



# Milestones for Computing

## September 2021

|  |             |   |  |
|--|-------------|---|--|
|  |             |   |  |
|  | <b>EYFS</b> | <p><b>EYFS</b><br/>Pupils should have the opportunity to cover the following:</p> <p><b>Physical Development</b></p> <ul style="list-style-type: none"><li>• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li><li>• Know and talk about the different factors that support their overall health and wellbeing.</li><li>• Further develop the skills they need to manage the school day successfully.</li></ul> <p><b>Literacy</b></p> <ul style="list-style-type: none"><li>• Spell words by identifying the sounds and then writing the sounds with letter/s.</li><li>• Re-read what they have written to check that it makes sense.</li><li>• Spell words by identifying the sounds and then writing the sounds with letter/s.</li><li>• Write short sentences with known letter-sound correspondences using a capital and full stop.</li></ul> <p><b>Mathematics</b></p> <ul style="list-style-type: none"><li>• Link the number symbol (numeral) with its cardinal number value.</li><li>• Count objects, actions and sounds.</li><li>• Link the number symbol (numeral) with its cardinal number value.</li><li>• <b>ELG: Numerical Patterns</b>&gt; Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.</li><li>• Count objects, actions and sounds.</li><li>• Subitise.</li><li>• Compare numbers.</li><li>• Understand the 'one more than/ one less than' relationship between</li><li>• consecutive numbers.</li><li>• Continue, copy and create repeating patterns.</li><li>• Compare length, weight and capacity.</li></ul> <p><b>Communication and Language</b></p> <ul style="list-style-type: none"><li>• Understand how to listen carefully and why listening is important.</li><li>• Describe events in some detail.</li><li>• Use talk to help work our problems and organise thinking and activities, and to explain how things work</li><li>• and why they might happen.</li><li>• Learn new vocabulary.</li><li>• Use new vocabulary throughout the day.</li><li>• Ask questions to find out more and to check they understand what has been said to them.</li><li>• Articulate their thoughts and ideas in well-formed sentences.</li><li>• Use talk to help work out problems and organise thinking and activities, and to explain how things work</li><li>• and why they might happen.</li><li>• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li></ul> |  |



## Milestones for Computing September 2021

- Confidently and safely use a range of large and small apparatus indoors and outside, alone and in a group.
- Articulate their thoughts and ideas in well-formed sentences.
- Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.
- **ELG:** Listening, Attention and Understanding> Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions.
- **ELG:** Listening, Attention and Understanding> Make comments about what they have heard and ask questions to clarify their understanding.
- **ELG:**Speaking> Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.

### **Personal, Social and Emotional Development**

- **ELG:** Self-Regulation> Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions.
- **ELG:** Managing Self> Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.
- **ELG:** Building Relationships> Work and play cooperatively and take turns with others.
- See themselves as a valuable individual
- **ELG:** Managing Self> Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.

### **Understanding the World**

- Describe what they see, hear and feel whilst outside.



# Milestones for Computing

## September 2021

|                         |             | Autumn   |   | Spring   |   | Summer   |
|-------------------------|-------------|--|---|--|---|--|
| <b>Foundation Stage</b> | <b>EYFS</b> | <p><b>Computing systems and networks 1: Using a computer.</b></p> <p>Learning the basic skills needed to use a computer, including keyboard and mouse exploration, and using these skills for a purpose.</p> <p>Learning to log in and log out. Using a simple online paint tool to create digital art. Learning what a keyboard is and how to locate relevant keys. Learning what a mouse is and developing basic mouse skills such as moving and clicking.</p> | <p><b>Programming 1: All about instructions</b></p> <p>Learning how to follow and give instructions in ‘unplugged’ practical games and activities, and learning what to do when things go wrong.</p> <p>Following instructions as part of practical activities and games and learning to debug when things go wrong.</p> <p>Learning to give simple instructions. Learning that an algorithm is a set of instructions to carry out a task, in a specific order. Using logical reasoning to read simple instructions and predict the outcome</p> | <p><b>Computing systems and networks 2: Exploring hardware</b></p> <p>Exploring hardware through the use of tinker trays for play and introducing cameras and other technology to record meaningful moments.</p> <p>Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Learning how to operate a camera and/or iPad and use them to take photos. Recognising that a range of technology is used in places such as homes and schools.</p> | <p><b>Programming 2: Programming Bee-Bots</b></p> <p>Exploring how Bee Bots work and how to give them simple instructions, using them in child-led play. Acquiring the help of an adult to learn to debug and problem solve when things go wrong.</p> <p>Experimenting with programming a Bee-bot/Blue-bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong.</p> | <p><b>Data handling: Introduction to data</b></p> <p>Learning to sort and categorise data and an introduction to branching databases and pictograms.</p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately.</p> <p>Recognising uses of technology beyond school</p> |



# Milestones for Computing September 2021

|  |                    |  |  |  |  |   |   |
|--|--------------------|--|--|--|--|---|---|
|  | <b>Key Stage 1</b> | <p><b>Key Stage 1:</b><br/><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• Create and debug simple programs</li> <li>• Use logical reasoning to predict the behaviour of simple programs</li> <li>• Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>• Recognise common uses of information technology beyond school</li> <li>• Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies</li> </ul> |  |  |  |   |   |
|  | <b>Year 1</b>      | <p><b>Online safety:</b><br/><b>An introduction to online safety:</b><br/><i>children learn what it means to be 'online' and how to stay safe whilst treating others with respect.</i></p> <p><b>Computing systems and networks:</b><br/><b>Improving mouse skills</b></p> <p><b>Introducing children to logging in and using technology for a purpose, including creating art.</b></p> <p>Understanding that they need to be kind on the internet, as they would in real life<br/>Discovering which devices connect to the internet<br/>Understanding some tips for staying safe</p>  | <p><b>Programming 1:</b><br/><b>Algorithms unplugged</b><br/><i>Learning how computers handle information by exploring 'unplugged' algorithms- completing tasks away from the computer</i></p> <p>Understanding how to create algorithms. Learning that computers need information to be presented in a simple and clear way. Understanding how to break a computational thinking problem into smaller parts in order to solve it.</p> <p>Planning and execution of an algorithm/set of instructions for a</p> | <p><b>Skills showcase:</b><br/><b>Rocket to the moon</b><br/><i>Appreciating the value of computers, understanding that they helped us get to the moon.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately. Computer files and formats – .jpegs, .txt, folders Using a computer to make a list/drawing and saving the document to a folder How to make a bottle rocket</p> | <p><b>Programming 2:</b><br/><b>Bee-Bots</b><br/><i>Using Bee-Bots to navigate an area and constructing simple algorithms, through the story of The Three Little Pigs</i></p> <p>Learning how to explore and tinker with hardware to find out how it works. Constructing a series of instructions into a simple algorithm. Applying computing concepts to real world situation in an unplugged activity. Bee-Bot – locating the buttons, battery compartment, on/off switch, wheels and speaker<br/>Understanding Bee-</p> | <p><b>Creating media:</b><br/><b>Digital imagery</b><br/><i>Taking and manipulating digital photographs, including adding images found via a search engine.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Knowing what to do if they have concerns about content or contact online. Information Technology Using cameras or tablets to take photos. Computer Science Using logical reasoning to predict the</p> | <p><b>Data handling:</b><br/><b>Introduction to data</b><br/><i>Learning about what data is and how it can be represented and using these skills to show the findings of a minibeast hunt</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Knowing what to do if they have concerns about content or contact online. Information Technology Using cameras or tablets to take photos. Computer Science Using logical reasoning to</p> |



# Milestones for Computing

## September 2021

|  |   |   |  |   |  |  |
|--|---|---|--|---|--|--|
|  | <p>and why this is important.<br/>         Know the meaning of 'sharing' and 'posting' in an online context<br/>         Know the 4 top tips for staying safe online</p> <ol style="list-style-type: none"> <li>1) People you do not know are strangers</li> <li>2) Be nice to people like you would be in the real world</li> <li>3) Keep your personal information private</li> <li>4) If you are unsure about anything, then tell an adult you trust</li> </ol> <p>Recognising common uses of information technology. Logging in and saving work on their own account.<br/>         Knowing what to do if they have concerns about content or contact online.<br/>         Understanding of how to create digital art using an online paint tool. Information Technology Learning to locate where keys are on the keyboard.<br/>         Developing basic mouse skills</p> <p>Keyboard skills – locating the letters of individual names<br/>         Computer menus - file, open, save, close</p> | <p>simple activity Basic debugging concepts<br/>         Decomposition – how to breakdown objects into separate parts and categorise them</p> |  | <p>Bot instructions and button functions – move forwards/backwards, turn left/right, clear, pause, go</p> | <p>behaviour of simple programs. How sequences work<br/>         Camera types and basic photography techniques Tell a trusted adult about any online safety concerns</p> | <p>predict the behaviour of simple programs. How sequences work<br/>         Camera types and basic photography techniques Tell a trusted adult about any online safety concerns</p> |
|--|---|---|--|---|--|--|



# Milestones for Computing

## September 2021

|  |               |  |  |  |   |  |  |
|--|---------------|--|--|--|---|--|--|
|  |               | Using a mouse – click and drag, drag and drop, left/right click, mouse mat   |  |  |   |  |  |
|  |               | <b>Autumn</b>  |  | <b>Spring</b>  |   | <b>Summer</b>  |  |
|  | <b>Year 2</b> | <p><b>Online safety: Pupils learn about how to:</b><br/><i>keep personal information safe online, including their right to give or deny permission for information to be shared online</i></p> <p><b>Computing systems and networks 1: What is a computer? Children explore what a computer is, learning about inputs and outputs, how computers are used in the wider world and designing an invention</b></p> <p>Identifying how to keep personal information private.</p> | <p><b>Programming 1: Algorithms and debugging</b><br/><i>Identifying problems with code using both ‘unplugged’ and ‘plugged’ systems to debug (identify and correct) errors in an algorithm.</i></p> <p>Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Zooming in and out of maps on Planet Earth<br/>Unplugged algorithms and instructional writing<br/>Abstraction/key information<br/>Decomposition/smaller chunks</p> | <p><b>Computing systems and networks 2:</b><br/><i>Word processing Using their developing word processing skills, pupils write simple messages to friends and learn why we must be careful about who we talk to online.</i></p> <p>Using word processing software to type and reformat text. Understanding the importance of staying safe online. Word processing – fonts, bold, italics, underline, highlight<br/>Keyboard skills – delete, enter, spacebar<br/>E-books and e-documents</p> | <p><b>Programming 2: ScratchJr</b><br/><i>Using ‘ScratchJr’, pupils programme a familiar story and an animation, make their own musical instruments and follow an algorithm to record a joke.</i></p> <p>Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Digital Literacy<br/>Using technology purposefully to create, organise, store, manipulate and retrieve digital</p> | <p><b>Creating media: Stop motion</b><br/><i>Pupils create simple animations, plan a storyboard, then decompose it into small chunks of action to be captured.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Understanding how to use tablets or computers to take photos. Animations – how still images become moving images<br/>Use of animation software<br/>Sketching and planning</p> | <p><b>Data handling: International Space Station</b><br/><i>Learn how data is collected and used to keep astronauts safe on the I.S.S</i></p> <p>Using technology to create and label images and to put data into a spreadsheet. Consider inputs and outputs to understand how sensors work. International Space Station – Node 1,2,3, Zvezda, Zarya, Destiny, Columbus, Kibo, survival items, growing plants in space</p> |



## Milestones for Computing September 2021

|  |  |   |  |  |  |  |  |
|--|--|---|--|--|--|--|--|
|  |  | <p>Using technology respectfully by asking for permission before sharing about others online. The difference between 'online' and 'offline.'</p> <p>How to create a strong password.</p> <p>Tell a trusted adult about any online safety concerns.</p> <p>Learning about inputs and outputs and how they are used in algorithms. Understanding what a computer is and the role of individual components.</p> <p>Different types of technology – cameras, phones, torches, microwave, alarm clock, remote control</p> <p>Inputs e.g. keyboard, mouse</p> <p>Outputs e.g. monitor, speakers, printers</p> |  |  | <p>content. Coding – Scratch Jr, code blocks, algorithms, sprites/speeds, repeat and loop control blocks, start/finish, direction</p> <p>Blocks – triggering, motion, looks, sound, end, control</p> |  |  |
|--|--|---|--|--|--|--|--|



# Milestones for Computing

## September 2021

|  |                    | Autumn   | Spring | Summer |
|--|--------------------|--|--------|--------|
|  | <b>Key Stage 2</b> | <p><b>Key Stage 2:</b><br/><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"><li>• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li><li>• Use sequence, selection, and repetition in programs, work with variables and various forms of input and output.</li><li>• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</li><li>• Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</li><li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</li><li>• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</li><li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li></ul> |        |        |



# Milestones for Computing

## September 2021

|  |               | Autumn   |  | Spring   |   | Summer  |  |
|--|---------------|--|--|--|---|---|--|
|  | <b>Year 3</b> | <p><b>Online safety:</b><br/><i>Understanding that you can't trust everything you read on the internet.<br/>Learning about social media platforms including their age-restrictions and privacy settings.</i></p> <p><b>Computing systems and networks 1:</b><br/><i>Networks and the internet<br/>To understand how computers communicate, children learn about networks and the internet, and how they are used to share information.</i></p> <p>Learn to distinguish between facts, opinions and beliefs on the internet<br/>Learn how to deal with upsetting online content<br/>Learn about how to protect our personal information using privacy settings and how to be discerning about what information we share and who with<br/>Know the steps to take</p> | <p><b>Programming:</b><br/><i>Scratch<br/>Using Scratch, with its block-based approach to coding, pupils learn to tell stories and create simple games</i></p> <p>Using logical reasoning to explain how simple algorithms work.<br/>Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts.<br/>Using sequence, selection, and repetition in programs. Working with variables and various forms of input and output.<br/>Scratch – building games and animations<br/>Choosing sprites, painting sprites, surprise sprites,</p> | <p><b>Computing systems emails, including attachments and how to be responsible digital citizens and networks 2:</b><br/><i>Emailing<br/>Pupils learn how to send.</i></p> <p>Learn about cyberbullying and fake emails.<br/>Understanding the purpose of emails.<br/>Keyboard skills - @ symbol<br/>Email compose windows – addresses, subjects<br/>Be careful with unexpected emails</p> | <p><b>Computing systems and networks 3:</b><br/><i>Journey inside a computer<br/>Children learn about the different parts of a computer through role-play and develop their understanding of how they follow instructions.</i></p> <p>Understanding what different components of a computer do.<br/>Understanding that programs execute by following precise and unambiguous instructions.<br/>Computer parts – CPU, GPU, RAM, HDD<br/>QR Codes and how to use them<br/>Other portable electronic devices</p> | <p><b>Creating media:</b><br/><i>Video trailers<br/>Developing their video skills, pupils create a book trailer, storyboarding their trailers before then filming and editing their videos, adding effects such as transitions, music, voice and text.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content, including searching for relevant information.<br/>Digital media – transitions, morph, cross zoom, peel off, dip to black, directional wipe<br/>Digital sound waves – viewing and editing</p> | <p><b>Data handling:</b><br/><i>Comparison cards<br/>databases<br/>Developing their understanding of data and databases, children play with and create their own comparison cards, learning how to interpret information by ordering and filtering.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve data.<br/>Identifying and reading databases<br/>Understanding bar graphs and pie charts</p> |



## Milestones for Computing September 2021

|  |  |   |   |  |  |  |  |
|--|--|---|---|--|--|--|--|
|  |  | <p>when faced with upsetting online content Know the difference between fact, opinion and belief Know age restrictions for popular online platforms.</p> <p>Identifying network components and understand how they are used to connect to the internet and how data is transferred. Understanding computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration. Network maps – house, router, ISP, smart phones, web server, cables Internet uses – communication, file sharing, websites, uploading/downloading, streaming media, games</p> | uploading sprites<br>Key for Scratch<br>colour coding<br>blocks |  |  |  |  |
|--|--|---|---|--|--|--|--|



## Milestones for Computing September 2021

|  |               | Autumn   |   | Spring  |   | Summer   |  |
|--|---------------|--|---|---|---|--|--|
|  | <b>Year 4</b> | <p><b>Online safety:<br/>Year 4</b><br/><i>Pupils develop their understanding of how to identify trustworthy information online and consider the implications of technology.</i></p> <p><b>Computing systems and networks:</b><br/><i>Collaborative learning<br/>Learning to work collaboratively in a responsible way using tools including Google Docs and Sheets</i></p> <p>Be discerning in evaluating content by learning about the techniques that companies use to advertise online. Use technology safely and responsibly by considering the risks of screen-time and technology. Using search</p> | <p><b>Programming 1:</b><br/><i>Further coding with Scratch<br/>The coding program Scratch is explored further by revisiting key features and introducing the children to the concept and execution of using 'variables' in code.</i></p> <p>Using logical reasoning to explain how simple algorithms work. Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts. Using sequence, selection and repetition in programs. Working with variables and various forms of input and output. Scratch coding</p> | <p><b>Creating media:</b><br/><i>Website design<br/>Pupils design and create their own websites, considering content and style, as well as understanding the importance of working collaboratively.</i></p> <p>Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Understanding opportunities offered by the World Wide Web for communication and collaboration. Websites – making a new site, building a new page, add text boxes, inserting files, changing themes, embedding links</p> | <p><b>HTML</b><br/><i>Pupils explore the language behind well-known websites, while developing their understanding of how to change the core characteristics of a website using HTML and CSS.</i></p> <p>Recognising that information on the internet might not be true or correct. Using technology safely, by recognising acceptable/unacceptable behaviour. Knowing what to do when they have concerns about content or contact online. Computer Science Understanding that websites can be altered by exploring the code beneath the site. Designing, writing and debugging programs that accomplish specific</p> | <p><b>Programming 2:</b><br/><i>Computational thinking<br/>Through developing their understanding of the four pillars of computational thinking, children learn to identify them in different contexts.</i></p> <p>Understand what decomposition is and how it facilitates problem solving. Designing, writing and debugging programs that accomplish specific goals. Understand abstraction and patterns recognition. Decomposition - data without any identification, order or sequence Sequencing and pattern recognition</p> | <p><b>Data handling:</b><br/><i>Investigating weather<br/>Children investigate the role of computers in forecasting and recording weather as well as how technology is used to present forecasts.</i></p> <p>Understanding why some sources are more trustworthy than others. Computer Science Understanding the role of inputs and outputs in computerised devices. Weather station – sensors, anemometer, probes, data recording, solar panel, rain gauge Weather satellites – altimeter, GPS, solar array, data transmission Green screen – how a subject can placed in a different background (chroma key)</p> |



## Milestones for Computing September 2021

|  |  |   |   |  |   |  |  |
|--|--|---|---|--|---|--|--|
|  |  | <p>technologies effectively, appreciating how results are selected and ranked. Chat bots Advertising-snippets, pop-ups, influencers The difference between facts, opinions and beliefs online.</p> <p>Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals.</p> <p>Understanding opportunities offered by the World Wide Web for communication and collaboration.</p> <p>Collaborative online documents</p> <p>Presentation skills</p> | <p>blocks – motion, sound, looks, events, control, operators, sensing, variables, my blocks Scratch sprites</p> |  | <p>goals. Solving problems by decomposing them into smaller parts.</p> <p>HTML code CSS code HTML tags – head, body, ordered lists, list items, image, line break</p> |  |  |
|--|--|---|---|--|---|--|--|



# Milestones for Computing

## September 2021

|  |               | Autumn   |   | Spring   |   | Summer   |   |
|--|---------------|--|---|--|---|--|---|
|  | <b>Year 5</b> | <p><b>Online safety:</b><br/><b>Year 5</b><br/><i>Considering online communication and the effects on mental health and wellbeing.</i></p> <p><b>Computing systems and networks:</b><br/><i>Search engines Enable children to quickly and accurately find information and become independent learners, develop their searching skills and learn how to identify trustworthy sources.</i></p> <p>Understanding permissions required by apps to access personal information. Considering online judgements that people make and how they treat others online. Forms of online communication- memes, gifs, emojis The importance of creating strong passwords Online bullying- what it is and what to do about it.</p> <p>Recognising that information on the internet might not be true or correct. Know how to use keywords to quickly find accurate information. Search Engines – search bar, company logo, hyperlink, keywords, fake news</p> | <p><b>Programming: Music</b><br/><i>Composing music using code through Sonic Pi or Scratch pupils can compose simple tunes culminating in a 'battle of the bands' using loops of music.</i></p> <p>Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Using programming language to create music, including use of loops. Sonic Pi interface – play controls, editor controls, information and help controls, code editor, scope, log viewer Live loop, simple melody, selecting sounds</p> | <p><b>Data handling:</b><br/><b>Mars Rover 1</b><br/><i>Pupils explore inputs and outputs as well as binary numbers to understand how the Mars Rover transmits and receives data.</i></p> <p>Understanding computer networks including the internet; how they can provide multiple services, such as the world-wide web; and the opportunities they offer for communication and collaboration. Using search technologies effectively, appreciating how results are selected and ranked, and be discerning in evaluating digital content. Recognising that computers transfer data in binary and understand simple binary addition. Mars Rover – distance and time travelled Binary numbers and equivalent decimal values</p> | <p><b>Micro:bit</b><br/><i>Programming a small device called a micro:bit to display animations or messages on its simple LED display using block Coding.</i></p> <p>Using block coding to program a device. To explore variables and different forms of input. Understand how external devices can be programmed by a separate computer. BBC Micro:bit – front and back features that can be included as part of an algorithm Code blocks key – basic, input, music, LED, radio, loops, logic, variables, math(s)</p> | <p><b>Creating media:</b><br/><i>Stop motion animation Collaboratively creating a stop-motion animation by sharing and then decomposing their ideas. Pupils will develop their ability to edit and improve their creations.</i></p> <p>Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Understanding how to use tablets or computers to take photos. Consider sequence and selection of frames when editing work. How animations developed over time. How still images become animations. Option 1: Use of animation software. Option 2: Use of editing software. How to take a good photo.</p> | <p><b>Skills showcase: Skills showcase:</b><br/><b>Mars Rover 2</b><br/><i>Children learn how the Mars Rover is able to send images all the way back to Earth and experiment with online CAD software to design new tyres for it Mars Rover 2</i></p> <p>Children learn how the Mars Rover is able to send images all the way back to Earth and experiment with online CAD software to design new tyres for it.</p> <p>Developing their CAD skills. Information Technology Understanding how image data is transferred. Digital Images – a series of programmed pixels RGB colour mode – produces a spectrum of colours</p> |



# Milestones for Computing

## September 2021

|  |               | Autumn  |  | Spring  |   | Summer   |  |
|--|---------------|---|--|---|---|--|--|
|  | <b>Year 6</b> | <p><b>Online safety:</b><br/>Year 6<br/><i>Learning about the impact and consequences of sharing information online; exploring how to develop a positive online reputation that will benefit the children in the long term; capturing evidence techniques and methods to combat online bullying.</i></p> <p>Learning about online reputations and how to go about creating a positive one Being aware of the threats that face us online such as scammers and phishing emails and how to identify them Know the steps to take if you witness online bullying How to capture a screen grab on various devices.</p> <p>Understanding the importance of secure passwords and using searching and word processing skills to create a presentation. Using programming software to understand hacking, relating this to computer cracking codes in WWII. Demographic and amount of workers, The Colossus, encrypted messages, date shift cypher, first electronic programmable computer</p> | <p><b>Programming:</b><br/><i>Intro to Python</i><br/><i>Introduction to the text-based programming language Python, which is the language behind many apps and programs, such as Dropbox</i></p> <p>Understanding the importance of secure passwords and using searching and word processing skills to create a presentation. Computer Science Using programming software to understand hacking, relating this to computer cracking codes in WWII. Demographic and amount of workers, The Colossus, encrypted messages, date shift cypher, first electronic programmable computer</p> | <p><b>Data handling 1:</b><br/><i>Big Data 1</i><br/><i>Children learn how data is collected and stored by exploring barcodes, QR codes and RFID chips, and investigate how collecting big data can be used to help people in a variety of different scenarios.</i></p> <p>Understanding how learning can be applied to a real world context. Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data. Understanding that computer networks provide multiple services Understanding how barcodes and QR codes work. Infrared light, barcodes – how they work and their uses</p> | <p><b>Creating media:</b><br/><i>History of computers</i><br/><i>Learn about Bletchley Park, including: key historical figures, how the first modern computers were created and how computers have evolved over time.</i></p> <p>Understanding how learning can be applied to a real world context. Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data. Understanding that computer networks provide multiple services Understanding how barcodes and QR codes work. Infrared light, barcodes – how they work and their uses</p> | <p><b>Data handling 1:</b><br/><i>Big Data 2</i><br/><i>Children learn the difference between mobile data and WiFi and how data is transferred and use their understanding of big data to design their own smart school.</i></p> <p>Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data. Wireless data transfer – barcodes, QR codes, NFC, Bluetooth, RFID What 100MB looks like – real life examples (e.g. one 30 minute TV show)</p> | <p><b>Skills showcase:</b><br/><i>Inventing a product</i><br/><i>Reflecting on and showcasing their computing skills, pupils create an entire project around a specific theme.</i></p> <p>Showcasing their digital literacy skills. Demonstrating their computational thinking skills by designing and debugging programs, using different inputs and outputs. Understanding how search engines work and knowing how to use them safely and effectively.</p> |