

Computing Skills Ladder

Skills ladders show the disciplinary knowledge that child will learn in the subject.



	Computer Science		Information Technology		Digital Literacy (Inc. E-safety)
	Programming	Computing systems and networks	Creating media	Data and information	
F2 Secure	Within the new EYFS curriculum the ‘Technology’ strand has been removed from ‘Understanding the World’ and has not been replaced with any updated guidance. We expose children to various devious and technology to lay the foundations for KS1 through our continuous provision.				
Year 1 Secure	- Match a command to an outcome - Predict the outcome of a command on a device - Run a command on a device - Predict the outcome of a sequence involving forwards and backwards commands - Start a sequence from the same place - Experiment with turn and move commands to move a robot - Predict the outcome of a sequence involving up to four commands - Choose the order of commands in a sequence - Debug a simple program - Run a programme and explain what it should do - Identify several possible solutions - Plan two programs - Use two different programs to get to the same place - Compare different programming tools - Find and use commands to move a sprite - Use a Start block in a program - Use more than one block by joining them together - Find blocks that have numbers - Add multiple and delete a sprite - Create an algorithm for each sprite - Add programming blocks based on an algorithm - Test the programs have been created	- Explain technology as something that helps us using examples - Locate examples of technology in the classroom - Name the main parts of a computer - Switch on and log into a computer - Use a mouse to click and drag - Click and drag to make objects on a screen - Use a mouse to create a picture - Use a mouse to open a program - Save my work to a file - Say what a keyboard is for - Type my name on a computer - Delete letters - Open my work from a file - Use the arrow keys to move the cursor	- Use the paint tools to draw a picture - Use the shape and line tools effectively - Explain that different paint tools do different jobs - Change the colour and brush sizes to achieve an outcome - Compare painting using a computer or using paper - Identify, find and recognise keys on a keyboard - Open a word processor - Enter text into a computer - Use backspace to remove text - Use letter, number, and space keys - Identify the toolbar and use bold, italic, and underline - Type capital letters - Change the font - Select all of the text by clicking and dragging - Select a word by double-clicking - Decide if my changes have improved my writing - Use 'undo' to remove changes - Explain the differences between typing and writing	- Describe objects using labels and identify the label for a group of objects - Match objects to groups - Count a group of objects - Describe an object and a property of it - Find objects with similar properties and count how many objects share a property - Group objects in more than one way - Group similar objects - Choose how to group objects - Describe groups of objects - Record how many objects are in a group - Compare groups of objects - Decide how to group objects to answer a question - Record and share what has been found	- Recognise that there may be people online who could make someone feel sad, embarrassed or upset. - Give examples of when and how to speak to an adult I trust to help when something makes them feel sad, worried, uncomfortable or frightened. - Give examples of when they need permission to do something online and why it is important - Use the internet with adult support to communicate with people I know - Explain why it is important to be considerate and kind to people online and to respect their choices - Explain that not everything is found funny by different people - Recognise that information can stay online and could be copied - Describe what information should not be put online without asking a trusted adult. - Describe how to behave online in ways that do not upset others and give examples - Give simple examples of how to find information using digital technologies - Understand that we can encounter a range of things online we like and don't like - Explain rules to keep myself safe when using technology both in and beyond the home - Explain how passwords are used to protect information, accounts and devices - Recognise more detailed examples of information that is personal to someone - Explain why work created using technology belongs to them - Understand that work created by others does not belong to them.
Year 2 Secure	- Show the difference in outcomes between two sequences that consist of the same commands - Use an algorithm to program a sequence on a floor robot - Use the same instructions to create different algorithms - Predict the outcome of a sequence and compare a prediction to the program outcome - Create an algorithm to meet a goal - Use my algorithm to create a program - Plan algorithms for different parts of a task - Identify that a program needs to be started and identify the start of a sequence - Change the outcome of a sequence of commands - Match two sequences with the same outcome - Predict the outcome of a sequence of commands - Build the sequences of blocks needed - Work out the actions of a sprite in an algorithm - Create an algorithm - Test and debug a program	- Describe some uses of computers - Identify examples of computers - Identify that a computer is a part of IT - Identify examples of IT - Identify that some IT can be used in more than one way - Sort school IT by what it's used for - Find examples of information technology - Sort IT by where it is found - Talk about uses of information technology - Demonstrate how IT devices work together - Recognise common types of technology - Say why we use IT - List different uses of information technology - Explain the need to use IT in different ways - Identify the choices that I make when using IT - Use IT for different types of activities	- Recognise what devices can be used to take photographs - Explain the process of taking a good digital photograph - Take photos in both landscape and portrait format and explain which is more appropriate - Apply a range of photography skills to capture a photo (light sources, tools, editing...) - Identify which photos are real and which have been changed - Relate an idea to a piece of music using computers - Use a computer to experiment with pitch in music - Explain how my music can be played in different ways - Refine my musical pattern on a computer - Create my animal's rhythm on a computer	- Compare totals in a tally chart - Record data in a tally chart - Represent a tally count as a total - Enter data onto a computer - Use a computer to view data in a different format - Use pictograms to answer simple questions about objects - Organise data in a tally chart - Answer 'more than'/'less than' and 'most/least' questions about an attribute - Create a pictogram to arrange objects by an attribute and draw conclusions from it - Share what has been found out using a computer - Use a computer program to present information in different ways	- Explain how other people may look and act different online and offline - Give examples of issues online that might make somebody feel sad, worried, uncomfortable or frightened and give examples of how they might help - Give examples of how someone might use technology to communicate with others they don't know also offline and why this is risky - Explain who they should ask before sharing things online - Describe different ways to ask for, give or deny permission online - Explain why they have the right to say 'no' or 'I will have to ask someone' - Identify trusted adults to support them make decisions when using digital devices and before pressing 'agree' online. - Explain how it may make others feel if I do not ask permission or I ignore their answers before sharing something about them online. - Explain how information put online about someone can last a long time - Describe how anyone's online information can be seen by others - Explain what bullying is, the impact it has and how they can get help - Use simple keywords in search engines - Demonstrate how to navigate a simple webpage to get to information - Explain what voice activated searching is and how it might be used - Explain why some information I find online may be real or not. - Explain simple guidance for using technology in different settings - Understand the role of a password - Describe and explain some rules for keeping personal information private - Explain how some devices in homes are connected to the internet (Lights, toys...) - Recognise that content on the internet may belong to other people
Year 3 Secure	- Explain that objects in Scratch have attributes (linked to) - Identify the objects in a Scratch project (sprites, backdrops) - Recognise that commands in Scratch are represented as blocks - Create a program following a design - Identify that each sprite is controlled by chosen commands - Create a sequence of connected commands - Explain that objects will respond exactly to the code - Start a program in different ways - Combine sound commands - Build a sequence of commands - Decide the actions for each sprite in a program - Implement algorithm as code - Choose which keys to use for actions and explain choices - Explain the relationship between an event and an action - Identify a way to improve a program - Program movement - Use a programming extension - Choose suitable keys to turn on additional features - Identify additional features (from a given set of blocks) - Match a piece of code to an outcome - Modify a program using a design - Test a program against a given design - Evaluate a project - Make design choices and justify them	- Explain that digital devices accept inputs - Explain that digital devices produce outputs - Follow and describe a process - Classify input and output devices - Design a digital device - Explain how digital devices are used for different activities - Recognise similarities and differences between using digital devices and non-digital tools - Discuss why we need a network switch - Explain how messages are passed through multiple connections - Recognise different connections - Demonstrate how information can be passed between devices - Explain the role of a switch, server, and wireless access point in a network - Recognise that a computer network is made up of a number of devices - Identify how devices in a network are connected together - Identify networked devices around them - Identify the benefits of computer networks	- Create an effective flip book—style animation - Explain how an animation/flip book works - Create an effective stop-frame animation - Explain why little changes are needed for each frame in stop-frame - Predict what an animation will look like - Describe an animation that is achievable on screen - Evaluate the quality of an animation - Review a sequence of frames to check work - Use onion skinning to help make small changes between frames - Evaluate another learner's animation - Evaluate and improve my animation based on feedback - Add other media to animation - Explain the difference between text and images and identify the advantages and disadvantages of using them - Recognise and explain that text and images can communicate messages clearly - Change font style, size, and colours for a given purpose - Edit text - Create a template for a particular purpose - Recognise placeholders and say why they are important - Choose the best locations for content - Make changes to content after it's been added - Paste text and images on desktop publishing - Identify different layouts and choose a suitable one for a given purpose - Compare work made on desktop publishing to work created by hand - Identify the uses of desktop publishing in the real world	- Investigate questions with yes/no answers - Arrange objects into a tree structure - Create a group of objects within an existing group - Select an attribute to separate objects into groups - Group objects using yes/no questions - Select objects to arrange in a branching database - Test a branching database to see if it works - Compare two branching database structures - Explain that questions need to be ordered carefully to split objects into similarly sized groups - Create questions that will enable objects to be uniquely identified - Independently create questions to use in a branching database - Suggest real-world uses for branching databases	- Explain what is meant by the term 'identify' and that people can represent themselves in different ways online - Describe how knowing someone online is different to knowing someone offline - Explain how it is important to be careful about who we 'trust' online and we can change our minds about who we trust. - Explain how someone's feelings can be hurt by what is said or written online. - Explain the importance of giving and gaining permission before sharing things online. - Explain how to search for information about others online - Explain the roles of trusted adults in keeping them safe online. - Describe appropriate ways to behave towards other people online and give examples of how bullying can occur and how to get support. - Demonstrate how to use key phrases in search engines to gather accurate information online. - Explain what autocomplete is and how to choose the best solution. - Explain how the internet can be used to sell and buy things - Explain the difference between a 'belief', 'opinion' and 'fact' - Explain that not all opinions shared may be accepted as true or fair - Explain why spending too much time on technology can have a negative impact on someone. - Explain why some online activities have age restrictions and why they should be followed. - Describe simple strategies for creating and keeping passwords private - Describe how connected devices can collect and share anyone's information with others. - Explain why copying someone's work from the internet without permission is not fair
Year 4 Secure	- Create a code snippet for a given purpose - Explain the effect of changing a value of a command - Program a computer by typing commands - Test algorithms in a text-based language - Use a template to create a design for a program - Write an algorithm to produce a given outcome - Identify patterns in a sequence - Use a count-controlled loop to produce a given outcome - Choose which values to change in a loop - Identify the effect of changing the number of times a task is repeated - Predict the outcome of a program containing a count-controlled loop - Explain that a computer can repeatedly call a procedure - Identify 'chunks' of actions in the real world - Use a procedure in a program - Design a program that includes count-controlled loops - Develop a program by debugging it - Modify a snippet of code to create a given outcome - Predict the outcome of a snippet of code	- Demonstrate how information is shared across the internet - Describe the internet as a network of networks - Describe networked devices and how they connect - Explain that the internet is used to provide many services - Recognise that the World Wide Web contains websites and web pages - Describe how to access websites on the WWW - Describe where websites are stored when uploaded to the WWW - Explain the types of media that can be shared on the WWW - Explain that internet services can be used to create content online - Explain what media can be found on websites - Recognise that they can add content to the WWW - Explain that websites and their content are created by people - Suggest who owns the content on websites	- Explain that the person who records the sound can say who is allowed to use it - Identify the input and output devices used to record and play sound - Use a computer to record audio - Discuss what sounds can be added to a podcast - Inspect the soundwave view to know where to trim my recording - Re-record their voice to improve their recording - Explain how sounds can be combined to make a podcast more engaging - Plan appropriate content for a podcast - Save a project so the different parts remain editable and podcasts - Review the quality of and improve my voice recordings - Record content following my plan - Arrange multiple sounds to create a desired effect - Explain the difference between saving a project and exporting an audio file - Listen to an audio recording to identify its strengths - Suggest improvements to an audio recording - Arrange multiple sounds to create the desired effect - Explain why it might be needed to crop an image - Improve an image by rotating it	- Choose a data set to answer a given question - Identify data that can be gathered over time - Suggest questions that can be answered using a given data set - Explain what data can be collected using sensors - Identify that data from sensors can be recorded - Use data from a sensor to answer a given question - Identify the intervals used to collect data - Recognise that a data logger collects data at given points - Talk about the data that has been captured - Explain that there are different ways to view data - Sort data to find information - View data at different levels of detail - Plan how to collect data using a data logger - Propose a question that can be answered using logged data - Use a data logger to collect data - Draw conclusions from the data that has been collected - Explain the benefits of using a data logger - Interpret data that has been collected using a data logger	- Explain how my online identity can be different to my offline identity - Describe positive ways to interact with someone online - Explain that others online can pretend to be someone else and reasons why they might do this - Describe strategies for safe and fun experiences in a range of online social environments - Give examples of how to be respectful to others online and healthy behaviours - Explain how content shared online may feel unimportant to one person but not to another - Describe how to find out information by searching online - Explain ways the some of the information online can be created, copied or shared - Describe ways people can be bullied through a range of media and why they need to think carefully about the content they post - Analyse information to make a judgement about the accuracy - Describe how to search for information within a wide group of technologies - Describe the methods used to encourage people to buy things online - Explain why lots of people sharing information does not necessarily mean it is true - Explain that technology can be designed to act like or impersonate living things

	- Choose when to use a count-controlled and an infinite loop - Modify loops to produce a given outcome - Recognise that some programming languages enable more than one process to be run at once - Choose which action will be repeated for each object - Evaluate the effectiveness of the repeated sequences used in a program - Explain what the outcome of the repeated action should be - Explain the effect of my changes to a program - Identify which parts of a loop can be changed - Re-use existing code snippets on new sprites - Develop their own design explaining what their project will do - Evaluate the use of repetition in a project - Select key parts of a given project in their own design - Build a program that follows a design - Evaluate the steps they followed when building their project - Refine the algorithm in their design		- Use photo editing software to crop an image - Experiment with different colour effects - Explain that different colour effects make you think and feel different things - Add to the composition of an image by cloning - Identify how a photo edit can be improved - Remove parts of an image using cloning - Experiment with tools to select and copy part of an image - Explain why photos might be edited - Use a range of tools to copy between images - Explain why photos might be edited - Use a range of tools to copy between - Combine text and image to complete a project - Review images against a given criteria - Use feedback to guide making changes		- Explain what is meant by fake news and why it might be created. - Explain how technology can be a distraction in both a positive and negative way - Identify times or situations when someone may need to limit the amount of technology they use. - Describe strategies for keeping personal information private - Explain that internet use is never fully private and is monitored - Describe how some online services may seek consent to store information about me and how to respond (inc. the role of a trusted adult) - Explain the digital age of consent - Explain that considering who owns digital content is important when searching the internet - Give some simple examples of content which must not be used without permission from the owner.
Year 5 Secure	- Create a simple circuit and connect it to a microcontroller - Explain what an infinite loop does - Program a microcontroller to make an LED switch on - Connect more than one output component to a microcontroller - Design sequences that use count-controlled loops - Use a count-controlled loop to control outputs - Design a conditional loop - Explain that a condition is either true or false - Program a microcontroller to respond to an input - Explain that a condition being met can start an action - Identify a condition and an action in my project - Use selection (an 'if...then...' statement) to direct the flow of a program - Identify a real-world example of a condition starting an action - Test and debug a project - Use selection to produce an intended outcome - Write an algorithm that describes what a model will do - Identify conditions in a program - Modify a condition in a program - Recall how conditions are used in selection - Create a program with different outcomes using selection - Identify the condition and outcomes in an 'if... then... else...' statement - Use selection in an infinite loop to check a condition - Design the flow of a program which contains 'if... then... else...' - Explain that program flow can branch according to a condition - Show that a condition can direct program flow in one of two ways - Identify the outcome of user input in an algorithm - Implement an algorithm to create the first section of a program - Test their programs - Identify the setup code needed in a program - Identify ways the program could be improved	- Describe that a computer system features inputs, processes, and outputs - Explain that computer systems communicate with other devices - Explain that systems are built using a number of parts - Explain the benefits of a given computer system - Identify tasks that are managed by computer systems - Identify the human elements of a computer system - Compare results from different search engines - Make use of a web search to find specific information - Refine web searches - Explain why tools are needed to find things online - Recognise the role of web crawlers in creating an index - Relate a search term to the search engine's index - Explain that a search engine follows rules to rank results - Give examples of criteria used by search engines to rank results - Order a list by rank - Describe some of the ways that search results can be influenced - Explain how search engines make money - Recognise some of the limitations of search engines	- Compare features in different videos - Identify features of videos - Experiment with different camera angles - Identify and find features on a digital video recording device - Make use of a microphone - Capture video using a range of filming techniques - Review how effective a video is - Create and save video content - Explain how to improve a video by reshooting and editing - Select the correct tools to make edits to a video - Store, retrieve, and export recordings to a computer - Evaluate their video - Make edits to a video and improve the final outcome - Recognise that the choices made when making a video will impact on the quality of the final outcome - Discuss how vector drawings are different from paper-based drawings - Experiment with the shape and line tools - Recognise that vector drawings are made using shapes - Explain that each element added to a vector drawing is an object - Identify the shapes used to make a vector drawing - Move, resize, and rotate objects that have duplicated - Modify objects to create a new image - Use the zoom tool to help me add detail to my drawings - Change the order of layers in a vector drawing - Identify that each added object creates a new layer in the drawing - Use layering to create an image - Copy part of a drawing by duplicating several objects - Recognise when I need to group and ungroup objects - Reuse a group of objects to further develop a vector drawing - Compare vector drawings to freehand paint drawings - Create a vector drawing for a specific purpose	- Explain how information can be recorded - Order, sort, and group data - Choose which field to sort data by to answer a given question - Explain what a field and a record is in a database - Navigate a flat-file database to compare different views of information - Combine grouping and sorting to answer specific questions - Explain that data can be grouped using chosen values - Group information using a database - Choose multiple criteria to answer a given question - Choose which field and value are required to answer a given question - Outline how 'AND' and 'OR' can be used to refine data selection - Explain the benefits of using a computer to create charts - Refine a chart by selecting a particular filter - Select an appropriate chart to visually compare data - Ask questions that will need more than one field to answer - Present my findings to a group - Refine a search in a real-world context	- Explain how identity online can be copied, modified or altered - Demonstrate how to make responsible choices about having an online identity - Give examples of technology-specific forms of communication - Explain that there are people online who may want to do them or their friends harm - Describe some of the ways people may be involved in online communities and how they might collaborate with others to make positive contributions. - Demonstrate how to support others online - Search for information about an individual online and summarise the information found - Describe ways that information about anyone online can be used to make judgements which could be incorrect - Recognise online bullying can be different to bullying in the physical world - Identify a range of ways to report concerns both in school and at home - Explain how to block abusive users - Explain the benefits and limitations of using different types of search technologies - Explain what is meant by being sceptical and why it is important to be - Evaluate digital content and explain how to make choices about what is trustworthy - Explain key concepts including: information, reviews, fact, opinion, belief, validity, reliability and evidence - Describe ways of identifying when online content has been commercially sponsored or boosted. - Explain what is meant by the term 'stereotype' and how they are amplified online - Describe how fake news can be harmful - Explain what is meant by a hoax. - Describe ways technology can affect health and well-being both positively and negatively - Describe strategies and advice to promote health and wellbeing when using technology - Recognise the benefits and risks of accessing information about health and well-being online. - Explain how and why some apps and games may request or take payment for additional content - Explain what a strong password is and how to create one - Explain how many free apps or services may read and share private information - Explain what app permission are and give some examples. - Access and justify when it is acceptable to use the work of others
Year 6 Secure	- Explain that the way a variable changes can be defined - Identify examples of information that is variable - Identify that variables can hold numbers or letters - Explain that a variable has a name and a value - Identify a program variable as a placeholder in memory for a single value - Recognise that the value of a variable can be changed - Decide where in a program to change a variable - Make use of an event in a program to set a variable - Recognise that the value of a variable can be used by a program - Create algorithms for a project - Choose a name that identifies the role of a variable - Test the code that they have written - Identify ways that their game could be improved - Use variables to extend their game - Test a program on an emulator - Transfer a program to a controllable device - Determine the flow of a program using selection - Identify examples of conditions in the real world - Use a variable in an if, then, else statement to select the flow of a program - Experiment with different physical inputs - Explain that checking a variable doesn't change its value - Use a condition to change a variable - Explain the importance of the order of conditions in else, if statements - Modify a program to achieve a different outcome - Use an operand (e.g. <=>) in an if, then statement - Decide what variables to include in a project - Use a range of approaches to find and fix bugs	- Describe how computers use addresses to access websites - Explain that internet devices have addresses - Recognise that data is transferred using agreed methods - Explain that all data transferred over the internet and networks is in packets - Identify and explain the main parts of a data packet - Explain that the internet allows different media to be shared - Recognise how to access shared files stored online - Send information over the internet in different ways - Explain how the internet enables effective collaboration - Identify different ways of working together online - Recognise that working together on the internet can be public or private - Choose methods of communication to suit particular purposes - Explain the different ways in which people communicate - Identify and compare a variety of ways to communicate over the internet	- Discuss the different types of media used on websites - Explore a website - Know that websites are written in HTML - Draw a web page layout that suits a purpose - Recognise the common features of a web page - Describe what is meant by the term 'fair use' - Find and understand copyright-free images - Add content to their own web page - Evaluate what a web page looks like on different devices and suggest/make edits - Describe why navigation paths are useful - Explain what a navigation path is - Make multiple web pages and link them using hyperlinks - Create hyperlinks to link to other people's work - Evaluate the user experience of a website - Explain the implication of linking to content owned by others - Add and manipulate 3D shapes to a project - Analyse a 3D model - Construct a 3D model based on a design - Modify a 3D model to improve it	- Collect data - Enter data into a spreadsheet - Suggest how to structure data - Apply an appropriate format to a cell - Explain what an item of data is - Construct a formula in a spreadsheet - Explain which data types can be used in calculations - Identify that changing inputs changes outputs - Apply a formula to multiple cells by duplicating it - Calculate data using different operations - Apply a formula to calculate the data to answer questions - Explain why data should be organised - Use a spreadsheet to answer questions - Produce a chart - Suggest when to use a table or chart - Use a chart to show the answer to questions	- Identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups. - Describe issues online that can cause negative impact on others - Explain the importance of asking and getting help - Explain how sharing something online can have positive or negative impact - Describe how content shared online can have unintended consequences - Explain that taking or sharing inappropriate images of someone can have a negative impact - Explain the ways in which anyone can develop a positive online reputation - Explain strategies anyone can use to protect their digital personality including degrees of anonymity. - Describe how to capture bullying content as evidence and explain how to report online bullying - Explain how search engines work and how results are ranked - Explain how to use search technologies effectively - Describe how some online information can be opinion and what some people may present them as facts - Define the terms: influence, manipulation and persuasion and how someone may encounter these online - Understand the concept of persuasive design and how it influences people's choices - Demonstrate how to analyse and evaluate the validity of information - Explain how companies and news providers target people online - Describe the difference between online misinformation and dis-information - Explain why information that is on a large number of sites may still be untrue or inaccurate - Identify, flag and report inappropriate content - Describe common systems that regulate age-related content - Recognise and discuss the pressures of technology and how they can be managed - Recognise features of persuasive design and how they are used to keep users engaged. - Assess and action different strategies to limit the impact of technology on health - Describe effective ways people can manage passwords and what to do if one is lost or stolen. - Describe how and why people should keep their software and apps up to date - Describe simple ways to increase privacy on apps and services - Describe ways in which some online content targets people to gain money or information illegally - Understand that online services have terms and conditions that govern their use. - Demonstrate the use of search tools to find and access online content that can be reused by others - Demonstrate how to make references to and acknowledge sources used.