

YEAR 3: COMPUTING SCHEME OF WORK - KNOWLEDGE ORGANISER



Unit: 3.1 – Coding

Key Learning

To design algorithms using flowcharts.

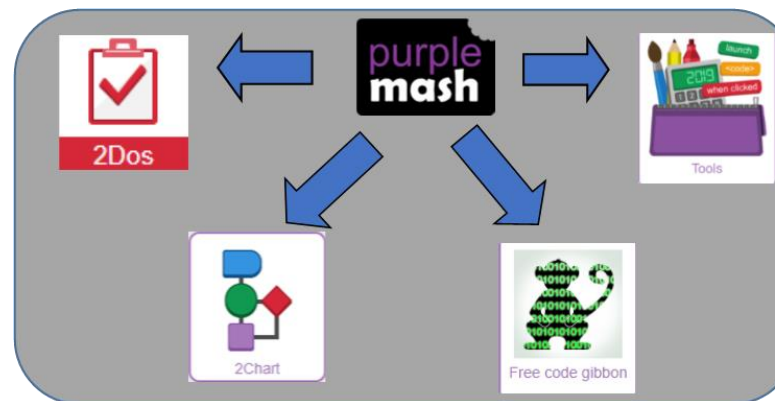
To design an algorithm that represents a physical system and code this representation.

To use selection in coding with the 'if' command.

To understand and use variables in 2Code.

To deepen understanding of the difference between timers and repeat commands.

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.

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

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

Code block - A group of commands that are joined together and are run when a specific condition is met or when an event occurs.

Code Design – Design what your 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.

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

Properties – All objects have properties that can be changed in design or by writing code e.g. image, colour and scale properties.

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

Computer simulation - A program that models a real-life situation.

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

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.



Unit: 3.1 – Coding

Key Images

Open the main menu



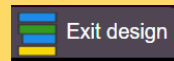
Save your work



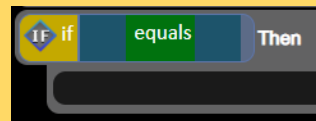
Open design mode in 2Code



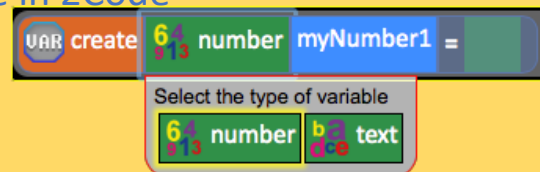
Switch to code mode in 2Code



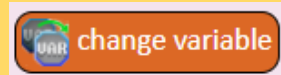
An 'if' command



Creating a variable in 2Code



A change variable block



Key Questions

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

The different objects have different properties. This makes them suitable for different types 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.

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.

Give an example of how you could use a variable in coding.

Some examples are:

- A timer that counts every second and displays the value.
- A value that changes depending upon whether a switch is on or off.
- Storing how many times a user has clicked on an object.

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Unit: 3.2 – Online Safety

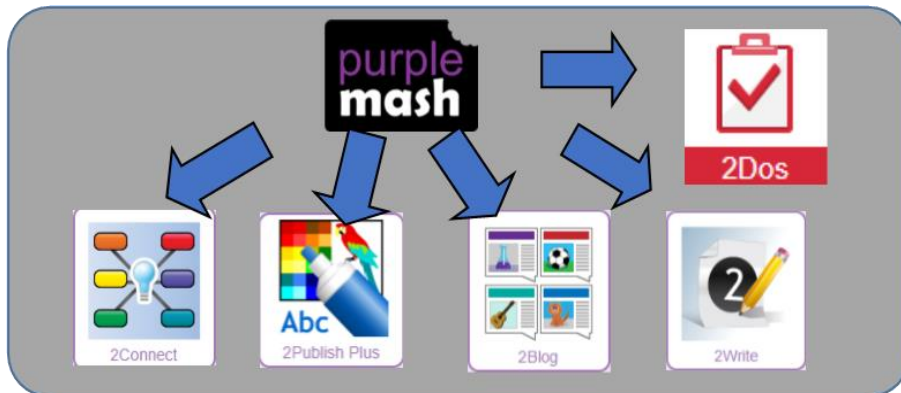
Key Learning

- To know what makes a safe password.
- Methods for keeping passwords safe.
- To understand how the Internet can be used in effective communication.
- To understand how a blog can be used to communicate with a wider audience.
- To consider the truth of the content of websites.
- To learn about the meaning of age restrictions symbols on digital media and devices.

Key Vocabulary

- Password** – A secret word, phrase or combination of letters, numbers and symbols that must be used to gain admission to a site or application such as a website.
- Internet** – A global computer network providing a variety of information and communication facilities, consisting of interconnected networks and computers.
- Blog** – A regularly updated website or web page, typically one run by an individual or small group, that is written in an informal or conversational style.
- Concept map** – A diagram that shows how different objects or ideas are related and connected.
- Username** – An identification used by a person with access to a computer, network, or online service.
- Website** – A set of related web pages located under a single name.
- Webpage** – A page online that makes up one screen of a website.
- Spoof website** – A website that uses dishonest designs to trick users into thinking that it represents the truth.
- PEGI rating** – A rating that shows what age a game is suitable for.

Key Resources

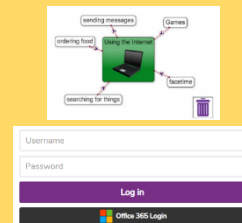


Key Images

2Connect screen with nodes added.

2Blog header

Username and Password screen



What is a password and why should we keep them safe?

A password is a secret word or phrase that allows a user to access a website. Passwords are like toothbrushes in that they should not be shared with anyone else.

Is everything I read on the Internet true?

Just because something is on the Internet doesn't mean that it is true. Some people create spoof websites that pretend to be something else such as a bank website or to provide misleading information.

How do I know if I am old enough to play a computer game?

Computer games, like films, are often not suitable for children. PEGI ratings will show how old a person must be to play a game.



Unit: 3.3 – Spreadsheets

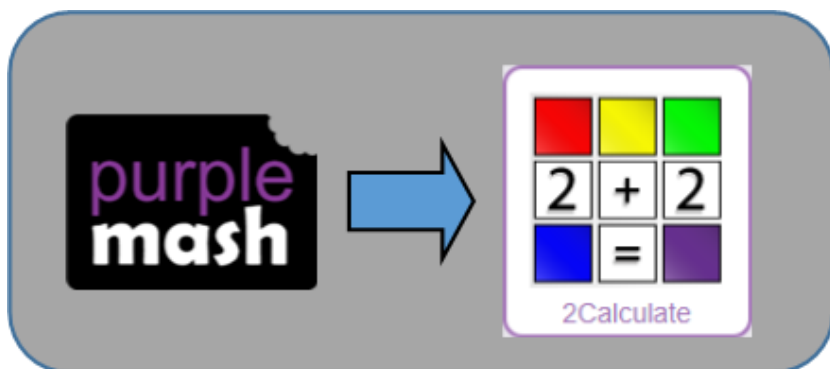
Key Learning

To use the symbols more than, less than and equal to, to compare values.

To use 2Calculate to collect data and produce a variety of graphs.

To use the advanced mode of 2Calculate to learn about cell references.

Key Resources



Key Vocabulary

$< > =$ – Symbols used to represent comparing two values. $a < b$ means 'a is less than b'. $a > b$ means 'a is greater than b'. $a = b$ means 'a is equal to b'. These can be combined, for example $a = < b$ means 'a is equal to or less than b'.

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.

Delete key - Use this key to remove the contents of a cell.

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.

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

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


Spin Tool – Clicking on this in a cell will increase or decrease the value in the cell to the right by 1.


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.




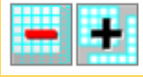
Unit: 3.3 – Spreadsheets

Key Images

Open the main menu 

Save your work 

Open a previously saved file 

Increase or decrease spreadsheet size 







2Calculate toolbox 


Chart control 


2Calculate control toolbox 


Move Cell 


Logic 


Equals 

Spin 

Is less than 

Is more than 

Is equal to 

Advanced mode 

Key Questions

Explain how you would collect data to find out children's favourite school subjects. What sort of graph would you create?

Label one column 'Subject' and list the subjects in this column. In the cells to the right put in the number of children who like this subject. Use the chart button to automatically create a chart. A pie chart would be a suitable choice.

How can you make a 3 times table machine using the spin tool? Could you use the equals tool to check your answer?

Put the spin tool in the left most cell of a row. Type 0 x 3 in the next three cells. Put an equals tool in the next cell in the row. When you spin the spin tool, the question will change. Enter the answer and the equals tool will tell you if it is correct.

Explain how you would locate a cell in the advanced mode?

Cells in advanced mode have rows labelled with numbers, and columns labelled with letters. So, each cell has a number and letter. For example, A1 or D7.

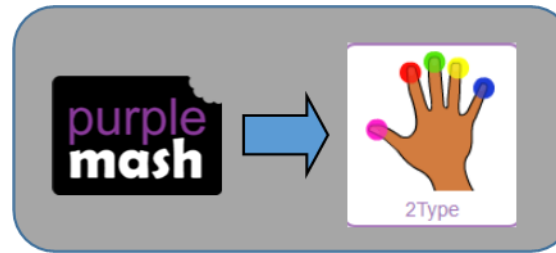
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Unit: 3.4 – Touch Typing

Key Learning

- To introduce typing terminology.
- To understand the correct way to sit at the keyboard.
- To learn how to use the home, top and bottom row keys.
- To practice typing with the left and right hand.

Key Resources

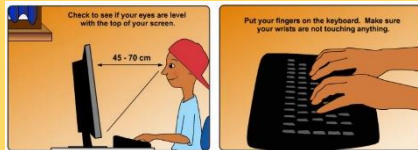


Key Vocabulary

- Posture** – The correct way to sit at the computer.
- Top row keys** – The keys on the top row of the keyboard.
- Home row keys** – The keys on the middle row of the keyboard.
- Bottom row keys** – The keys on the bottom row of the keyboard.
- Space bar** – The bar at the bottom of the keyboard.

Key Images

Posture



Top Row



Home Row



Bottom Row



Space Bar



Key Questions

Why should I have a good posture at the computer?

A good posture is important to help you avoid any injuries that come from repeatedly using the computer incorrectly.

Why should I type certain keys with certain fingers?.

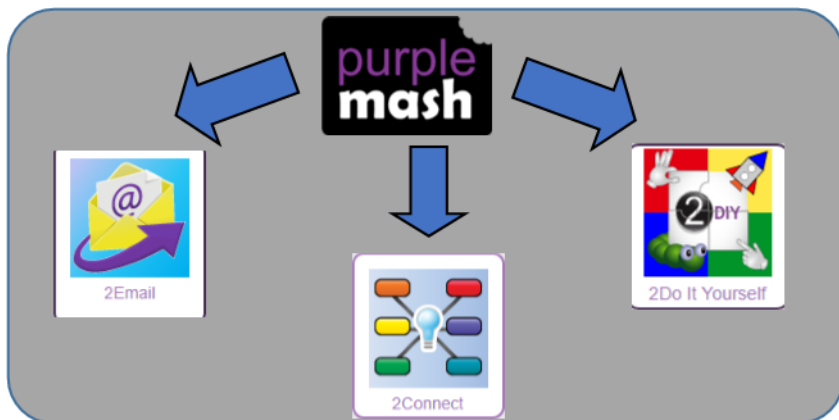
Using specific fingers for specific keys allows you to type more quickly.

Unit: 3.5 – Email

Key Learning

To think about different methods of communication.
To open and respond to an email using an address book.
To learn how to use email safely.
To add an attachment to an email.
To explore a simulated email scenario.

Key Resources



Key Vocabulary

Communication – The sharing or exchanging of information by speaking, writing, or using some other medium such as email.

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

Compose – To write or create something.

Send – To make an email be delivered to the email address it is addressed to.

Report to the teacher – A way in 2Email to tell the teacher if you have received an email that makes you feel upset or scared.

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

Address book – A list of people who you regularly send an email to.

Save to draft – Allows you to save an email that you are working on and send it later.

Password – A secret word, phrase or combination of letters, numbers and symbols that must be used to gain admission to a site or application such as email.

CC – A way of sending a copy of your email to other people so they can see the information in it.

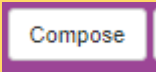
Formatting – Allows you to change the way the text of an email looks. For example, you can make the text bold or underline it.




Unit: 3.5 – Email

Key Images

Click here to write your email.



A list of people you have sent emails to before.



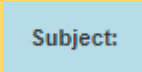
Who is the email to be sent to?



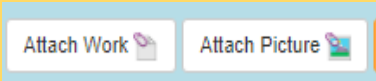
Who else will the email be sent to?




What is the email about?



Allows you to attach work and pictures to the email.



Click the button to send the email.



Formatting bar where you can change how the message looks.



Key Questions

What is email?

Email is a method of sending electronic communication from one device to another.

What should I do if I receive an email that makes me upset or scared?

If you are at school, you should tell the teacher immediately. If you receive the message at home, then you should tell a parent or guardian.

What information can I send in an email?

As well as sending a message, files such as photographs, videos, music and other resources can be attached to the email and sent to the receiver.



Unit: 3.6 – Branching Databases

Key Learning

To sort objects using just 'yes' or 'no' questions.

To complete a branching database using 2Question.

To create a branching database of the children's choice.

Key Vocabulary

Branching database – A way to sort information by asking questions that are normally answered 'yes' or 'no'.

Data – Facts and statistics collected together for information.

Database – A collection of data organised in such a way that it can be searched, and information found easily. Database usually refers to data stored on computers.

Question – Something that is asked or written to try and gain information.

Key Images

Open, save and share files.



Give the database a name.

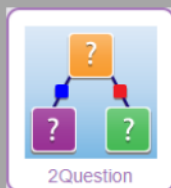
Title

Add a question to begin to sort the information.



Key Resources

purple
mash



Key Questions

What is meant by data?

Facts about something; data can be words, numbers or pictures. For example, the class register contains data about the names, addresses and attendance of the children in the class.

What is a database?

A collection of data organised in such a way that it can be searched, and information found easily. Database usually refers to data stored on computers

What is a branching database?

Used to classify groups of objects. It is used to help identify the objects by answering questions with either 'yes' or 'no'. Branching databases can also be called binary trees.



Unit: 3.7 – Simulations

Key Learning

- To consider what simulations are.
- To explore a simulation.
- To analyse and evaluate a simulation.

Key Resources



Key Vocabulary

Simulation – A computer simulation is 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.

Key Images

2Simulate Main screen.



Locked Out: A lively dog causes problems for Mariza, her baby brother Sam and her mum.



The Dark Side of Elpmis: Trainee astronauts get ready for a mission to the planet Elpmis.



Key Questions

What is a computer 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.

What kind of simulations are there?

Some simulations represent dangerous situations for training such as flying in space, carrying out medical operations or piloting an aeroplane. Others simulate activities for fun, such as racing simulations.

Are there any problems with simulations?

Simulations are often too simple; and unexpected problems can still occur in real life that are difficult to simulate. Simulations can also be very expensive.



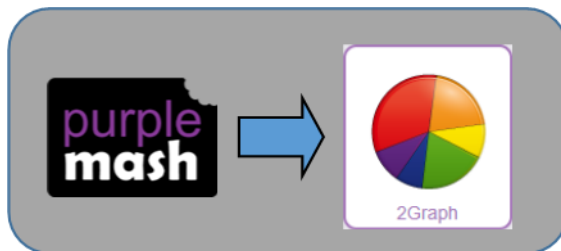
Unit: 3.8 – Graphing

Key Learning

To enter data into a graph and answer questions.

To solve an investigation and present the results in graphic form.

Key Resources



Key Vocabulary

Graph – a diagram showing the value of objects.

Field – a part of a record.

Data – facts and statistics collected together for reference

Bar chart – a graph in which the numerical amounts are shown by the height or length of lines or rectangles of equal width.

Block graph – a graph where a block represents one item.

Line graph – a graph where a line is used to show an amount.

Key Images

Insert the name of the graph here.

Add and remove a row from the graph.

Vertical Bar Chart

Horizontal Bar Chart

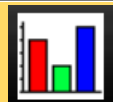
Block Graph

Line Graph

Pie Chart

Data entry table

Chart Title



Item	Number
Total	

Key Questions

What is a graph?

A diagram representing part of a set of data. Graphs can be drawn by hand or on the computer. There are different types of graphs.

What are the frame lines on the graph called?

They are the axes. The axis that goes up and down (vertical) is called the 'y' axis and usually shows the amount. The axis that goes across (horizontal) is called the 'x' axis and shows what is being measured.

What different kinds of graphs are there?

There are lots of different types of graphs including line graph, bar chart and pie chart.