The Federation of Snape Community & Thornton Watlass CE Primary Schools

Inspire • Enrich • Enjoy • Succeed

Computing

Progression of Skills and Knowledge

EYFS to Year 6

Compassion ● Forgiveness ● Hope ● Justice ● Respect ● Honesty ● Love

COMPUTING PROGRESSION OF SKILLS and KNOWLEDGE

Skills	Sunflowers		Owls		Red Kites		
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Computer Science Hardware	Learning how to operate a camera to takephotographs of meaningful creations or moments. Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Recognising and identifying familiar lettersand numbers on a keyboard. Developing basic mouse skills such as moving and clicking.	Learning how to operate a camera or tablet to takephotos and videos. Learning how to explore and tinker with hardwareto find out how it works. Recognising that some devices are input devices andothers are output devices. Learning where keys are located on the keyboard.	Understanding what a computer is and that it'smade up of different components. Recognising that buttons cause effects and thattechnology follows instructions. Learning how we know that technology is doingwhat we want it to do via its output. Using greater control when taking photos withcameras, tablets or computers. Developing confidence with the keyboard and the basics of touch typing.	Understanding what the different components of a computer do and how they work together. Drawing comparisons across differenttypes of computers. Learning about the purpose of routers.	Using tablets or digital cameras tofilm a weather forecast. Understanding that weather stations use sensors to gather and record data, which predicts the weather.	Learning that external devices can be programmed by a separate computer. Learning the difference between ROM andRAM. Recognising how the size of RAM affects the processing of data. Understanding the fetch, decode, executecycle. cycle.	Learning about the history of computers and how they have evolved overtime. Using the understanding of historic computers to design a computer of the future. Understanding and identifying barcodes,QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes andRFID. Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**			
Computer Science Networks and data representation	N/A	N/A	N/A	Understanding the role of the keycomponents of a network. Identifying the key components within a network, including whether they are wired or wireless Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.	Understanding that computer networks provide multiple services, such as the World WideWeb, and opportunities for communication and collaboration.	Learning the vocabulary associated withdata: data and transmit. Learning how the data for digital images can be compressed. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. Understanding how bit patterns represent images as pixels.	Understanding that computer networks provide multiple services.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Computer Science Computational thinking	Using logical reasoning to understand simple instructions and predict the outcome.	Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm.	Articulating what decomposition is. Decomposing a game to predict the algorithms usedto create it. Learning that there are different levels of abstraction. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following preciseinstructions. Incorporating loops within algorithms.	Using decomposition to explain theparts of a laptop computer. Using decomposition to explore thecode behind an animation. Using repetition in programs. Using logical reasoning to explain how simple algorithms work. Explaining the purpose of an algorithm. Forming algorithms independently.	Using decomposition to solve a problemby finding out what code was used. Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities. Using past experiences to help solve new problems. Using abstraction to identify the important parts when completing both plugged and unplugged activities.	Decomposing animations into a series ofimages. Decomposing a program withoutsupport. Decomposing a story to be able to plan a program to tell a story. Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose.	Decomposing a program into algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Computer Science Programming	Following instructions as part of practical activities and games. Learning to give simple instructions. Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. Learning to debug instructions, with the helpof an adult, when things go wrong.	Programming a Floor robot to follow a planned route. Learning to debug instructions when things gowrong. Using programming language to explain how a floorrobot works. Learning to debug an algorithm in an unpluggedscenario.	Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computerprogram. Using loop blocks when programming to repeat an instruction more than once.	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient. Continuing existing code. Making reasonable suggestions for how to debug their own and others' code.	Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient.	Programming an animation. Iterating and developing their programming as they work. Confidently using loops in their programming. Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Amending code within a live scenario.	Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Information Technology Using software	Using a simple online paint tool to create digital art.	Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools.	Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Using software (and unplugged means) to create story animations. Creating and labelling images.	Taking photographs and recordingvideo to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions.	Building a web page and creating contentfor it. Designing and creating a webpage for a given purpose. Use online software for documents, presentations, forms and spreadsheets Using software to work collaboratively with others.	Using logical thinking to explore softwaremore independently, making predictionsbased on their previous experience. Using software programme Sonic Pi/Scratch to create music. Using the video editing software to animate. Identify ways to improve and edit programs, videos, images etc. Independently learning how to use 3D design software package TinkerCAD.	Using logical thinking to explore software independently, iterating ideas and testing continuously. Using search and word processing skills to create a presentation. Creating and editing sound recordings for a specific purpose. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions. Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Information Technology Using email and internetsearches	N/A	Recognising devices that are connected to the internet. Searching and downloading images from the internetsafely. Understanding that we are connected to others when using the internet.	Searching for appropriate images to use in a document. Understanding what online information is.	Learning to log in and out of an email account. Writing an email including a subject, 'to' and 'from.' Sending an email with an attachment. Replying to an email.	Understanding why some results come before others when searching. Using keywords to effectively search for information on the internet. Understanding that information found by searching the internet is not all grounded in fact. Searching the internet for data.	Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.	Understanding how search engines work.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Information Technology Using Data	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physicalgames.	Understanding that technology can be used to representdata in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases.	Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet.	Understanding the vocabulary to dowith databases: field, record, data. Learning about the pros and cons ofdigital versus paper databases. Sorting and filtering databases toeasily retrieve information. Creating and interpreting charts and graphs to understand data.	Understanding that data is used to forecastweather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by…' option. Designing a device which gathers andrecords sensor data.	Understanding how data is collected inremote or dangerous places. Understanding how data might be used totell us about a location.	Understanding how barcodes, QR codesand RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Information Technology Wider use oftechnology	N/A	Recognising common uses of information technology, including beyond school. Understanding some of the ways we can use the internet.	Learning how computers are used in the wider world.	Understanding the purpose ofemails. Recognising how social mediaplatforms are used to interact.	Understanding that software can be used collaboratively online to work as a team.	Learn about different forms of communication that have developed with the use oftechnology.	Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solvea problem or improve efficiency.

Knowledge	Sunflowers		Owls		Red Kites		
	EYFS	Y1	Y2	Y3			
Digital Literacy	Recognising that a range of technology is used for different purposes. Learning to log in and log out.	Logging in and out and saving work on their own account. When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. Understanding how to interact safely with others online. Recognising how actions on the internet can affect others. Recognising what a digital footprint is and how to be careful about what we post.	Learning how to create a strong password. Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable Identifying whether information is safe or unsafe to be shared online. Learning to be respectful of others when sharing online and ask for their permission before sharing content. Learning strategies for checking if something they read online is true.	Recognising that different information is shared online including facts, beliefs and opinions. Learning how to identify reliable information when searching online. Learning how to stay safe on social media. Considering the impact technology can have on mood. Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.	Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online. Recognising what appropriate behaviour is when collaborating with others online. Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour.	Identifying possible dangers online and learning how to stay safe. Evaluating the pros and cons of online communication. Recognising that information on the internet might not be true or correct and learning ways of checking validity. Learning what to do if they experience bullying online. Learning to use an online community safely	Learning about the positive and negative impacts of sharing online. Learning strategies to create a positive online reputation. Understanding the importance of secure passwords and how to create them. Learning strategies to capture evidence of online bullying in order to seek help. Using search engines safely and effectively. Recognising that updated software can help to prevent data corruption and hacking.

	Sunflowers		Owls		Red Kites		
	EYFS	Y1	Y2	Y3			
Computer Systems and Networks	To be able to understand what a computer keyboard is and recognising some lettersand numbers. To know that a mouse canbe used to click, drag and create simple drawings. To know that to use a computer you need to login to it and then log out atthe end of your session. To know that different types of technology can be found at home and in school. To know that you can takesimple photographs with a camera or iPad. To know that you must hold the camera still and ensure the subject is in theshot to take a photo.	To know that "log in and log out" means to begin and end a connection witha computer. To know that a computerand mouse can be used to click, drag, fill and select and also add backgrounds,text, layers, shapes and clip art. To know that passwords are important for security. To know that when we create something on a computer it can be moreeasily saved and sharedthan a paper version. To know some of the simple graphic design features of a piece of online software.	To know the difference between a desktop andlaptop computer. To know that people control technology. To know that buttons are aform of input that give a computer an instruction about what to do (output). To know that computers often work together. To know that touch typingis the fastest way to type. To know that I can make text a different style, size and colour. To know that "copy andpaste" is a quick way ofduplicating text.	To know what a tablet is andhow it is different from a laptop/desktop computer. To understand what a network is and how a schoolnetwork might be organised. To know that a server is central to a network and responds to requests made. To know how the internet uses networks to share files. To know that a router connects us to the internet. To know what a packet isand why it is important forwebsite data transfer. To know the roles that inputs and outputs play oncomputers. To understand that email stands for 'electronic mail.' To know that an attachment is an extra file added to an email. To understand that emails should contain appropriate and respectful content. To know what some of the different components insidea computer are e.g. CPU, RAM, hard drive, and how they work together.	To understand that software can be used collaboratively online to work as a team. To know what type of comments and suggestions on a collaborative documentcan be helpful. To know that you can use images, text, transitions and animation in presentation slides.	To know how search engines work. To understand that anyone can create a website and therefore we should take steps to check the validity of websites. To know that web crawlers are computer programs that crawl through the internet. To understand whatcopyright is. To know the difference between ROM and RAM.	To understand the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. To know about some of the historical figures that contributed to technological advances in computing. To understand what techniques are required to create a presentation using appropriate software.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Programming	To know that being able to follow and give simple instructions is important in computing. To understand that it is important for instructions to be in the right order. To understand why a set of instructions may have gone wrong. To know that you can program a Bee-Bot with some simple commands. To understand that debugging means how to fix some simple programming errors. To understand that an algorithm is a set of clear and precise instructions.	To understand that an algorithm is when instructions are put in an exact order. To know that input devices get information into a computer and that output devices get information out of a computer. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination.	To understand what machine learning is and how that enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem. To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke.	To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming. To understand that you can remix and adapt existing code.	To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that variables can help you to create a quiz on Scratch. To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design etc.	To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. To understand that using loops can make the process of writing music simpler and more effective. To know how to adapt their code while performing their music. To know that a Micro:bit is a programmable device. To know that Micro:bit uses a block coding language similar to Scratch. To understand and recognise coding structures including variables. To know what techniques to use to create a program for a specific purpose (including decomposition).	To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops. To understand the use of random numbers and remix Python code.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Creating Media	N/A	To understand that holding the camera still and considering angles and light are important totake good pictures. To know that you can edit,crop and filter photographs. To know how to searchsafely for images online.	To understand that an animation is made up of asequence of photographs. To know that small changes in my frames will create a smoother lookinganimation. To understand what software creates simple animations and some of itsfeatures e.g. onion skinning.	To know that different types of camera shots canmake my photos or videoslook more effective. To know that I can editphotos and videos usingfilm editing software. To understand that I can add transitions and text tomy video.	To know some of the features of web design software. To know that a website is a collection of pages that are all connected. To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks.	To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. To know that decomposition of an ideais important when creating stop-motion animations. To know that websites should be informative and interactive.	To know that radio plays are plays where the audience can only hear the action so sound effects are important. To know that sound clips can be recorded using sound recording software. To know that sound clips can be edited and trimmed. To know that editing is an important feature of making and improving a stop motion animation

	Sunflowers		Owls		Red Kites		
Data Handling	To know that sorting objects into various categories can help youlocate information. To know that using yes/noquestions to find an answer is a branching database. To know that a pictogramis a way of showing information.	To know how that chartsand pictograms can be created using a computer. To understand that a branching database is a way of classifying a groupof objects. To know that computers understand different types of 'input'.	To understand that you can enter simple data intoa spreadsheet. To understand what stepsyou need to take to createan algorithm. To know what data to useto answer certain questions. To know that computerscan be used to monitor supplies.	To know that a database isa collection of data storedin a logical, structured andorderly manner. To know that computerdatabases can be usefulfor sorting and filtering data. To know that different visual representations ofdata can be made on a computer.	To know that computers can use different forms ofinput to sense the world around them so that theycan record and respond todata. This is called 'sensordata'. To know that a weather machine is an automated machine that responds tosensor data. To understand that weather forecasters use specific language, expression and pre-prepared scripts tohelp create weather forecast films.	To know that Mars Roveris a motor vehicle that collects data from spaceby taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sentin this format. To understand that RAM is Random Access Memory and acts as the computer's working memory. To know what simple operations can be used to calculate bit patterns.	To know that data contained within barcodesand QR codes can be usedby computers. To know that infrared waves are a way of transmitting data. To know that Radio Frequency Identification (RFID) is a more private way of transmitting data. To know that data is often encrypted so that even if itis stolen it is not useful tothe thief. To know that data can become corrupted within a network but this is less likely to happen if it is sentin 'packets'.

	Sunflowers		Owls		Red Kites		
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Online Safety	N/A	To know that the internetis many devices connectedto one another. To know that you shouldtell a trusted adult if youfeel unsafe or worried online. To know that people you do not know on the internet (online) are strangers and are not always who they say theyare. To know that to stay safeonline it is important to keep personal information safe. To know that 'sharingonline means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.	To understand the difference between onlineand offline. To understand what information I should notpost online. To know what the techniques are for creating a strong password. To know that you should ask permission from others before sharing about them online and that they have the right tosay 'no.' To understand that noteverything I see or readonline is true.	To know that not everything on the internetis true: people share facts,beliefs and opinions online. To understand that theinternet can affect yourmoods and feelings. To know that privacy settings limit who can access your important personal information, Information, such as your name, age, gender etc. To know what social mediais and that age restrictionsapply.	To understand some of the methods used to encourage people to buy things online. To understand that technology can be designed to act like or impersonate living things. To understand that technology can be a distraction and identify when someone might need to limit the amountof time spent using technology. To understand what behaviours are appropriate in order to stay safe and be respectfulonline.	To know different ways we can communicate online. To understand how online information can be used to form judgements. To understand some waysto deal with online bullying. To know that apps require permission to access private information and that you can alter the permissions. To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.	To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity. To know what steps are required to capture bullying content as evidence. To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation. To know some commononline scams.