Purple Mash Computing Scheme of Work: Knowledge Organisers

# 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 a 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

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

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

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

**Concatenation**
The action of linking a mixture of strings, variable values and numbers together in a series.

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

**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.

**Efficient**
In coding, simplified code runs faster and uses less processing memory, it is said to be more efficient.

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

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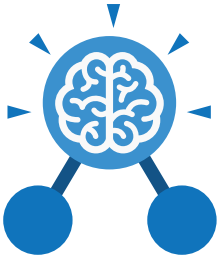




# Unit: 5.1
# Coding

## 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**) or when objects interact (collision). In 2Code, the event commands are used to create blocks of code that are run when events happen.

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

### Physical System
In this context, this is any object or situation that can be analysed and modelled. For example modelling the function of a traffic light, modelling friction of cars moving down surfaces or modelling the functions of a home's security system.

### 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.

### Object
Items in a program that can be given instructions to move or change in some way (action). In 2Code Gorilla, the **object type**s are button number, input, text, shape turtle, character, object, vehicle, animal.

### 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
A conditional decision command. When selection is used, a program will choose which bit of code to run depending on a condition. In 2Code selection is accomplished using '**if**' or '**if/else**' statements.

### 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.

### Output
Information that comes out of the computer e.g. **sound**, **prompt**, **alert** or **print to screen**.

### Repeat
This command can be used to make a block of commands run a set number of times, until a condition is met or forever.

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

### Simplify
In coding this is used to describe modifying the code to complete the same process with less lines of code.

Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.1
# Coding

## Key Vocabulary

**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. Variables are used in programming to keep track of things that can change while a program is running. In 2Code, variables can be **strings**, **numbers** or **computer-generated** variables to control objects of a type.

## Key Images

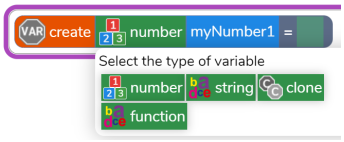

Open design mode in 2Code.


Switch to code mode in 2Code.

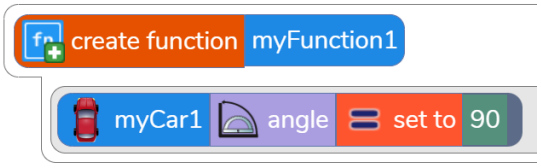

Add a new Tab to your code


A change variable block.


Example of combining variables and strings to print to the screen




Creating a variable in 2Code




Creating a function in 2Code


Calling a function in 2Code

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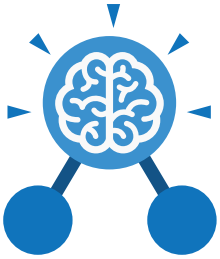



# Unit: 5.1
## Coding

### 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.

**Give examples of how you could use the Launch command in 2Code.**

Clicking on a button or other object in the program to opens another 2Code program or a webpage.

**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.

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# 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

purple mash


Display Boards


2Paint a Picture


2Connect

2Publish 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.

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# Unit: 5.2
# Online Safety

## Key Vocabulary

**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.

**Identity theft**
When someone pretends to be another person online. It can be done for financial gain or to steal others' private information.

**PEGI ratings**
These show the age that digital content is suitable for and the type of content that it contains.

**Password**
The 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.

**Reliable source**
A source of information that provides thorough, well-reasoned details based on valid evidence.

**Collaborate**
To work jointly on an activity or project.

**Creative Commons Licence**
A non-profit organisation who provide free licences for creators to use. If an image has a CC licence, you may usually use the image for non-commercial purposes. You must still give credit to the original creator of the image.

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

**Personal information**
Identifying information about yourself such as your name, address and telephone number.

**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.

**Communication**
A way of exchanging information for example, email, blogs, speaking, writing.

**Encrypt**
The translation of data into a secret code to achieve data security.

**Ownership**
Who has permission or can give permission to use or edit a resource or part of the resource.

**Phishing**
The 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.

**Spoof**
An imitation of something that appears to look genuine.

**Validity**
The quality of something being logically or factually sound.

# Unit: 5.2
## Online Safety


SMART rules- S


SMART rules- M


SMART rules- A


SMART rules- R


SMART rules- T

Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.3
# Spreadsheets

## Key Learning

- To use formulae within a spreadsheet to convert measurements of length and distance.
- To use a spreadsheet to model a real-life problem.
- To use spreadsheet tools to investigate probability.
- To use the count tool to answer hypotheses about common letters in use.

## Key Resources

purple mash

2Calculate

## Key Questions

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

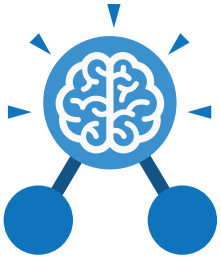
Click on the cell where you want the product to be displayed then click the formula wizard button. Click on the cell that contains the first number. Choose the x operation then click on the second number. Click OK.

**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.



Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.3
# Spreadsheets

## Key Spreadsheet Vocabulary

**Budget**
The amount of money available to spend on a project.

**Columns**
Boxes running vertically in a spreadsheet.

**Computational model**
Creating or using a simulation (a model) of a real-life situation, on a computer.

**Count tool**
Counts how many of a variable there are in a spreadsheet.

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

**Dice tool**
Simulates the roll of a die to a random number between 1 and 6 when you click on it.

**Expenses**
A cost associated with a project. For example, the cost of buying ingredients for a cake sale, materials for making banners etc.

**Format**
The way that text looks. Formatting cells is helpful for interpreting a cell's contents for example you might want to format a cell to show a fraction e.g. 4 ½ or include units such as £ or $.

**Formula**
A group of letters, numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae.

**Formula Bar**
An area of the spreadsheet into which formulae can be entered using the '=' sign to open the fomula.

**Hypothesis**
A concept or idea that you test through research and experiments. The plural of hypothesis is hypotheses.

**Profit**
Money that is earned in trade or business after paying the costs of producing and selling goods and services. For example, the amount of money there is from a cake sale when the cost of creating them has been subtracted.

**Totalling tool**
Adds up the value of every cell above it, next to it or diagonal to it according to which total tool is selected.

**Rows**
Boxes running horizontally in a spreadsheet.

Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.3
## Spreadsheets

### Key Images

Open, close or share a file

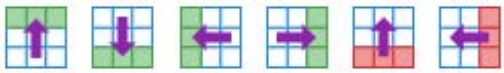
Save your work

Open a previously saved file


Format cells

Tools

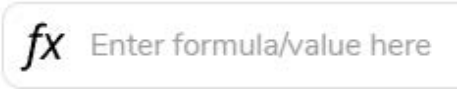
Charts and Graphs



Insert or Remove rows or columns

Count tool

Dice tool




Formula bar

Spin tool

Random number tool

Equals tool

Lock tool


To Copy


To Cut


To Paste

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# 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?

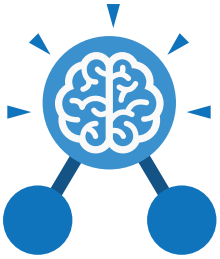
A collection of data organised in such a way that it can be searched, and information found easily. Database usually refers to data stored on computers.

### 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

**Arrange**
Sorting information in order against a search request.

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

**Chart**
A diagram that represents data. Charts include graphs and other diagrams such as pie charts or flowcharts.

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

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

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

**Field**
A heading in a database record against which information is entered.

**Group**
Putting similar pieces of information together in a database so it is easy to read, understand and interpret.

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

**Database Report**
A way of producing a written paragraph that incorporates the data from the fields and records of the database.

**Search**
A way of finding information.

**Statistics**
The study and manipulation of data, including ways to gather, review, analyse, and draw conclusions from data.

**Sort**
Organising data by a rule such as alphabetical or numerical.

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# 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

Table view of records


Avatar creator

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# 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

purple mash

2DIY3D

### Key Vocabulary

**Evaluation**
To critically examine a program. It involves collecting and analysing information about a program's activities, characteristics, and outcomes.

**Instructions**
Detailed information about how something should be done or operated.

**Scene**
The place where an incident in real life or fiction occurs or occurred.

**Feedback**
In this case, share information with the creator about how the game could be improved.

**Promotion**
The publicising of a product, in this case a game, so as to increase sales or public awareness.

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

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

**Quest**
To find or do something.

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

**Theme**
In this case, the subject of the game.

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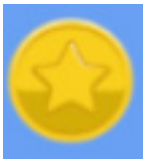
# Unit: 5.5
# Game Creator

## Key Images

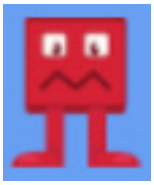
Open, close and share work

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.

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# 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

purple mash

2D&M

## Key Vocabulary

**2D**
Something that has only two dimensions; height and width.

**3D**
Something that has three dimensions; height, width and depth.

**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.

**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.

**Design Brief**
A document for a design project, defining the core details, including the goal and strategy.

**Net**
What a 3D shape would look like if it was unfolded and opened out flat.

**Pattern Fill**
A tool where you can add a customised repeating pattern to the surface of the net.

**Points**
The points on a 3D net which create the corners of the 3D shape.

**Template**
Something that serves as a model for others to copy and edit.

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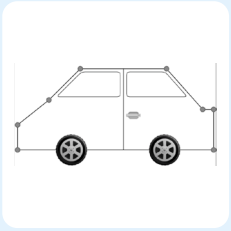
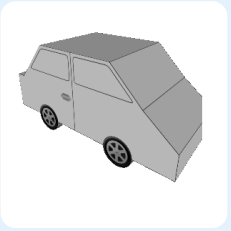
# Unit: 5.6
# 3D Modelling

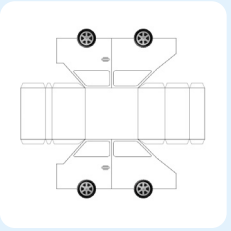
## Key Images



2D Image

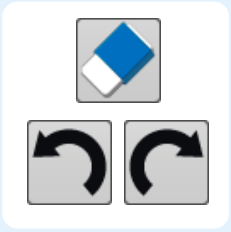


3D Image



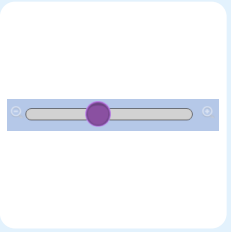
Net View

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.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# 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

**Concept**
An idea in the form of a question.

**Collaborate**
Participating in an activity with more than one person working together.

**Story Mode**
A way to use a 2Connect concept map to create a piece of text.

**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. Can contain text and\or an image.

**Connection**
Represent a relationship or link between two nodes or ideas.

**Presentation Mode**
A mode on 2Connect where nodes and connections are revealed gradually to be accompanied by a verbal presentation.

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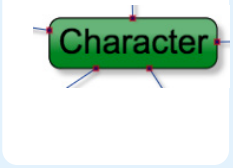
# Unit: 5.7
# Concept Maps

## 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.

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# 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

purple mash

2Connect

Google Docs

## 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.

Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.8
# Word Processing with Google Docs

## Key Vocabulary

**Bulleted lists**
A list with bullet points, used when the items do not have an order.

**Copy and Paste**
A way of transferring words or images from one location to another.

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

**Hyperlink**
A clickable link from a document to another location, often a webpage.

**Formatting**
Changing the look of a document by selecting fonts, colours and how the text is spaced or aligned.

**Word Processing tool**
A program which allows you to write, edit and print different documents.

**Caps Lock**
A button on the computer keyboard which changes the letters to upper case (capital letters).

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

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

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

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

**Captions**
Text under an image to provide more information about what is shown.

**Creative Commons**
Images where the copyright holder, often the creator, has given permission for the image to be used as long as the creator is attributed.

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

**Page Orientation**
The direction that the rectangular page is viewed. Portrait means longer side going upwards, Landscape means the longer side going sideways.

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

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

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.8
# Word processing with Google Docs

## Key Images

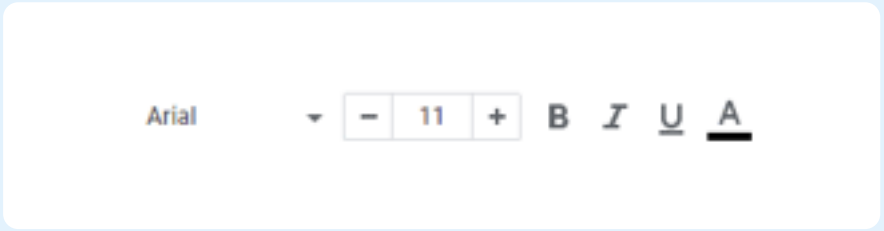
Open a new document


Access sharing options

Return to docs home



Undo key

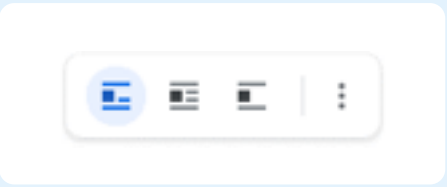



Text formatting

Text Alignment

Insert image

Crop image



Text wrapping

Clear formatting

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# 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

purple mash

2Connect

Microsoft Word

### 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.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.8
## Word Processing with Microsoft Word

### Key Vocabulary

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**Page Orientation**
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**Readability**
How easy and pleasant it is to read and understand a document.

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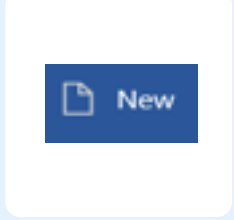
Purple Mash Computing Scheme of Work: Knowledge Organisers

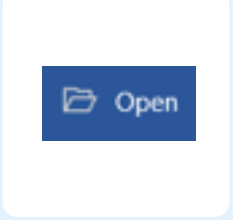
# Unit: 5.8

## Word Processing with Microsoft Word

### Key Images




Open a new document



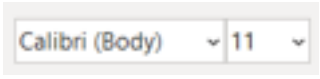

Open an existing document

Save your work

Undo key


Insert a table


Text wrapping

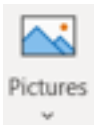



Font Category


Design tab where you can change the style of the document


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


Home tab where many editing tools are found




Insert a picture

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.8

## Word Processing with Microsoft Word (Tablet App)

### 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 use templates.

### Key Resources

purple mash

2Connect

### Key Questions

**What is a word processing tool used for?**

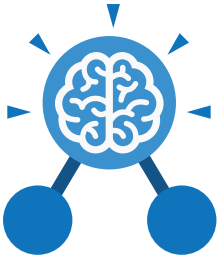
A word processing tool is used to create, edit and print off a document. This can contain text, images, tables or charts. Documents are a type of file that portray information as text, images and charts.

**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?**

Save the image to your device. Tap on 'Insert' in the top menu bar – tap the picture icon and locate the saved image on the device. You can resize and move the image and ensure it fits well on the page by changing the text wrap setting.



Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.8

## Word Processing with Microsoft Word (Tablet App)

### Key Vocabulary

**Bulleted lists**
A list with bullet points, used when the items do not have an order.

**Caps Lock**
Double-tapping the shift key on the on screen keyboard to ensure any letters types display as upper case (capital letters).

**Captions**
Text under an image to provide more information about what is shown.

**Copy and Paste**
A way of transferring words or images from one location to another.

**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**
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**Formatting**
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**Hyperlink**
A clickable link from a document to another location, often a webpage.

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

**Page Orientation**
The direction that the rectangular page is viewed. Portrait means longer side going upwards, Landscape means the longer side going sideways.

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

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**Word Processing tool**
A program which allows you to write, edit and print different documents.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

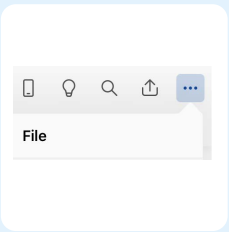
# Unit: 5.8

## Word Processing with Microsoft Word (Tablet App)

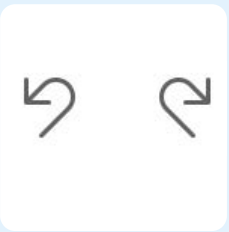
### Key Images

Open a new document

Open an existing document




Save your work



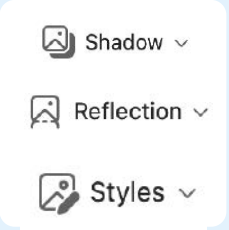
Undo key

Picture

Crop

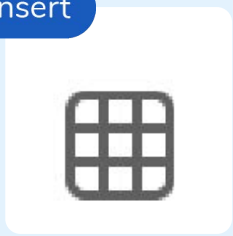
Text wrapping


Layering




Style images

Insert



Insert table

Insert picture

Insert shape

Insert text box

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.9
# Using External Devices - Purple Chip

## Key Learning

- To understand how a device can be programmed to be used as a game controller.
- To explore the functions available for the Purple Chip and appraise their uses.
- To create a simple quiz program that can be answered using an external device.
- To create a program in which an external device can be used to monitor real world conditions.

## Key Resources

2Dos

2Chart

2Code Purple Chip and Purple Chip app

## Key Vocabulary

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

**Host**
The main device that the external devices connect to.

**QR Code**
A machine-readable code consisting of an array of black and white squares, used for storing a URL or other information that can be read by a device's camera.

**Emulator/ Simulator**
In computing this is a piece of software that causes the host device to behave like a different computer system (the guest).

**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.

**Output**
Information that comes out of the computer e.g. sound. prompt, alert or print to screen.

**External device**
A portable computerised device such as a micro-bit, Makey Makey, Crumble board, temperature, pressure or light sensor. Devices such as smart phones can also be used as external devices using their sensors and functions to replicate the functionality of simpler devices. These devices communicate with other devices.

**Sensor**
A device that produces an output signal for the purpose of sensing a physical phenomenon. The input can be light, heat, motion, moisture, pressure or a growing number of other environmental phenomena.

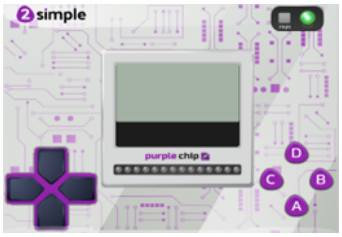
Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.1
# Coding

## Key Images

Link to Purple Chip or emulator

Device Link screen




Purple Chip app


Host and Device tabs

## Key Questions

### Describe some uses for an external device?

An external device could be used as a handset to control a program on the host device.
An external device could also be used as a sensor to monitor environmental conditions such as light or sound and send signals to the host responding to changes.

### Describe how you would link a 2Code program to the external device.

The program should be written using the Purple Chip version of 2Code. The device can be a tablet or smartphone. It should have the Purple Chip app installed. Use the Link button in 2Code Purple Chip to open the device link screen. Open the Purple Chip app on the external device and tap on the pair button. Point the external device at the QR code to create a connection. Run the code from 2Code.

### What actions of the device can provide input?

Tapping any one of 8 buttons, shaking the device, tilting the device, making noise.

### What output can be sent to the external device?

Scrolling text, images on the screen, flashing of the camera flash, vibrations, sound.

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Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.10
# Using External Devices - micro:bit

## Key Learning

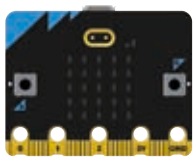
- To use inputs from the accelerometer to execute programs.
- To incorporate conditional logic in programs using IF/THEN coding structures.
- To use the sensors of the micro:bit to set the values of variables and trigger action in the programs.
- To use the micro:bit to create simulations.
- To create devices that give input to the micro:bit via the pins.

## Key Resources

purple mash

2Dos

2Dos



micro:bits

Free code micro:bit

## Key Vocabulary

**Accelerometer**
A sensor that detects movement.

**Crocodile clip**
Wires used to connect external devices to the pins on a micro:bit.

**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.

**IF/THEN**
Logic commands that help the computer make decisions or choices based on conditions.

**Input**
Information going into a device. On a micro:bit, this includes button presses, sensor readings and messages via the micro:bit pins

**LED**
Light emitting diode - the micro:bit display is made of 25 LEDs.

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

**Output**
Information that comes out of the computer such as sound or lights shown on the LED display.

**Pins**
Small connection areas on the micro:bit used to communicate with external devices.

**Selection**
A conditional 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.

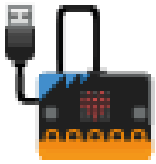
**Simulation**
A model that represents a real or imaginary situation. Simulations can be used to explore options and to test predictions.

**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. This data can be accessed and updated while a program is running.

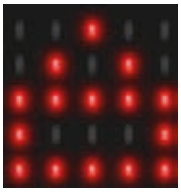
Purple Mash Computing Scheme of Work: Knowledge Organisers

# Unit: 5.10
# Using External Devices - micro:bit

## Key Images



USB transfer



LED screen

Run simulator


Respond to a gesture, using a variable and selection.


Use of the pins, a varible and scrolling text.


Use of the pins, a varible and scrolling text.

## Key Questions

### What sensors does a microbit have?

**Accelerometer**: This measures forces in three dimensions, to determine the micro:bit's orientation. This can be used for science experiments, games, and alarms.
**Compass**: This detects magnetic fields, to determine the micro:bit's direction and movement.
**Light sensor**: The micro:bit's LEDs can act as an input device to measure the amount of light falling on them.

### How can the microbit respond to external signals such as the touch of foil?

The pins can be used to create elecrical circuits and physically connect the micro:bit to external things. Pins 0,1 and 2 are GPIO pins (general purpose input and output) they can be connected to crocodile clips, foil, headphones and other equipment. The 3V pin can power accessories.

### 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 on the LED screen.