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EBJ Knowledge Organiser Computing Year 5

Spring 1
Mars Rover 1



Overview

The Mars Rover is a robotic vehicle that travels on the surface of Mars to explore the planet. It collects different types of data, such as images, temperature, and soil samples. The Rover sends this information back to Earth using computers that encode data in binary code, allowing scientists to study Mars remotely.



How the Mars Rover Collects Data

Sensors detect conditions on Mars (e.g., temperature, soil type, images).

Cameras take pictures of the surface and rocks.

Environmental instruments measure atmospheric pressure, wind speed, and radiation.

Data is **encoded into binary** so it can be transmitted back to Earth.

Scientists **decode the binary data** to understand what the Rover has discovered.

Computer Architecture of the Mars Rover

CPU (Central Processing Unit) – The brain of the Rover those processes instructions.

Memory (RAM / storage) – Stores programs, data, and instructions temporarily or permanently.

Input/Output devices – Sensors and cameras collect data; antennas transmit data to Earth.

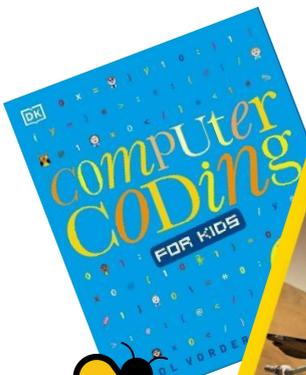
Power system – Solar panels or nuclear batteries keep the Rover running.

Algorithms – Instructions for collecting, encoding, and transmitting data.

Key vocabulary

debug, genre, input, loop, nested loop, output, pitch, program, remixing, repeat, rhythm, tempo, soundtrack

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



Using Binary Code

Reading and Calculating Numbers

- Binary uses only 0 and 1 to represent numbers.
- Each position in a binary number has a value that doubles from right to left (1, 2, 4, 8...).
- You can add, subtract, and calculate using binary just like decimal numbers.



Representing Text

- Letters and characters are also stored as binary using a code table (like ASCII).
- Each letter is converted into a series of 0s and 1s so computers can store and transmit text.



Operations with Binary

- Binary numbers can be added, subtracted, and combined using simple operations.
- These operations allow the Rover to encode measurements and messages efficiently.