

Unit: 5.1

Coding

Key Learning

- To begin to simplify code.
- To create a playable game.
- To understand what a simulation is.
- To program a simulation using 2Code.
- To know what decomposition and abstraction are in computer science.
- To take a real-life situation, decompose it and think about the level of abstraction.
- To understand how to use friction in code.
- To begin to understand what a function is and how functions work in code.
- To understand what the different variables types are and how they are used differently.
- To understand how to create a string.
- To understand what concatenation is and how it works.

Key Resources

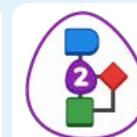
purple
mash



Tools



2Dos



2Chart



Free code gorilla

Key Vocabulary

Action

Types of commands, which are run on an object. They could be used to move an object or change a property.

Abstraction

A way of de-cluttering and removing unnecessary details to get a program functioning.

Algorithm

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

Button

An object that can trigger an event in response to being clicked.

Called

A line of code that triggers a function to be executed.

Co-ordinates

Numbers which determine the position of a point, shape or object in a particular space.

Decomposition

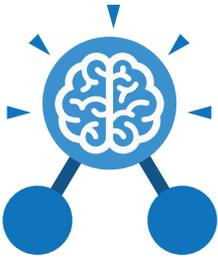
A method of breaking down a task into manageable components. This makes coding easier as the components can then be coded separately and then brought back together in the program.

Event

Something that causes a block of code to be run.

Function

A block or sequence of code that you can access when you need it, so you don't have to rewrite the code repeatedly. Instead, you simply 'call' the function each time you want it.



Unit: 5.1

Coding

Key Vocabulary

If

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

Nesting

When you write a command inside something else e.g. a block of commands could be nested inside a timer.

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.

Physical System

A system or process which happens in the real world using robotics, sensors or motors e.g. traffic lights.

Properties

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

Run

To cause the instruction in a program to be carried out.

Repeat

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

Score

A record of points won or lost in a game.

Sequence

This is when a computer program runs commands in order. In 2Code this can also include "repeat" or a timer.

Simplify/Simplified

To make something easier.

Simulation

A model that represents a real or imaginary situation.

Tab

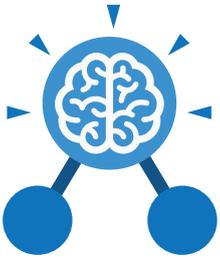
In 2Code, this is a way to organise a program into separate pages (tabs) of code.

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: 5.1

Coding

Key Images



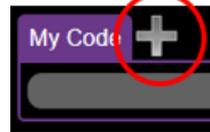
Design

Open design mode in 2Code.



Exit Design

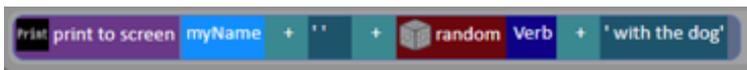
Switch to code mode in 2Code.



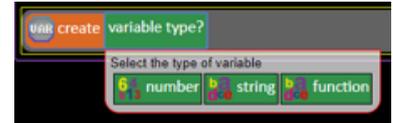
Add a new Tab to your code



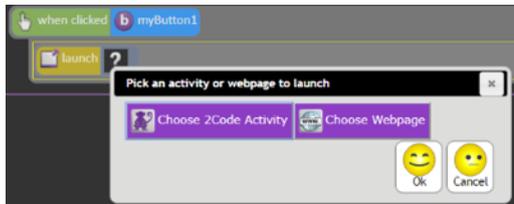
A change variable block.



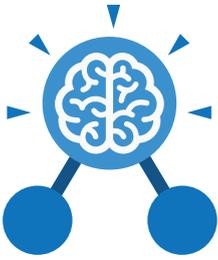
Example of combining variables and strings to print to the screen



Creating a variable in 2Code



Creating a variable in 2Code



Unit: 5.1

Coding

Key Questions

What does simulating a physical system mean?

Creating a program where the objects behave as they would in the real world. For example, a football program that uses angles, speed and friction to simulate kicking a football. When simulating a physical system, you first must break the system down into parts that can be coded (decomposition). The different parts will come together to make the full simulation.

Describe how you would use variables to make a timer countdown and a scorepad for a game.

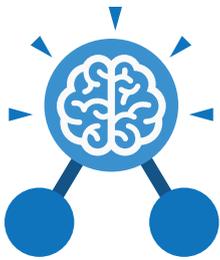
Timer countdown:
Create a timer variable and set it to the starting number of seconds. Add a Timer command that repeats and subtracts 1 every second. Add a text object in design view to display this number.

Score:
Create a variable to store the score, each time the user gains a point, change and display 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: 5.2 Online Safety

Key Learning

- To gain a greater understanding of the impact that sharing digital content can have.
- To review sources of support when using technology and children's responsibility to one another in their online behaviour.
- To know how to maintain secure passwords.
- To understand the advantages, disadvantages, permissions and purposes of altering an image digitally and the reasons for this.
- To be aware of appropriate and inappropriate text, photographs and videos and the impact of sharing these online.
- To learn about how to reference sources in their work.
- To search the Internet with a consideration for the reliability of the results of sources to check validity and understand the impact of incorrect information.
- To ensure reliability through using different methods of communication.

Key Resources



Display Boards



Paint a Picture



Connect



Publish Plus

Key Questions

Who do I tell if I see anything online that makes me upset or scared?

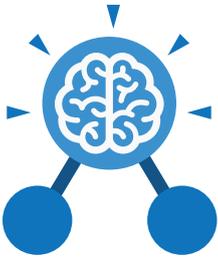
When you are at school, you should tell the teacher or another adult. At home, you should tell your parent or guardian or another adult that you trust.

Why are passwords so important?

Passwords protect your information and stop other people accessing it. Passwords are like a toothbrush; they should not be shared with anyone else.

Why is it important to reference sources in my work?

If you use a book or article written by someone else, then you must reference it, so people know where you got the information from. If you don't do this then it is known as plagiarism.



Unit: 5.2

Online Safety

Key Vocabulary

Online safety

Refers to staying safe when having a presence online.

Smart rules

A set of rules based around the word SMART designed to help you stay safe when online.

Password

A string of characters that allows access to a computer system or service.

Reputable

Having a good reputation.

Encryption

The process of converting information or data into a code, especially to prevent unauthorized access.

Identity theft

The practice of using another person's name and personal information in order to obtain credit, loans, etc.

Shared image

A picture that is shared online for other people to see.

Plagiarism

The practice of taking someone else's work or ideas and passing them off as one's own.

Citations

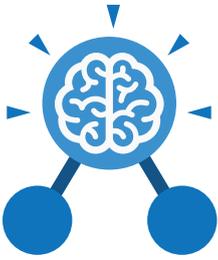
A quotation from or reference to a book, paper, or author, especially in an academic work.

Reference

A mention of a source of information in a book or article including online.

Bibliography

A list of all the books and articles used in a piece of work.



Unit: 5.2

Online Safety



SMART rules- S



SMART rules- M



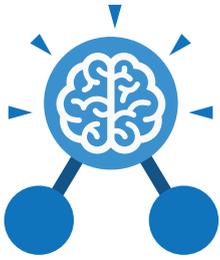
SMART rules- A



SMART rules- R



SMART rules- T



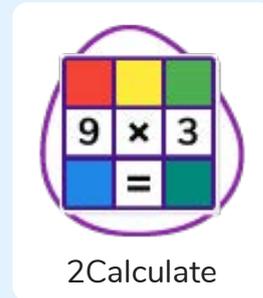
Unit: 5.3

Spreadsheets

Key Learning

- To use formulae within a spreadsheet to convert measurements of length and distance.
- To use the count tool to answer hypotheses about common letters in use.
- To use a spreadsheet to model a real-life problem.
- To use formulae to calculate area and perimeter of shapes.
- To create formulae that use text variables.
- To use a spreadsheet to help plan a school cake sale.

Key Resources



Key Questions

How would you add a formula so that the cell shows the product of two other cells?

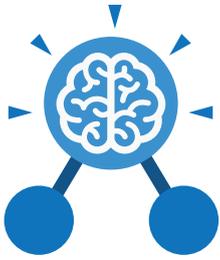
Click on the cell where you want the product to be displayed then click the formula wizard button. Click on the cell that contains the first number. Choose the x operation then click on the second number. Click OK.

What would you use in 2Calculate to have a cell that automatically calculates the number of days since a certain date?

You could use formulae and the totalling tools. To make the spreadsheet easier to understand, you could use named variables.

Explain what a spreadsheet model of a real-life situation is and what it can be used for?

It represents the data of a situation 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. Using the existing data to predict what time your shadow will be a certain length etc.



Unit: 5.3

Spreadsheets

Key Vocabulary

Average Function

A feature that allows a user to find the average values of selected cells.

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

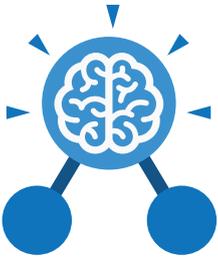
Adds or subtracts 1 from the value of the cell to its right.

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 add 1 to the value of the cell to its right every second until it is clicked again.



Unit: 5.3

Spreadsheets

Key Images



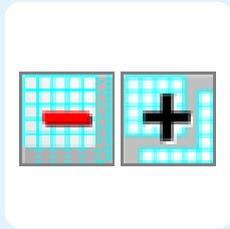
Open, close or share a file



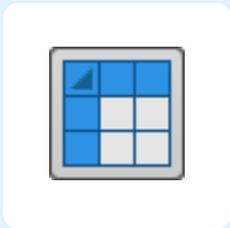
Save your work



Open a previously saved file



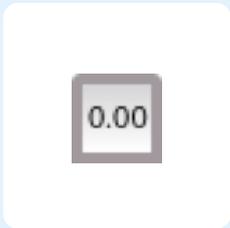
Increase or decrease spreadsheet size



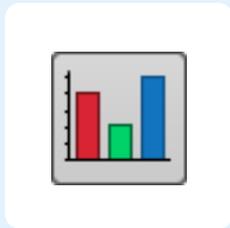
Advanced mode



Formula Wizard



Format Cell Toolbox



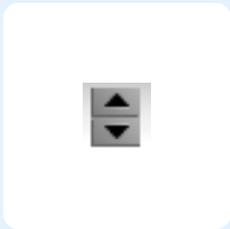
Charts



Totals toolbox



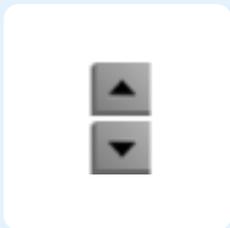
Image Tools



Controls Toolbox



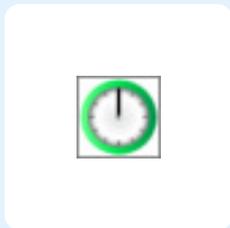
Random Number



Spin



Equals



Timer



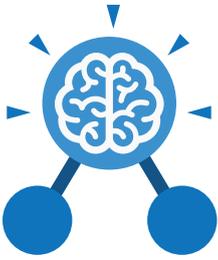
To Copy



To Cut



To Paste



Unit: 5.4 Databases

Key Learning

- To learn how to search for information in a database.
- To contribute to a class database.
- To create a database around a chosen topic.

Key Resources

**purple
mash**



2Investigate



Avatar builder

Key Questions

What is a database?

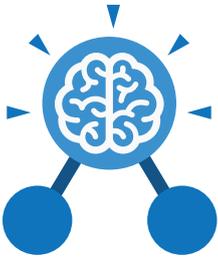
A collection of data organised in such a way that it can be searched, and information found easily. Database usually refers to data stored on computers.

Why is the collaborative feature important?

Making a database collaborative allows lots of people to enter information into the database at the same time. This is a lot quicker than one person entering the data by themselves.

In what ways can I sort information in a database?

A database can hold lots of information so it is essential that information can be effectively investigated. In 2Investigate, data can be searched and sorted in a variety of ways. It can also be presented pictorially.



Unit: 5.4 Databases

Key Vocabulary

Avatar

An icon or figure representing a person in a video game, Internet forum, etc.

Collaborative

Produced by, or involving, two or more parties working together.

Record

A collection of data about one item entered into a database.

Binary tree (branching database)

A way to sort information by dividing the information into groups based upon questions with yes or no answers.

Data

Facts and statistics collected together for information.

Sort, Group and Arrange

Different ways to sort information in a database to it is easy to read, understand and interpret.

Charts

Representing information in a pictorial form.

Database

A set of data that can be held in a computer in a format that can be searched and sorted for information.

Statistics and reports

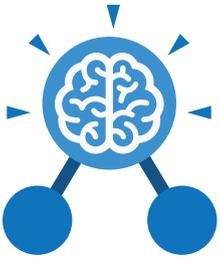
To produce information about data in a database.

Find

Search for information in a database.

Table

Sorting information into rows and columns.



Unit: 5.4 Databases

Key Images



Open, close or share
a file



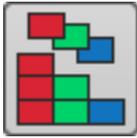
Design a new
database



Add a record to the
database



Find information in
the database



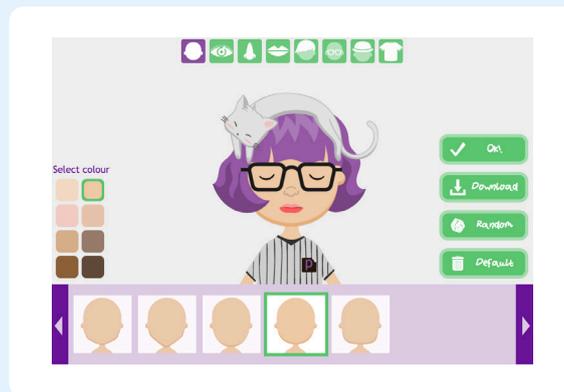
Sort, group and
arrange information



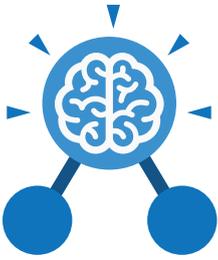
Statistics and reports



Represent the
information as a
chart



Avatar creator



Unit: 5.5

Game Creator

Key Learning

- To plan a game.
- To design and create the game environment.
- To design and create the game quest.
- To finish and share the game.
- To self and peer evaluate.

Key Resources



2DIY3D

Key Vocabulary

Animation

Creating an illusion of movement.

Image

In this case, a picture displayed on the computer screen.

Texture

High frequency detail or colour information on a computer-generated graphic.

Computer game

A game played using a computer, typically a video game.

Instructions

Detailed information about how something should be done or operated.

Perspective

Representing three-dimensional objects on a two-dimensional surface to give the right impression of their height, width, depth, and position in relation to each other.

Customise

Modify (something) to suit an individual or task.

Interactive

Responding to a user's input on a computer or device.

Playability

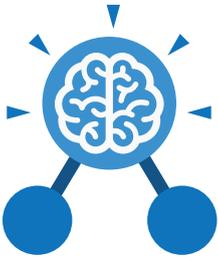
A measure of either the ease by which a video game may be played, or of the overall quality of its gameplay.

Evaluation

The making of a judgement about the value of something.

Screenshot

An image of the data displayed on the screen of a computer or mobile device.



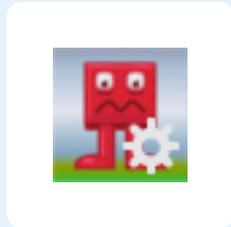
Unit: 5.5

Game Creator

Key Images



Open, close and share work



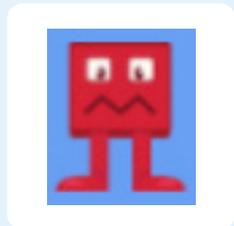
Change the settings of your game



Insert treasure into your game



Add images to your game



Insert enemies into your game



Drag to set the start position of your game



Play your game

Key Questions

What is the 2DIY3D tool on Purple Mash?

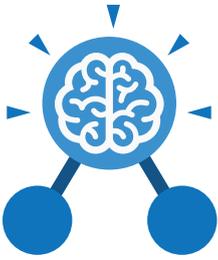
2DIY 3D allows users to create a playing area, such as a maze, in 2D and then turn it into a 3D computer game. The aim is to avoid the 'baddies' and collect 'treasure'.

What makes a good computer game?

A good game designer gives the player continuous challenges in a visually stimulating environment, each of which leads to another challenge, to keep the game challenging and fun.

Why is it important to continually evaluate your game?

Evaluating your game as you make it allows you to think about ways in which it can be improved. Evaluation may also involve the views of other people who play your game.



Unit: 5.6

3D Modelling

Key Learning

- To be introduced to 2Design and Make and the skills of computer aided design.
- To explore the effect of moving points when designing.
- To design a 3D Model to fit certain criteria.
- To refine and print a model.

Key Resources



2D&M

Key Vocabulary

CAD – Computer aided Design

A CAD computer program or app allows you to design a 3D object or environment in 2D and visualise it in 3D on the screen from many angles.

Modelling

The activity of making models.

3D

Something that has three dimensions; height, width and depth.

Viewpoint

A person's opinion or point of view.

Polygon

An object with at least three straight sides and angles, and typically five or more.

2D

Something that has only two dimensions; height and width.

Net

A pattern that you can cut and fold to make a model of a solid shape.

3D Printing

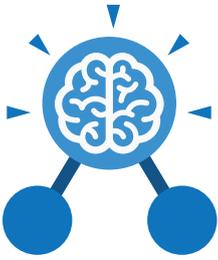
The action or process of making a physical object from a three-dimensional digital model, typically by laying down many thin layers of a material in succession.

Points

An exact position or location on a 2D surface.

Template

Something that serves as a model for others to copy.



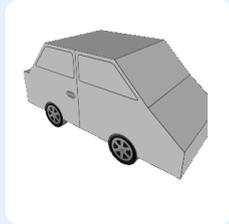
Unit: 5.6

3D Modelling

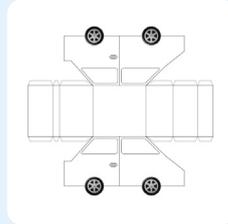
Key Images



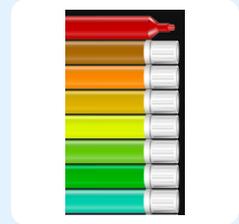
2D Image



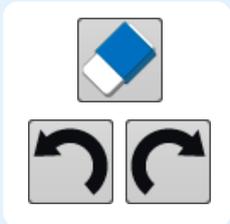
3D Image



Net View



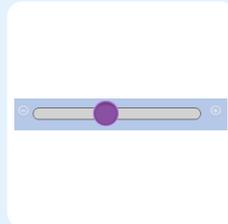
Colour Palette



Clear, Undo and Redo



Fill Options



Magnify

Key Questions

What are the different view of an object available in 2Design and Make?

Net, Points and 3D.

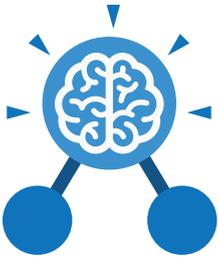
How can the objects designed in 2Design and Make be turned into 3D objects?

You can print the net and then cut and fold this into shape or you can convert the file into a format recognised by 3D printers.

How is CAD software used in industry? Give some examples.

It is used to design 3D objects in a 2D environment.

Some examples are; Architectural plans for buildings; designing layouts for interiors; designing objects such as packaging and designing mechanical components; designing shoes and clothing.



Unit: 5.7

Concept Maps

Key Learning

- To understand the need for visual representation when generating and discussing complex ideas.
- To understand the uses of a 'concept map'.
- To understand and use the correct vocabulary when creating a concept map.
- To create a concept map.
- To understand how a concept map can be used to retell stories and information.
- To create a collaborative concept map and present this to an audience.

Key Resources



2Connect

Key Vocabulary

Audience

People giving attention to something.

Concept Map

A tool for organising and representing knowledge. They form a web of ideas which are all interconnected.

Node

A way to represent concepts or ideas.

Collaboratively

Something that is produced by, or involves, two or more parties working together.

Connection

A relationship or link between two nodes or ideas.

Thought

An idea or opinion produced by thinking or occurring suddenly in the mind.

Concept

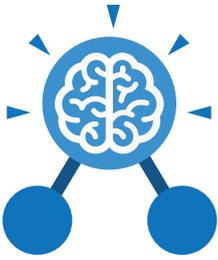
An idea.

Idea

An opinion or belief.

Visual

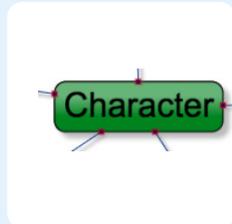
A picture, piece of film or display used to illustrate or accompany something.



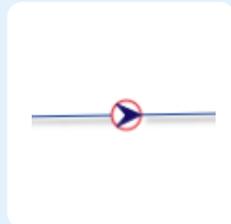
Unit: 5.7

Concept Maps

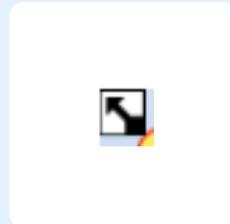
Key Images



Node



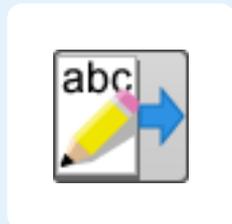
Connection



Resize node



Edit node



Show story



Begin Presentation



Collaboration Off



Collaboration On

Key Questions

What is a concept map?

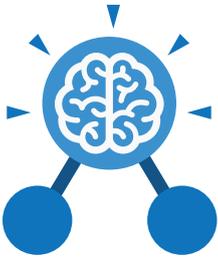
A concept map is a pictorial way of showing relationships between concepts and ideas. A concept map allows you to show information, pictures and links to support an idea or concept.

How is information arranged on a concept map?

On a concept map ideas or concepts are organised into nodes which are linked together with lines to show how the concepts and ideas link together.

How does a concept map help share ideas?

A concept map in 2Connect allows many users to contribute to the map which means that ideas or concepts can be quickly amended or additional information provided.



Unit: 5.8

Word Processing with Google Docs

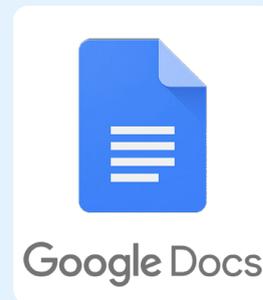
Key Learning

- To know what a word processing tool is for.
- To add and edit images to a word document.
- To know how to use word wrap with images and text.
- To change the look of text within a document.
- To add features to a document to enhance its look and usability.
- To use the sharing capabilities in Google Docs.
- To use tables within to present information.
- To introduce children to templates.

Key Resources



2Connect



Key Questions

What is a word processing tool used for?

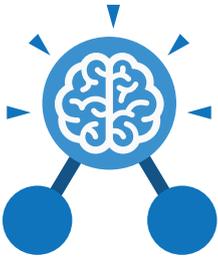
A word processing tool is used to create, edit and print off a document. This can contain text, images, tables or charts. Documents are a type of file that portray information.

What features can you use to make a document more readable?

You can change the font format to give the document a theme and make it more readable. By changing the paragraph formatting, you can ensure the words are spaced evenly. You can add images and use text wrapping to ensure they are positioned well on the page.

How do you successfully add an image to a document?

If you have an image saved onto your computer, you click on insert – pictures – insert image from this device. You can resize and move the image and ensure it fits well on the page by changing the text wrap setting.



Unit: 5.8

Word Processing with Google Docs

Key Vocabulary

Copyright

When an image, logo or idea has a legal right to not be copied or used without the owner's permission.

Cursor

The flashing vertical line that shows your place in a document.

Document

A type of file which shows written information and/or images and sometimes charts and tables.

Font

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

In-built styles

A bank of ready-made styles which you can use to make sure your style (font, headers, spacing, size etc) is consistent throughout the document.

Merge cells

A tool you can use when making a table to join cells which are next to each other in columns or rows.

Paragraph formatting

When you change the format of the text in a paragraph, including how the text is aligned and spaced.

Readability

How easy and pleasant it is to read and understand a document.

Template

A ready-made outline of a document you might want to adapt, such as a letter or certificate.

Text formatting

When you change the format of text on a page, including the font and the size and whether it is bold, underlined or in italics.

Text wrapping

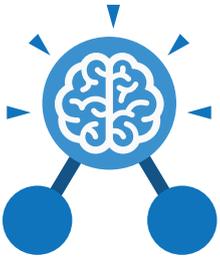
A feature which helps you place and position an image neatly on a page or within a paragraph of text.

Textbox

A way to include text in a position that you want out of the usual flow of the document.

Word Processing tool

A programme which allows you to write, edit and print different documents.



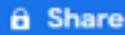
Unit: 5.8

Word processing with Google Docs

Key Images



Open a new document



Access sharing options



Return to docs home



Undo key



Text formatting



Text Alignment



Insert image



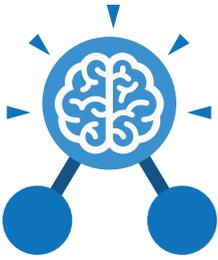
Crop image



Text wrapping



Clear formatting



Unit: 5.8

Word Processing with Microsoft Word

Key Learning

- To know what a word processing tool is for.
- To add and edit images to a word document.
- To know how to use word wrap with images and text.
- To change the look of text within a document.
- To add features to a document to enhance its look and usability.
- To use tables within MS Word to present information.
- To introduce children to templates.
- To consider page layout including heading and columns.

Key Resources



2Connect



Key Questions

What is a word processing tool used for?

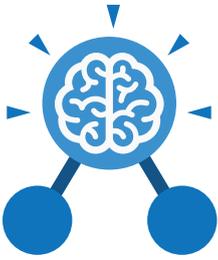
A word processing tool is used to create, edit and print off a document. This can contain text, images, tables or charts. Documents are a type of file that portray information.

What features can you use to make a document more readable?

You can change the font format to give the document a theme and make it more readable. By changing the paragraph formatting, you can ensure the words are spaced evenly. You can add images and use text wrapping to ensure they are positioned well on the page.

How do you successfully add an image to a document?

If you have an image saved onto your computer, you click on insert – pictures – insert image from this device. You can resize and move the image and ensure it fits well on the page by changing the text wrap setting.



Unit: 5.8

Word Processing with Microsoft Word

Key Vocabulary

Copyright

When an image, logo or idea has a legal right to not be copied or used without the owner's permission.

Cursor

The flashing vertical line that shows your place in a Word document.

Document

A type of file which shows written information and/or images and sometimes charts and tables.

Font

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

In-built styles

A bank of ready-made styles which you can use to make sure your style (font, headers, spacing, size etc) is consistent throughout the document.

Merge cells

A tool you can use when making a table to join cells which are next to each other in columns or rows.

Paragraph formatting

When you change the format of the text in a paragraph, including how the text is aligned and spaced.

Readability

How easy and pleasant it is to read and understand a document.

Template

A ready-made outline of a document you might want to adapt, such as a letter or certificate.

Text formatting

When you change the format of text on a page, including the font and the size and whether it is bold, underlined or in italics.

Text wrapping

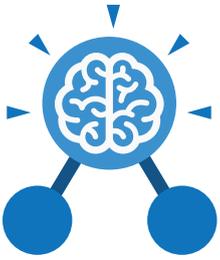
A feature which helps you place and position an image neatly on a page or within a paragraph of text.

Word Art

A way to treat text as a graphic so that you can add special effects to text.

Word Processing tool

A programme which allows you to write, edit and print different documents.



Unit: 5.8

Word Processing with Microsoft Word

Key Images



Open a new document



Open an existing document



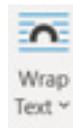
Save your work



Undo key



Insert a table



Text wrapping



Font Category

Design

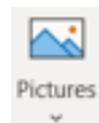
Design tab where you can change the style of the document

Insert

Insert tab where you can add an object such as a picture or table

Home

Home tab where many editing tools are found



Insert a picture