

My Knowledge Organiser



Computer
Science



Information
Technology



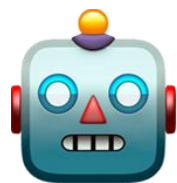
Digital
Literacy

Computing Knowledge Organiser for **Year 3**

Name:

Computing in Year 3

Computing is full of important skills and it helps us understand the digital world around us. Computing has three parts.



Computer Science

Computer Science teaches us about problem-solving, how computers work and coding languages.



Information Technology

Information Technology teaches us about how to use devices and apps to be creative and make digital content.



Digital Literacy

Digital Literacy teaches us about online life and how to stay safe and healthy when using technology.

Year 3's Important Person:

Ada Lovelace



- A brilliant mathematician known as 'the world's first computer programmer'.
- Her notes on technology in her time inspired Alan Turing to create the first computer in the 1940s.
- Born in 1815 when there were no computers, she was able to understand what technology could look like in the future.



[Watch video about Ada Lovelace.](#)



What Should I Already Know Checklist:

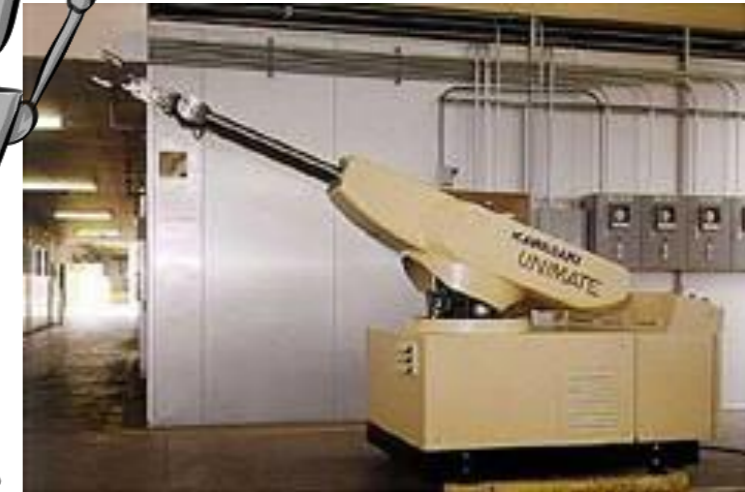
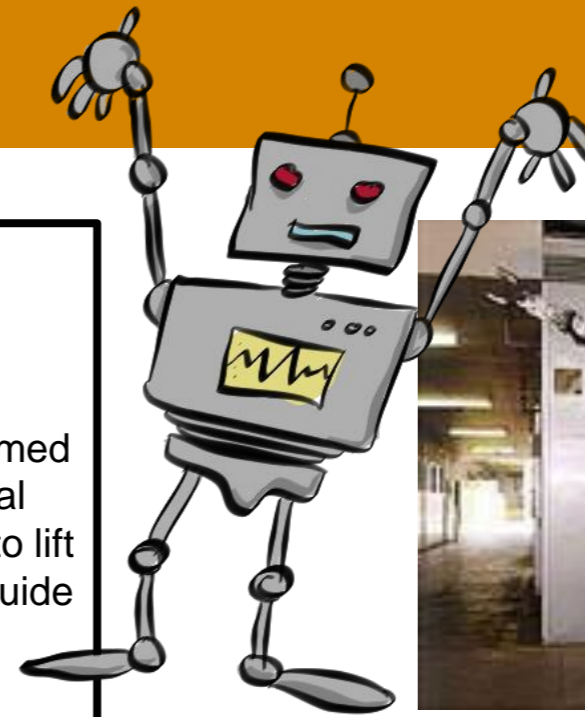
- Can you write algorithms and turn them into programs?
- Can you create and debug simple programs that includes a repeat loop?
- Can you make accurate predictions about the outcome of programs?
- Can you use inputs and outputs in programs?
- Can you use internet services like email, streaming and the web?

We will learn:

- To create a detailed flow diagram.
- To turn an algorithm into a program.
- To test programs and recognise when it needs to be debugged.
- To create their own sprite in Scratch/Scratch Jr.
- To sequence commands and add a repeat command in a program in order to improve it.
- To create a variable.
- To create a program that contains selection, inputs and outputs.
- To use logical reasoning to detect potential problems.
- About the World Wide Web and Internet.
- To send an email and understands how this works.
- How information travels through computer networks.
- To use keywords effectively.
- That search engines will try to put the most useful websites at the top.

What was the first robot?

The first commercial, digital and programmable robot was built by George Devol in 1954 and was named **the Unimate**. It was sold to General Motors in 1961 where it was used to lift pieces of hot metal at the Fisher Guide Plant in New Jersey, USA.



What do you think?

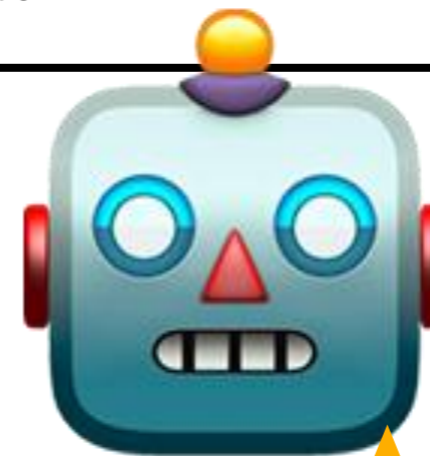
Almost anything computers are capable of is done by **computer programs**. The most basic programs use simple commands in a step-by-step order. They're called sequences. **Sequences** are everywhere, from simple tasks like getting dressed or making a cup of coffee to doing rocket science. Can you order this sequence so it makes sense? Number these instructions (right) 1-4 so that they are in the correct order, 1 being the first instruction.



- Enter the room
- Close the door behind you
- Unlock the door
- Open the door



Meet some real-life robots and find out what robots really are and what they do for us every day! [Watch the video.](#)



I do the jobs you humans don't want to do!

What are robots?

The word robot is used to mean a man-made machine that can perform work or other actions normally performed by us (humans), either automatically with instructions or by remote control. The word Robot comes from the Czech word 'robota' which means 'forced Labour'. It was used in a play by Karel Capek called Rossum's Universal Robots in 1920.



Important Words:

- Algorithm:** Steps or instructions to follow to achieve a task.
- Application (App):** A program such as a game or drawing app that performs a task on a computer.
- Bugs:** Mistakes or errors in code.
- Code/Coding:** Lines or blocks of instructions (see program).
- Command:** A step or line of programming (instruction for younger children).
- Data:** Numbers and information that can be represented by images, video, text and sound.
- Debug:** Finding and correcting errors (bugs).
- Decomposition:** Splitting things into smaller parts.
- Event:** Code that runs when something happens, such as a button being clicked.
- Execute:** Play or run code in a program.
- Input:** A method of computers receiving data (Eg. keyboard, mouse, touch, sensors etc).
- Object:** An item on screen, such as an image, a button or some text.
- Output:** The information produced by a computer system for its user, typically on a screen, through speakers or on a printer, but possibly through the control of motors in physical systems.
- Prediction:** Make a guess about what happens in a program or how a problem might be solved. Also known as logical reasoning.
- Program:** A series of instructions written in a computer language (Code).
- Repeat (Loop):** Instructions that can be repeated.
- Sequence:** A set of instructions that are followed in order.
- Sprite:** (in Scratch) an object that can be controlled by programming.
- Testing:** Checking if a program works how it should.

Videos to watch:



A basic explanation of what coding is. Programs are used to play games, do homework or talk to friends on a computer, [Watch video.](#)

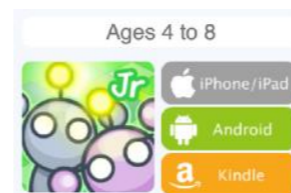


A quick video on how to create a program with Scratch Jr - [Watch video.](#)



Learn how to use Scratch. Video tutorial on using Scratch to create programs. [Watch video.](#)

Try this online game to learn about programming robots.



What is Code?

It's code that makes your technology work. When someone makes an app or game, they can't use any of the languages that people normally use to speak to each other.

For instance you can't just shout at a computer and expect it to do what you want. Instead you have to use a special language called a programming language (code). There are 100s of these!

So code can be simply thought of as instructions in a language that computers understand and coding as the act of writing those instructions.

Code = Instructions that computers can understand!



There are two types of coding

Visual: Lego blocks of instructions that stick together to build a program/app.



Text Based: There are 100s of text-based programming languages for writing programs/apps.

```

01 move(.left)
02 move(.up)
03 move(.left)
04 move(.up)
05 set()

```

Speaking a computer's language.

There are many different types of programming languages. Some that you may come across are Logo, Scratch, Blockly, Python, Swift and Kodu. Each of these languages are suited to creating different things.



NEW WORDS TO LEARN

LOOP

What is a repeat command?

A sequence of instructions that is executed repeatedly.



What is Decomposition?

In computing, decomposition means to take a problem and break it down into smaller manageable bits. [Watch video.](#)



Computer programmers decompose their code into small parts. If they are programming a computer game they might write the code to control a character's movement and then write the code to control sound effects. Making a computer game is quite a complex problem. You could solve this by breaking it down into smaller tasks.

1. Come up with an idea.
2. Create graphics.
3. Program each sprite one at a time.
4. Test game.
5. Debug and make improvements.

Different types of instructions to learn.

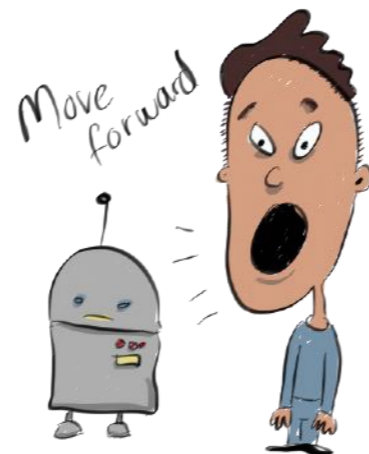
A **“command”** tells a computer to do one thing.

A **“decision”** but computers can only make simple yes/no or true/false decisions.

Sometimes you want the computer to do something more than once. This is called a **“repeat”** or **“loop”**.

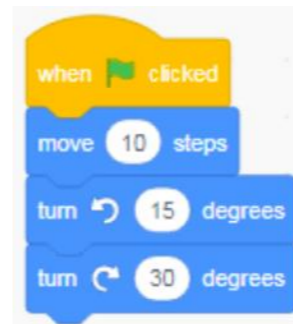
A set of instructions for a task is known as an **“algorithm”**. An algorithm is a bit like a recipe.

It's called a **“program”** when all the commands (instructions) are put together so a computer can understand them.

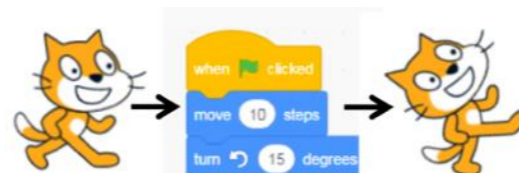


What does a command look like?

For example, here is a simple sequence of command blocks used in Scratch.

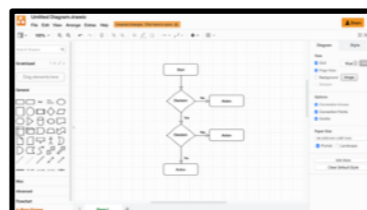


When the flag is clicked, the sprite will move 10 steps, turn right 15 degrees and left 30 degrees.



Creating Flowcharts

Building a flowchart is very easy, simply drag and drop the shapes from the left hand side. <https://app.diagrams.net>



What is an algorithm?

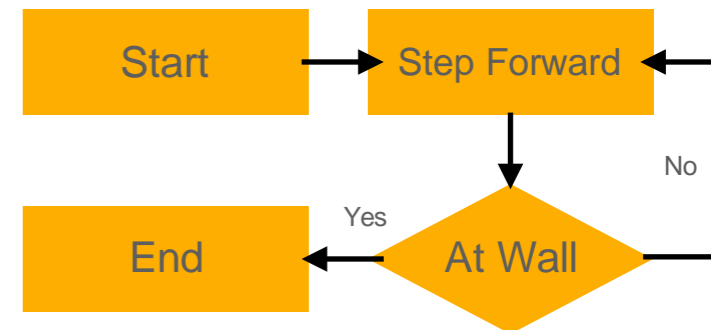
An algorithm is a sequence of instructions or a set of rules that are followed to complete a task. The task can be anything, but clear instructions must be given for the task.

What does an algorithm look like?

Algorithms are usually written using a flowchart. A flowchart is used to show processes and decisions made in an algorithm, whilst the arrows are used to show the flow of the program.

Processes are shown as squares and are used when we are doing something.

Decisions are shown as a diamond and are used to represent when we are testing something.



Shape	Name	What it means
	Start/End	An oval means the start or end.
	Arrows (flow)	A line means what happens next and connects shapes.
	Input or Output	A parallelogram means input or output.
	Process	A rectangle means - do something.
	Decision	A diamond means a choice - "if"

What Should I Already Know Checklist:

- Can you create a presentation or basic digital book?
- Can you read a simple database to find information?
- Can you organise & collect the data?
- Can you create digital content using more than one app?
- Can you independently save and open files?
- Can you use a search engine & navigate the results to answer questions?

We will learn:

- To create digital content using a range of mixed apps and media.
- To be creative and independent while using unfamiliar apps or technology.
- To create a plan and storyboard for producing digital content.
- To design a simple questionnaire to collect information, and display the information in a graph or table.
- To add information to a database.
- That the top search results can be manipulated and are based on things like most popular, recently updated.
- About advanced search tools.
- To use search engines to collect information.

Did you know?

More people have mobile phones than toilets. Out of the 7.7 billion people in the world, more than 6 billion people have access to a mobile phone. Compared to only 4.5 billion people who have access to a working toilet.



What do you think?

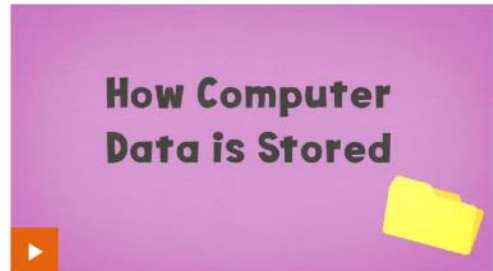
Photos and videos can be stored on a computer, but which files take up the most space? A video is the larger file. A video is made of lots of photos, shown quickly, one after the other. It contains sound too. It will need more data.

1024 bytes	= 1 KB	KB	= Kilobyte
1024 KB	= 1 MB	MB	= Megabyte
1024 MB	= 1 GB	GB	= Gigabyte
1024 GB	= 1 TB	TB	= Terabyte
1024 TB	= 1 PB	PB	= Petabyte

How do you save work?

You can make lots of things on a computer. You can make a picture, write a letter or draw a chart. It is important to save your work. Then you can come back to it at another time. To save your work you need to give it a name. Then you click the 'save' button to store it safely on your computer. When your work is saved it is called a 'file'. You can save photos, music, videos, games and lots of other things on a computer. Different files have different file extensions, for example Microsoft Word documents have the file extension .docx. Here are some of the common ones you will see.

File Extension	Type of file
.mp4	Movie: used for downloading and streaming videos from the internet.
.mp3	Music: digital music format for creating high-quality sound files.
.gif	Small image: Image files that supports both animated and static images.
.jpg	Photo: Popular file format used for images and graphics—especially on the internet.
.pdf	Document or book: Used to distribute read-only documents.
.mov	Movie: Video file mainly used by Apple devices.
.png	Photo: File type used to offer a clear background or a partially transparent image



Watch this video to find out how a computer stores data.



= This icon is used to represent a folder.



= This icon is used to represent a file.



Important Words:

Data

Numbers that represent images, video, text and sound.

eBook

A digital book that can be read on a computer.

Emoji

Images that show a mood, feeling or actions.

Format

Changing or editing the look of your digital work. For example making the text bigger.

Frame

Single image in a film or animation.

Icon

Small image that can be used instead of words.

Illustration

Drawings showing ideas or characters.

Information

Data such as numbers, text, images presented in a meaningful way.

Menu

A set of options when using a **computer** or app to help find information or do a task.

Multimedia

Different types of media. For example images, text, video and sound.

Save

Keep and store your work on a computer.

Tool

An item in an app that helps you do something on a computer. For example the pen tool can be used to draw.

Word Processor

An application for writing text on a computer.

Keyboard Shortcuts:

Quiz of keyboard short cuts: How many do you know?

 +  = _____

 +  = _____

 +  = _____

 +  = _____

   = _____

Score _____ /5

What is "Casting" & "Airplay"?

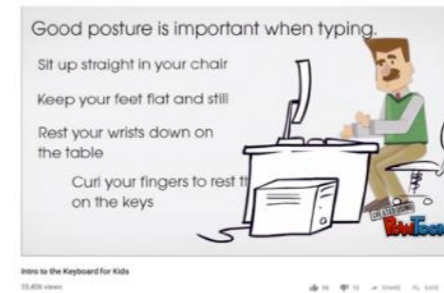
Casting or screen mirroring involves sending what's on your device's screen to a TV or projector usually via a wireless connection. On the iPad this is called Airplay. Look for this icon on your device.



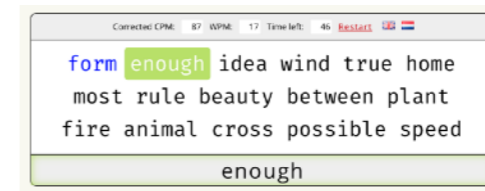
Using a keyboard:

In an age of touch screens, it is still important we learn important mouse/trackpad skills, plus typing quickly and correctly.

This video was created to introduce children to the QWERTY keyboard, how it got its name, and why it is arranged in that order.



Test your typing speed on a Computer Keyboard versus iPad Keyboard. Record your time using this website.



Have a go at this typing game. It's Computer and iPad compatible.





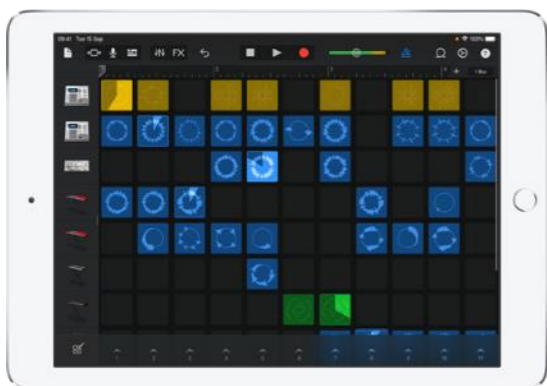
Making Music:

GarageBand on the iPad is a fantastic app for creating music. This is also a great app for those of us who aren't musically gifted. We will be using GarageBand to create simple pieces of music. Whilst doing this we will be learning how to create a new song, adding instruments, using pre-set patterns and adding loops/tracks.

Start by watching this introduction video on how to create your own music using GarageBand on the iPad.



Start with Live Loops as it's designed to make it easy to create music like a DJ. It's a simple to use grid, where you can start and stop the playback of loops, while keeping everything in sync. You'll be able to create great music in no time!



Using Google Earth:

Google Earth is a great way of exploring the planet. One of the first things that you'll want to do when you open up Google Earth is to find where you live. So type the place you are looking for in the search box and press 'enter'. The search result will be marked by a grey cross hair. Open the app or visit the Google Earth website (use the Chrome browser).



Next, try searching for countries and places you have visited or would like to visit.

What is VR?:

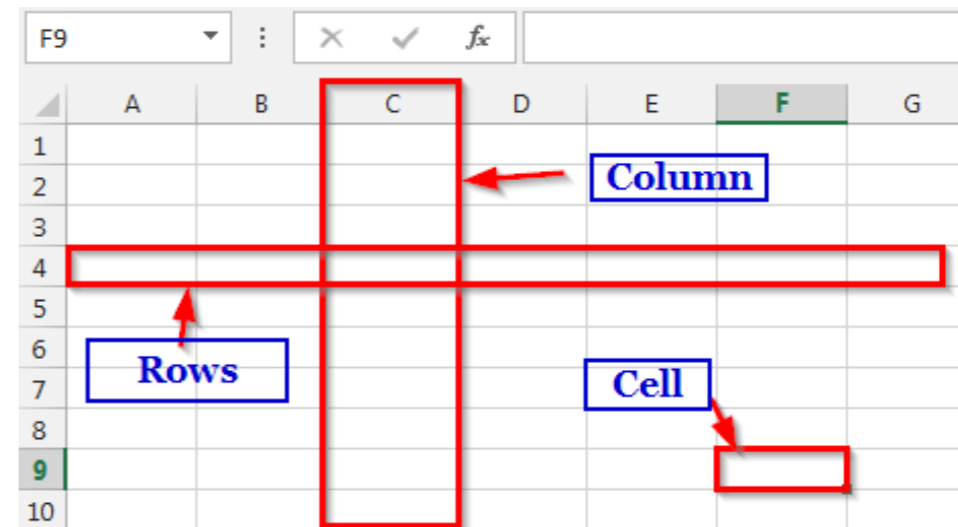
Virtual reality (often just called VR) is the name for computer technology that makes a person feel like they are somewhere else. It uses software to produce images, sounds, and other sensations to create a different place so that a user feels like he or she is really part of this other place. Watch this video all about how Google Earth VR is bringing the whole wide world to virtual reality. Visit this website and try some of the 360^a videos.



What is a spreadsheet?:

A spreadsheet is a powerful tool for organising information and data. What are they for? They are used to carry out lots of calculations quickly and to store large amounts of information for a range of purposes. They are used a lot by businesses to organise money and data. What can they do? Once you know how to do it – they can do almost any maths calculation that you could need!

A spreadsheet consists of a grid of 'cells' arranged in rows and columns and information can be inserted into each cell. Each cell can contain text, numbers and formulas. A formula is a calculation.



What is posture?

The benefits of good posture, the way you sit or stand are important. Your posture is the foundation for every movement your body makes and can determine how well your body adapts to the stresses on it. Your use of technology can have a big impact! Watch this video.





What Should I Already Know Checklist:

- Do you know about communication online in the world around you and how to communicate in a polite manner?
- Do you know about the Internet and which sites/apps are suitable for you to use?
- Do you know about different types of media content?
- Do you know about trusted adults, personal information and using strong passwords?
- Do you know the differences between the Internet and the real world?
- Do you know about copyright?
- Do you know about how some information may be inaccurate or untrue?
- Do you know about using a search engine?

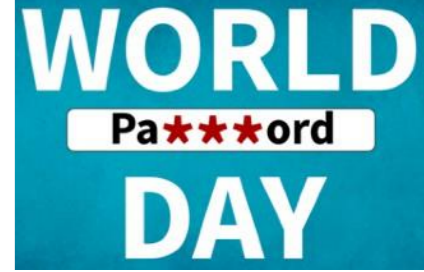
We will learn:

- About the internet, services and computer networks.
- About web sites and web terminology.
- About how to make judgements about the usefulness and accuracy of information, including 'fake news'.
- About copyright and to recognise copyright material.
- About the SMART internet safety rules.
- About personal information and why it shouldn't be shared.
- About who you should seek help from about online concerns.
- About how to send and reply to online messages, such as email, respectfully and understand the difference between online and face-to-face.
- About how use the safety features of websites as well as reporting concerns to an adult they trust.
- About online bullying/cyberbullying and the different forms it can take.
- About having a balanced approach to the use of technology.
- About recognising websites and games that are appropriate e.g. PEGI rating.
- About online accounts, signing-in and why passwords should never be shared.
- About what makes a secure password and why they are important.
- About username, information shared and digital footprint.

Did you know?

The first Thursday of every May is **World Password Day**. This date is a global reminder of the importance of password security but also an opportunity to review latest research and recommendations for online safety. The National Cyber Security Centre recommends to 'Think Random' when setting passwords.

Choosing three random words that are memorable, but not personal to you, makes it easy to remember but also difficult to guess your password. A good way to create a strong and memorable password is to use three random words. Numbers and symbols can still be used if needed, for example **3redhousemonkeys27!**



What do you think?

What makes a strong password? Passwords keep your personal information safe, this is why it is so important to make sure you have a strong one.

Passwords should be easy to remember but difficult for someone to guess or figure out. Avoid using the same password for all your accounts. Never use your name, birthday, phone number, star sign etc as these can easily be found out.

My Password Generator

Strong passwords need to be memorable but **NOT** personal!

Step 1:	Step 2:	Step 3:	Step 4:																																																																																																				
Choose an action	Choose a mood	Choose an animal	Choose a number																																																																																																				
Dance	Happy	Dog	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Run	Sad	Cat																																																																																																					
Sit	Sick	Duck																																																																																																					

S Stay Safe: Don't give out your personal information to people / places you don't know.

M Don't Meet Up: Meeting someone you have only been in touch with online can be dangerous. Always check with an adult you trust.

A Accepting Files: Accepting emails, files, pictures or texts from people you don't know can cause problems.

R Reliable?: Check information before you believe it. Is the person or website telling the truth?

T Tell Someone: Tell an adult if someone or something makes you feel worried or uncomfortable.

Follow these SMART tips to keep yourself safe online!

What is personal information?

This is the information that identifies who you are, where you live, who you live with, where you go to school, your age, date of birth and so on.

What are online safety rules?

These are instructions of how things should be done online, these rules will help to keep you safe.



[BBC's Top tips website.](#)



Important Words:

- Bluetooth**
Is a way of wirelessly exchanging of data over short distances.
- Chat**
To talk online in a friendly or easy manner.
- Communication**
To exchange thoughts, ideas, or information online. This could be talking, photos, video or text.
- Digital**
Storing, using, or sending information electronically in the form of numbers. A computer is a digital device.
- Download**
A computer file that is sent from one computer to another. She keeps all of her downloads in one folder.
- Follow**
To make friends with someone online and follow (see) what they share online.
- Link**
A button with a web address that when clicked will open that web page on your computer.
- Online**
Another name for using the internet or web.
- Online bullying**
The abuse and mistreatment of someone online.
- Online game**
A game that requires the internet. Also game were players can play against others who are not in the same room.
- Personal information**
Information about you, address, school, age, passwords etc.
- Search**
To use a search engine to find information online.
- Send / Share**
To send a message, photo or video using an online communication app to one or more people.
- Sign-in / Log in**
To join a particular online website or app. When signed in more features are available.
- Trusted adult**
A trusted adult is someone that you have a good relationship with. It is someone who you think has your best interests in mind. Parents and teachers etc.
- Website**
An information page online that can only be accessed using the internet.
- Wireless (Wifi)**
Is a way of connecting computers and digital devices to the internet and each other.

Videos to watch:



There are lots of different ways to communicate. Watch video.



Just like in real life it's important to be polite and respectful when you are online. Watch video.



'CEOP - Lee and Kim - Animal Magic'. Watch video.



Sharing information online can sometimes come with risks. Watch video.

What is a Phishing email?

One of the most popular forms of online communication is the email. When using email you have to watch out for scam emails, one of the big types of scam email is called phishing. These are emails that appear to come from a bank, or a company like Apple, PayPal or Google or other service provider. The scam email will usually try to get you to click a link to enter your details or personal information. This then allows criminals to get access to bank account details or other personal accounts online. Below is an example scam (phishing) email pretending to be from Apple.



Dear Apple Customer,



To get back into your apple account, you'll need to confirm your account . It's easy: Click the link below to open a secure browser window. Confirm that you're the owner of the account and then follow the instructions.

The link will expire 72 hours after this email was sent.

[Unlock Apple ID >](#)

What is Screen Time?

Screen time is the amount of time that someone spends using a device or computer, watching television or playing on a games console. Managing this is important, too much of a good thing can be bad for you!

Have you ever binge-watched videos on social media that have become more and more extreme?

It's important to find a healthy balance between the time you spend on and offline.

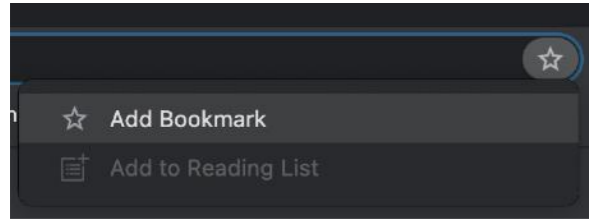


Watch this video - Down the rabbit hole.



What is a Bookmark?

The Internet allows you to see shortcuts to your favourite websites. This makes it really easy to find the webpages you like or need. To bookmark a website in your browser, simply look for an icon that looks similar to these below.



What is a Digital Footprint?

It's simply all the stuff you do online. Everyone leaves a digital footprint behind when they use the internet. Whenever you go online you are being tracked, either by your IP address or the accounts you sign into. Companies see what websites you visit, the things you like and record them. This allows companies to suggest more things online that you might like.



What are Privacy Settings?

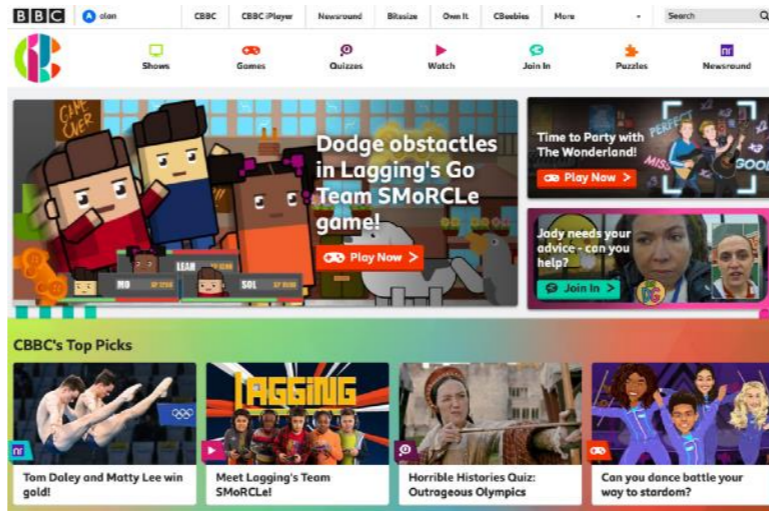
Privacy settings are the controls available on devices and many apps/websites. They allow users to limit who can access profiles and what information can be seen. Privacy settings put you in control of your personal information.



How Do You Use a Website?

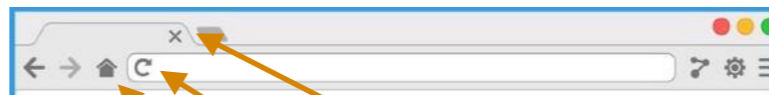
Most websites work in the same way, they will have a menu and links to help you find your way around. You can navigate a website using:

- A menu of buttons or icons. These will be either at the top or the left hand side.
- You can click on text links and image buttons.
- You can use an in-site search, using keywords.



What do the buttons on a browser do?

Remember a web browser lets you view websites on the Internet.



- Back button, takes you to last page you looked at.
- Home, takes you back to the start page.
- Refresh, reloads the page again. Useful if you have a problem.
- Tabs, lets you have more than one webpage open at once.

What is a Search Engine?

Search engines are used to search the world wide web for keywords and display the results in order. When using search engines it is useful to think about the words that you use in your search. If you use too few words, you will get too many results, but if you use too many words you may not get any results at all. When you want to find the answer to a question, such as, 'What countries did the Vikings raid?' You need to think about the **keywords**.



Spotting Fake News Tips!

Fake News is big news. How good are you at telling what's true and what isn't? There are lots of different forms of misleading information. Here are some you may see online:

- **Hoaxes** such as the Momo Challenge and the often reported stories of celebrity deaths where the person concerned is alive and kicking.
- **User-generated 'factual' content** like Wikipedia – often top of internet searches, and therefore the go-to source for many children.
- **News outlets** that have a political bias.
- **Blogs and vlogs**, such as on YouTube, where a person's opinions are presented as fact.
- **Outdated information**, for example news stories dating back several years. Social media, where people often share stories without checking if they're true.

BBC's top tips for spotting Fake News.



Quiz: Can you spot the signs of fake news?



