

## Unit: 6.1 – Coding

### Key Learning

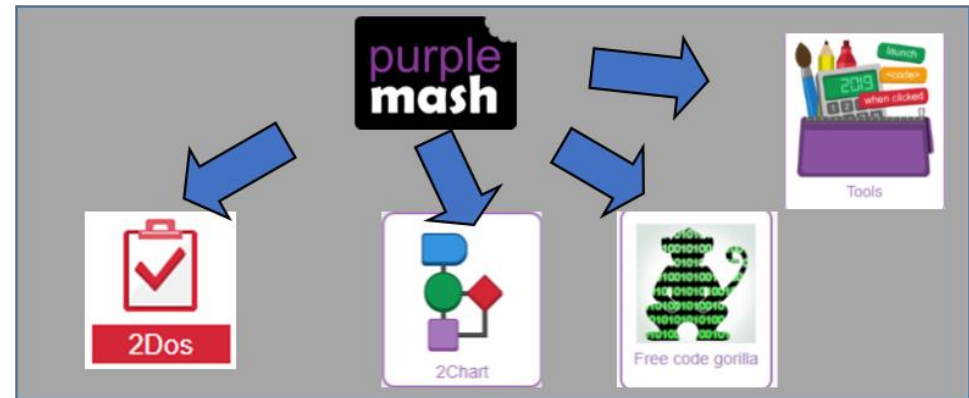
To use the program design process, including flowcharts, to develop algorithms for more complex programs using and understanding of abstraction and decomposition to define the important aspects of the program.

To code, test and debug from these designs.

To use functions and tabs in 2Code to improve the quality of the code.

To code user interactivity using input functions.

### Key Resources



### Key Vocabulary

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

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

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

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

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

**Command** - A single instruction in a computer program.

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

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

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

**Function** – A type of procedure or routine.

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

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

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

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

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

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

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

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

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

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

**Tabs** – Allows you to move between blocks of code on different pages

**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



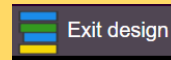
## Unit: 6.1 – Coding

### Key Images

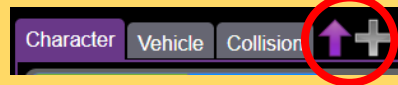
Open design mode in 2Code



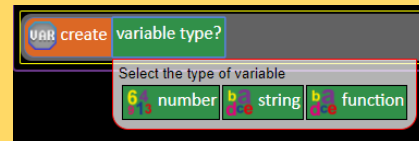
Switch to code mode in 2Code



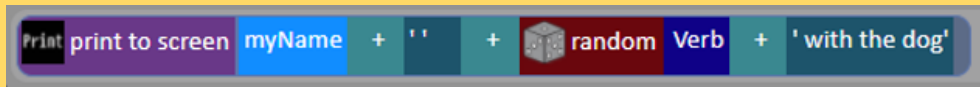
Add a new Tab to your code or move code blocks between tabs



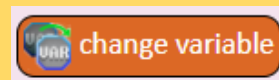
Creating a variable or function in 2Code  
Gorilla



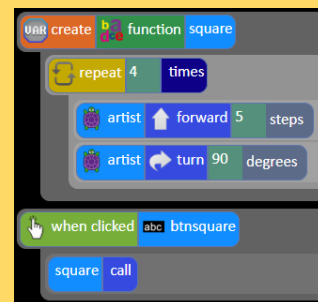
Example of combining variables and strings to print to the screen



A change variable block. Also used to call a function



A function called 'square' that is called by clicking on a button called btnSquare.



### Key Questions

How can you use Tabs in 2Code Gorilla?

Tabs are used to organise your code and make it more readable. This also makes it easier to debug. Give the Tabs useful names to help with this.

What is a function in coding? Give an example that you have used in 2Code Gorilla.

A **function** is a block of code that you can access when you need it, so you don't have to rewrite the same block repeatedly. You **call** the function each time you want it. In a turtle program you could have a button that will make the turtle draw a square each time you click it. In the text adventure, there were functions for each room that were called when the user navigated to the room.

In 2Code Gorilla, how can a program receive user input?

When the user clicks on an object, when the user presses keys or swipes the screen with the mouse, the 'Get Input' and 'Prompt for input' commands. On a touchscreen: when the screen is touched or swiped.



# YEAR 6: COMPUTING SCHEME OF WORK - KNOWLEDGE ORGANISER

## Unit:6.2 – Online Safety

### Key Learning

- Identify benefits and risks of mobile devices broadcasting the location of the user/device.
- Identify secure sites by looking for privacy seals of approval.
- Identify the benefits and risks of giving personal information.
- To review the meaning of a digital footprint.
- To have a clear idea of appropriate online behaviour.
- To begin to understand how information online can persist.
- To understand the importance of balancing game and screen time with other parts of their lives.
- To identify the positive and negative influences of technology on health and the environment.

### Key Vocabulary

- Digital footprint** – The information about a person that exists on the Internet as a result of their online activity.
- Password** - A string of characters that allow access to a computer system or service.
- PEGI rating** – A rating that shows what age a game is suitable for.
- 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
- Screen time** - Time spent using a device such as a computer, television, or games console.
- Spoof website** – A website that uses dishonest design to trick users into thinking that it represents the truth.

### Key Questions

Why do I need to be aware of the dangers of being online?

Although the Internet is a brilliant resource for learning and entertainment some people use the Internet to cause you harm. Being aware of these dangers can help keep you safe and protect your privacy.

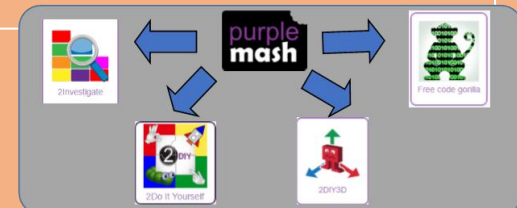
What is meant by my digital footprint?

The term digital footprint is used to describe the traces that people leave behind when they have visited a website or used social media. Your digital footprint is unique to you.

Why is it important to think about how much time use a screen for?

Using a screen can help you surf the Internet or enjoy computer games but you need to be careful how much time you spend using a screen. For instance, using a screen at night can damage your sleep patterns. Turn your screen off regularly and enjoy the world outside.

### Key Resources:





## Unit: 6.3 – Spreadsheets

### Key Learning

To use a spreadsheet to investigate the probability of the results of throwing many dice.

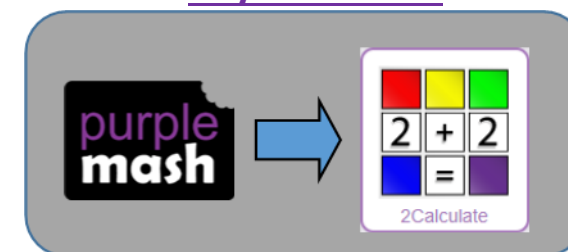
Using the formula wizard to add a formula to a cell to automatically make a calculation in that cell.

To create graphs showing the data collected.

To type in a formula for a cell to automatically make a calculation in that cell.

Using a spreadsheet to create computational models and answer questions.

### Key Resources



### Key Vocabulary

**Average** – Symbols used to represent comparing two values

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

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

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

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

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

**Count (how many) tool** – Counts the number of whatever value object is in the cell to its immediate left and puts the answer in the cell to its immediate right.

**Dice** – When clicked, this will simulate a dice roll by switching to one of the faces of a die.

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

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

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

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

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

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

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


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


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




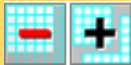
## Unit: 6.3 – Spreadsheets


### Key Images


Open the main menu 


Save your work 


Open a previously saved file 

Increase or decrease spreadsheet size 

Advanced mode 

Formula wizard 

Format cell toolbox 

Charts 







Totals toolbox 


Image Tools 







Controls Toolbox 

Move 

Equals 

Dice 

Count 

To copy   To cut   To paste  

### Key Questions

How would you add a formula so that the cell shows the total of a column of cells?

Use the formula wizard advanced total tool or type a formula into the cell by using the '=' symbol, mathematical operators and cell references.

What is a computational model and what it can be used for?

Modelling in Computing means creating or using a simulation (a model) of a real-life situation, on a computer. 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 the best price for an item or using the existing data to predict what time your shadow will be a certain length.

If you were going to use a spreadsheet to plan your dream holiday. What data would you collect to cost the trip?

Ideas could include:

- Include travel; comparing the cost of different methods, airports, airlines, different companies and discounts such as rail cards.
- Cost of accommodation of different types, trips out, food, passports, immunisations.

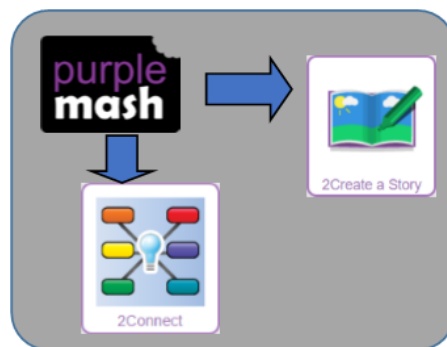


## Unit: 6.5 – Text Adventures

### Key Learning

- To find out what a text adventure is.
- To plan a story adventure.
- To make a story-based adventure.
- To introduce map-based text adventures.
- To code a map-based text adventure.

### Key Resources



### Key Vocabulary

**Text-based adventure** - A computer game that uses text instead of graphics.

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

**Debug** - Identify and remove errors from (computer hardware or software).

**Sprite** - A computer graphic which may be moved on-screen.

**Function** – In this context, a section of code that gets run when it is called from the main code. A function in a program is usually a piece of code that gets run lots of times.

### Key Images

Create an adventure story in 2Create a Story



Plan out your story



Add a button to the story



Add a sprite to the story



Add sound to the story



Choose a background



Undo or redo the last action



Play your text based adventure



### Key Questions

What is a text based adventure?

A text based adventure is a type of game that uses text rather than graphics to tell the story. The player normally selects the next move from a series of text based options.

Why is it important to plan a text based adventure?

Text based adventures can often be complicated and give the player lots of options about what to do next. Planning the game ensures the player doesn't make a decision that has no outcome.



## Unit: 6.6 – Networks

### Key Learning

To learn about what the Internet consists of.

To find out what a LAN and a WAN are.

To find out how the Internet is accessed in school.

To research and find out about the age of the Internet.

To think about what the future might hold.

### Key Vocabulary

**Internet** - A global computer network providing a variety of information and communication facilities consisting of interconnected networks using standardized communication protocols.

**World Wide Web** - An information system on the Internet which allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.

**Network** - Several interconnected computers, machines, or operations.

**Local area network (LAN)**- A computer network that links devices within a building or group of adjacent buildings, especially one with a radius of less than 1 km.

**Wide area network (WAN)** - A computer network in which the computers connected may be far apart, generally having a radius of more than 1 km.

**Router** - A device which forwards data packets to the appropriate parts of a computer network.

**Network cables** - Used to connect and transfer data and information between computers and routers.

**Wireless** – The ability to transmit data from one device to another without using wires.

### Key Resources



### Key Questions

What is the difference between the Internet and the World Wide Web?

The Internet is a global network of networks while the Web, also referred formally as the World Wide Web (www) is collection of information which is accessed via the Internet.

What is the difference between a LAN and a WAN?

Both are networks that connect computers together. A LAN (Local Area Network) is normally for computers connected less than 1KM distance whilst a WAN (Wide Area Network) refers to computers connected more than 1KM away.

Who is Tim Berners-Lee?

Tim Berners-Lee is the inventor of the World Wide Web. The WWW is the system that delivers webpages over the internet.

## Unit: 6.7 – Quizzing

### Key Learning

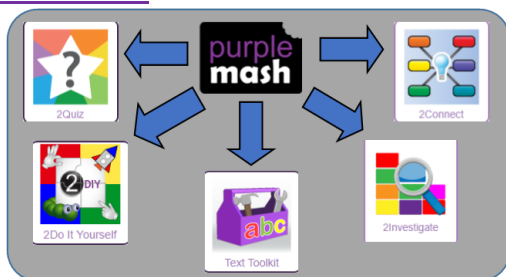
To create a picture-based quiz for young children.

To learn how to use the question types within 2Quiz.

To explore the grammar quizzes.

To make a quiz that requires the player to search a database.

### Key Resources



### Key Questions

What factors do you need to consider when creating a quiz

The intended audience; age and reading ability and interests.

The aim of the quiz; is it for fun like a game, or to make sure that the user has learnt something?

Name three question types in 2Quiz

- Sequencing
- Grouping and Sorting
- Text based
- Multiple-choice
- Labelling

Apart from the questions, what else does a quiz need to contain?

A title screen and instructions for the user.  
Feedback for the user (some quizzes).  
Time limits (some quizzes)  
  
Images for interest as well as part of the questions

### Key Vocabulary

**Audience** - the people giving attention to something.

**Collaboration** - the action of working with someone to produce something.

**Concept map** - a tool for organising and representing knowledge. They form a web of ideas which are all interconnected.

**Database** - a structured set of data held in a computer, especially one that is accessible in various ways.

**Quiz** - a test of knowledge, especially as a competition between individuals or teams as a form of entertainment.

### Key Images

Create a quiz using 2Do It Yourself



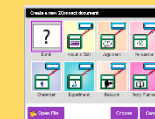
Create a quiz using Text Toolkit



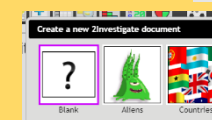
Choose a question type in 2Quiz



Create a concept map from a blank or a template



Create a blank database







## Unit: 6.8 – Binary

### Key Learning

To know what the terms binary and denary mean and how they relate to the number system, the digital system and the terms base-10 and base-2

To relate binary to the on and off states of electrical switches.

To convert numbers from decimal to binary.

To convert numbers from binary to decimal.

To represent states of object in their own program using binary.

### Key Vocabulary

**Base 10** – The number system commonly used in day-to-day life. Using the digits 0,1,2,3,4,5,6,7,8,9 to make. Also known as decimal or denary.

**Base 2** – A number system based only on the numerals 0 and 1. Also known as binary. The digits 1 and 0 used in binary reflect the on and off states of transistors.

**Binary** – See *Base-2*.

**Bit** – A single 0 or 1 in the binary system.

**Byte** – 8 bits.

**Decimal** – See *Base-10*.

**Denary** – See *Base-10*.

**Digit** – A single integer used to show a number.

**Gigabyte (GB)** – 1024 MB.

**Integer** – Any whole number. This includes negative and positive numbers but not fractions or decimals.

**Kilobyte (KB)** – 1024 bytes.

**Machine code** – The code that signals to a computer which transistors should be on or off. Machine code is written in binary.

**Megabyte (MB)** – 1024 KB.

**Nibble** – 4 bits.

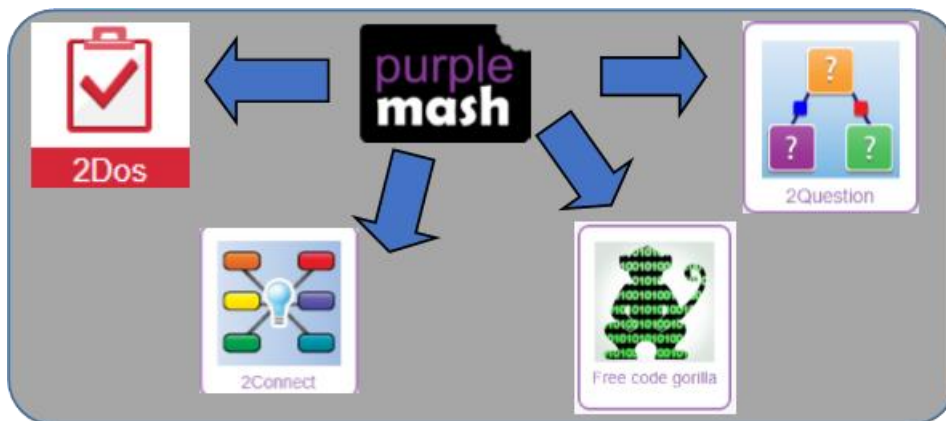
**Switch** – A component that can be one of two states at any time: on or off.

**Tetrabyte (TB)** – 1024 GB

**Transistor** – A tiny switch that is activated by the electronic signals it receives.

**Variable** - A variable is used in programming to keep track of things that can change while a program is running. A variable must have a name. The *value* of the variable is the information to store.

### Key Resources

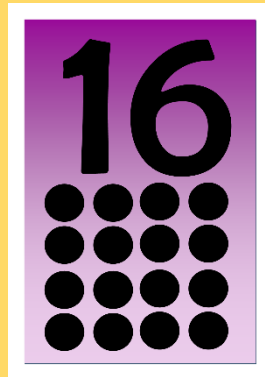
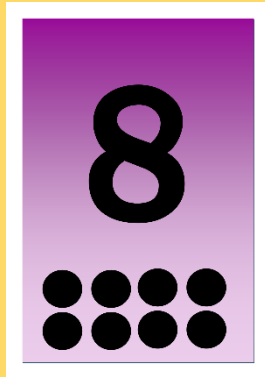


# YEAR 6: COMPUTING SCHEME OF WORK - KNOWLEDGE ORGANISER

## Unit: 6.8 – Binary



### Key Images



### Key Questions

How does binary relate to the programs that you use or create?

In a computer everything is translated into binary stored by on and off switches that pass electronic signals that the computer interprets. It can then pass the correct signals to the components of the computer such as the sound card to make the requested sound. Or graphics card to make images appear on the screen.

How does binary relate to computer memory.

A single 0 or 1 is called a bit. The word comes from Binary Digit. The bigger the program, the more bits are used so more memory space is taken up. For example, 1 byte is 8 bits, 1 megabyte (Mb) or 8,388,608 bits, 1 gigabyte (GB) is 8,589,934,592 bits!

How would you write the numbers 0 to 10 in binary?

0, 1, 10, 11, 100, 101, 110, 111, 1000, 1001, 1010.