



SUPER 6

- I know that sorting objects into various given categories can help to locate information
- I can choose how to sort objects, including sorting other children into groups
- I am beginning to sort independently using my own categories
- I know that using yes/no questions to find an answer is known as a branching database
- I can ask and answer yes/no questions to create a branching database
- I know how to create a branching database

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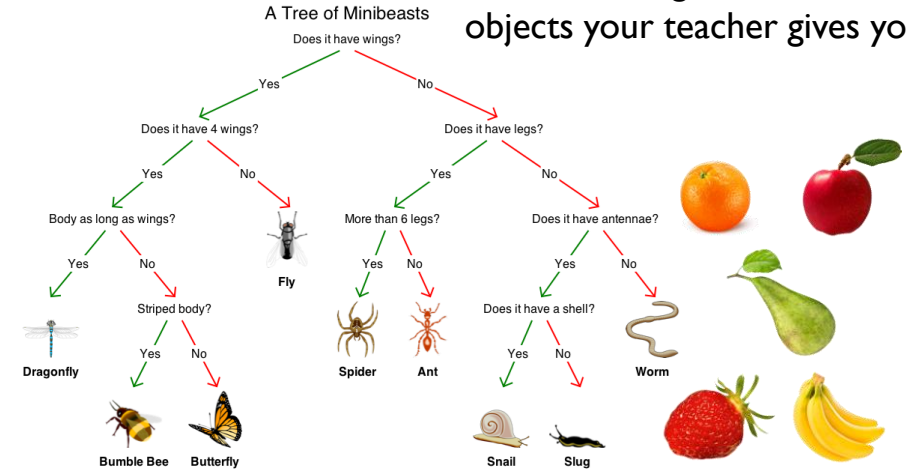
This is a **branching database**  
It uses yes/no questions to sort minibeasts  
You will need to make your own branching database to sort objects your teacher gives you

**I can use common words and phrases relating to computing**

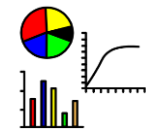
column		A set of information (data) all of the same type; it goes up and down the screen
row		A set of information about the same thing; it goes across the screen
graph		A picture that is made using different pieces of information

**Other words or phrases I may use...**

...for programming		robot, instruction, program, turtle, control, rule, coding, design, up, down, underneath, centre, (anti)clockwise, position, direction, above, below
...for hardware, systems, etc.		network, internet, web, computer, app, Google, search engine, gif, digital
...for controls		keyboard, double-click, mouse, right-click, left-click, screen, touchscreen, shut down, start, menu
...for talk about IT		research, search



When you collect data, you might need to put it in a table to make it easier to read  
You can present it in other ways, including **graphs** and **pictograms**



Can you make a branching database to sort these fruits?

This pictogram shows how many minibeasts a class found  
Can you work out how many of each type of minibeast they saw?

Minibeast	Number of minibeasts
spider	●●●●●●●●
ladybird	●●●●●●
centipede	●●
worm	●●●●

**Key**  
● = 1 minibeast  
Can you use your own data to make your own pictogram?

**Did you know?**  
Pictograms are a type of **graph** where different symbols represent amounts



SUPER 6

- I know that being able to follow and give simple instructions is important in computing
- I am able to follow and give simple instructions to a game or activity
- I understand that it is important for instructions to be in the right order
- I understand why a set of instructions may have gone wrong
- I am beginning to make corrections in instructions that may have gone wrong
- I can explain what inputs and outputs are

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Red / Orange / Green

In this unit, you will learn how to follow and give instructions. You will learn how to spot mistakes (**bugs**) in instructions and correct (**debug**) them.

I can use common words and phrases relating to computing

instruction		A set of commands or directions about how to do something
direction		One part of an instruction
program		A set of instructions for a computer



What is happening in this set of pictures?  
Can you **predict** what will the **output** be?  
Are there any steps (or **directions**) that are missing?



What is happening in this set of pictures?  
Can you **predict** what will the **output** be?  
Are there any steps (or **directions**) that are missing?  
Are the directions in the correct order?  
Could you **debug** these instructions?

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An **output** is something that is created when a set of instructions are followed.  
A meal is the **output** of a recipe.



A set of instructions for a computer is called a **program**. People who create programs are called **programmers**.



SUPER 6

- I can discuss what the internet is and how it can be used
- I recognise that the internet may affect mood or emotions
- I recognise how internet use can affect and upset others
- I can identify which information is appropriate to share and post online and which is not
- I know what to do if I feel unsafe or worried online – I tell a trusted adult
- I know that people I do not know on the internet (online) are strangers and are not always who they say they are

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Red / Orange / Green
Red / Orange / Green
Red / Orange / Green

**I can use common words and phrases relating to computing**

feelings		Emotions we have (happy, sad, etc.)
online		Using the internet
appropriate		Things that are meant for children to see and do

**Other words or phrases I may use...**

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**Key ideas**



digital footprint



going online



online / internet



personal information



trusted adult

**Types of personal information**



name



birthday



address

5

age

**Staying safe online**

Strangers are people you don't know online

Be kind online as you would in real life

Keep personal information private and secure

Tell or ask a trusted adult if you are unsure



SUPER 6

- I can use computers more purposefully
- I can log in and navigate around a computer
- I can drag, drop, click and control a cursor using a mouse
- I can use software tools to create art on the computer
- I can use a computer and mouse to click, drag, fill, select, add backgrounds, text, layers, shapes and clipart
- I know passwords are important for security and to keep us safe

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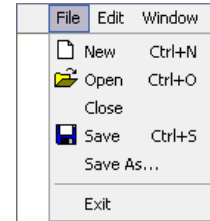
In this unit, you will improve your mouse skills and create amazing artwork!

### I can use common words and phrases relating to computing

click		Press the button down on a mouse to choose something; this picture shows a <b>left click</b>
cursor		The arrow (or other shape) that appears on screen and moves when you move the mouse
drag		Move something around the screen

### Other words or phrases I may use...

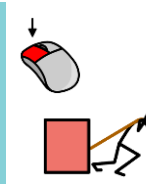
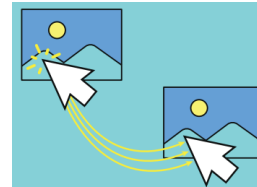
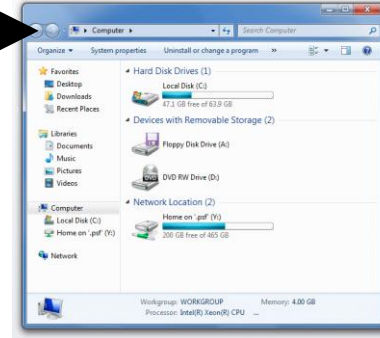
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This is a **menu**

It shows you different choices of actions the computer can do

This is a **window**  
You can **left click** on the icons (pictures) to open new windows



You can **click** and **drag** icons to move them on your screen

You can **drag** and **drop** icons and files into **folders** to organise your files

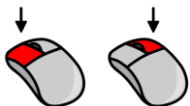


You will use a website called **Sketchpad** to make your own artwork in the style of Kandinsky – scan the QR code to go there!

You can select lots of different shapes in Sketchpad – this shows you how to select circles  
The **Fill** tool sets the colour inside the shape  
The **Outline** tool sets the colour of the line the shape is drawn with



**Left click** to select something



**Right click** shows you more options (choices)



**FILL**  
**OUTLINE**



SUPER 6

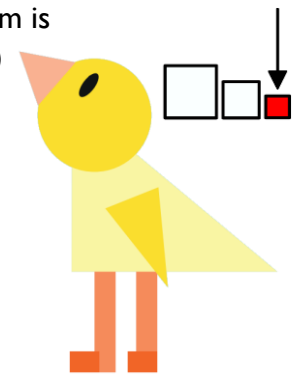
- I can explain what an algorithm is
- I can write clear algorithms
- I can follow an algorithm
- I can decompose a design into steps
- I can identify bugs in an algorithm and say how to fix them
- I can write an achievable algorithm

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**Decomposition** is where a task or problem is broken down into smaller parts (or chunks)

This picture of a bird can be made with the pieces in the table

Shape:	How many?	Body part
	One	Eye
	One	Head
	One	Beak
	One	Wing
	One	Body
	Two	Legs
	Two	Feet



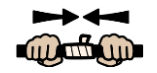
**Algorithms** are sets of instructions that tell you how to do something  
Here is an algorithm for brushing your teeth



Sometimes, **algorithms** will have mistakes, or errors

1. Brush your front teeth
2. Add some toothpaste
3. Get your toothbrush
4. Brush your back teeth
5. Rinse your mouth
6. Smile!

These mistakes are called **bugs**



When you fix an **algorithm**, this is called **debugging**

Can you debug the algorithm?

1. Get your toothbrush
2. Add some toothpaste
3. Brush your front teeth

**I can use common words and phrases relating to computing**

debug		To fix the errors in code
algorithm		A clear set of instructions to carry out a task
output		Information (or data) that is sent by the computer to an output device such as a printer or speakers

**Other words or phrases I may use...**

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**Did you know?** Early computers were so big that insects could fly or crawl inside them and make the programs stop working! This is why errors that stop programs working are called bugs! The first recorded bug took place in 1947 when engineers working on an early computer at Harvard University, found a moth lodged in the machine's hardware!





SUPER 6

- I can plan a pictorial story using photographic images in sequence
- I can explain how to take clear photos
- I can take photos using a device
- I can edit photos by cropping, filtering and resizing and organise images on the page, orientating where necessary
- I can search for and import images from the internet
- I can explain what to do if something makes me uncomfortable online

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**I can use common words and phrases relating to computing**

background		The part of a picture that provides the setting for the main objects
editing		Changing an image in any way
save		Keep the changes you have made

**Other words or phrases I may use...**

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When taking photographs, remember to:

Check there is enough light

low light

lights on

frame

Check the camera frame to position your photograph

Hold the camera still because movement can blur the photo

motion blur

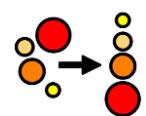
still

Make sure you get all of the subject in the photo

- Crop – this allows you to 'chop' parts off the image
- Adjustment – this allows you to change the brightness and other colour settings
- Erase – 'rub out' part of your image
- Filter – apply some pre-made settings
- Mark up – draw on your image



A **sequence** is where you can use a series of images to tell a story; this sequence shows an egg hatching





SUPER 6

- I can name some computer peripherals and their functions
- I recognise that buttons cause effects
- I can explain that technology follows instructions
- I recognise different forms of technology
- I can design an invention which includes inputs and outputs
- I can explain the role of computers in the world around me

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Do all computers look like this?  
Can you think of or draw a different type of computer?

### I can use a wide variety of everyday computing terms

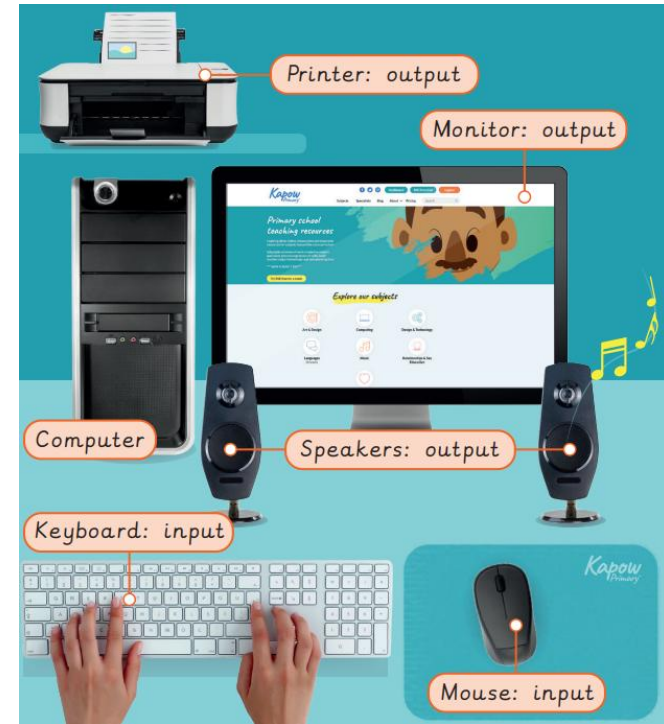
desktop		A tower computer that stays in one place and needs a keyboard, monitor and mouse
technology		Using scientific knowledge to help us make new devices and tools
digital		Using (or relating to) computer technology

### Other words or phrases I may use...

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...for talk about IT		similarity, difference, landscape, portrait

Computers have different **input** and **output** peripherals – some are shown here

Some computers have a keyboard and mouse, others have buttons and touchscreens



These are all examples of technology  
Are they computers?  
Do you know any other examples of technology?



Did you know?

All computers need electricity – they can get this through wires or batteries!





SUPER 6

- I recognise cause and effect when pressing buttons on an EaRL
- I can discuss and demonstrate how the EaRL works
- I can record video, ensuring everyone is in the shot
- I can give several clear instructions in sequence
- I can program a EaRL to reach a destination
- I can identify and correct mistakes in my programming

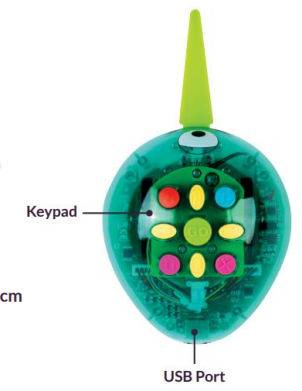
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In this unit, you will learn how to program an **EaRL**; an exciting programmable robot

Use the buttons to **input directions** and **commands**. Directions and commands together are called a **program**

- Insert a light effect program
- Turn right 90°
- Insert a sound effect program
- Turn left 90°
- Clear the entire program
- Move forward 15cm
- Insert a pause program step
- Move backwards 15cm
- Run the program

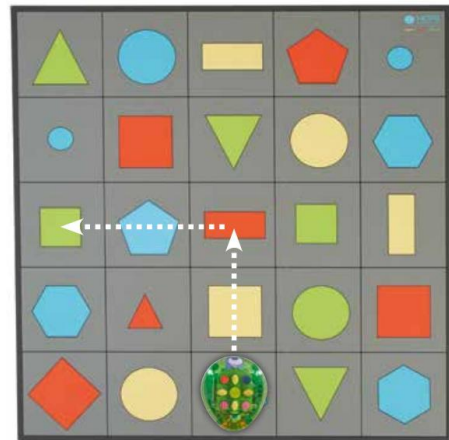


**I can use a wide variety of everyday computing terms**

code		Words, numbers and symbols that make a computer language
predict		To make a guess about what will happen
inputting		Putting information or code into a computer

**Other words or phrases I may use...**

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You might use cards to create your own programs for the EaRL. Can you **predict** where the EaRL will go if it follows this **program**?

You might need to **debug** programs. Does the program above match the route shown on the shape mat?

**Did you know?**

The word **robot** comes from a Czech word **robota**, which means **forced labour** (work); it was first used in a play in 1920





SUPER 6

- I can explain what is meant by online information and what information is safe to be shared online
- I can explain why we need passwords and what makes a strong password
- I understand that I need to ask permission before sharing content online and explain why
- I understand that I have the right to deny my permission to information about me being shared online
- I can say who I can ask for help with online worries
- I can use some strategies to work out if online information is reliable or not

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You will learn different ways to make a strong password

**I can use a wide variety of everyday computing terms**

consent		When you agree to something
permission		When you are allowed to do something
reliable		Can be trusted

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1. You can combine upper and lower case letters, numbers and symbols

**Happy333? BiKeR4646!**

2. You can make numbers look like letters

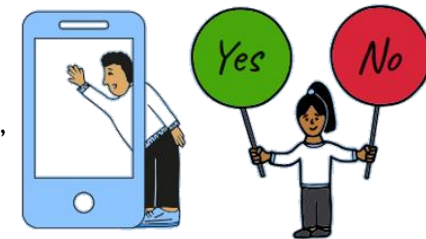
**M0nk3y321. D1nos4ur456!**

3. You can join words together

**Slimebike45! Iloveschool123.**



We must ask someone's **permission** before sharing photos, videos or information about them



It is OK to say no when someone asks if they can share something online about us; if you agree, you are giving **consent**



**Did you know?**

Not everything on the internet is true  
It can sometimes be difficult to tell what is true and what is false; this is why it is important to use **reliable** websites





SUPER 6

- I can decompose a game to predict the algorithms
- I can give a definition for 'decomposition'
- I can write clear and precise algorithms
- I can create algorithms to solve problems
- I can use loops in my algorithms to make my code more efficient
- I can explain what abstraction is

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**Abstraction** is where you pick out the **key information**. In the text below, the key information has been highlighted.

Remember to **take spare clothes**, including t-shirts, trousers, a coat, underwear and a hat. There will be lots of **wet weather** in the rainforest, so wrap up to stay dry. You might hear lots of animals, such as monkeys and parrots. **Keep close to your adults**, and be careful where you step. Do not forget to **take a drink and a snack**.

**I can use a wide variety of everyday computing terms**

abstraction		Picking out the important information
decompose		Breaking a problem or code into smaller parts
key features		The most important parts of something

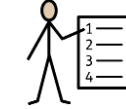
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**Decomposition** is where a problem, code, or information is broken down into smaller chunks (parts) to make it easier to understand.

- List for the rainforest:
- Take spare clothes
  - Wet weather
  - Keep close to your adults
  - Take a drink and snack

**Algorithms** are clear sets of instructions that tell you (or a computer) how to do something.



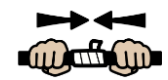
Sometimes, the algorithms we create will have **mistakes** in them; fixing these mistakes is called **debugging**.

**What makes a good algorithm?**

- Instructions that tell you what to do step-by-step
- Easy to follow
- Clear and concise
- Detailed
- In the correct order



Can you **debug** this algorithm?  
Which steps are in the correct order?



- Step 1: Get your toothbrush
- Step 2: Get the toothpaste
- Step 3: Put toothbrush in mouth
- Step 4: Put toothpaste on toothbrush
- Step 5: Brush your teeth
- Step 6: Rinse and spit

You can create verbal **algorithms** using your **oracy skills** – make sure you talk clearly and remember your **oracy guidelines** so you are successful!





SUPER 6

- I can describe and digitally draw items that humans need and explain how astronauts' survival needs are met aboard the ISS
- I can read the correct temperature on a thermometer
- I can design a display showing everything that needs to be monitored by sensors on the ISS
- I can create an algorithm that addresses all plants' needs
- I can explain how space exploration can benefit life on Earth
- I can read data to identify whether a planet might be habitable

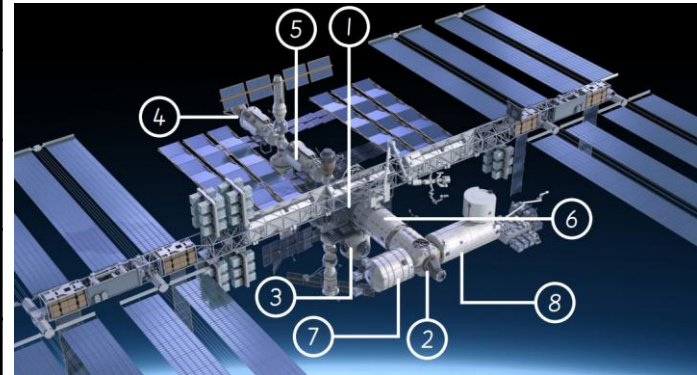
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**I can use a wide variety of everyday computing terms**

data		Information used for a specific purpose or investigation
sensor		A tool or device that is designed to monitor, detect and respond to changes
interpret		To look at data and understand what it means

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The **International Space Station (ISS)** orbits the earth

Astronauts and scientists conduct experiments to help us understand how humans can survive in space

Number	Name	Purpose
1	Node 1 (Unity)	Connects the American and Russian ISS modules
2	Node 2	Connects the American, European and Japanese modules
3	Node 3	Sleeping and resting area
4	Zvzda (Star)	Central hub for Russian astronauts
5	Zarya (Sunshine)	Russian research module
6	Destiny	American research module
7	Columbus	European research module
8	Kibo (Hope)	Japanese research module

**Jupanus**

Average temp °C: 135  
Size (km.): 30,200  
Colour: pink  
Number of moons: 0  
Name of star: Loxy

**Ross**

Average temp °C: 12  
Size (km.): 9,300  
Colour: green  
Number of moons: 2  
Name of star: Kapteyn's star

**Earth**

Average temp °C: 15  
Size (km.): 6,371  
Colour: blue/green  
Number of moons: 1  
Name of star: Sol

**Terronium**

Average temp °C: -75  
Size (km.): 5,200  
Colour: white  
Number of moons: 0  
Name of star: Loxy

Astronomers are always searching for planets where there might be life



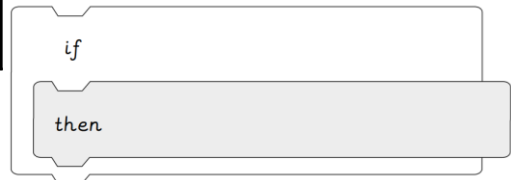
They will look at lots of **data** to try and find the most likely planets for life

They are looking for planets that are not too hot and not too cold

These planets are said to be in the **'Goldilocks zone'**



**Did you know?** Some experiments on the ISS involve growing plants; **sensors** are used to detect if the plants are growing well or not  
You will need to design **if/then algorithms** for the sensors to help the plants grow well



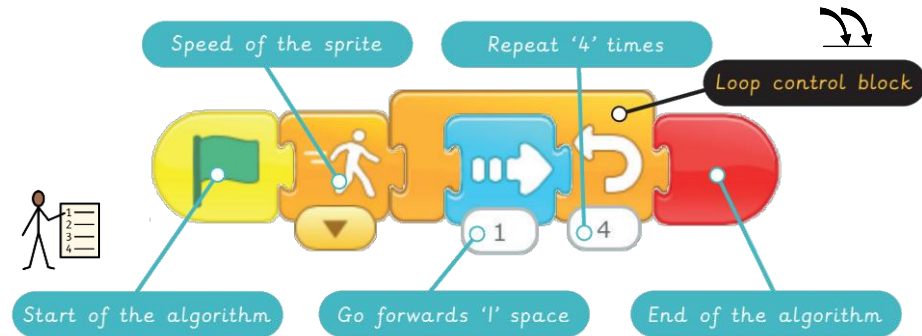


SUPER 6

- I can explore a new application independently
- I can explain what the blocks on Scratch Jr do and use them for a purpose
- I can recognise a loop in coding and why it is useful
- I can use a code to create an animation of an animal moving and create an algorithm
- I can program code to run 'on tap'
- I can explain the role of the blocks in a program I have created

Red / Orange / Green  
Red / Orange / Green  
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Red / Orange / Green  
Red / Orange / Green  
Red / Orange / Green

In this unit, you will use **Scratch Jr**, a **block-based** programming language



This shows a Scratch Jr **algorithm** with a **loop**

Different coloured **blocks** have different purposes

	Yellow blocks are <b>triggering blocks</b>
	Blue blocks are <b>motion blocks</b>
	Purple blocks are <b>looks blocks</b>
	Green blocks are <b>sound blocks</b>
	Red blocks are <b>end blocks</b>

**I can use a wide variety of everyday computing terms**

sequence		A set order or pattern for something to follow
blocks		Instructions in Scratch Jr that you can use to 'build' code
loop		A repeated sequence of instructions

**Other words or phrases I may use...**

...for programming		sprite, (de)bug, data, information, object, model, process, horizontal, vertical, diagonal (i.e. sloped), symmetrical, reflect, left, right
...for hardware, systems, etc.		device, application, tool, file, drive, disk, (sub)folder, save, save as, internet search, video, audio, text, image, hardware, editing, presentation software, window, material
...for controls		shift, control, caps lock, password, return, enter, backspace, delete, open, close, select, zoom, highlight
...for talk about IT		similarity, difference, landscape, portrait

Orange blocks are **control blocks**

Green blocks are **sound blocks**



SUPER 6

- I recognise that a network is two or more devices connected and its purpose and identify key components that make up the school's network
- I can explain the difference between wired and wireless connections
- I understand the role of the server in a network when requesting a website and recognise that files are saved on a server
- I can identify parts of a website's journey to reach my computer
- I recognise that routers connect to send information
- I understand that data is broken into packets

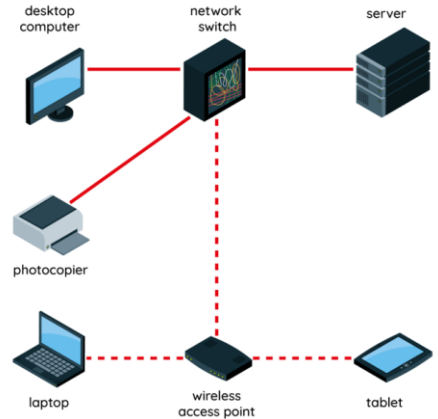
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Red / Orange / Green

**I can start using specialist vocabulary and computing terms**

World Wide Web		An information system on the internet that allows us to find information by clicking on links
Wi-Fi		A wireless network connection that allows devices to connect without cables
network		Multiple devices connected over the internet (or a local connection) to share files and information
internet		A global computer network

**Other words or phrases I may use...**

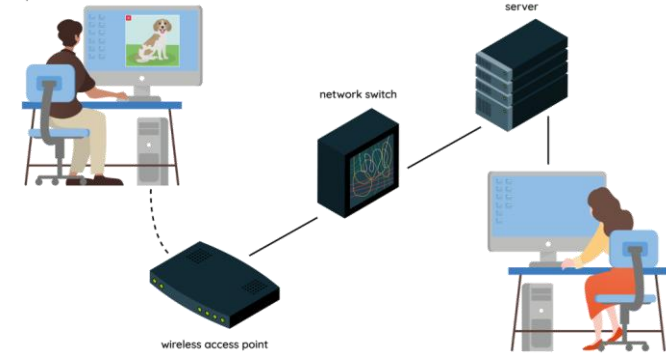
...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication



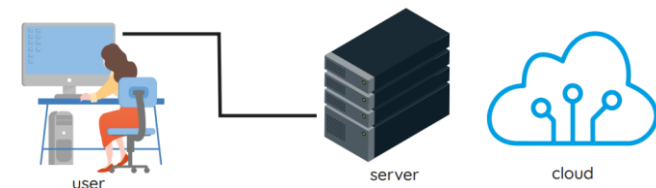
Networks are made up of different devices

When a file is shared, it travels through these devices on the network

You can send many different types of file through a network, including images, music and videos



When a user requests a website, the server retrieves the stored data and sends it back as the displayed website





SUPER 6

- I can log in and out of email
- I can edit and send a simple email with a subject plus 'To' and 'From' in the body of the text
- I can type in the email address correctly and send the email
- I can add an attachment to an email
- I can write an email using positive language, with an awareness of how it will make the recipient feel
- I recognise when an email may be fake and explain how I know

Red / Orange / Green  
Red / Orange / Green  
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Red / Orange / Green

In this unit, you will learn how to send emails to different people

**I can start using specialist vocabulary and computing terms**

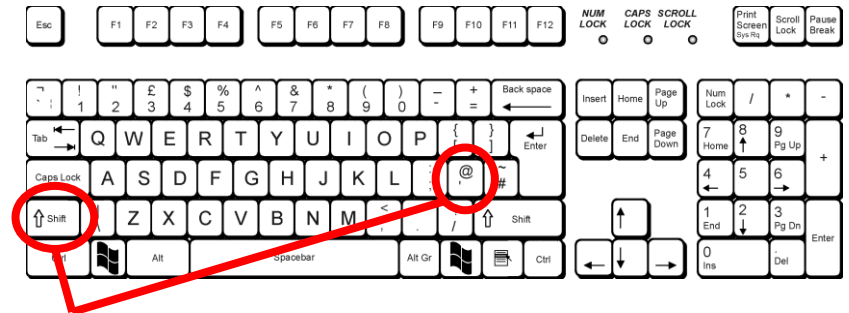
email		Electronic mail which allows us to send messages and files from one account to another over a network
subject bar		Where you put the title of the email so the recipient knows what it is about
compose		To create or write an email
attachment		A function that allows you to add files to an e-mail before sending it

**Other words or phrases I may use...**

...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication

**Carbon copy (Cc)** means you can send an email to more than one person at a time

**Blind carbon copy (Bcc)** means you can send an email to more than one person at a time **and** the recipients cannot see who else has received the email



Press these two keys at the **same** time to type the @ symbol  
You need to be able to type the @ symbol to write an **email address**  
Example year3@whitmore-pri.com

Did you know?  
You should watch out for emails with unknown links or attachments.  
**Do not click or open them!** Inform a trusted adult!





SUPER 6

- I can differentiate between fact, opinion and belief online
- I can explain how to deal with upsetting online content
- I know how to support others who may have encountered upsetting content
- I can recognise that digital devices communicate with each other to share personal information
- I can explain what social media platforms are used for
- I recognise why social media platforms are age-restricted

Red / Orange / Green
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Red / Orange / Green

**Find more information!**  
The BBC's Own It website has lots of tips and information to keep you safe online!  
[www.bbc.com/ownit](http://www.bbc.com/ownit)

Scan this QR code to take you there!



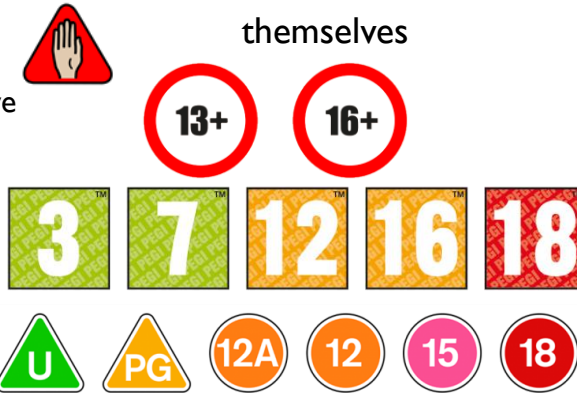
Our **digital devices** are communicating all the time and sharing the information between themselves

It is important to think carefully about the information we share online



**Age restrictions** show the minimum age you have to be to go on apps, websites, or see certain media

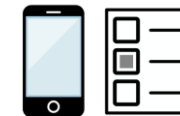
Age restrictions are used to stop children seeing inappropriate content



If you see something online that makes you feel upset or unsafe, you should:



Block and report it



Check your device's privacy settings



Tell a trusted adult

**I can start using specialist vocabulary and computing terms**

accurate		Something that is correct in every way
digital devices		A piece of technology that can send, receive, process and store information
age restrictions		Age restrictions are rules that mean you have to be a certain age to do things, such as being on social media

**Other words or phrases I may use...**

...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication



SUPER 6

- I can describe the purpose of a trailer
- I can create a storyboard for a book trailer
- I consider camera angles when taking photos or videos
- I can import videos and photos into film editing software
- I can incorporate transitions between images including adding text to a video
- I can evaluate my own and others' trailers

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In this unit, you will make trailers for books; scan the QR codes below to watch two examples!



*The Dark* by  
Lemony Snickett



*It's a Book* by  
Lane Smith

**I can start using specialist vocabulary and computing terms**

transition		A visual effect that can be applied to occur in-between digital media (slides, images, video clips)
import		To pull another file into software, to place, edit and manipulate
trailer		A series of extracts from a film or broadcast, often used for advertising
graphics		The use of images or visuals designed to communicate, demonstrate a concept or promote something

**Other words or phrases I may use...**

...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication

**Good features of a book trailer**

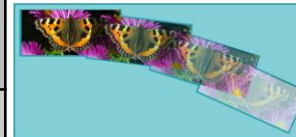
- Tells the viewer what the story is about
- Tells the reader how the story begins
- Tells the viewer something about one of the main characters
- Shows the viewer what the characters might think or feel at one part in the story
- Tells the viewer questions they might find answers to in the book
- Tells the viewer why they should read the book

**Things to consider**

- Think about the voiceover you will need for each part of your trailer
- Think about sound effects you might want to use in your trailer
- Think about what music you will need for your trailer



**Transitions** are visual effects that can be applied to occur (happen) in-between digital media (slides, images, or video clips)  
There are many different types of transition that you can use



**Morph**

The media appears from a selected corner



**Cross zoom**

The media zooms and fades in from the middle

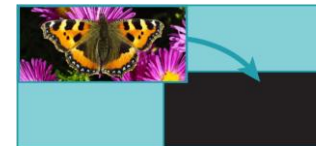


**Peel off**

The page peels off to reveal the media

**Dip to black**

The media fades to a black screen



**Directional wipe**

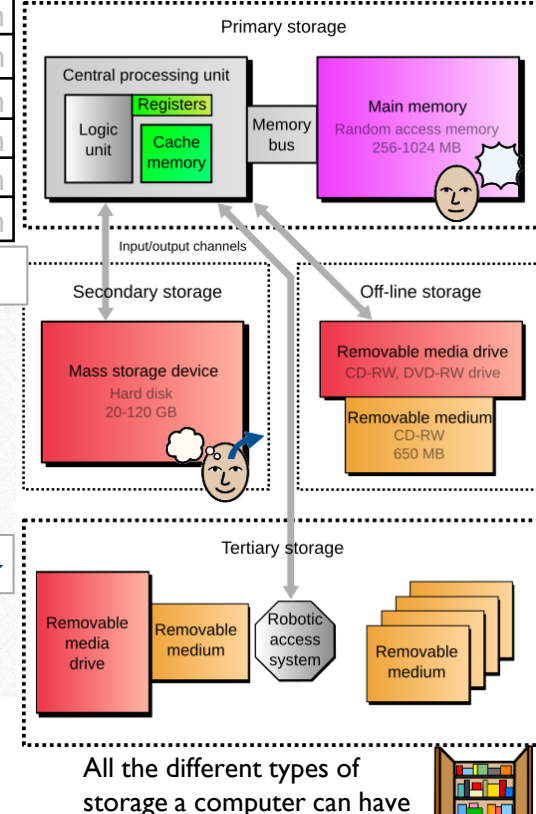
The media appears from a selected side



SUPER 6

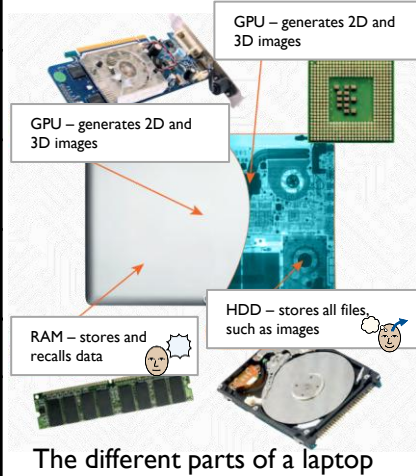
- I recognise inputs and outputs and that the computer sends and receives information
- I can explain that the parts of a laptop work together
- I can explain the purpose of each part of a computer
- I can explain what an algorithm is
- I can make suggestions as to what the memory inside a computer is for
- I can make comparisons between different types of computer

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**I can start using specialist vocabulary and computing terms**

hard disk drive HDD		An internal or external device that can store information such as files, documents, images and programs
Memory RAM		Computer memory stores information such as data and programs for immediate use in the computer; RAM stands for Random Access Memory
storage		All types of memory in a computer



The different parts of a laptop

**Other words or phrases I may use...**

...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication

All the different types of storage a computer can have



All the parts of a computer work together

They all have different jobs

- Hard drive – HDD** – photos, games and other files are stored in this memory
- ROM** – important instructions are saved in this memory, such as what to do when the 'On' button is pressed
- RAM** – very recent actions are stored in this memory, such as which keys on the keyboard have been clicked
- CPU** – deals with all the data it receives from input and output devices
- GPU** – takes instructions from the CPU, and then processed the instructions to form images on the screen



SUPER 6

- I can explain what some of the blocks do in Scratch
- I can explain what a loop is and include one in my program
- I can suggest possible additions to an existing program by remixing code
- I recognise where something on screen is controlled by code
- I can use a systematic approach to find bugs
- I understand the definitions of decomposition and algorithm and how they are used to create accurate code

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**I can start using specialist vocabulary and computing terms**

repetition		When something happens more than once (it is repeated)
animation		Bringing concepts to life through moving pictures or photographs, e.g. cartoons
application		A program or piece of software designed to do a specific job
tinker		To explore and play with something to discover its key functions

**Other words or phrases I may use...**

...for programming		digitise, algorithm, sequence, series, programming language, purpose, value, perpendicular
...for hardware, systems, etc.		motor, input, output, digital resources, text, post, social media, community, meme, email, blog, vlog, forum, font, URL, word processing, voice recognition, kilobyte, megabyte, tab, control panel, icon, file extension, personal data
...for controls		'control alt', cursor, short cut, drag, drop, cut, copy, paste, crop, rotate, flip, top-and-tail, screengrab, minimise, maximise
...for talk about IT		relevance, retrieve, content, numerical, clarify, opinion, communication

**Scratch** is a coding program where you can make interactive games and animations  
You chose and move **blocks** with different functions

There are four different ways to add a **sprite**



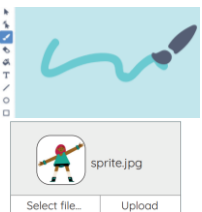
Choose a pre-made sprite

Paint your own sprite



Generate a random (surprise) sprite

Upload your own sprite





SUPER 6

- I understand what the different code blocks do
- I understand the terms pattern recognition and abstraction, and how they help to solve a problem
- I can create a Scratch program which draws a square and at least one other shape
- I understand how computational thinking can help to solve problems
- I can apply computational thinking to problems I face
- I can create a simple game

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Is this unit, you will learn about many different blocks in Scratch and how to use them

Different colour blocks have different functions

They attach to each other using the bumps at the bottom of blocks and the notches at the tops of blocks



Do you think adults who work as programmers use Scratch? Why or why not?

**I can use specialist vocabulary and computing terms**

broadcast		A message sent from one sprite to another
conditional		Helps the computer decide what to do next based on the user's response
parameters		When a block has a 'gap' for adding data, these gaps are called parameters
variables		A container or holder for storing information that can change; e.g. numbers or text

**Motion:** move 1 steps

move, turn, slide or point a sprite in different directions.

**Sound:**

play sounds, add effects or change the volume and pitch when a sprite performs an action.

**Looks:**

add speech, thought bubbles, change a sprite's size or appearance or switch the background.

**Events:**

perform an action when a keyboard key or sprite is clicked or when a condition is met.

**Control:**

loops to repeat code, if statements for when conditions are met or clone code.

**Other words or phrases I may use...**

...for programming		repetition, selection, simulation, pattern, logical reasoning, structure, cause, characteristic, phase, transition, angle
...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
...for talk about IT		inappropriate, contribution, manipulate, reliability



Did you know?  
There are many different **sprites** (or characters) in Scratch that you can use in your programming



**Operators:**

maths blocks, e.g. more than, less than, equal to, and, or and not statements; (+, -, x, ÷).

**Sensing:**

respond to certain actions, such as moving the mouse pointer, questions, timers and dates.

**Variables:**

create and manage variables, track a score or remember a user's name.

**My blocks:**

create your own coding blocks, give them a name and add instructions.





SUPER 6

- I understand what the different code blocks do
- I understand the terms pattern recognition and abstraction, and how they help to solve a problem
- I can create a Scratch program which draws a square and at least one other shape
- I understand how computational thinking can help to solve problems
- I can apply computational thinking to problems I face
- I can create a simple game

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There are three main branches of **computational thinking**



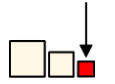
**I can use specialist vocabulary and computing terms**

computational thinking		A method of tackling a complex problem to devise a solution, in a way that both humans and computers can understand
logical thinking		Analysing a problem using reason and finding a solution
pattern recognition		Identifying similarities and recurrences in data

**Other words or phrases I may use...**

...for programming		repetition, selection, simulation, pattern, logical reasoning, structure, cause, characteristic, phase, transition, angle
...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
...for talk about IT		inappropriate, contribution, manipulate, reliability

**Decomposition:** breaking a problem down into smaller parts



**Pattern recognition:** identifying patterns and familiar outcomes



**Abstraction:** identifying the important details, like size, shape, colour, etc. and ignoring irrelevant information



When you design your **algorithms**, you need to use all the information you have collected to create a recipe for success



**SCRATCH**



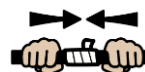
These **Scratch blocks** will make the sprite draw a square

What do you need to change to make the sprite draw an equilateral triangle instead?

What other regular shapes can you make the sprite draw?

Remember to **debug** your code if you don't get the desired result!

Do you think adults who work as programmers use Scratch? Why or why not?





SUPER6

- I can describe how to search over multiple platforms and be aware of the accuracy of the results presented
- I can describe some of the methods used to persuade people to buy online
- I can explain the difference between fact, opinion and belief and recognise these online
- I can explain what a bot is and give examples of different bots
- I can explain some positive and negative distractions of using technology
- I can suggest small strategies for reducing the time spent on technology

- Red / Orange / Green
- Red / Orange / Green
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- Red / Orange / Green
- Red / Orange / Green

We all need to behave safely and respectfully both online and offline

I can use specialist vocabulary and computing terms

trustworthy		Can be trusted; has been proven to be reliable in the past
bot		A computer program (sometimes called a <b>chatbot</b> ) that can act like a living thing, e.g. talking to Alexa
implications		When you can draw a conclusion, or infer, from something, even though it is not clearly said
screen time		How much time you spend using a digital device like a computer, phone, tablet, television or games console



Other words or phrases I may use...

...for programming		repetition, selection, simulation, pattern, logical reasoning, structure, cause, characteristic, phase, transition, angle
...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
...for talk about IT		inappropriate, contribution, manipulate, reliability

search bar

Search... UK best burgers

Go

search results

adverts

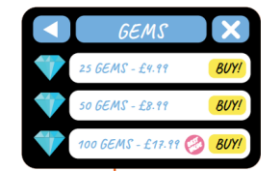
snippets

All search engines work slightly differently. It is important to understand how the results are found and displayed.

Technology can be both a positive and negative distraction. If technology is making you feel sad or angry, or if you are spending too much time on it, then try to find something else to do that does not involve **screen time**.



Companies will use lots of different ways to try and get you to spend money online. How many of these have you seen?



Special offers

Extra lives/objects

Pay to see no ads



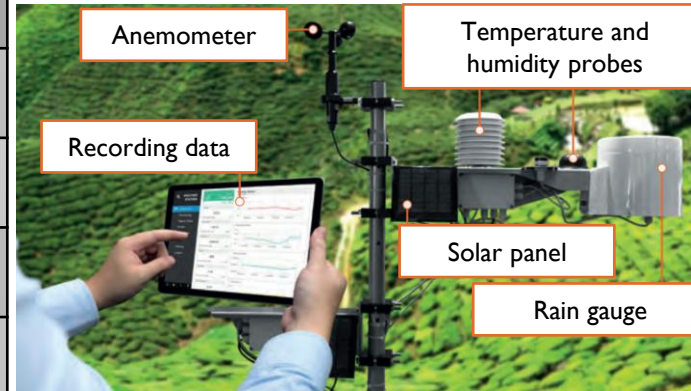
SUPER 6

- I can search the web efficiently to find temperatures of different cities and record this accurately
- I can design a weather station that gathers and records sensor data, explain how it works and the units of measurement it uses
- I can design an automated machine that uses selection to respond to sensor data
- I can search for and record weather forecast information in a spreadsheet
- I can explain how my data has been collected
- I can create a video which includes weather forecast information

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**I can use specialist vocabulary and computing terms**

satellite		An artificial body placed in orbit around the earth, moon or another planet in order to collect information or for communication
forecast		To predict what might happen or occur in the future as the result of information you have collected (e.g., weather forecast)
weather		The current condition of the atmosphere around the world, such as temperature, rain, wind, clouds and sunshine
presenter		A person who introduces and appears in a television or radio programme, or someone who delivers information



**Weather stations** use a series of sensors to measure the atmosphere

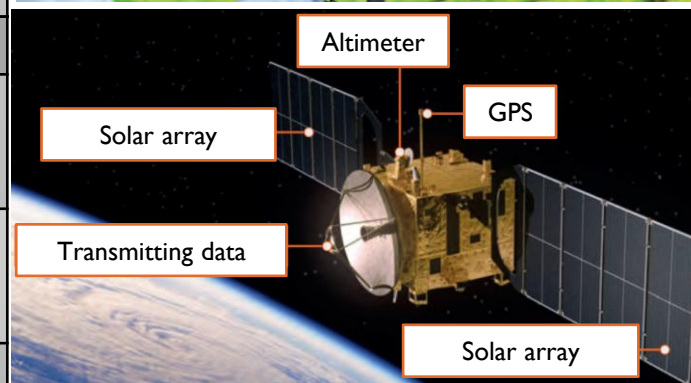


**Weather satellites** collect and send data down to Earth after monitoring the atmosphere from space

**Presenters** will deliver the information about the weather as part of a **weather forecast** – you may have seen one on TV!

**Other words or phrases I may use...**

...for programming		repetition, selection, simulation, pattern, logical reasoning, structure, cause, characteristic, phase, transition, angle
...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
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**Top tips for filming!**

- Don't film into the light e.g. by a window
- Don't stand too close
- Don't stand too far away
- Make sure your surroundings are quiet
- Let the presenter know when to start by saying, "3,2,1, action!"
- Keep the presenter in the middle of the screen – don't chop off their head!

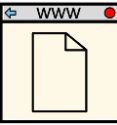


SUPER 6

- I can create a Sway with a title, image and a completed first header section
- I can create a clear plan for my web page and begin to create it
- I can create a professional-looking web page with useful information and a clear style
- I can create a webpage which is easy for the user to read and find information from
- I can refer back to my checklist to ensure I include a range of features
- I can create a web page with clear sections and with a range of features in

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In this unit of learning, you will learn how to make your own **website**



A website is a collection of **web pages** that link together

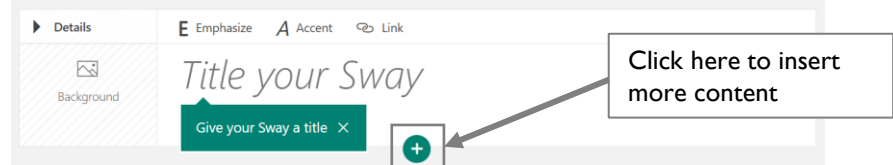
**I can use specialist vocabulary and computing terms**

embed		When you store a media file (such as music or video) in a webpage so it can be viewed within the webpage
hyperlinks		A link that you can click on to direct you to another website or file
web page		A hypertext page that can be viewed through a web browser
web browser		A piece of software that allows you to view webpages

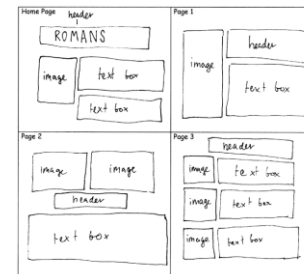
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...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
...for talk about IT		inappropriate, contribution, manipulate, reliability

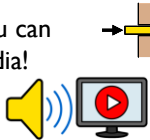
Once a website is published, it can be viewed by anyone in the world



When you open Microsoft Sway and choose 'Create New', you will be able to add a title for your **web page** and choose a background image



You can add lots more content; you can even **embed** videos and other media!



Creating a **plan** before you start using Sway can help you focus and ensure you include all the features you need to!



**Searching on the internet**

**Do** seek help from an adult if something online makes you angry or upset

**Do** make sure that you spell correctly when typing in a search bar and if you are unsure, check

**Do** remember that not all information is reliable or true

**Do** think carefully about the words you use and try to use more than one word

**Do not** share your personal information online (e.g. name and address)

**Do not** click on a link unless you know it is safe

**Do not** respond to unexpected messages and pop-ups online

**Do not** download files or software without asking an adult first





SUPER 6

- I understand the need to be thoughtful when working on a collaborative document
- I can use comments to suggest changes to a document
- I understand how to resolve conflicts when disagreements arise
- I can plan a survey for Microsoft Form with a range of different questions types that will provide different types of answer
- I can create a Microsoft Form with a range of different question types that will provide different types of answer
- I can export data to a spreadsheet, highlighting data, using conditional formatting and calculating averages and sums of numbers

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**I can use specialist vocabulary and computing terms**

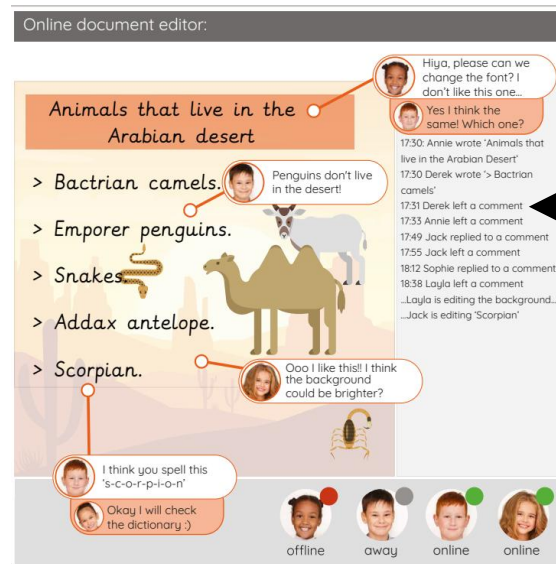
collaboration		Working with others to achieve a specific goal
format		The way something is arranged or laid out
contribution		An idea that you add to a discussion or project
numerical data	123	Information in the form of numbers

**Other words or phrases I may use...**

...for programming		repetition, selection, simulation, pattern, logical reasoning, structure, cause, characteristic, phase, transition, angle
...for hardware, systems, etc.		sensor, physical, system, browser, gigabyte, back up, jpeg, pixel, resolution, quality, Mpeg, wav, pdf
...for controls		control pane animation pane, pop up, publish, share
...for talk about IT		inappropriate, contribution, manipulate, reliability



Did you know?  
People can **collaborate** (work together) on documents, spreadsheets, presentations and more over different networks



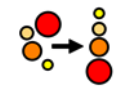
You can see who has left comments and who has replied to comments in the **comments pane**

Your **contributions** can be seen by everyone working on the document



Some software will tell who is online and who isn't

The **format** of a document can include:  
colours      fonts      shapes and sizes of pictures  
layout      text size      text colour





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SUPER 6

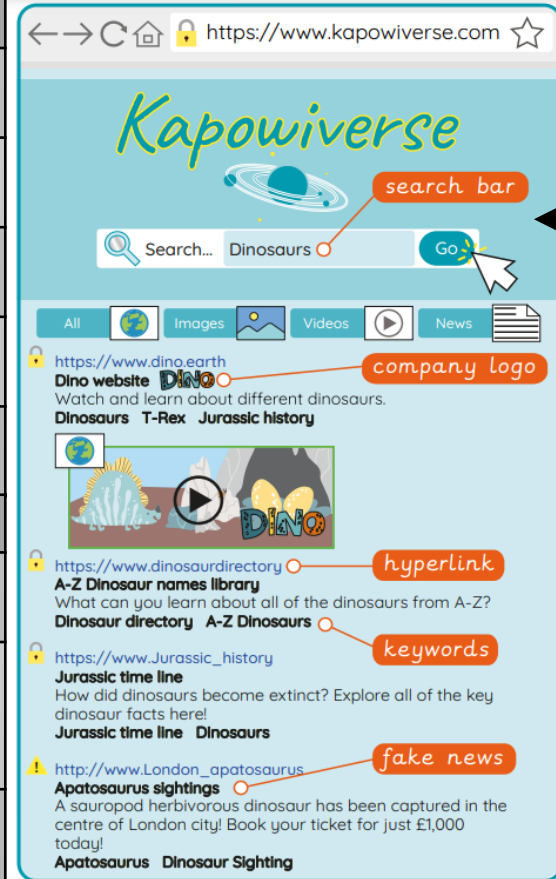
- I can explain what a search engine is, suggesting several search engines to use and explain how to use them to find websites and information
- I can suggest that things online aren't always true and recognise what to check for
- I can explain why keywords are important and what TASK stands for, and use these strategies to search effectively
- I recognise the terms 'copyright' and 'fair use'
- I can combine text and images in a poster
- I can make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank

**I can use specialist vocabulary and computing terms in appropriate ways**

copyright		The exclusive rights given to the creators of film, music and other media to publish, perform, etc.
deceive		To convince someone that a lie is the truth
index	A-Z	How a computer saves information about previous searches to make results quicker the next time they are accessed
rank		How web pages are sorted to give the user the most suitable results at the top of the list; the first result can be considered 'rank one'
web crawler		A program that uses keywords to search the web in logical and systematic ways to find the most suitable results for the user

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
...for controls		internet/browser history, bookmark, password strength
...for talk about IT		impact, obstacle, crucial, rigorous, verify, context, paraphrase, quote, verbatim



There are many different search engines, but they often have similar features



Fake news can be a threat to democracy – you need to learn how to spot it!



Use **TASK** to help you find suitable search results

**Title** – the name of the page

**Author** – is it reliable?

**Summary** – read the description

**Kids** – add 'kids' to your search term





SUPER 6

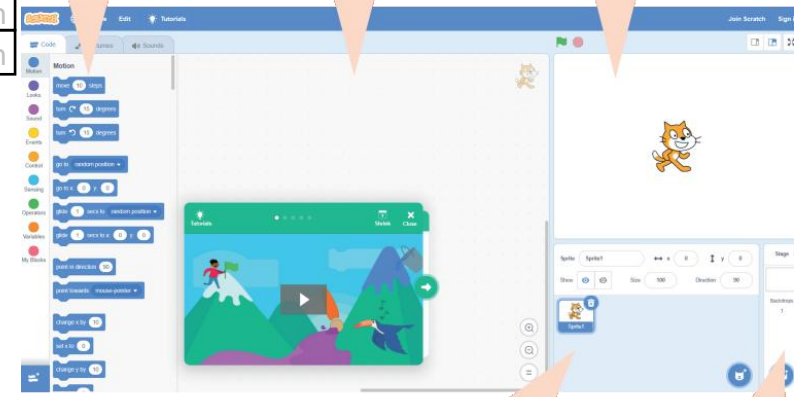
- I can iterate ideas, testing and changing throughout the lesson
- I can correct my own simple mistakes
- I can include a repeat and explain its function to enhance music
- I can code a piece of music that combines a variety of structures
- I can use loops in my programming
- I recognise that programming music is a way to apply my skills

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**Block Palette**  
This is where you choose the blocks to use.

**Scripts Area**  
This is where you create your program.

**Stage**  
This is where you see your program in action.



**Sprites**  
This is what characters or objects are called in Scratch

**Backdrop**  
Backgrounds for your project.

In what ways is writing with code on a computer easier than using a musical instrument?

What do you need to think about when composing music for a film **soundtrack**?

Different colour blocks have different functions  
Blocks attach using the bumps at the bottom and the notches at the top

	Motion		Events		Operations
	Looks		Control		Variables
	Sound		Sensing		My Blocks

**I can use specialist vocabulary and computing terms in appropriate ways**

beat		The basic unit of time, or pulse, of a piece of music
command		Command blocks tell the sprites to do things; e.g. move 10 steps
mind map		A diagram where information is presented visually with the main idea in the centre and other ideas coming off it
tutorials		When you play a game for the first and the program gives you suggestions about how to use each of the functions and controls to teach you how to play
soundtrack		A music recording that accompanies media such as a game, TV show or film

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
...for controls		internet/browser history, bookmark, password strength
...for talk about IT		impact, obstacle, crucial, rigorous, verify, context, paraphrase, quote, verbatim



SUPER6

- I understand that passwords need to be strong and that apps require some form of password
- I can recognise some types of online communication and know who to go to if I need help with any matters online
- I can search for simple information about a person, such as their birthday or key life moments
- I know what bullying is and that it can occur both online and in the real world
- I recognise when health and well-being are being affected in either a positive or negative way through online use
- I can offer some advice and tips to combat the negative effects of online use

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**I can use specialist vocabulary and computing terms in appropriate ways**

opinion		Someone's view about something, that is not always based on facts or knowledge
trusted adult		People who's words and actions make you feel safe; they could be a parent, carer, teacher, aunt, uncle, older sibling
contribution		An idea that you add to a discussion or project
well-being		The state of your mind, health and happiness
health		The mental and physical condition of a person or living thing

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
...for controls		internet/browser history, bookmark, password strength
...for talk about IT		impact, obstacle, crucial, rigorous, verify, context, paraphrase, quote, verbatim

Strong passwords have these features

**Did you know?**

When you install apps on your device, they need your permission for things such as accessing the location, contacts list or photo library  
It is important to know where these settings are, and what the apps do with this information

1. Access the camera (and take pictures/video), the microphone (and record sound), the device's WIFI connection, and the full contact list on the device
2. Determine if the internet is available and access it
3. Keep the device turned on and automatically start itself when the device restarts
4. Secure detailed information on the user's location using GPS and other apps that are running
5. Read and write to the device's storage, install/remove shortcuts, access the flashlight (turn it off and on), request additional installation packages



These are the permissions that a popular video sharing app asks for when you install it  
Do some of these permissions surprise you?



**Fun Fact!**  
Any form of online communication can be misinterpreted – even emojis and memes!



If you see something online that upsets you, tell a **trusted adult**  
You can also contact Childline which is a **free** service





SUPER 6

- I can create a toy with simple images and a single movement
- I can create a short stop motion with small changes between images
- I can think of a simple story idea for my animation and then decompose it into smaller parts to create a storyboard
- I can make small changes to the models to ensure a smooth animation and delete unnecessary frames
- I can add effects such as extending parts and titles
- I can provide helpful feedback to other groups about their animations

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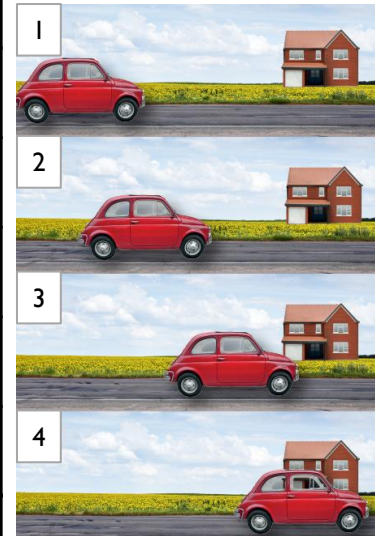


**I can use specialist vocabulary and computing terms in appropriate ways**

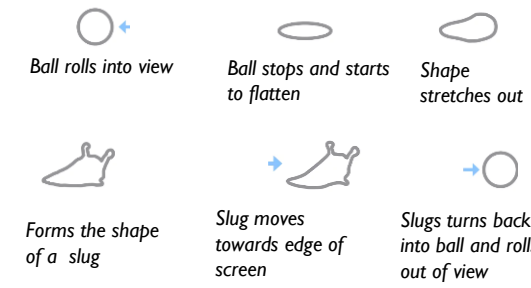
still images		A single static (non-moving) picture, as opposed to a moving image (like a film or TV show)
decomposition		The process of breaking a task, project, problem or code into smaller parts
onion skinning		A way of seeing the previous frame to help create the next frame in an animation
storyboard		A sequence of sketches to show what will be included in an animation or video
model		A small, 3D version of a person or thing; usually made at a smaller scale than the original

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
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**Animation** works by taking lots of still images and combining them so it looks as though they are moving; you can use a **flipbook** to make your own, hand-drawn, animations



To make a **stop-motion animation**, animators will use small **models** and take lots of **still images**; these will then be combined into an animation so it looks like the models are moving



When making an animation, animators will create **storyboards**; a storyboard is like a plan of the events that will happen in the animation



This is an example of **onion skinning**; it helps to create more flowing animations. Sometimes, animators will use the outline of the previous image to help them position the model in exactly the right place



**Did you know?** 24 frames (still images) are needed to make 1 second of film!





SUPER 6

- I can identify some types of data the Mars Rover could collect
- I can explain how the Mars Rover transmits the data back to Earth and the challenges involved
- I can read any number in binary, up to eight bits
- I can identify input, processing and output on the Mars Rovers
- I can grasp the concept of binary addition
- I can relate binary signals (Boolean) to a simple character-based language, ASCII

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Any number can be represented as a series of **bits (binary digits)**

In the early days of computing, switches, holes punched in paper or tape were used to represent binary digits

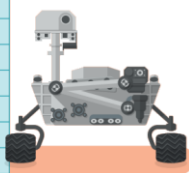
010110

**I can use specialist vocabulary and computing terms in appropriate ways**

binary code	010110	Code used in computers, based around the values of zero (0) and one (1)
communicate		A exchange of information or ideas
data transmission		The movement of information from one point to another
radio signal		A radio wave that is sent or received somewhere
transmit		Broadcast or send out an electrical, radio or television signal

Binary value	Decimal value
0 0 0 0	0 zero
0 0 0 1	1 one
0 0 1 0	2 two
0 0 1 1	3 three
0 1 0 0	4 four
0 1 0 1	5 five
0 1 1 0	6 six
0 1 1 1	7 seven
1 0 0 0	8 eight
1 0 0 1	9 nine
1 0 1 0	10 ten

All decisions and data stored by a computer – including the Mars Rover – are carried out in **binary**

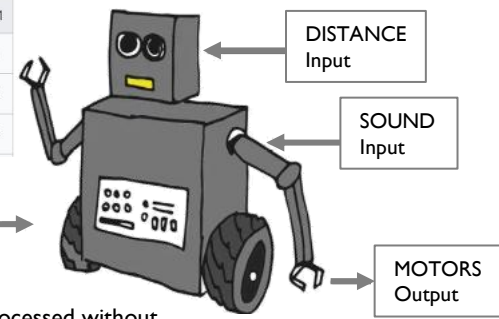


Mars Rovers will need to have a variety of different inputs and outputs

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
...for controls		internet/browser history, bookmark, password strength
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Rover (mission, organisation, year)	CPUs	RAM
<i>Sojourner Rover</i> <small>(Pathfinder, NASA, 1997)</small>	2 MHz Intel 80C85	512 KB
<i>Spirit and Opportunity</i> <small>(Mars Exploration Rover (MER), NASA, 2004)</small>	20 MHz BAE RAD6000	128 MB
<i>Curiosity</i> <small>(Mars Science Laboratory (MSL), NASA, 2011)</small>	200 MHz BAE RAD750	256 MB



What do the terms **CPU** and **RAM** mean?

- The Rover's **CPU** cannot carry out processed without receiving instructions first
- The **RAM** holds all of the instructions for the CPU
- The CPU and the RAM must work together
- The larger the RAM, the more instructions it can hold



Sojourner Rover

**Did you know?**

The first Mars Rover (the Sojourner Rover) could handle just over 4,000,000 bits at once (four million ones or zeros)  
It had 512kb of RAM, which is 512,000 bytes because one kilobyte = 1000 bytes  
Eight bits are in a byte, so 512,000 x 8 = 4,096,000, or just over four million

Using a system called **ASCII**, we can turn binary numbers into text (and vice versa)  
Scan the QR code to find an ASCII table so you can see which binary numbers turn into which letters





SUPER 6

- I can clip blocks together and predict what will happen
- I can make connections with previous programming interfaces I've used, e.g., Scratch
- I can create my own images to make the animation and recognise the difference between 'on start' and 'forever'
- I recognise blocks I've used previously, identifying inputs and outputs used and make predictions about how variables work
- I can choose appropriate blocks to complete the program and attempt the challenges independently
- I can break a program down into smaller steps, suggesting appropriate blocks and match the algorithm to the program

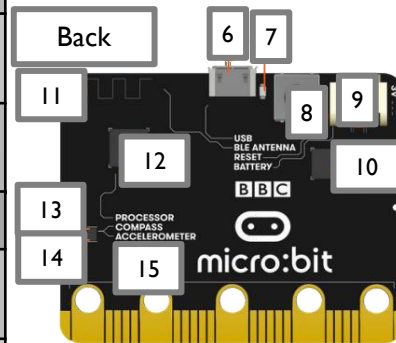
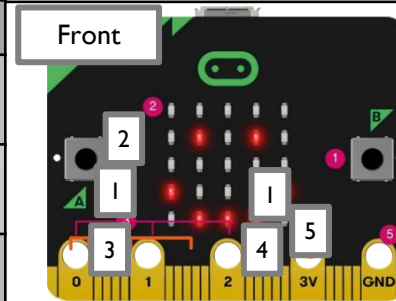
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**I can use specialist vocabulary and computing terms in appropriate ways**

Bluetooth		Device to device connectivity; e.g., sharing images between two smart phones, playing music on a tablet on a wireless speaker
load		To copy a program from storage into the RAM so it is executed (run, or started)
pairing		When you set up an initial link between devices so they can communicate (sometimes using Bluetooth)
systematic		Doing something in an ordered way to achieve a specific goal
USB		A standard type of connection that allows transfer of data and power between many different devices; <b>USB</b> stands for <b>U</b> niversal <b>S</b> erial <b>B</b> us

**Other words or phrases I may use...**

...for programming		protocol, deconstruct, improve, efficiency, audience, complex, prior, subsequent
...for hardware, systems, etc.		gateway, hub, router, server, driver, cookies, file directory, send, reply, CC, BCC, reply all, recipient, field, permissions, cache, flash drive, memory stick, HTML, open source, wikis, solid state, fibre optic, identity theft
...for controls		internet/browser history, bookmark, password strength
...for talk about IT		impact, obstacle, crucial, rigorous, verify, context, paraphrase, quote, verbatim



The **BBC Micro:Bit** is a pocket-sized computer that you can program to do many different things!

- 1: A and B buttons
- 2. LED display and light sensor
- 3: Pin: GPIO
- 4: Pin: 3 volt power
- 5: Pin: Ground
- 6: Micro **USB** socket
- 7: Single LED
- 8: Reset button
- 9: Battery socket
- 10: **USB** interface chip
- 11: Radio and **Bluetooth** antenna
- 12: Processor and temperature sensor
- 13: Compass
- 14: Accelerometer / motion sensor
- 15: Pins

**Polling program code**

```

on start
  set happy to 0
  set neutral to 0
  show icon
  change happy by 1
  clear screen

on button A pressed
  show leds
  change happy by 1

on button B pressed
  show icon
  change sad by 1

on shake
  show leds
  show number happy
  show number neutral
  show icon
  show number sad
  
```

**Scoreboard code**

```

on start
  set player1 to 0
  set player2 to 0
  change player1 by 1
  change player2 by 1
  show string Player 1
  show number player1
  pause (ms) 2000
  show string Player 2
  show number player2
  pause (ms) 2000
  clear screen

on button A pressed
  show number steps
  change steps by 1

on shake
  show string Player 1
  show number player1
  pause (ms) 2000
  show string Player 2
  show number player2
  pause (ms) 2000
  clear screen
  
```

**Pedometer (step counter) program code**

```

on start
  set steps to 0
  show number steps
  change steps by 1

on shake
  show string Player 1
  show number player1
  pause (ms) 2000
  show string Player 2
  show number player2
  pause (ms) 2000
  clear screen
  
```

**Did you know?** You can use Microsoft MakeCode (a block-based programming language) to make programs for BBC Micro:Bits!



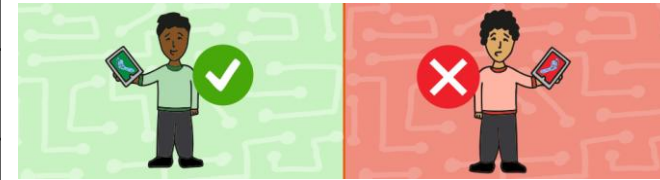
SUPER6

- I can discuss various issues online that can leave children feeling sad, frightened, worried or uncomfortable and can describe numerous ways to get help, including how sharing online can have both positive and negative impacts
- I am aware of how to seek consent from others before sharing material online and describe how content can still be shared online even if it is set to private
- I can explain what a digital reputation is and what it can consist of
- I understand the importance of capturing evidence of online bullying and demonstrate some of these methods on the devices used at school
- I can describe ways to manage passwords and strategies to add extra security, such as two-factor authentication and explain what to do if passwords are shared, lost or stolen
- I can describe strategies to identify scams and ways to increase my privacy settings and understand why it is important to keep my software updated

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**I can use specialist vocabulary and computing terms in sophisticated ways**

phishing		Where someone tries to trick you into giving them your information
malware		Software that can steal and send your personal information
two-factor authentication		A security process where users provide two different ways to show who they are
digital personality		The person that companies, organisations and other people can see based on someone's digital footprint



Your **digital footprint**, or **digital personality**, can affect your online reputation in positive and negative ways



Using avatars, impersonal usernames and **not** giving out your personal information are good ways to reduce your **digital footprint** and **digital personality**

**Other words or phrases I may use...**

...for programming		binary, functionality, aesthetics, user, interface, deterministic, simultaneous, cumulative, concentric, radial, intersecting
...for hardware, systems, etc.		IP address, phishing, virus, terabyte, metadata, VoIP service
...for talk about IT		controversy, prejudice, authentic, plausible, analyse, discern, copyright, plagiarism

Before you share online...**THINK!**

Who do I want to see this?

Do I need to ask someone's permission?

Is this something I should be sharing?

Am I sharing something I know is true?

You might see something online that makes you feel sad, worried, uncomfortable or frightened

- To protect yourself and get help, you can:
- Tell a trusted adult
- Use privacy settings
- Block, report and screengrab



**Phishing** is where scammers try to trick people into giving them personal information, usually via email

**Malware** is software that can steal and send information from your computer to criminals; it is usually disguised as something else to trick people into installing it





SUPER 6

- I understand why barcodes and QR codes were created then create my own QR code using a QR code generator website
- I can explain how infrared can be used to transmit a Boolean type signal
- I can explain how RFID works, recall a use of RFID chips, and type formulas into spreadsheets
- I can take real-time data and enter it effectively into a spreadsheet
- I can present data I have collected as an answer to a question and recognise the value of analysing real-time data
- I can analyse and evaluate transport data and consider how this provides a useful service to commuters

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**I can use specialist vocabulary and computing terms in sophisticated ways**

barcode		A machine-readable code of lines and numbers, printed on an item and scanned to identify the item and information about it
infrared		The red section of the electromagnetic spectrum; we cannot see it with our eyes, but we can use it to transmit small amounts of data
proximity		Nearness in space, time, or a relationship
RFID		<b>R</b> adio <b>F</b> requency <b>I</b> dentification devices use radio waves to see where someone or something is
transmission		When something is passed to or sent to another place

**Other words or phrases I may use...**

...for programming		binary, functionality, aesthetics, user, interface, deterministic, simultaneous, cumulative, concentric, radial, intersecting
...for hardware, systems, etc.		IP address, phishing, virus, terabyte, metadata, VoIP service
...for talk about IT		controversy, prejudice, authentic, plausible, analyse, discern, copyright, plagiarism

Did you know?

**Infrared** can be used for many different everyday (and not so everyday) uses. Which of these have you encountered before?

Thermal imaging

Night vision

Remote controls for TV/VCR

Cooking

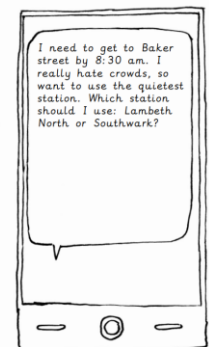
Short range communication

Which of these can send the most information?

QR codes    barcodes

Transport networks worldwide collect huge amounts of **data** (information). They **analyse** this data to help solve problems.

In this unit, you will be **systems/data analysts** and use data to help commuters solve problems.



Most bank cards have an **RFID** chip. This is how 'contactless' payments work.



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SUPER6

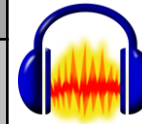
- I can explain how to record sounds and add in sound effects over the top
- I can produce a simple radio play with some special effects and simple edits which demonstrate an understanding of how to use the software
- I can create a document that includes correct date information and facts about the computers and how they made a difference
- I can demonstrate a clear understanding of my device and how it affected modern computers
- I can include well-researched information with an understanding of the reliability of my sources
- I can describe all of the features that we'd expect a computer to have including RAM, ROM, hard drive and processor

**I can use specialist vocabulary and computing terms in sophisticated ways**

background music		A secondary sound (or piece of music) that is part of the media, but the viewer's attention is not focussed on it because of another, primary, sound
hardware		The machines, wiring and other physical components of a computer
operating systems (OS)		The base software needed on a computer for it to be able to manage basic commands, hardware and software, and provide a user-friendly interface
processor		A name for the central processing unit ( <b>CPU</b> ) of a computer; CPUs control and run operations
sound		The noise that is played as part of a piece of media; it might be dialogue, music or sound effects

**Other words or phrases I may use...**

...for programming		binary, functionality, aesthetics, user, interface, deterministic, simultaneous, cumulative, concentric, radial, intersecting
...for hardware, systems, etc.		IP address, phishing, virus, terabyte, metadata, VoIP service
...for talk about IT		controversy, prejudice, authentic, plausible, analyse, discern, copyright, plagiarism



**Audacity** is a sound editing software where you can combine sound clips, edit clip lengths, record sounds and add sound effects

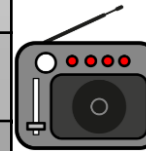


The **BBC Sound Effects Archive** has lots of free clips you can download and use for non-commercial projects

**(-) Soundtrap**



**Soundtrap** is an online music editing program with similar features to Audacity



**Did you know?**

Some of the first computers were created in WW2 and helped the Allies win the war

In this unit, you will make a short radio play (or podcast) to share information about these computers or important people



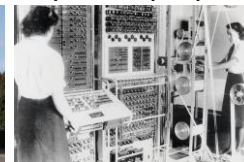
Alan Turing



Tommy Flowers



Bletchley Park



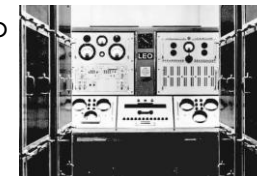
Colossus

Computers have changed a lot over the years  
You will research about different computers and their impact on the history of computing

Memory sizes:	Bytes:	Invented:	Abbreviation:
1 kilobyte	1,000	1950	(kb)
1 megabyte	1,000,000	1956	(mb)
1 gigabyte	1,000,000,000	1986	(gb)
1 terabyte	1,000,000,000,000	2007	(tb)



Commodore 64



LEO



Raspberry Pi



Nintendo Entertainment System (NES)



SUPER6

- I can explain that codes can be used for a number of different reasons and decode messages
- I can explain how to ensure a password is secure and how this works
- I can create a simple website with information about Bletchley Park
- I can explain why people needed to build electronic thinking machines to solve cipher codes
- I can explain the importance of historical figures and their contribution towards computer science
- I can present information about my historical figure in an interesting and engaging manner

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**Did you know?**  
Over 10,000 people worked at Bletchley Park during WW2; 75% of them were women

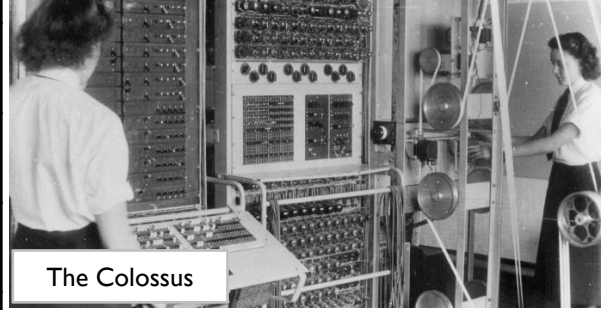
**I can use specialist vocabulary and computing terms in sophisticated ways**

acrostic code		A type of code where the first letter of each word or paragraph spells a message when put together
cipher		Information that is written in a secret way, also known as a code (sometimes spelt cypher)
combination		A sequence of numbers or letters used to open a lock; it can also be when things are joined or merged together
contribute		To give something in order to help something be completed; the part you play in completing a project
scrambled		Mixed up

**Other words or phrases I may use...**

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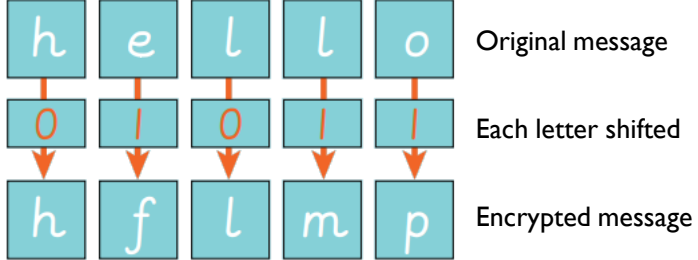
In 1943, the Colossus computer was constructed by codebreakers. It was enormous and was the world's first programmable electronic computer. It took hours instead of days and weeks to crack encrypted messages.



The Colossus

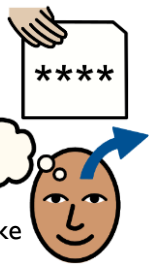
Enemy messages were intercepted and written down on paper, these were then transferred to Bletchley Park to be decrypted.

This is an example of a date shift cipher  
Date used to encrypt the message: 1<sup>st</sup> January 1984  
Date in number format: 01 01 1984



Brute force emulator

**Brute force hacking** is when a hacker will use trial and error to guess a password. They can use computer programs to check many different passwords so they can access secure information. Use the QR code above to access a brute force emulator. Can you use your prior learning from your E-safety lessons to make a password that is difficult to crack?



Name: **Margaret Hamilton**  
Born: **1936**  
Famous for: **Developing onboard software for Apollo Moon missions** (amongst other things)

Name: **Charles Babbage**  
Born: **1791** Died: **1871**  
Famous for: **Inventing the first mechanical computer**



SUPER 6

- I can iterate ideas, testing and changing them throughout the lesson, and explain what my program does
- I can use nested loops in my designs, explaining why I need two repeats
- I can alter the house drawing using Python commands and use comments to show a level of understanding around what my code does
- I can use loops in Python and explain what the parts of a loop do
- I recognise that computers can choose random numbers
- I can decompose a program into an algorithm and modify a program to personalise it

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Red / Orange / Green

I can use specialist vocabulary and computing terms in sophisticated ways

import		To pull another file into software, to place edit and manipulate it
indentation		In programming, <b>indentation</b> is used to define a block of code
random		Unpredictable, with no pattern
remix		Something that has been changed or reworked so it varies from the original
shape		The external lines or form of something

Other words or phrases I may use...

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In this unit, you will learn how to use **Logo** and **Python**, two text-based programming languages



```
# Times tables in Python
input = 10
# Iterate 10 times from i = 1 to 10
for i in range(1, 11):
    print(input, 'x', i, '=', input * i)
```

Legend:  
█ Indentation  
█ Variable  
█ Loop

This is what code in **Python** looks like  
 This code makes the computer display the ten times table  
 How could you **remix** it so it displays a different times table?



You can use **repetition** or **loops** to create concise **algorithms**  
 Consider these algorithms – both will draw a square, but one is a lot more concise

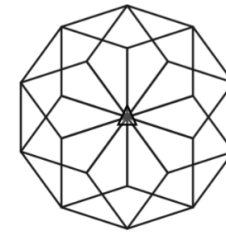


- Forward 10
- Right 90
- Forward 10
- Right 90
- Forward 10
- Right 90
- Forward 10
- Right 90



- Repeat 4
- Right 90
- Forward 10

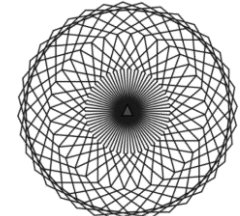
10 pentagons – rpt 10 [rpt 5 [fd 100 rt 72] rt 36]



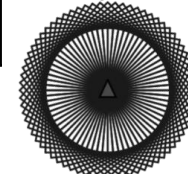
**Logo** does not understand the word 'backward' so we have to use commands it is familiar with

- fd** = forward
- bk** = backward
- rt** = right turn
- lt** = left turn
- cs** = clear screen
- rpt** = repeat

36 octagons – rpt 36 [rpt 8 [fd 100 rt 45] rt 10]



72 squares – rpt 72 [rpt 4 [fd 100 rt 90] rt 5]



**Did you know?**

**Python** is sometimes used to teach computers how to think for themselves; this is sometimes known as Artificial Intelligence (AI) or machine learning  
 The AI can learn skills such as speech recognition