

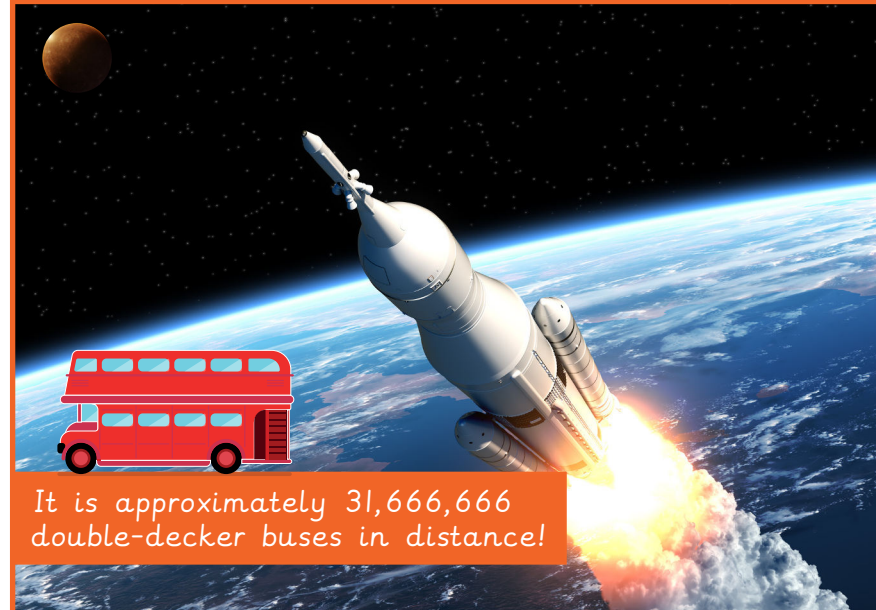
Mars Rover I

Binary code	A code used in computers, based around the binary values of 0 and 1.
Data	Information used for a specific purpose or investigation.
Data transmission	The movement of information from one or more points to another.
Discovery	When something is intentionally or unintentionally found.
Distance	The amount of space between two places or objects.
Input	Information sent to a computer by an input device such as a keyboard or mouse for processing.
Mars Rover	A robotic vehicle, that explores, investigates and returns data about the terrain on Mars.
Moon	Orbits round planet Earth and is Earth's only natural satellite.
Numerical data	Information that is based on numbers and digits.
Output	Information or data that is sent by the computer to an output device such as a printer or speakers.
Planet	A large natural object that orbits around a star.
Radio signal	A radio wave that is sent or received to somewhere.
Scientist	A person who studies within the fields of Science, such as Physics, Biology and Chemistry.
Sequence	A set order or pattern for something to follow.
Signal	A voltage, current or electromagnetic wave that is either sent or obtained.
Computer simulation	Computer generated imitation of something such as a program test or product prototype.
Space (astronomy)	A vast area around and beyond planet Earth, which is not inhabited.



Key facts

The Mars Rover had to travel 380,000km to get to Mars, it took eight and a half months.

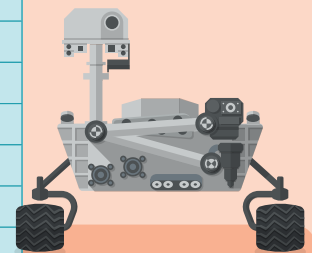


It is approximately 31,666,666 double-decker buses in distance!

Binary:

When a robot thinks independently, it needs to be able to calculate a range of data. All decisions carried out by a robot, or any computer, are done in binary - including the Mars Rover.

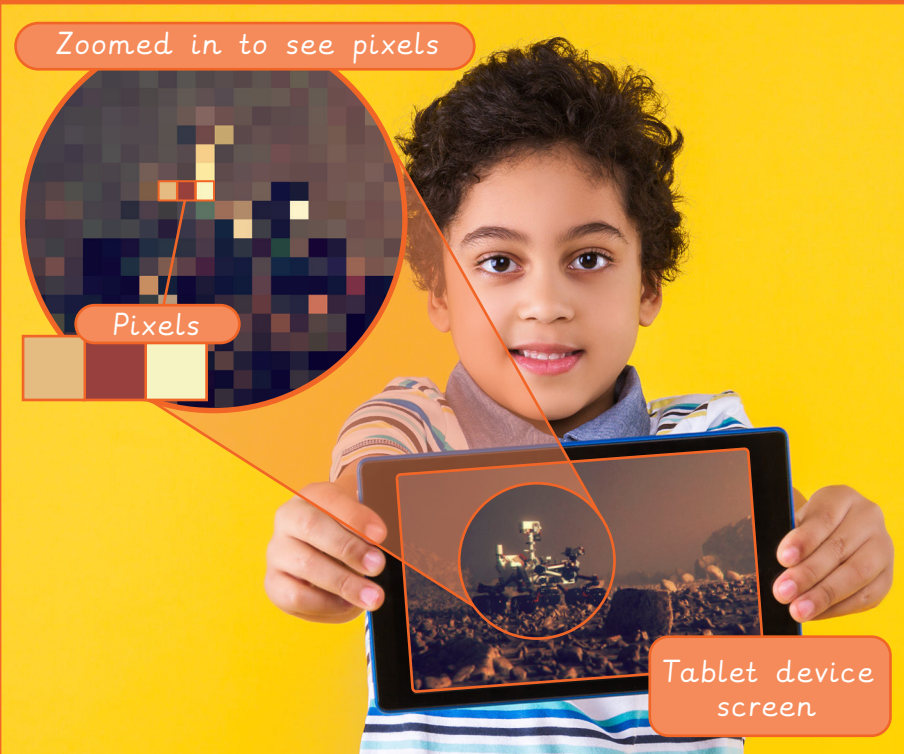
Binary value	Decimal value
0 0 0 0	0 zero
0 0 0 1	1 one
0 0 1 0	2 two
0 0 1 1	3 three
0 1 0 0	4 four
0 1 0 1	5 five
0 1 1 0	6 six
0 1 1 1	7 seven
1 0 0 0	8 eight
1 0 0 1	9 nine
1 0 1 0	10 ten



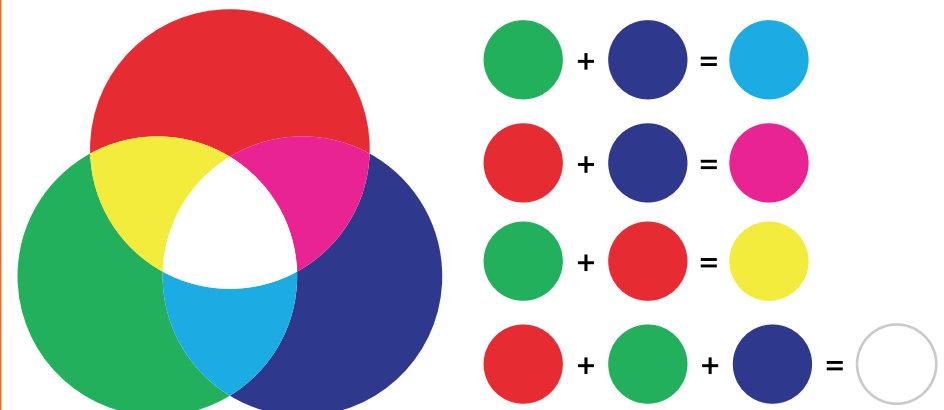
Algorithm	A sequence of instructions which, when followed, solve a problem.
Binary image	An image where the pixels are made up of only two colours, such as black and white. 
Bit	One unit of data, that either has a value 1 or 0. A bit is also known as a 'binary digit'.
Bit pattern	A sequence of binary digits.
CAD	Computer-aided design, software used to create graphics, diagrams or other visuals.
Compression file	Taking single or multiple files, and reducing their file size to take up less digital storage space.
CPU	Central Processing Units are the brains of a computer and deal with all of the data it receives from input and output devices, as well as programs ran within the computer.
Data	Information used for a specific purpose or investigation.
Digital image	Formed by a series of programmed pixels.
Encode	To convert something into a different code, for someone or something else to understand it.
Image	A picture of people or objects.
JPEG	Joint Photographic Experts Group. A popular image compression format.
Memory computer	Any hardware device that is able to store data or information.
Operating system	The base software needed on a computer for it to manage basic commands, hardware and software and provide a user-friendly interface.
Pixels	A screen is made up of a grid of pixels, each pixel is programmed to display a certain colour which when put together form an image.
RGB	Red, Green, Blue. A colour mode, that uses these three hues combined to create a spectrum of colours.

Key facts

Digital images are formed by a series of programmed pixels.



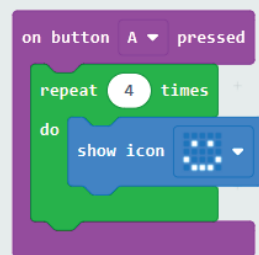
The RGB colour mode, uses different levels of red, blue and green light to produce a spectrum of colours.



.hex file	A file type, that carries binary information.
.zip file	Multiple files that are bound together as a single file, to use less digital storage space.
Bluetooth	Device to device connectivity, for example sharing images between two smart phones.
Code blocks	A visual representation for a section of code that performs a certain job. They can be snapped together to build a program.
Decompose	To break something down into smaller chunks.
Emulator	A program or machine that is built to copy the way another computer system works.
Feature	Distinctive characteristics of something.
Loop	A repeated sequence of instructions.
Micro:bit	Created by the BBC, a small compact computer that you can code.
Pedometer	A device used to record the number of steps taken to calculate the distance travelled.
Predict	To make an educated guess, as to what might happen or occur as the result of something in the future.
Systematic	Doing something in an ordered way to achieve a specified goal.
Tinker	To explore and play with something to discover the key functions.
Variable	This could be a number or text, that can change each time the program is run and often in combination with selection to change the end result of the program.

BBC Micro:bit Make code - Code blocks key:

 Basic	 Input	 Music
 Led	 Radio	 Loops
 Logic	 Variables	 Math(s)

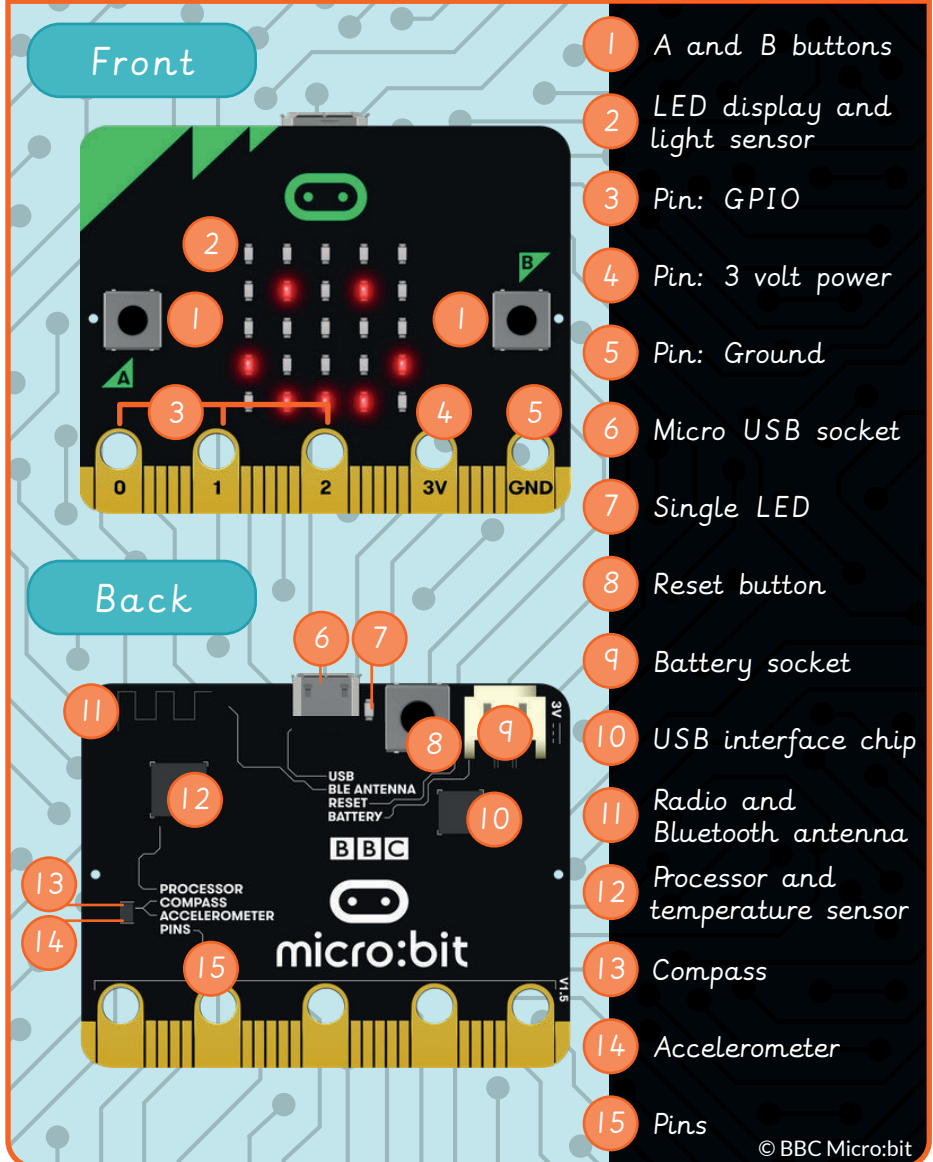


Key facts

BBC Micro:bit

The BBC Micro:bit has a wide-range of features for you to program and experiment with. Each feature can be included as part of an algorithm.

BBC Micro:bit features:



Online safety

Catfishing (online)	Creating a fake profile on social media to deliberately trick someone.
Cyberbully	Someone who bullies others through the internet.
Exclusion	Being deliberately left out of an online conversation or game.
Fake profile	A fake profile pretending to be someone they are not.
Information	Knowledge which can be remembered, written in documents or stored in different forms as data, such as in video files and audio recordings.
Online	When a person is accessing the internet through an electronic device.
Online safety (e-safety)	The rules and advice we should follow, to remain safe when using the internet (World Wide Web).
Password	A unique combination of letters, numbers or symbols that protects personal information online.
Personal information	Facts about someone, which identify them, the place they live and their person.
Phishing	When someone pretends to be someone else in an email, especially a reputable or trusted company, to get money or information from users.
Trickery	Lying to someone to gain their trust, then using this to get them to reveal secrets, which they can share publicly or use to access private information.
Trolling	Deliberately saying inflammatory things to try and get a response.

Remember, to stay safe:

Stop



Think



Talk it through with a trusted adult

Key facts

Online safety rules

RULE ONE:

Do not post personal information online.

Name:

Address:

Phone number:



RULE TWO:

Do think carefully about sharing photos of yourself, even with friends. Once it is sent, that other person has it forever.



RULE THREE:

Do not share your passwords with anyone, except for trusted adults.

Username:

Password:



RULE FOUR:

Do be aware that not everyone online is who they appear to be.



RULE FIVE:

Do not meet up with anyone you meet online, or give them your personal information.



RULE SIX:

Do tell a trusted adult if you see anything that makes you scared, sad or afraid.



Search engines

Algorithm	A sequence of instructions which, when followed, solve a problem.
Company logo	A symbol or motif, used to represent an organisation, so that it can be identified quickly and easily in a busy environment online or in the real world.
Data leak	When information is released without approval from the owner or creator.
Data privacy	The right to keep information private and away from those you do not wish to have access.
Fake news	False and inaccurate information that is shared in a convincing way, usually on social media and in websites.
Inaccurate information	When information is false and untrue. ⚠️
Index	A computer saves key information about previously searched results, to make this quicker next time they are accessed.
Keywords (internet)	A set of words used to define and produce an accurate search engine result.
Network	When more than one electronic device is connected in a network through the internet or a local connection in order to share files and information.
Online	When a person is accessing the internet through an electronic device.
Page rank	Web pages are sorted in an order to give the user the most suitable results at the top of the list, the first result could be considered rank one.
Search engine	A way for a user to search the internet's database of information.
TASK	Title, Author, Summary, Kids
Web crawler	A program that uses keywords to search the WWW in a logical and systematic way to find the most suitable results for the user.
Website	A series of web pages and other content, which can be discovered and read through an internet browser, that all belong to a single domain name. For example, Google. The main place where particular web pages can be viewed or accessed.
WWW	The acronym used to express the 'World Wide Web'. It is found at the beginning of website addresses e.g. www.kapowprimary.com

Key facts

The screenshot shows a web browser window with the address bar displaying 'https://www.kapowiverse.com'. The website has a light blue background with the 'Kapowiverse' logo in a stylized font. A search bar is located at the top right, with a magnifying glass icon and a 'Go' button. Below the search bar, there are navigation tabs for 'All', 'Images', 'Videos', and 'News'. The main content area features a link to 'https://www.dino earth' with the text 'Dino website' and 'Watch and learn about different dinosaurs.' Below this, there is a video player with a play button and the word 'DINO' in large letters. Further down, there is a link to 'https://www.dinosaurdirectory' with the text 'A-Z Dinosaur names library' and 'What can you learn about all of the dinosaurs from A-Z?'. Below this, there is a link to 'https://www.Jurassic_history' with the text 'Jurassic time line' and 'How did dinosaurs become extinct? Explore all of the key dinosaur facts here!'. At the bottom, there is a link to 'http://www.London_apatosaurus' with the text 'Apatosaurus sightings' and 'A sauropod herbivorous dinosaur has been captured in the centre of London city! Book your ticket for just £1,000 today!'. Annotations with orange boxes and lines point to various elements: 'Search bar' points to the search bar; 'Company logo' points to the 'DINO' logo; 'Hyperlink' points to the 'https://www.dinosaurdirectory' link; 'Keywords' points to the 'Jurassic time line' text; and 'Fake news' points to the 'http://www.London_apatosaurus' link.

Basic commands	The simplest instructions that can be used.
Bug	A mistake or error in the code, stopping the program from working as intended.
Code (computer)	A set of instructions written in programming language, to tell a computer what to do.
Code (verb)	To write in programming language (code).
Debug	To remove and repair the error or mistake in computer code.
Error	A mistake or a fault in software.
Live loop	Like loops, but instead of repeating a number of times, they go on forever. You can also have multiple running at the same time.
Loop	A repeated sequence of instructions.
Pitch (music)	A musical term which refers to how high or low a note is.
Program language	The particular library of code which a piece of software is written in, for example Java and C++.
Rhythm	A musical term that refers to the 'pattern' of long and short notes.
Sonic Pi π)))	A coding program specifically dealing with music, that is based upon a computing language called Ruby.
Soundtrack	A music recording that accompanies a film or tv show.
Tempo (music)	A musical term which refers to the speed of the music.
Timbre (music)	A musical term which refers to the characteristic trait of a sound.
Tinker	To explore and play with something to discover the key functions.

Live loop:

```
live_loop :beats do
  sample :bd_haus
  sleep 0.5
end
```

Simple melody:

```
play 70
sleep 1
play 75
sleep 0.5
play 82
```

Selecting sounds:

```
sample :drum_cowbell
use_synth :tb303
sample :ambi_choir
```

Key facts

The Sonic Pi interface

Play controls:



Editor controls:



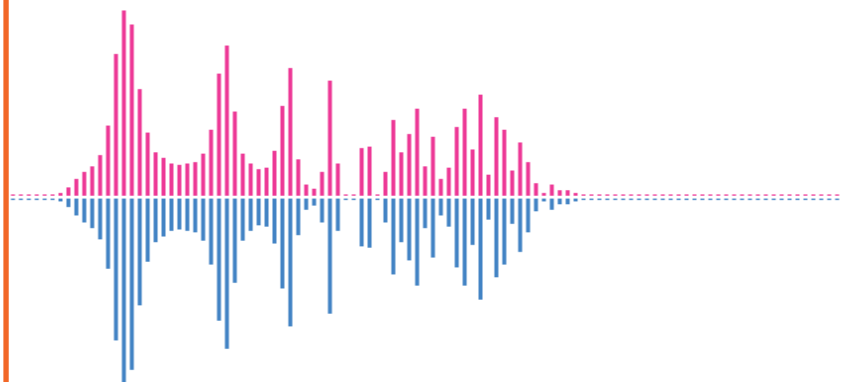
Information and help controls:



Code editor: Design the track here in Ruby code

```
1 use_synth :tb303
2 play_chord [62, 64, 66]
3
```

Scope: View the rhythm of your coded track



Log viewer: View Sonic Pi instruction here

```
> Redefining fn: live_loop_drive
```