

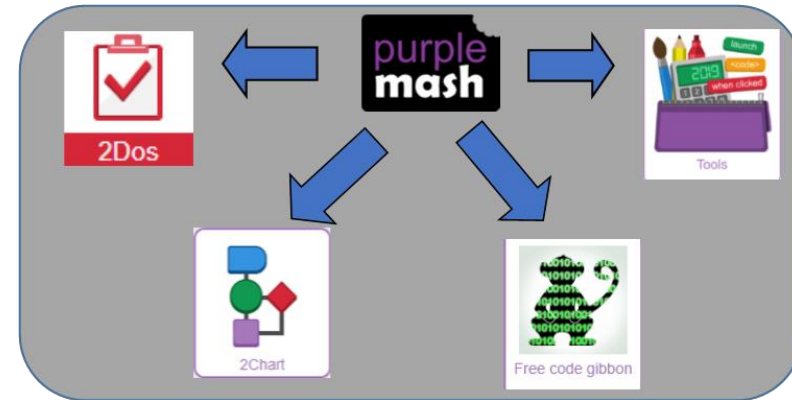


Unit: 4.1 – Coding

Key Learning

- To use selection in coding with the 'if/else' command.
- To understand and use variables in 2Code.
- To use flowcharts for design of algorithms including selection.
- To use the 'repeat until' with variables to determine the repeat.
- To learn about and use computational thinking terms decomposition and abstraction.

Key Resources



Key Vocabulary

Action - Types of commands, which are run on an object. They could be used to move an object 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. Flowchart

Bug - A problem in a computer program that stops it working the way it was designed.

Code Design – Design what a program will look like and what it will do.

Command - A single instruction in a computer program.

Control - These commands determine whether parts of the program will run, how often and sometimes, when.

Debug/Debugging - Looking for any problems in the code, fixing and testing them.

Design Mode - Used to create the look of a 2Code computer program when it is run.

Event – Something that causes a block of code to be run.

Get Input - This puts the text that a user types into the computer's temporary memory to be used to control the program flow.

If - A conditional command. This tests a statement. If the condition is true, then the commands inside the block will be run.

If/Else - 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.

Input - Information going into the computer. Can include moving or clicking the mouse, using the keyboard, swiping and tilting the device.

Output - Information that comes out of the computer e.g. sound.

Object - An element in a computer program that can be changed using actions or properties. In 2Code, buttons, characters and vehicles are types of objects.

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

Selection - This is a conditional/decision command. When selection is used, a program will choose a different outcome depending on a condition.

Simulation - A model that represents a real or imaginary situation.

Timer - Use this 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.

YEAR 4: COMPUTING SCHEME OF WORK - KNOWLEDGE ORGANISER

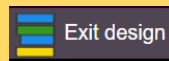
Unit: 4.1 – Coding

Key Images

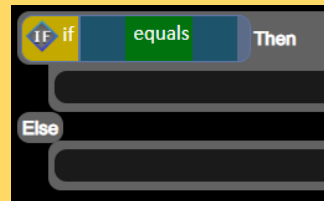
Open design mode in 2Code



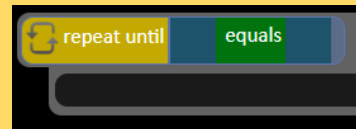
Switch to code mode in 2Code



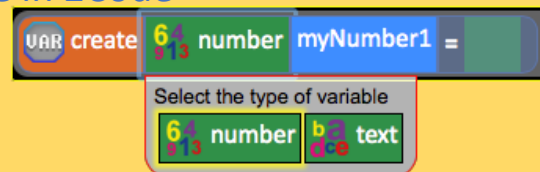
An 'if/else' command



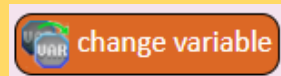
Repeat until command



Creating a variable in 2Code



A change variable block



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 2Code 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.

What do the terms decomposition and abstraction mean. Use examples to explain them.

Decomposition is breaking a task into its component parts so that each part can be coded separately.

If you were coding a game of chess, you could decompose into the moves of the different pieces and the setup of the playing space.

Abstraction is removing unnecessary details to get the program functioning. In the example, the colour and size of the squares is not important to game play.



Unit: 4.2 – Online Safety

Key Learning

To understand how children can protect themselves from online identity theft.

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 Vocabulary

Computer 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.

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.

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

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

Email – Messages sent by electronic means from one device to one or more people.

Identity theft – When a person pretends to be someone else.

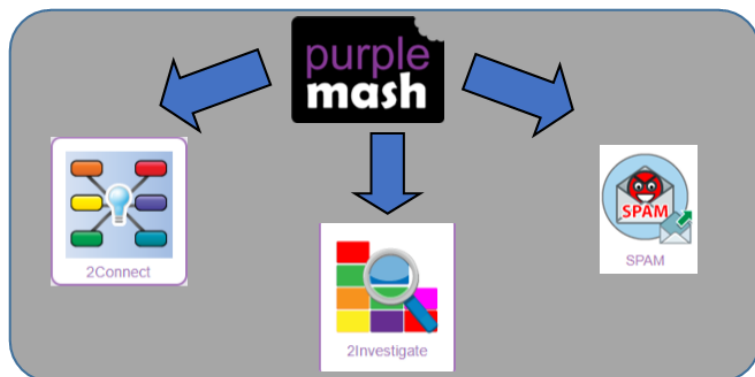
Malware – Software that is specifically designed to disrupt, damage, or gain unauthorized access to a computer system.

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.

Plagiarism – When you use someone else's words or ideas and pass them off as your own.

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

Key Resources





Unit: 4.2 – Online Safety

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.



Unit: 4.3 – Spreadsheets

Key Learning

Formatting cells as currency, percentage, decimal to different decimal places or fraction.

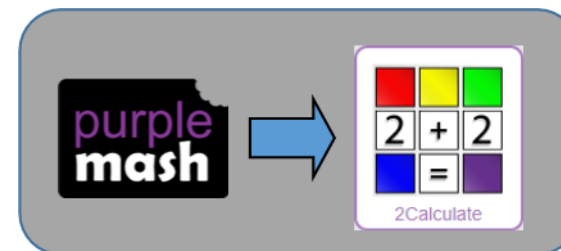
Using the formula wizard to calculate averages.

Combining tools to make spreadsheet activities such as timed times tables tests.

Using a spreadsheet to model a real-life situation.

To add a formula to a cell to automatically make a calculation in that cell.

Key Resources



Key Vocabulary

Average – Symbols used to represent comparing two values

Advance mode – A mode of 2Calculate in which the cells have references and can include formulae.

Copy and Paste – A way to copy information from the screen into the computer's memory and paste it elsewhere without re-typing.

Columns – Vertical reference points for the cells in a spreadsheet.

Cells – An individual section of a spreadsheet grid. It contains data or calculations.

Charts – Use this button to create a variety of graph types for the data in the spreadsheet.

Equals tool – tests whether the entered calculation in the cells to the left of the tool has the correct answer in the cell to the right of the tool.

Formula – Use the formula wizard or type into the formula bar to create a formula in a cell, this will calculate the value for the cells based upon the value of other cells in the spreadsheet.

Formula Wizard – The wizard guides you in creating a variety of formulae for a cell such as calculations, totals, averages, minimum and maximum for the selected cells.

Move cell tool – This tool makes a cell's contents moveable by drag-and-drop methods.

Random tool – Click to give a random value between 0 and 9 to the cell.

Rows - Vertical reference points for the cells in a spreadsheet.

Spin Tool – Adds or subtracts 1 from the value of the cell to its right.

Spreadsheet - A computer program that represents information in a grid of rows and columns. Any cell in the grid may contain either data or a formula that describes the value to be inserted based on the values in other cells.

Timer – When placed in the spreadsheet, click the timer to adds 1 to the value of the cell to its right every second until it is clicked again.



Unit: 4.3 – Spreadsheets

Key Images

Open the main menu	
Save your work	
Open a previously saved file	
Increase or decrease spreadsheet size	
Advanced mode	
Formula wizard	
Format cell toolbox	
Charts	
Totals toolbox	
Image Tools	
Controls Toolbox	
Random number	
Spin	
Equals	
Timer	
To copy	
To cut	
To paste	

Key Questions

<p>How would you add a formula so that the cell shows the percentage score for a test?</p>	<p>Click on the cell where you want the percentage score to be displayed then click the formula wizard button. Click on the cell that contains the score. Choose the ÷ operation then click on the cell that shows what the test was out of. Click OK.</p>
<p>Which tools would you use to create a timed times tables test in 2Calculate?</p>	<p>You could use the random tool, the spin tool, the equal tool and the timer tool.</p>
<p>Give an example of the data that could be best represented by a line graph.</p>	<p>Data where both axes will contain continuous data so that you can see trends in the data. Such as ages and heights, time and temperature, years and costs.</p>
<p>Explain what a spreadsheet model of a real-life situation is and what it can be used for?</p>	<p>It represents the data of a situations for example budgeting for a party, working out how big a field needs to be for a certain number of animals, working out how to spend your pocket money over time.</p>



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 Vocabulary

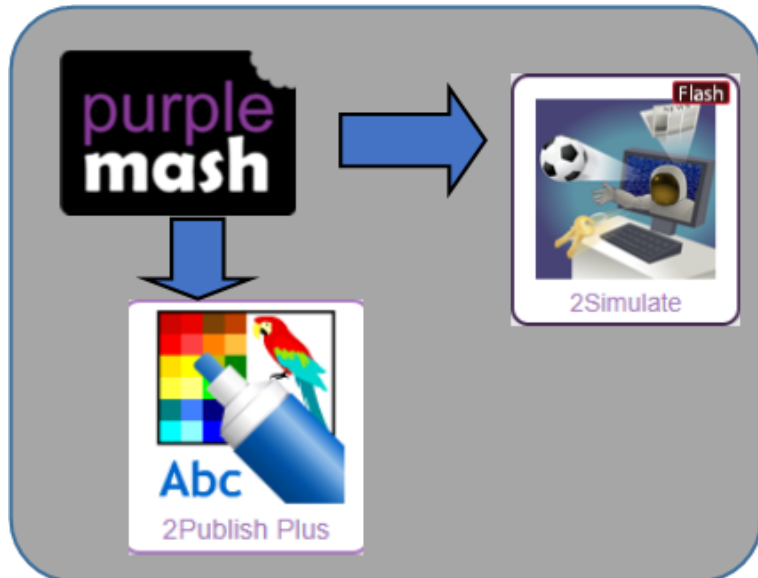
Font – the style of writing one can use when typing on a document.

Bold – to make the text stand out

Italic – a style of formatting when the text is at an angle.

Underline – to draw a line underneath the font.

Key Resources



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.

Key Images

Text Toolbar. Click here to format your text.



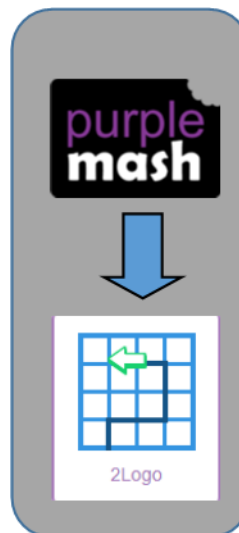


Unit: 4.5 – Logo

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 Resources



Key Vocabulary

- LOGO** – a text-based coding language used to control an on-screen turtle to create mathematical patterns.
- BK** – move backwards a distance of units.
- FD** – move forward a distance of units.
- RT** – turn right a given number of degrees.
- LT** – turn left a given number of degrees.
- REPEAT** – repeat a set of instructions a specified number of times.
- SETPC** – set pen colour to a given colour.
- SETPS** – set the pen thickness.
- PU** – lift the pen up off the screen.
- PD** – put the pen back down on the screen.

Key Images

Open, save 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



Key Questions

What is Logo?

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



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 2Animate 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 Vocabulary

Animation – A process by which still pictures appear to move.

Flipbook – A book with pictures drawn in a way that makes them appear to move when the pages are flicked.

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.

Background – A non-moving image that appears behind the animated images.

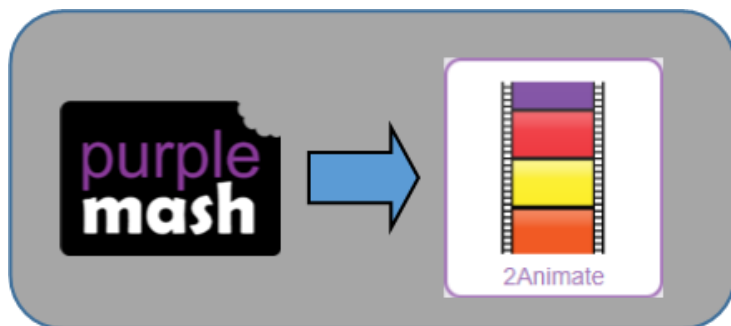
Play – Press this button to make the animation start.

Sound – Music or oral effects that can be added to the animation.

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

Video clip – A short piece of film or animation.

Key Resources





Unit: 4.6 – Animation

Key Images

Open, save and 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.



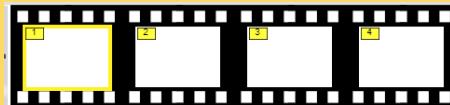
Insert a photograph from a webcam into the animation.



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 frame 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.



Unit: 4.7 – Effective Searching

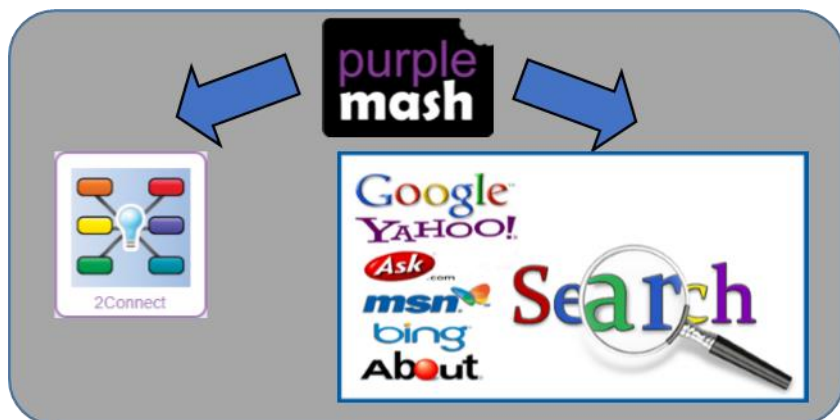
Key Learning

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



Key Vocabulary

Easter egg – 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.

Internet browser – A software application used to locate and display Web pages.

Search – To look for information. In this case on the Internet.

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

Spoof website – Website spoofing is the act of creating a website, as a hoax, with the intention of misleading readers that the website has been created by a different person or organisation.

Website – A set of related web pages located under a single domain name.

Key Questions

What is a search engine?

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



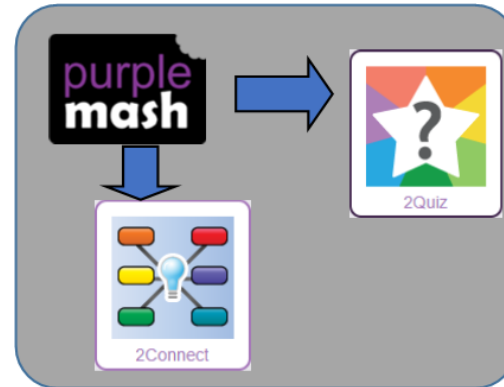
Unit: 4.8 – Hardware Investigators

Key Learning

To understand the different parts that make up a computer.

To recall the different parts that make up a computer.

Key Resources



Key Vocabulary

Motherboard – a printed circuit board containing the main parts of a computer or other device, with connectors for other circuit boards to be slotted into.

CPU – the part of a computer in which operations are controlled.

RAM – allows programs to store information to help the computer run more quickly.

Graphics card – a printed circuit board that controls the output to a display screen.

Network card – an electronic device that connects a computer to a computer network.

Monitor – a screen which displays an image generated by a computer.

Speakers – a device for letting you hear sounds generated by the computer.

Keyboard and mouse – external devices

Key Images

Motherboard



CPU



RAM



Graphics card



Network card



Monitor



Speakers



Keyboard and mouse



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.