres to make more complex objects. In this unit, pupils will design a functional Mars Rover tyre, learning how to plan, position, and resize shapes so the final model works as intended. Tinkercad helps pupils develop spatial awareness, problem-solving skills, and an understanding of how digital design can be applied in real-world engineering and robotics.

