# Year 4: Autumn

# 4.1 Coding

| Enquiry Question | What are conditional commands? | |
|---|---|---|
| | **Required Prior Knowledge** | **Knowledge to be taught** |
| **Declarative Knowledge** | • Flowcharts are a type of diagram that use specifically shaped labelled boxes and arrows to represent an algorithm as a diagram.<br>• Timers are used in coding to help control when a block of commands are run.<br>• Repeat is a control block and blocks of commands can be set to repeat a specified number of times using the repeat control block.<br>• Testing, debugging and fixing are an important part of the process of making computer programs.<br>• Understanding what nesting is and the effect it has on a program can help when trying to debug a program. | • Selection is a term used in computer programming.<br>• **If** statements are used to create selection in 2Code<br>• Coordinates are used in computer programming to determine the position of a point, shape or object.<br>• **Repeat until** is a control block and that blocks of code will repeat until a condition is met.<br>• **If/else** statements are a conditional command that tests a statement. |
| **Procedural Knowledge** | • Identify the point the flowchart starts.<br>• Identify any points on it that represent an input or output.<br>• Follow the flow of the chart and interpret what it is representing.<br>• Create a representation of the flowchart by using 2Code.<br>• Insert a **timer after** command in code view and use a **timer every** command to make an event happen.<br>• Insert a **repeat** command into the coding area and set it a specified number of times to repeat.<br>• Test what happens when changing how a program is nested.<br>• Use the knowledge of nesting to help debug a program that isn't working as intended. | • Interpret flow charts depicting selection and explain what happens if a condition is or isn't met within it.<br>• Recognise how an **if** Statement in 2Code is being used to create selection within a simple program. Create selection within 2Code using **if** statement blocks within their own program.<br>• Look at code with **repeat until** and know how to change code within it to meet an expected outcome. Insert **repeat until** into their own programs.<br>• Insert the if/else command within a program. Create an if/else statement using blocks of code.<br>• Execute code with a variable within it. Use the variable watch to monitor how a variable changes as the program executes code. |
| **Vocabulary** | **code blocks, command, co-ordinates, debug, execute, flowchart, 'If' statement, 'If/Else' statement, input, nest, object, prompt, implement, predict, repeat, repeat until, run, properties, selection, sequence, timer, variable** | |

| Learning Questions | What do we know about coding already? | What is selection in computer programming? | How do coordinates work in computer programming? | What is the Repeat until command? | What is a variable in programming? | Can I create a program that includes an IF/ELSE statement (2Code)? |
|---|---|---|---|---|---|---|
| Mastery Key | ➢ Can create a program that includes an IF/ELSE statement. | | | | | |

# Year 4: Autumn

# 4.2 Online Safety

| Enquiry Question | What is too much screen time? | |
|---|---|---|
| | **Required Prior Knowledge** | **Knowledge to be taught** |
| **Declarative Knowledge** | • Passwords are private and should never be shared.<br>• Blogs can help us to communicate our thoughts and ideas.<br>• Not everything online is factually correct, and some websites can be referred to as spoof websites.<br>• PEGI/BBFC ratings exist to keep young people safe and steps can be taken should students see inappropriate content. | • Safe protocols can be developed to protect people when using email.<br>• Everything put online leaves a trail known as a digital footprint.<br>• There are risks and benefits of installing software including apps.<br>• Copying the work of others and presenting it as their own is called 'plagiarism'.<br>• There are positive and negative influences of technology on health and the environment. |
| **Procedural Knowledge** | • Take steps to keep a password safe.<br>• Set a password featuring a mix of letters, numbers and special characters.<br>• Use a blog or vlog to communicate ideas and thoughts.<br>• Ascertain which information in a website maybe fake,<br>• Look for alternative ways to check the validity of information.<br>• Consider why spoof websites exist.<br>• Consider what content may be deemed inappropriate.<br>• Check PEGI / BBFC ratings to see if chosen media are suitable.<br>• Talk to a trusted adult about what they have seen or heard if inappropriate content or contact makes them feel uncomfortable. | • Identifying emails that may be phishing emails and another name for these emails is spam emails. Ignore these emails and not reply to them.<br>• Understand that spam emails may be too good to be true or offer prizes to the recipient. Look at the sender's email address as a clue if the email is spam.<br>• Use the padlock on the web address bar which indicates the site will be safe.<br>• Be aware that a digital footprint can be positive or negative depending upon what they posted.<br>• Define the word malware as a type of software designed to cause viruses on your device or leave it unusable. Define a computer virus.<br>• Avoid clicking on ads on screen which can be dangerous.<br>• Identify plagiarism in text and talk about what it means.<br>• Think about the positive and negative influences of too much screen time. |
| **Vocabulary** | **AdFly, attachment, citation, collaborative database, cookies, copyright, data analysis, malware, phishing, plagiarism, ransomware, report, SMART rules, software, spam, virus, watermark** | |

| Learning Questions | How do you protect yourself from online identity theft? | What are the risks of installing software including apps? | What is plagiarism and how can it be avoided? | Can I give reasons for limiting my own screen time? |
|---|---|---|---|---|
| Mastery Key | ➢ Can reflect on own screen time and give reasons for limiting it that include the effect on own physical and mental health. | | | |

# Year 4: Spring

# 4.5 Logo

| Enquiry Question | How can Logo be used efficiently? | | | |
|---|---|---|---|---|
| | **Required Prior Knowledge** | | **Knowledge to be taught** | |
| **Declarative Knowledge** | • Timers are used in coding to help control when a block of commands are run.<br>• Repeat is a control block and blocks of commands can be set to repeat a specified number of times using the repeat control block.<br>• It is important to test and debug if needed when creating branching databases so that they work as intended. | | • 2Logo has its own language with specific instructions.<br>• Representations of shapes, letters and flowers can be created in 2Logo using the repeat command.<br>• The repeat command is a more efficient way to code in 2Logo.<br>• It is important to test and debug code in 2Logo as with other coding platforms to ensure it runs effectively. | |
| **Procedural Knowledge** | • Identify the point the flowchart starts.<br>• Insert a **timer after** command in code view and use a **timer every** command to make an event happen.<br>• Insert a **repeat** command into the coding area and set it a specified number of times to repeat.<br>• Use the knowledge of nesting to help debug a program that isn't working as intended.<br>• Explain binary databases are also known as branching databases due to the branch-like structure. | | • Input directional instructions into 2Logo and leave appropriate spaces.<br>• Input the more abstract non directional code such as PU, PD and CS.<br>• Follow simple instructions to create simple shapes initially on paper and then on the screen.<br>• Create their own shapes by typing all the instructions and then using the repeat command.<br>• Follow instructions to create letter shapes and four-letter words.<br>• Program repeating commands of code a line at a time.<br>• Use the repeat command to replicate the same outcomes as repeated typing of commands.<br>• Look at the screen and isolate errors in the output.<br>• Look at the code and identify why the errors have occurred. | |
| **Vocabulary** | **Debugging, grid, logo, logo commands, multi line mode, pen down, pen up, prediction, procedure, repeat, run speed, SETPC, SET PS** | | | |
| **Learning Questions** | **How do you input simple instructions in 2Logo?** | **How do you increase the complexity of your drawings?** | **What does the Repeat command do in 2Logo?** | **Can I use procedures in 2Logo?** |
| **Mastery Key** | ➢ Can edit instructions to produce shapes in the most efficient way including using the procedures function. | | | |

# Year 4: Spring

# 4.6 Animation

| Enquiry Question | How are animations created? | |
|---|---|---|
| | **Required Prior Knowledge** | **Knowledge to be taught** |
| **Declarative Knowledge** | • Images can be created within e-book software. Animations can be included in e-books.<br>• Computer drawing programs contain palettes - the range of colours or shapes available.<br>• Computer drawing programs may have a choice of painting effects. Painting effects can be combined to help a user make pictures. | • Some animations are created by hand and others with the help of technology.<br>• Onion skinning is a term used in animation and can make the animation process more efficient.<br>• Sound can be added to animation to enhance the finished product.<br>• The term stop frame animation refers to animation where the stopping and starting of a camera gives an object the impression of movement. |
| **Procedural Knowledge** | • Identify the animation tool and test each animation effect within the animation tool for a selected image.<br>• Locate the clip art gallery icon. Select a background for a page from the gallery.<br>• Select a painting effect and colour from the palette.<br>• Produce a range of paintings formed from different painting effects.<br>• Use the eCollage template and combine drawing by using the clipart library.<br>• Sequence programmes to create an animation effect. | • Make a simple flick animation book.<br>• Open 2Animate on Purple Mash and discuss why animation using technology may be easier than using hand drawn images.<br>• Create a simple moving object animation on Purple Mash using 2Animate.outcomes as repeated typing of commands.<br>• Appreciate the purpose of onion skinning.<br>• Use the onion skinning tool in 2Animate and they can talk about how it speeds the process up.<br>• Add sounds and background to their animations to improve them.<br>• Talk about stop frame animation they have watched, and the techniques used.<br>• Create a simple stop frame animation. |
| **Vocabulary** | **animation, FPS (frame per second), frame, onion skinning, pause, stop motion** | |
| **Learning Questions** | **How do you animate an object using technology?** | **How do you add backgrounds and sounds to animations?** / **Can I create my own animation (2Animate)?** |
| **Mastery Key** | ➢ Can create own animation using 2Animate. | |

# Year 4: Summer

# 4.7 Effective Searching

| Enquiry Question | How do you know if information is credible? | | |
|---|---|---|---|
| | **Required Prior Knowledge** | **Knowledge to be taught** | |
| **Declarative Knowledge** | • Different icons in a tools bar carry out different functions.<br>• It is important to log out when you have finished working as a way of securing personal accounts.<br>• Searches can be refined so it is easier to find something.<br>• Not everything online is factually correct, and some websites can be referred to as spoof websites. | • Information can be located on a search engine page.<br>• There are different skills needed to research effectively.<br>• Web pages need to be evaluated to see if the information contained is true and reliable. | |
| **Procedural Knowledge** | • Locate the search bar.<br>• Search for a given resource and double click to load the resource up.<br>• Know what is meant as a safe search.<br>• Recognise a web browser and search engine and key elements within.<br>• Discuss with others that a digital footprint is a record of individuals' interactions online and that this is used to help search engines provide better results for individuals.<br>• Ascertain which information in a website maybe fake,<br>• Look for alternative ways to check the validity of information.<br>• Consider why spoof websites exist. | • Load up a search engine onto their device and give the name of a well-known search engine.<br>• Enter the search enquiry.<br>• Correctly interpret the information outputted.<br>• Enter basic search enquiries.<br>• Enter more advanced effective enquiries without the need for full sentences.<br>• Answer a quiz using effective search.<br>• Analyse the contents of a web page for clues about the reliability of information.<br>• Appreciate that the search engine will give results tailored to the interests of the searcher. | |
| **Vocabulary** | **balanced view, easter eggs, internet, key words, reliability** | | |
| **Learning Questions** | **What is a search engine?** | **How do you search for information effectively?** | **Can I analyse the contents of a webpage for clues about the credibility of the information?** |
| **Mastery Key** | ➢ Can recognise whether information on a website is credible or not. | | |

# Year 4: Summer

# 4.8 Hardware Investigators

| Enquiry Question | What is inside a computer? | |
|---|---|---|
| | **Required Prior Knowledge** | **Knowledge to be taught** |
| **Declarative Knowledge** | • The Internet is a global network of connected computers around the World.<br>• The World Wide Web refers to the documents and pages someone sees when using a browser.<br>• There are different methods of communication and they each have strengths and weaknesses. | • Different parts make up a computer. |
| **Procedural Knowledge** | • Recognise technology.<br>• Identify common types of technological devices.<br>• Search using words and questions.<br>• Use the address book within 2Email to find contacts.<br>• Send an email to multiple contacts using the address book. | • Name the different parts of a computer such as Hard Drive, RAM, Network Card etc.<br>• Define what is meant by hardware, components and peripherals.<br>• Describe the function of these different parts. |
| **Vocabulary** | components, CPU, graphics card, hard drive, hardware, input, motherboard, network card, output, peripherals, RAM, software | |
| **Learning Questions** | **What are the different parts that make up a desktop computer ?** | **Complete end of unit quiz.** |
| **Mastery Key** | ➢ Can recognise the main component parts of hardware which allow computers to join and form a network. | |

# Year 4: Summer

# 4.10 Artificial Intelligence

| Enquiry Question | What is AI and what is its future? | | | |
|---|---|---|---|---|
| | **Required Prior Knowledge** | | **Knowledge to be taught** | |
| **Declarative Knowledge** | • Technology is science and engineering knowledge put into practical use to solve problems or invent useful tools.<br>• Technology is used both within and outside school.<br>• Different parts make up a computer. | | • Artificial intelligence is having an impact already in day-to-day life.<br>• Artificial intelligence can assist and benefit us in our everyday life<br>• The potential of artificial intelligence is limitless<br>• Artificial intelligence is already being used to create music and art. | |
| **Procedural Knowledge** | • Recognise technology.<br>• Identify common types of technological devices.<br>• Name the different parts of a computer such as Hard Drive, RAM, Network Card etc.<br>• Define what is meant by hardware, components and peripherals.<br>• Describe the function of these different parts. | | • Recall artificial intelligence in news stories and talk about positives and negatives.<br>• Define artificial intelligence in their own words.<br>• Answer a quiz about artificial intelligence.<br>• Give three examples of artificial intelligence in their lives.<br>• Recap what artificial intelligence is.<br>• Talk and write about real life applications of artificial intelligence.<br>• Discuss how these applications are making life better for us.<br>• Critically think about the future of artificial intelligence.<br>• Express their ideas in written and illustrated form about the future of artificial intelligence.<br>• Consider if there are negatives associated with artificial intelligence.<br>• Decide if art and music are created by humans or artificial intelligence.<br>• Use various artificial intelligence programs to create music and art to meet a description. | |
| **Vocabulary** | artificial intelligence, algorithm, data | | | |
| **Learning Questions** | **What is Artificial Intelligence (AI) ?** | **How can AI help us?** | **What is the future of AI?** | **How can AI be used to create music and art?** |