# Computing Progression of Skills

| Computing Curriculum Areas | | | | |
|---|---|---|---|---|
| Information Technology | | Computer Science | Digital Literacy | |
| Word Processing/Typing | Web design and eBooks | Computational Thinking | Self-image and Identity | Online Relationships |
| Data Handling | Presentations | Coding/Programming | Online Reputation | Online Bullying |
| Animation | Sound | Computer Networks | Privacy and Security | Copyright and Ownership |
| Augmented and Virtual Reality | Video, Photography and Digital Art | | Managing Online Information | Health, Wellbeing and Lifestyle |

Although there is a simmering element of all three areas within all our computing lessons, here is our termly computing topics and what they generally focus on.

| Year | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| 1 | Farms | | Rainforests | | Castles | |
| | Computing systems and networks – Technology around us | Creating media – Digital painting | Programming A – Moving a robot | Data and information – Grouping data | Creating media – Digital writing | Programming B - Programming animations |
| 2 | Forests | | Ice and Fire | | Pirates | |
| | Computing systems and networks – IT around us | Creating media – Digital photography | Programming A – Robot algorithms | Data and information – Pictograms | Creating media - Digital music | Programming B - Programming quizzes |
| 3 | Ancient Egypt | | Stone Age | | Victorians | |
| | Computing systems and networks – Connecting computers | Creating media - Stop-frame animation | Programming A - Sequencing sounds | Data and information – Branching databases | Creating media – Desktop publishing | Programming B - Events and actions in programs |
| 4 | Romans | | World War 2 | | Cornwall | |
| | Computing systems and networks – The Internet | Creating media – Audio production | Programming A – Repetition in shapes | Data and information – Data logging | Creating media – Photo editing | Programming B – Repetition in games |
| 5 | Space | | Ancient Greece | | Coasts | |
| | Computing systems and networks - Systems and searching | Creating media - Video production | Programming A – Selection in physical computing | Data and information – Flat-file databases | Creating media – Introduction to vector graphics | Programming B – Selection in quizzes |
| 6 | Ancient Maya Civilization | | Vikings | | France | |
| | Computing systems and networks - Communication and collaboration | Creating media – Web page creation | Programming A – Variables in games | Data and information - Introduction to Spreadsheets | Creating media – 3D Modelling | Programming B - Sensing movement |

# Computing Progression of Skills

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|
| **Autumn 1**<br><br>Computing systems and networks | Technology around us<br>-To identify technology<br>-To identify a computer and its main parts<br>-To use a mouse in different ways<br>-To use a keyboard to type on a computer<br>-To use the keyboard to edit text<br>-To create rules for using technology responsibly | IT around us<br>-To recognise the uses and features of information technology<br>-To identify the uses of information technology in the school<br>-To identify information technology beyond school<br>-To explain how information technology helps us<br>-To explain how to use information technology safely<br>-To recognise that choices are made when using information technology | Connecting computers<br>-To explain how digital devices function<br>-To identify input and output devices<br>-To recognise how digital devices can change the way we work<br>-To explain how a computer network can be used to share information<br>-To explore how digital devices can be connected<br>-To recognise the physical components of a network | The Internet<br>-To describe how networks physically connect to other networks<br>-To recognise how networked devices make up the internet<br>-To outline how websites can be shared via the World Wide Web (WWW)<br>-To describe how content can be added and accessed on the World Wide Web (WWW)<br>-To recognise how the content of the WWW is created by people<br>-To evaluate the consequences of unreliable content | Systems and searching<br>-To explain that computers can be connected together to form systems<br>-To recognise the role of computer systems in our lives<br>-To experiment with search engines<br>-To describe how search engines select results<br>-To explain how search results are ranked<br>-To recognise why the order of results is important, and to whom | Communication and collaboration<br>-To explain the importance of internet addresses<br>-To recognise how data is transferred across the internet<br>-To explain how sharing information online can help people to work together<br>-To evaluate different ways of working together online<br>-To recognise how we communicate using technology<br>-To evaluate different methods of online communication |
| **Autumn 2**<br><br>Creating media | Digital painting<br>-To describe what different freehand tools do<br>-To use the shape tool and the line tools<br>-To make careful choices when painting a digital picture | Digital photography<br>-To use a digital device to take a photograph<br>-To make choices when taking a photograph<br>-To describe what makes a good photograph | Stop-frame animation<br>-To explain that animation is a sequence of drawings or photographs<br>-To relate animated movement with a sequence of images<br>-To plan an animation | Audio production<br>-To identify that sound can be recorded<br>-To explain that audio recordings can be edited<br>-To recognise the different parts of creating a podcast project | Video production<br>-To explain what makes a video effective<br>-To identify digital devices that can record video<br>-To capture video using a range of techniques<br>-To create a storyboard | Web page creation<br>-To review an existing website and consider its structure<br>-To plan the features of a web page<br>-To consider the ownership and use of images (copyright) |

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| | -To explain why I chose the tools I used<br>-To use a computer on my own to paint a picture<br>-To compare painting a picture on a computer and on paper | -To decide how photographs can be improved<br>-To use tools to change an image<br>-To recognise that photos can be changed | -To identify the need to work consistently and carefully<br>-To review and improve an animation<br>-To evaluate the impact of adding other media to an animation | -To apply audio editing skills independently<br>-To combine audio to enhance my podcast project<br>-To evaluate the effective use of audio | -To identify that video can be improved through reshooting and editing<br>-To consider the impact of the choices made when making and sharing a video | -To recognise the need to preview pages<br>-To outline the need for a navigation path<br>-To recognise the implications of linking to content owned by other people |
| **Spring 1**<br><br>Programming A | Moving a robot<br>-To explain what a given command will do<br>-To act out a given word<br>-To combine forwards and backwards commands to make a sequence<br>-To combine four direction commands to make sequences<br>-To plan a simple program<br>-To find more than one solution to a problem | Robot algorithms<br>-To describe a series of instructions as a sequence<br>-To explain what happens when we change the order of instructions<br>-To use logical reasoning to predict the outcome of a program<br>-To explain that programming projects can have code and artwork<br>-To design an algorithm<br>-To create and debug a program that I have written | Sequencing sounds<br>-To explore a new programming environment<br>-To identify that commands, have an outcome<br>-To explain that a program has a start<br>-To recognise that a sequence of commands can have an order<br>-To change the appearance of my project<br>-To create a project from a task description | Repetition in shapes<br>-To identify that accuracy in programming is important<br>-To create a program in a text-based language<br>-To explain what 'repeat' means<br>-To modify a count-controlled loop to produce a given outcome<br>-To decompose a task into small steps<br>-To create a program that uses count-controlled loops to produce a given outcome | Selection in physical computing<br>-To control a simple circuit connected to a computer<br>-To write a program that includes count-controlled loops<br>-To explain that a loop can stop when a condition is met.<br>-To explain that a loop can be used to repeatedly check whether a condition has been met.<br>-To design a physical project that includes selection<br>-To create a program that controls a physical computing project | Variables in games<br>-To define a 'variable' as something that is changeable<br>-To explain why a variable is used in a program<br>-To choose how to improve a game by using variables<br>-To design a project that builds on a given example<br>-To use my design to create a project<br>-To evaluate my project |
| **Spring 2**<br><br>Data and information | Grouping data<br>-To label objects<br>-To identify that objects can be counted<br>-To describe objects in different ways | Pictograms<br>-To recognise that we can count and compare objects using tally charts | Branching databases<br>-To create questions with yes/no answers<br>-To identify the attributes needed to | Data logging<br>-To explain that data gathered over time can be used to answer questions | Flat-file databases<br>-To use a form to record information<br>-To compare paper and computer-based databases | Introduction to Spreadsheets<br>-To create a data set in a spreadsheet<br>-To build a data set in a spreadsheet |

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| | -To count objects with the same properties<br>-To compare groups of objects<br>-To answer questions about groups of objects | -To recognise that objects can be represented as pictures<br>-To create a pictogram<br>-To select objects by attribute and make comparisons<br>-To recognise that people can be described by attributes<br>-To explain that we can present information using a computer | collect data about an object<br>-To create a branching database<br>-To explain why it is helpful for a database to be well structured<br>-To plan the structure of a branching database<br>-To independently create an identification tool | -To use a digital device to collect data automatically<br>-To explain that a data logger collects 'data points' from sensors over time<br>-To recognise how a computer can help us analyse data<br>-To identify the data needed to answer questions<br>-To use data from sensors to answer questions | -To outline how you can answer questions by grouping and then sorting data<br>-To explain that tools can be used to select specific data<br>-To explain that computer programs can be used to compare data visually<br>-To use a real-world database to answer questions | -To explain that formulas can be used to produce calculated data<br>-To apply formulas to data<br>-To create a spreadsheet to plan an event<br>-To choose suitable ways to present data |
| Summer 1<br><br><u>Creating media</u> | <u>Digital writing</u><br>-To use a computer to write<br>-To add and remove text on a computer<br>-To identify that the look of text can be changed on a computer<br>-To make careful choices when changing text<br>-To explain why I used the tools that I chose<br>-To compare typing on a computer to writing on paper | <u>Digital music</u><br>-To say how music can make us feel<br>-To identify that there are patterns in music<br>-To experiment with sound using a computer<br>-To use a computer to create a musical pattern<br>-To create music for a purpose<br>-To review and refine our computer work | <u>Desktop publishing</u><br>-To recognise how text and images convey information<br>-To recognise that text and layout can be edited<br>-To choose appropriate page settings<br>-To add content to a desktop publishing publication<br>-To consider how different layouts can suit different purposes<br>-To consider the benefits of desktop publishing | <u>Photo editing</u><br>-To explain that the composition of digital images can be changed<br>-To explain that colours can be changed in digital images<br>-To explain how cloning can be used in photo editing<br>-To explain that images can be combined<br>-To combine images for a purpose<br>-To evaluate how changes can improve an image | <u>Introduction to vector graphics</u><br>-To identify that drawing tools can be used to produce different outcomes<br>-To create a vector drawing by combining shapes<br>-To use tools to achieve a desired effect<br>-To recognise that vector drawings consist of layers<br>-To group objects to make them easier to work with<br>-To apply what I have learned about vector drawings | <u>3D Modelling</u><br>-To recognise that you can work in three dimensions on a computer<br>-To identify that digital 3D objects can be modified<br>-To recognise that objects can be combined in a 3D model<br>-To create a 3D model for a given purpose<br>-To plan my own 3D model<br>-To create my own digital 3D model |

# Computing Progression of Skills

| Summer 2<br><br>Programming B | Programming animations<br>-To choose a command for a given purpose<br>-To show that a series of commands can be joined together<br>-To identify the effect of changing a value<br>-To explain that each sprite has its own instructions<br>-To design the parts of a project<br>-To use my algorithm to create a program | Programming quizzes<br>-To explain that a sequence of commands has a start<br>-To explain that a sequence of commands has an outcome<br>-To create a program using a given design<br>-To change a given design<br>-To create a program using my own design<br>-To decide how my project can be improved | Events and actions in programs<br>-To explain how a sprite moves in an existing project<br>-To create a program to move a sprite in four directions<br>-To adapt a program to a new context<br>-To develop my program by adding features<br>-To identify and fix bugs in a program<br>-To design and create a maze-based challenge | Repetition in games<br>-To develop the use of count-controlled loops in a different programming environment<br>-To explain that in programming there are infinite loops and count controlled loops<br>-To develop a design that includes two or more loops which run at the same time<br>-To modify an infinite loop in a given program<br>-To design a project that includes repetition<br>-To create a project that includes repetition | Selection in quizzes<br>-To explain how selection is used in computer programs<br>-To relate that a conditional statement connects a condition to an outcome<br>-To explain how selection directs the flow of a program<br>-To design a program which uses selection<br>-To create a program which uses selection<br>-To evaluate my program | Sensing movement<br>-To create a program to run on a controllable device<br>-To explain that selection can control the flow of a program<br>-To update a variable with a user input<br>-To use a conditional statement to compare a variable to a value<br>-To design a project that uses inputs and outputs on a controllable device<br>-To develop a program to use inputs and outputs on a controllable device |
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# Computing Progression of Skills

## E-Safety

E-Safety is part of digital literacy and is embedded within each half termly focus. However, we look to providing children with the following skills to equip them with the e-safety skills that they can use independently to keep themselves and others safe whilst accessing the extensive range of online platforms in all environments.

| | |
|---|---|
| Year 1 | - Going places safely – Pupils learn that they can go to exciting places online, but they need to follow certain rules to remain safe.<br>- ABC searching - Pupils search for pictures online by clicking on letters of the alphabet. They learn that directory sites with alphabetical listings offer one way to find things on the internet.<br>- Keep it private -Pupils learn that many websites ask for information that is private and discuss how to responsibly handle such requests.<br>- My creative work - Pupils are introduced to the concept of having ownership over creative work. They practice putting their name and date on something they produce.<br>- Sending emails - Pupils explore how they can use email to communicate with real people within their schools, families, and communities. |
| Year 2 | - Staying safe online – Pupils understand that they should stay safe online by choosing websites that are good for them to visit, and avoid sites that are not appropriate for them.<br>- Follow the digital trail - Pupils learn that the information they put online leaves a digital footprint or “trail.” This trail can be big or small, helpful or hurtful, depending on how they manage it.<br>- Screen out the mean - Pupils learn that children sometimes can act like bullies when they are online. They explore what cyberbullying means and what they can do when they encounter it.<br>- Using keywords - Pupils understand that keyword searching is an effective way to locate information on the Internet. They learn how to select keywords to produce the best search results.<br>- Sites I like – Pupils discuss criteria for rating informational websites and apply them to an assigned site. Pupils learn that all websites are not equally good sources of information. |
| Year 3 | - Powerful passwords – Pupils explore reasons why people use passwords, learn the benefits of using passwords, and discover strategies for creating and keeping strong, secure passwords.<br>- My online community – Pupils explore the concept that people can connect with one another through the internet. They understand how the ability for people to communicate online can unite a community.<br>- Things for sale -Pupils examine product websites and understand that the purpose of the site is to encourage buying the product. Pupils learn methods used to promote products on these sites.<br>- Show respect online – Pupils explore the similarities and differences between in person and online communications, and then learn how to write clear and respectful messages.<br>- Writing good emails – Pupils learn how to communicate effectively by email, taking into account the purpose and audience of their message, and the tone they want to convey. |
| Year 4 | - Rings of responsibility – Pupils explore what it means to be responsible to and respectful of their offline and online communities as a way to learn how to be good digital citizens.<br>- Private and personal information – How can you protect yourself from online identity theft? Pupils think critically about the information they share online. |

# Computing Progression of Skills

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|---|---|
| | - The power of words – Pupils consider that they may get online messages from other kids that can make them feel angry, hurt, sad, or fearful. Pupils identify actions that will make them Upstanders in the face of cyberbullying.<br>- The Key to Keywords – Pupils learn strategies to increase the accuracy of their keyword searches and make inferences about the effectiveness of the strategies.<br>- Whose is it, anyway? - Pupils learn that copying the work of others and presenting it as one's own is called plagiarism. They also learn about when and how it's ok to use the work of others. |
| Year 5 | - Strong passwords – Pupils learn how to create secure passwords in order to protect their private information and accounts online.<br>- Digital citizen pledge – Pupils work together to outline common expectations in order to build a strong digital citizenship community. Each member of the class signs a We the Digital Citizens Pledge.<br>- You've won a prize – Pupils learn what spam is, the forms it takes, and then identify strategies for dealing with it<br>- How to cite a site – Pupils reflect on the importance of citing all sources when they do research. They then learn how to write bibliographical citations for online sources.<br>- Picture perfect – Pupils learn how photos can be altered digitally. They will consider the creative upsides of photo alteration, as well as its power to distort our perceptions of beauty and health |
| Year 6 | - Talking safely online - Pupils discuss criteria for rating informational websites and apply them to an assigned site. Pupils learn that all websites are not equally good sources of information.<br>- Super digital citizen – Pupils explore Spider Man's motto, "with great power comes great responsibility" through the lens of digital citizenship. They create comic strips show a digital superhero who witnesses an act of poor digital citizenship, and then helps resolve it.<br>- Privacy rules – Pupils learn that children's websites must protect their private information. They learn to identify these secure sites by looking for their privacy policies and privacy seals of approval.<br>- What is cyberbullying – Pupils explore how it feels to be cyberbullied, how cyberbullying is similar to or different than in-person bullying and learn strategies for handling cyberbullying when it arises.<br>- Selling stereotypes – Pupils explore how the media can play a powerful role in shaping our ideas about girls and boys. They practice identifying messages about gender roles in two online activity zones for children |

# Computing Progression of Skills

## Glossary

| Term | Key Stage | Definition |
|---|---|---|
| Algorithm | 1&2 | A precise set of ordered steps that can be followed by a human or a computer to achieve a task |
| Attribute (property) | 1&2 | A word or a phrase that can be used to describe an **object** such as its colour, size, or price |
| Browser | 2 | SEE: Web browser |
| Code | 1&2 | The **commands** that a **computer** can **run** |
| Code snippet | 1&2 | A section of a **program** viewed in isolation |
| Command | 1&2 | A single instruction that can be used in a **program** to control a **computer** |
| Computer | 1&2 | A **programmable** machine that accepts and **processes inputs** and produces **outputs** (input, process, output; IPO) |
| Computer network | 2 | A group of interconnected computing devices |
| Computer system | 2 | A combination of **hardware** and **software** that can have **data input** to it, which it then **processes** and **outputs**. It can be **programmed** to perform a variety of tasks. |
| Condition | 2 | A statement that can be either True or False |
| Condition-controlled loop | 2 | SEE: Loop (condition-controlled) |
| Count-controlled loop | 2 | SEE: Loop (count-controlled) |

# Computing Progression of Skills

| Term | Key Stage | Definition |
|---|---|---|
| Data | 1&2 | A letter, word, number etc. that has been collected for a purpose, but **stored** without context |
| Data set | 2 | A collection of related **data** |
| Debugging | 1&2 | The process of finding and correcting errors in a **program** |
| Decompose | 2 | To break down a task into smaller, more achievable steps |
| Digital device | 2 | A computer or a device with a computer inside that has been programmed for a specific task |
| Domain name | 2 | The part of a **website**'s **URL** that is user friendly and identifies that it is under the control of a particular person or organisation e.g. raspberrypi.org |
| Execute (run) | 2 | SEE: Run |
| Hardware | 2 | The physical parts of a **computer system** |
| HTML (HyperText Markup Language) | 2 | A standardised language used to define the structure of **web pages** |
| Hyperlink | 2 | (Also: link, weblink) Text or media that when clicked, takes the user to another specified location (**URL**) |
| Infinite loop | 2 | SEE: Loop (infinite) |
| Information | 1&2 | **Data** put into a context that provides meaning |
| Information technology | 1 | The study, use, and development of **computer systems** for storing, processing, retrieving, and sending information |

# Computing Progression of Skills

| Term | Key Stage | Definition |
|---|---|---|
| Input | 2 | **Data** that is sent to a **program** to be **processed** |
| Input device | 2 | A piece of **hardware** used to control, or send **data** to, a **computer** |
| Internet | 2 | The global system of interconnected **computer networks** |
| Loop | 2 | (**Count-controlled**, **condition-controlled**, or **infinite**) **Commands** that repeatedly **run** a defined section of **code** |
| Loop (condition-controlled) | 2 | A **command** that repeatedly **runs** a defined section of **code** until a **condition** is met |
| Loop (count-controlled) | 2 | A **command** that repeatedly **runs** a defined section of **code** a predefined number of times |
| Loop (infinite) | 2 | A **command** that repeatedly **runs** a defined section of **code** indefinitely |
| Network | 2 | SEE: Computer network |
| Object | 1 | Something that can be named and has other **attributes** (**properties**), which can be labelled |
| Object | 2 | Something that is uniquely identifiable and has **attributes** |
| Output | 2 | The result of **data processed** by a **computer** |
| Output device | 2 | A piece of **hardware that** is controlled by **outputs** from a **computer** |
| Procedure | 2 | A named set of **commands** that can be called multiple times throughout a **program**. This type of **subroutine** does not return a value. |

# Computing Progression of Skills

| Term | Key Stage | Definition |
|---|---|---|
| Process | 2 | A **program**, or part of a **program**, that is running on a **computer** |
| Program | 1&2 | A set of ordered **commands** that can be **run** by a **computer** to complete a task |
| Property (attribute) | 1 | A word or a phrase that can be used to describe an **object** such as its colour, size, or price |
| Repetition | 2 | Part of a **program** where one or more **commands** are **run** multiple times in a **loop** |
| Router | 2 | A device that manages the flow of data between **computer networks** |
| Run (execute) | 1&2 | To action the **commands** in a **program** |
| Selection | 2 | Part of a **program** where if a **condition** is met, then a set of **commands** is **run** |
| Server | 2 | A networked **computer** that manages, **stores,** and provides **data** such as files to other computers |
| Software | 2 | The **programs** used to control **computers** and perform specific tasks |
| Stored (data) | 2 | **Data** kept digitally so that it can be accessed by a computer |
| Subroutine | 2 | A named sequence of **commands** designed to perform a specific task |
| Switch (network switch) | 2 | A device that manages the flow of **data packets** within a **computer network** |
| Technology | 1 | The use of scientific knowledge for practical purposes |
| URL (Uniform Resource Locator) | 2 | The address of a file on the **internet** |

# Computing Progression of Skills

| Term | Key Stage | Definition |
|---|---|---|
| Variable | 2 | A named piece of **data** (often a number or text) **stored** in a computer's memory, which can be accessed and changed by a **computer program** |
| Web | 2 | SEE: WWW (World Wide Web) |
| Web address | 2 | SEE: URL (Uniform Resource Locator) |
| Web browser | 2 | A **program** used to view, navigate, and interact with **web pages** |
| Web page | 2 | A **HTML** document viewed using a **web browser** |
| Website | 2 | A collection of interlinked **web pages**, stored under a single **domain** |
| Wi-Fi | 2 | A technology that allows devices to wirelessly access a **network** and transfer **data** |
| WAP (Wireless Access Point) | 2 | A network device that allows wireless computing devices to connect to a wired **network** |
| WWW (World Wide Web) | 2 | A service provided via **the internet** that allows access to **web pages** and other shared files |