Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.1
Coding

Key Learning

- To begin to understand selection in computer programming.
- To understand how an IF statement works.
- To understand how to use co-ordinates in computer programming.
- To understand the 'repeat until' command.
- To understand how an IF/ELSE statement works.
- To understand what a variable is in programming.
- To use a number variable.
- To create a playable game.

Key Resources

purple mash

Tools

2Dos


2Chart


Free code gibbon

Key Vocabulary

Action
The way that objects change when programmed to do so. For example, move or change a property.

Alert
This is a type of output. It shows a pop up of text on the screen.

Algorithm
A precise, step-by-step set of instructions used to solve a problem or achieve an objective.

Background
In 2Code the background is an image in the design that does not change.

Button
A type of object that responds to being clicked on.

Code blocks
A way to write code using blocks which each have an object or an action. Each group of blocks will run when a specific condition is met or when an event occurs.

Command
A single instruction in 2Code.

Debug/Debugging
Fixing code that has errors so that the code will run the way it was designed to.

Design
In coding, this is a plan for the program showing the visual look of the user interface (the screen) with the objects. The algorithm can be represented as part of the design, showing actions and events.

Execute
This is the proper word for when you run the code. We say, 'the program (or code) executes.'

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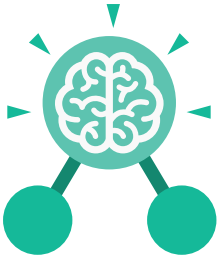


Unit: 4.1
Coding

Key Vocabulary

Event
An occurrence that causes a block of code to be run. The event could be the result of user action such as the user pressing a key (when Key) or clicking or swiping the screen (when Clicked, when Swiped). In 2Code, the event commands are used to create blocks of code that are run when events happen.

Nest
When coding commands are put inside other commands. These commands only run when the outer command runs.

Implement
When a design is turned into a program using coding.

Repeat until
In 2Code this command will repeat a block of commands until a condition is met.

Flowchart
A diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram.

'If/Else' Statement
A conditional command. This tests a statement. If the condition is true, then the commands inside the 'if block' will be run. If the condition is not met, then the commands inside the 'else block' are run.

Object
Items in a program that can be given instructions to move or change in some way (action). In 2Code Gibbon, these include character, turtle, button, vehicle, animal, food, shape, number, input and label.

Predict
Use your understanding of a situation to say what will happen in the future or will be a consequence of something.

'If' Statement
A computer uses an IF statement to decide which bit of code to run. IF a condition is true, then the commands inside the block will be run.

Input
Information going into the computer. This could be the user moving or clicking the mouse, or the user entering characters on the keyboard. On tablets there are other forms such as finger swipes, touch gestures and tilting the device.

Prompt
A question or request asked in coding to obtain information from the user in order to select which code to run.

Repeat
This command can be used to make a block of commands run a set number of times or forever.

Run
Clicking the Play button to make the computer respond to the code.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.1
Coding

Key Vocabulary

Properties
These determine the look and size of an object. Each object has properties such as the image, scale and position of the object.

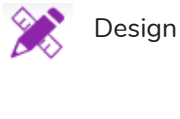
Selection
Selection is a decision command. When selection is used, a program will choose which bit of code to run depending on a condition.

Sequence
This is when a computer program runs commands in order.

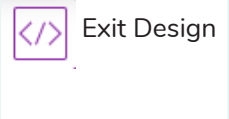
Timer
In coding, use a timer command to run a block of commands after a timed delay or at regular intervals.

Variable
A named area in computer memory. A variable has a name and a value. The program can change this variable value. Variables are used in programming to keep track of things that can change while a program is running.

Key Images

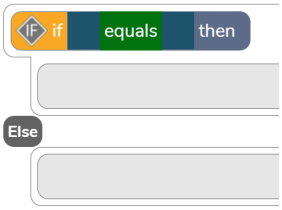


Open design mode in 2Code.

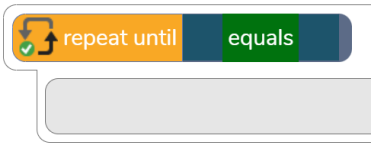


Switch to code mode in 2Code.

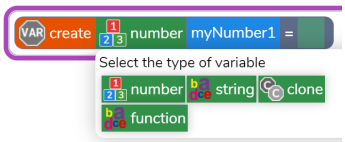
A change variable block.



An ‘if/Else’ command.



Repeat until.



Creating a variable in 2Code.

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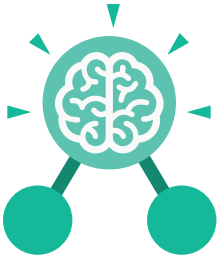


Unit: 4.1
Coding

Key Questions

Explain the stages of the design, code, test, debug coding process.

This is a process to go through as you create a program using coding

- Design: create a design which could be a flowchart, a labelled diagram or a storyboard. This helps to think through the algorithms required
- Code: code the algorithms using to code and adapting the design.
- Test and Debug: see if the program works and fix any errors.

How can variables and if/else statements be useful when coding programs with selection?

The variable could be set either to 0 or 1 and this could be changed by user action or a timer. If/else statement outcomes could depend upon the value of the variable. command for selection.

What does selection mean in coding and how can you achieve this in 2Code?

The code will contain commands that require a decision and the next code to run will depend upon the outcome of this decision. In 2Code we used the 'if' command for selection.

What is the difference between the different object types in 2Code Gibbon level?

The different objects have different properties. This makes then suitable for different type of programs.

- Buttons can only be clicked and have their colour and text changed.
- Vehicles have speed and angle.
- Characters have movement in 4 directions.
- Turtles have rotation, pen up and down.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.2
Online Safety

Key Learning

- To understand how children can protect themselves from online identity theft.
- To understand that information put online leaves a digital footprint or trail and that this can aid identity theft.
- To identify the risks and benefits of installing software including apps.
- To understand that copying the work of others and presenting it as their own is called 'plagiarism' and to consider the consequences of plagiarism.
- To identify appropriate behaviour when participating or contributing to collaborative online projects for learning.
- To identify the positive and negative influences of technology on health and the environment.
- To understand the importance of balancing game and screen time with other parts of their lives.

Key Resources

purple mash


2Connect


2Investigate

SPAM

Key Questions

What is meant by a digital footprint?

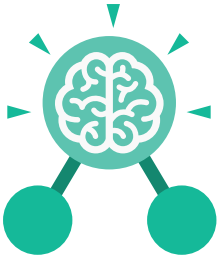
A digital footprint is the information that exists about a person based upon sites that they have visited, searches that they have done, information that they have shared and other online behaviours.

What is SPAM?

SPAM messages are emails or online messages sent from a computer to many other users. The users are sent the email without requesting it. The purpose of SPAM is for advertising, phishing or malware.

What is meant by plagiarism?

Plagiarism refers to using someone else's work and claiming it to be your own.



Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.2
Online Safety

Key Vocabulary

AdFly
An online advertising marketplace that allows publishers to monetize their website traffic by placing advertisements on their site.

Collaborate
To work jointly on an activity or project.

Digital footprint
The information about a person that exists on the Internet as a result of their online activity.

Plagiarism
Taking someone else's work or ideas and passing them off as one's own.

Spam
Messages sent over the Internet, typically to many users, for the purposes of advertising, phishing or spreading malware.

Attachment
A file, which could be a piece of work or a picture, that is sent with an email.

Cookies
A small amount of data generated by a website and saved by a web browser. Its purpose is to remember information about the user.

Malware
Software that is specifically designed to disrupt, damage, or gain unauthorised access to a computer system.

Ransomware
A type of malicious software designed to block access to a computer system until a sum of money is paid.

Virus
A piece of code which can copy itself and typically has a damaging effect on the device, such as corrupting the system or destroying data.

Citation
Making reference to the original source of a piece of information quotation or image.

Copyright
When the rights to something belong to a specific person.

Phishing
Practice of sending email pretending to be from reputable companies in order to persuade individuals to reveal personal information, such as passwords and credit cards numbers.

SMART rules
A set of rules based around the word SMART designed to help you stay safe when online. SMART represents the words Safe, Meet, Accept, Reliable, Tell.

Watermark
Watermarks are used mainly on images or videos to show who the content belongs to.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.4
Writing for Different Audiences

Key Learning

- To explore how font size and style can affect the impact of a text.
- To use a simulated scenario to produce a news report.
- To use a simulated scenario to write for a community campaign.

Key Resources

purple mash

2Publish Plus

2Simulate

Key Images

Text Toolbar. Click here to format your text.

Key Vocabulary

Campaign
An organised course of action to achieve a goal.

Format
The way in which something is arranged or set out.

Font
A set of type which shows words and numbers in a particular style and size.

Genre
The style or category type of a piece of art, music or writing.

Opinion
A view or judgment someone forms about something, not always based on fact.

Reporter
A person who reports news or conducts interviews for the press or broadcasting media.

Viewpoint
The way someone sees or thinks about something.

Key Questions

Why should I change the font when I am writing?
Changing the appearance of the font can help make things easier to read and highlight important parts of the text.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.5
Logo

Key Learning

- To learn the structure of the coding language of Logo.
- To input simple instructions in Logo.
- Using 2Logo to create letter shapes.
- To use the Repeat function in Logo to create shapes.
- To use and build procedures in Logo.

Key Questions

What is Logo?

Logo is a text-based coding language used to control an on-screen turtle to create mathematical patterns.

Key Resources

2Logo

Key Vocabulary

Debugging
The process of identifying and removing errors from computer hardware or software.

LOGO Commands (e.g FD, BK, RT, LT)
A list of commands inputted into 2Logo to move the turtle around the screen.

Pen Up
Raises the screen pen so the 2Logo turtle doesn't draw on screen.

Grid
The template around which the 2Logo turtle moves.

Multi Line Mode
Type several lines of commands in the text area.

Prediction
When you say what is going to happen when you run the instructions.

LOGO
A text-based coding language used to control an on screen turtle to create mathematical patterns.

Pen Down
Lowers the screen pen so the 2Logo turtle draws a line on the screen.

Procedure
Pieces of Logo text with a procedure name that can be run by calling them by name. Saves time if you want to print to screen lots of the same shape.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.5
Logo

Key Vocabulary

Repeat
A set of instructions that is run a specified number of times.

Run Speed
The speed at which the 2Logo turtle moves around the screen.

SETPC
Set pen colour to a given colour.

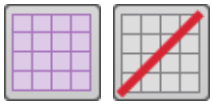
SETPS
Set the thickness of the pen's line.

Key Images

Open, close and share work

Choose the turtle style

Choose a background

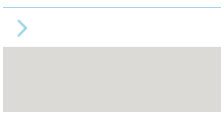


Switch the grid on and off

Press and the logo mouse follows the instructions

Reset the mouse to the start position

Change the speed at which the mouse moves



Write the Logo instructions here

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Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.6
Animation

Key Learning

- To discuss what makes a good animated film or cartoon.
- To learn how animations are created by hand.
- To find out how animation can be created in a similar way using the computer.
- To learn about onion skinning in animation.
- To add backgrounds and sounds to animations.
- To be introduced to 'stop motion' animation.
- To share animation on the class display board and by blogging.

Key Resources

2Animate

Key Vocabulary

Animation
The process of adding movement to still objects.

FPS (Frames Per Second)
The number of frames played per second.

Frame
A single image in an animation.

Onion Skinning
A process where the shadow image of the previous frame is present to help you line up the objects of the animation correctly.

Pause
To temporarily stop the animation.

Stop motion
A technique whereby the camera is repeatedly stopped and started, for example to give animated figures the impression of movement.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.6
Animation

Key Images

Open, close or share animation.

Add or delete a frame from the animation.

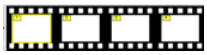
Play the animation.

Switch onion skinning on or off.

Add a background picture to the animation.

Insert a photograph from a webcam into the animation.

Insert a sound file into the animation.



Number of frames in the animation.

Key Questions

What is an animation?

Animation is the process of giving the illusion of movement to drawings, models, or inanimate objects. Animated motion pictures and television shows are highly popular forms of entertainment.

What is meant by onion skinning?

Onion skinning is a 2D computer graphics term for a technique used in creating animated cartoons and editing movies to see several frames at once.

What is meant by stop motion animation?

Stop motion animation is a filming technique in which objects (such as clay models) are photographed in a series of slightly different positions so that the objects seem to move.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.7
Effective Searching

Key Learning

- To locate information on the search results page.
- To use search effectively to find out information.
- To assess whether an information source is true and reliable.

Key Resources

purple mash

2Publish Plus

Key Questions

What is a search engine?

A search engine is a piece of software that allows the user to find and display pages from the World Wide Web.

Key Vocabulary

Balanced View
Presenting opposing points of view fairly and without bias.

Easter eggs
An unexpected or undocumented feature in a piece of computer software or on a DVD, included as a joke or a bonus.

Internet
A global computer network providing a variety of information and communication facilities.

Key words
A word or a group of words an Internet user uses to perform a search in a search engine.

Reliability
The degree to which the result of something can be depended on to be accurate.

Results page
Where the answers to a search are displayed.

Search engine
A program that searches for and identifies items in a database. Used especially for finding sites on the World Wide Web.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.8
Hardware Investigators

Key Learning

- To understand the different parts that make up a computer.
- To recall the different parts that make up a computer.

Key Resources

purple mash

2Connect

2Quiz

Key Questions

What is the difference between hardware and software?

Hardware refers to the physical parts of a computer or device. The parts inside the computer casing are often called the components. The parts that are attached to the computer case are called peripherals. Software describes the programs that run on the computer.

Key Vocabulary

Components
Parts inside the computer casing.

CPU
The 'brains' of the computer, where all the calculations take place.

Graphics Card
Also known as a video card and used for displaying images.

Hard Drive
Where the computer stores all your documents, pictures, games and videos.

Input
How information enters the computer.

Motherboard
Main printed circuit board of the computer.

Network Card
Used to connect the computer to a network such as the Internet.

Output
Where information leaves the system.

Peripherals
Parts that are attached to the computer case.

RAM
Allows programs to store information to help the computer run quickly.

Software
The programs that run on the computer.

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.8
Hardware Investigators

Key Images

Motherboard

CPU

RAM

Graphics card

Network card

Monitor

Speakers

Keyboard

Mouse

Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.9
Making Music

Key Learning

- To identify and discuss the main elements of music.
- To understand and experiment with rhythm and tempo.
- To create a melodic phrase.
- To electronically compose a piece of music.

Key Questions

What is the difference between melody and rhythm?

A rhythm is a pattern of sounds based on the length of the notes and the silences. A melody is a pattern of notes based on the pitch and rhythm, which make up a memorable tune.

Key Resources

purple mash

Busy Beats

Key Vocabulary

BPM
Beats per Minute. Changing the BPM changes the speed of the music.

Melody
A sequence of notes which make up a tune.

Rhythm
A pattern of long and short sounds and silences.

Dynamics
How loud or quiet a sound is.

Pitch
How high or low a sound is.

Tempo
How slow or fast a piece of music is.

Synths
Short for synthesizer. Electronic musical instrument sounds.

Harmonious
Notes which sound tuneful and pleasant together.

Pulse
The steady beat of a piece of music.

Texture
The different sounds you can hear in a piece of music.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.9
Making Music

Key Images

Open, save and share work.

Play and add different notes or synths.

Play and add different sample sounds.

Clicking on the rippler triggers the sounds.

Stop the music by pressing this button.

This changes the speed – beats per minute.

Record, stop recording and replay your work.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.10
Introduction to Artificial Intelligence

Key Learning

- To learn what is meant by the term artificial intelligence.
- To be clear about ways artificial intelligence is used in our everyday lives.
- To consider the future of artificial intelligence
- To look at how artificial intelligence is used in music and the arts to create things.

Key Resources

purple mash

Bard

MusicLM

Music LM

Chat GPT

Quick, Draw

Key Questions

What is artificial intelligence?

Artificial intelligence (AI) is when computers and machines can do things that usually need human intelligence, like learning, solving problems, and making decisions.

How is artificial intelligence used in our lives?

Artificial intelligence is used in many ways in our lives. It helps us find information online, play games, use voice assistants, and even control some devices at home.

Key Vocabulary

Algorithm

A precise, step-by-step set of instructions used to solve a problem or achieve an objective.

Artificial Intelligence:

Computer systems able to perform tasks normally requiring human intelligence, such as seeing things, speech recognition, decision-making, and translation between languages.

Data

A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision-making.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.11
micro:bit

Key Learning

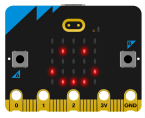
- To understand how sensor inputs from the accelerometer can be used to detect movement, such as when a step is taken.
- To understand how variables can be used to keep track of things in a program.
- To understand how inputs, outputs and computer code work together to make control systems.
- To understand what logic is and how it can be used to make different outputs happen according to different inputs.
- To be able to make a control system and game.

Key Resources

purple mash

2Dos

2Dos



micro:bit

Freecode micro:bit

Key Vocabulary

Accelerometer
A sensor that detects movement.

Data
A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision-making.

Gestures
A type of input where the micro:bit is moved in different ways such as tilting, dropping, shaking.

Infinite loop
A loop that runs forever.

Light sensor
An input that senses the level of light in the real world.

Logic
How computers make decisions based on whether things are true or false.

Selection
Selection is a decision command. When selection is used, a program will choose which bit of code to run depending on a condition.

Sensor
An input that senses things in the real world, such as movement, temperature, and light levels.

Simulation
A program that models a real-life situation. They let you try things out that would be too difficult or dangerous to do in real life.

Variable
A named area in computer memory. A variable has a name and a value. The program can change this variable value. Variables are used in programming to keep track of things that can change while a program is running.

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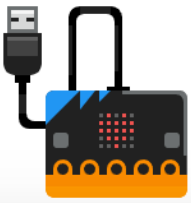
Purple Mash Computing Scheme of Work: Knowledge Organisers

Unit: 4.11
micro:bit

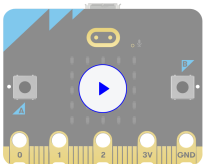
Key Images

Open, close or share a file.

Save your work.

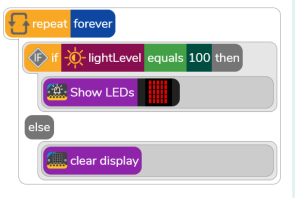


USB transfer.

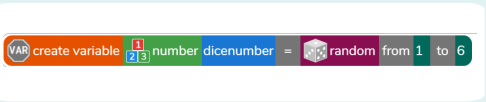


Test code using simulator.

An event triggered by a gesture which adds 1 to the variable 'steps' and outputs this number.



Logic - IF/ELSE.



A variable called 'dicenumber' set to random number 1 to 6

Key Questions

How can sensors, code and outputs work together?

When using micro:bit a user can program the device to sense the environment around it. When particular environmental conditions are met such as the accelerometer detecting movement, code written can then trigger an output response such as displaying a message.

What examples can you think of a good use for variables when programing micro:bits?

Variables are places in a computer memory that store information and can have their content changed by a program.
An example of this might be creating a variable that stores the number of times a micro:bit's accelerometer is triggered. Each time the accelerometer is triggered, the variable count is changed and then this number is outputted to the micro:bit LED.

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