Pensilva Primary School

Subject coverage map – Computing

	Autumn 1	Autumn 2	Spring	Summer
Year 1/2 Year A	*Online safety lesson 1 (Year 1)* **Computing systems and networks: Improving mouse skills** • *Discuss whether given information is safe or unsafe to be shared online* • Using mouse skills to draw and manipulate shapes, dragging objects to change their size or position and moving shapes in front of behind one another. • Using a range of tools to create desired effects, using drag and drop to resize and reposition objects and a variety of digital painting tools to create different effects. • Identifying key features of an object and breaking it down into simple shapes. • Using click and drag to create and layer shapes to make an image; repositioning, resizing and changing the order of shapes.	*Online safety lesson 2 (Year 1)* **Programming : Algorithms unplugged** • *Recognising that internet use may affect mood or emotions and linking this to specific online activity* • Understanding that an algorithm is a clear set of instructions to be carried out in a specific order to achieve a given task and that computers use algorithms • Following instructions precisely to carry out an action • Understanding that computers and devices around us use inputs and outputs and identifying some of these • Explaining that decomposition refers to the breaking down of a problem into smaller parts to help solve a problem more easily • To know how to debug an algorithm Spotting and fixing bugs in algorithms and explaining the problem that caused it.	*Online safety lesson 3 (Year 1)* **Computing systems and networks: What is a computer?** • *Able to explain why it is important to ask permission before sharing content and talk about how people may feel if content is shared without their permission* • Naming the key parts of a computer and explaining what they do • Understanding that technology is controlled • Identifying items that might have a computer inside and what the technology does • Creating a design for an invention, making a detailed plan, including inputs and outputs and explaining how it works • Understanding the role of computers, explaining where computers are used and what their job is.	*Online safety lesson 4 (Year 1)* **Programming: Algorithms and debugging** • *Are able to identify a trusted adult who they can ask for help* • Decomposing a game to predict the algorithms that are used • Knowing that computers can use algorithms to make predictions and writing a clear and precise algorithm • Creating algorithms to solve problems, including loops • Understanding what abstraction is and giving examples of when abstraction might be useful • Planning an algorithm using different types of loops
Year B	*Online safety lesson 1 (Year 2)* **Programming 2: Bee-bots** • Children can discuss whether given information is safe or unsafe to be shared online • Exploring a new device, predicting what it might do, trying it out and then explaining their findings	*Online safety lesson 2 (Year 2)* **Data handling: Introduction to data** • Can follow the guidance to create a strong password • Representing data in different ways and answering questions about the data	*Online safety lesson 3 (Year 2)* ***Programming: Scratch junior*** • Able to explain why it is important to ask permission before sharing content and talk about how people may feel if content is shared without their permission	*Online safety lesson 4 & 5 (Year 2)* **Data handling: International Space Station** • *Are able to identify a trusted adult who they can ask for help* • *Learning strategies for checking if something they read online is true.*

	• Creating a demonstration video to explain how to use a Bee-Bot • Planning and following a set of instructions precisely, assuming roles of: Bee-Bot (following instructions given by the controller), Controller (giving instructions to the Bee-Bot) and Judge (checking that the instructions given by the 'controller' are correct) • Programming a device, considering how it moves from one place to another and planning its route • Programming using clear instructions and debugging them if they go wrong by identifying and correcting the mistake.	• Comparing and ordering values in a spreadsheet or table and suggesting interpretations • Collecting and recording data and representing this data digitally • Identifying questions to sort data in the most efficient way and creating branching databases • Designing a computerised invention to gather data and understanding that computers interpret different types of input.	• Understanding that computers and devices use inputs and outputs, identifying some of these • Following an algorithm • Creating a clear and precise algorithm • Learning to debug • Use loop blocks.	• Retrieving digital content from an interactive map and learning how a computer can be used to monitor data relating to human survival needs • Considering how computers would monitor items aboard the ISS and using mouse and keyboard skills to draw and add text to a project • Understanding the role of sensors on the ISS and designing a display to show the data that the sensors collect • Creating an algorithm for growing a plant in space • Interpreting data and identifying temperatures within a range to decide if they are a Goldilocks planet.
Year 3/4 Year A	*Online safety lesson 1 (Year 3)* ***Computing systems and networks 1: Networks and the internet*** • *Know the difference between an opinion, belief and a fact and know that not everything on the internet is factual* • Learning that a network joins things together and that it can be wired or wireless. Creating an informative poster about what a network is • Understanding how information moves around a network, explaining what a server does and what it is connected to and discussing the journey of a file	*Online safety lesson 2 (Year 3)* ***Computing systems and networks 3: Journey inside a computer*** • *Understanding that digital devices share personal information amongst each other* • Recognising basic inputs and outputs and understanding that a computer follows instructions • Understanding that a laptop is made up of many parts and using logic to explain the purpose of some of these parts • Suggesting the purpose of different parts of a computer and following an algorithm • Understanding the purpose of computer parts and using a QR code • Decomposing a tablet computer, describing similarities and	*Online safety lesson 3 (Year 3)* **Computing systems and networks: Collaborative learning** • *Able to recall some of the 7 tips for dealing with upsetting online content* • Learning that software can be used collaboratively online to work as a team • Learning how to share work with others, access shared documents and comment on someone else's work effectively • Plan a simple Microsoft Form survey with at least one question type • Learning why a survey might be useful and how to create and share it with others	*Online safety lesson 4 (Year 3)* **Skills showcase: HTML** • *Understanding what social media is and being able to name some social media platforms and some of the features of those platforms* • Adding text between the heading and paragraph tags. Finding some of the tags found in the treasure hunt. • Identifying and remixing HTML code to alter the text size and content of a web page • Changing the colours of their object elements. • Changing the sizes of some of the elements. • Explaining how they created their story.

	• Understanding that computers have to locate websites, which are files saved on a computer • Exploring the role and purpose of routers • Understanding the role of packets and that they take their own routes to get to their destination.	differences across different types of computer.	• Using a shared spreadsheet to explore data	• Adapting the basic elements of a story within a web page using the 'Inspect Elements' tool. • Finding images that are permitted for reuse and changing at least one image and text in a web page to create a new story.
Year B	*Online safety lesson 1&2 (Year 4)* ***Programming: Scratch*** • *Being able to search on a search engine* • *Describing some of the methods used to persuade people to buy online* • Using repetition (a loop) in a program • Exploring a programming application independently, predicting what the code will do and explaining what they found • Programming an animation, decomposing a project; planning what is going to happen and selecting the blocks to make it happen • Programming a story, choosing appropriate blocks, debugging a program and continuing someone else's program • Programming a game, explaining the purpose of an algorithm, decomposing a problem and using an algorithm to code a program.	*Online safety lesson 3 (Year 4)* **Programming 1: Further coding with Scratch** • *Using examples to explain the difference between fact, opinion and beliefs found online and describe why it is important to create your own judgements about what you have read* • Revisiting and exploring further a programming application independently, identifying the key features and writing a simple code script • Decomposing a Scratch game to understand which code blocks have been used • Knowing what a variables is and using the 'say' and 'ask' blocks • Exploring how to make a variable in Scratch using specific code blocks • Using knowledge of how variables work to help create a quiz in Scratch	*Online safety lesson 4 (Year 4)* ***Creating media: Video trailers*** • *Can explain what a bot is and give examples of different bots* • Planning a book trailer, picking out the key events in a story • Using digital devices to record video or take photos to tell a story • Editing videos and photos using film editing software, recording sounds using digital devices and adding sound effects and music • Adding text and transitions to a video • Evaluating video editing, explaining what makes a successful video and book trailer.	*Online safety lesson 5 (Year 4)* **Programming 2: Computational thinking** • *Children can describe strategies for being safe online and give examples of how to be respectful. They know how to respect the thoughts and beliefs of others* • Understanding that computational thinking is made up of four key strands: decomposition, pattern recognition, abstraction and algorithm design • Understanding what decomposition is and how to apply it to solve problems • Understanding the terms 'pattern recognition' and 'abstraction' and how they help to solve a problem as well as making some changes to the existing code. • Understanding how to abstract key information • Creating a Scratch program which draws a square and at least one other shape. • Combining computational thinking (decomposition, pattern recognition, abstraction and algorithm design) skills to solve a problem

Year 5/6 Year A	*Online safety lesson 1&2 (Year 5)* ***Data handling: Mars Rover 1*** • Understanding that passwords need to be strong and that apps do require some form of passwords • Evaluating the pros and cons of online communication • Identifying how and why data is collected from space. Understanding the challenges of transmitting data over large distances • Identifying how messages can be sent using binary code. Reading and calculating numbers using binary code • Identifying input, processing and output on the Mars Rovers. Explaining how the size of RAM affects the processing of data. • Recognising that computers use binary mathematically and using simple operations to calculate bit patterns • Relating binary signals (Boolean) to a simple character based language, ASCII.	*Online safety lesson 3 (Year 5)* ***Computing systems and networks: Bletchley Park*** •Learning strategies to create a positive online reputation • Explaining that codes can be used for a number of different reasons and decoding messages. • Explaining how to ensure a password is secure and how this works. Understanding why a longer password is more secure than a short one. • Create a simple poster with information about Bletchley Park including the need to build electronic thinking machines to solve cipher codes. • Understanding about some of the historical figures that contributed to technological advances in computing • Identifying why historical figures were influential in creating modern computers. Researching and presenting information about historical figures in computing	*Online safety lesson 4 (Year 5)* ***Creating media: History of computers*** • Learning what to do if they experience cyber bullying • Learning strategies to capture evidence of cyber bullying in order to seek help • Tinkering with sound by using sound recording software and identifying the key features of a radio play. • Recording, editing and adding sound effects to a radio play • Understanding and identifying how computers have changed and the impact this has had on the modern world • Researching about one of the computers that changed the world and present information about it to the class • Understanding of historic computers in order to design a computer of the future.	*Online safety lesson 5 (Year 5)* ***Skills Showcase: Inventing a product*** •Identifying possible dangers online and learning how to stay safe • Predicting how software will work based on previous experience • Writing more complex algorithms for a purpose • Debugging quickly and effectively to make a program more efficient •Remixing existing code to explore a problem •Evaluating code to understand its purpose. •Changing a program to personalise it • Predicting code and adapting it to a chosen purpose •Using logical thinking to explore software independently, making predictions and testing ideas •Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns •Identify ways to improve and edit programs, videos, images etc • Creating a website with embedded links and multiple pages. • Using design software TinkerCAD to design a product.

Year B	*Online safety lesson 1&2 (Year 6)* ***Programming 1: Music*** • *Can discuss how they would feel in different situations online* • *Can discuss whether sharing online has a positive or negative impact in different scenarios* • Iterating ideas, testing and changing throughout the lesson. • Explaining what the basic commands do: 'play', 'sleep', '2.times do' • Correcting their own simple mistakes in their code • Decomposing the story • Including a live loop and explaining its function. • Using samples effectively to enhance music • The ability to code a piece of music that combined a variety of structures. • Recognising that programming music is a way to apply their skills	*Online safety lesson 3 (Year 6)* ***Computing systems and networks: Search engines*** • *Discussing what their 'digital footprint' is* • *Understand the importance of capturing evidence of online bullying and can demonstrate some of these methods on the devices at school* • Understanding what a search engine is and how to use it to navigate the web • Suggesting that things online aren't always true and recognising what to check for. Understanding that anyone can create a website • Searching effectively and understanding the importance of keywords • Creating an informative poster with appropriate images, colours, design and a clear title • Making parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.	*Online safety lesson 4 (Year 6)* ***Data handling 1: Big Data 1*** • *Describing ways to manage passwords and strategies to add extra security such as two-factor authentication.* • *Explaining what to do if passwords are shared, lost or stolen* • A firm understanding of why barcodes and QR codes were created and how the data contained within barcodes and QR codes can be used by computers. • Create (and scan) their own QR code using a QR code generator website. • Explaining how infrared can be used to transmit a Boolean type signal. • Explain how RFID works • Typing formulas into cells using a spreadsheet • Taking real time data and entering it effectively into a spreadsheet. • Presenting the data collected as an answer to a question (Which ride is the best choice for a FastPass?). • Recognising the value of analysing real time data. • Sorting data within an Excel spreadsheet by inserting a table.	*Online safety lesson 5 (Year 6)* ***Programming: Intro to Python*** • *Describing strategies to identify scams. Explaining ways to increase privacy settings and understanding why it's important to keep software updated* • Predicting what I think something new will do when I tinker • Using nested loops in their designs, explaining why they need two repeats. • Beginning to draw the house using Python commands; using comments to show a level of understanding around what their code does. • Using loops in Python and explaining what the parts of a loop do and suggesting an appropriate place to use a loop • Recognising that computers can choose random numbers; decomposing the program into an algorithm and modifying a program to personalise it.