



Our Approach to Teaching Computing

Our Curriculum Intent: *To create a flexible, responsive curriculum which can be adapted to reflect children's interests and teachers' passions whilst ensuring rigorous progression and coverage of key skills and knowledge*

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. National Curriculum, 2013

Key Concepts in Computing

Hollybush Primary school uses the National Centre for Computing Education's (NCCE) [Teach Computing Curriculum](#) (NCCE). Following a thorough review of the KS1-2 computing programme of study the NCCE created 10 taxonomy strands which sit under four primary themes (concepts). The strands all the learning outlined in Teach Computing's Curriculum. These strands move through the primary curriculum journey; each one building on the prior knowledge and skills that it follows. Each each strand is divided into teaching units. For these units to be coherent, the lessons within a unit must be taught in order. However, across a year group, the units themselves do not need to be taught in order, with the exception of 'Programming' units, where concepts and skills rely on prior learning and experience. These 10 strands and the four overarching concepts are:

COMPUTER SYSTEMS AND NETWORKS	Computer Networks - Understand how networks can be used to retrieve and share information, and how they come with associated risk
	Computer systems - Understand what a computer is, and how its constituent parts function together as a whole
PROGRAMMING	Design and development - Understand the activities involved in planning, creating, and evaluating computing artefacts
	Algorithms - Be able to comprehend, design, create and evaluate algorithms
	Programming - Create software to allow computers to solve problems
DATA AND	Data and information - Understand how data is stored, organised, and used to represent

INFORMATION	real - world artefacts and scenarios
CREATING MEDIA	Design and development - Understand the activities involved in planning, creating, and evaluating computing artefacts
	Creating media - Select and create a range of media including text, images, sounds and video
The three taxonomy strands below run through each of the four main themes (concepts)	
Effective use of tools - Use software tools to support computing work	
Impact of technology - Understand how individuals, systems, and society as a whole interact with computer systems - this runs through all the units	
Safety and security - Understand risks when using technology, and how to protect individuals and systems	

Online safety / Safety and security - each unit show the links between the content of the lessons and the national curriculum and [Education for a Connected World framework](#). These references have been provided to show where aspects relating to online safety, or digital citizenship, are covered within the Teach Computing Curriculum. Not all of the objectives in the Education for a Connected World framework are covered in the Teach Computing curriculum as some are better suited to personal, social, health, and economic (PSHE) education; spiritual, moral, social, and cultural (SMSC) development; and citizenship. However, the coverage required for the computing national curriculum is provided. Hollybush uses Thoughtful Thursday as it's main vehicle to teach online safety. Teachers are encouraged to use [Project Evolve](#) which is based on the UK Council for Internet Safety's (UKCIS) framework "Education for a Connected World" will be used. A structured approach has been put in place to ensure the eight strands set out in Education for a Connected World framework are covered - this includes Nursery and Reception.

Nursery and Reception

EYFS is not part of the Teach Computing Curriculum. However, computing and technology are still vitally important in EYFS. Computing in EYFS ensures that pupils enter Year 1 with a strong foundation, builds problem-solving abilities, encourages resilience and supports other areas of learning. By integrating computing into EYFS, pupils also begin to build their digital literacy and their understanding of e-safety. Technology is about children understanding how things work. It is not about electronics but finding out how things work, cause and effect.

Katie Joyce a Primary Computing Subject Specialist summarises the following benefits (taken from an article dated 22/01/2024 on the [STEM Learning platform](#))

- 1. Building a strong foundation** - computing in EYFS doesn't have to mean creating a PowerPoint, or writing a Word document! It can be unplugged activities which don't use a computer. It can also be activities which familiarise pupils with technology they may use more formally in KS1. For example, computing in EYFS may look like taking photos with a tablet, tinkering with a Bee-bot, doodling on an iPad or including an old keyboard in the role play area.
- 2. Building problem solving skills** - computing activities, especially those involving computational thinking, build problem solving skills. Pupils learn to break problems down into smaller pieces and focus on the important facts. They take big problems and turn them into smaller ones which can be solved. These problem-solving skills support pupils across the domains of the EYFS framework.
- 3. Encouraging resilience** - computing tasks often require persistence to find a solution. There can be an element of trial and error, or tasks can need debugging. This process helps children develop their resilience as they learn to keep trying until they find a solution.
- 4. Supporting other areas of learning** - technology can give a helping hand to other areas of learning. Using a drawing app like Doodle Buddy the Notes app on iPads can help develop fine motor skills, while educational games can reinforce numeracy and

literacy skills. Computing activities often require children to follow instructions and explain their thinking, which is great for building communication skills. Plus, computational thinking activities also include pattern spotting and logical thinking, which are important mathematical skills.

5. Developing digital literacy - in this technological age, digital literacy is becoming an absolutely fundamental skill for all. Introducing computing in EYFS helps children get to grips with technology from a young age, preparing them for a world where digital skills are essential. Plus, it's a great way to teach early e-safety, ensuring pupils can use tech safely both in and out of school.

Statements from [Development Matters 2021](#) that could proceed the programme of study for computing have been used to guide the teaching of technology in Nursery and Reception.

Concepts	Nursery	Reception
Following rules and instructions Making choices Exploring and investigating Construction and using tools appropriately and safely Resilience and perseverance	Remember rules without needing an adult to remind them (Personal, Social and Emotional Development) Match their developing physical skills to tasks and activities in the setting (Physical Development) Explore how things work (Physical Development)	Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time' (Personal, Social and Emotional Development) Develop their small motor skills so that they can use a range of tools competently, safely and confidently (Physical Development) Explore, use and refine a variety of artistic effects to express their ideas and feelings (Expressive Arts and Design)

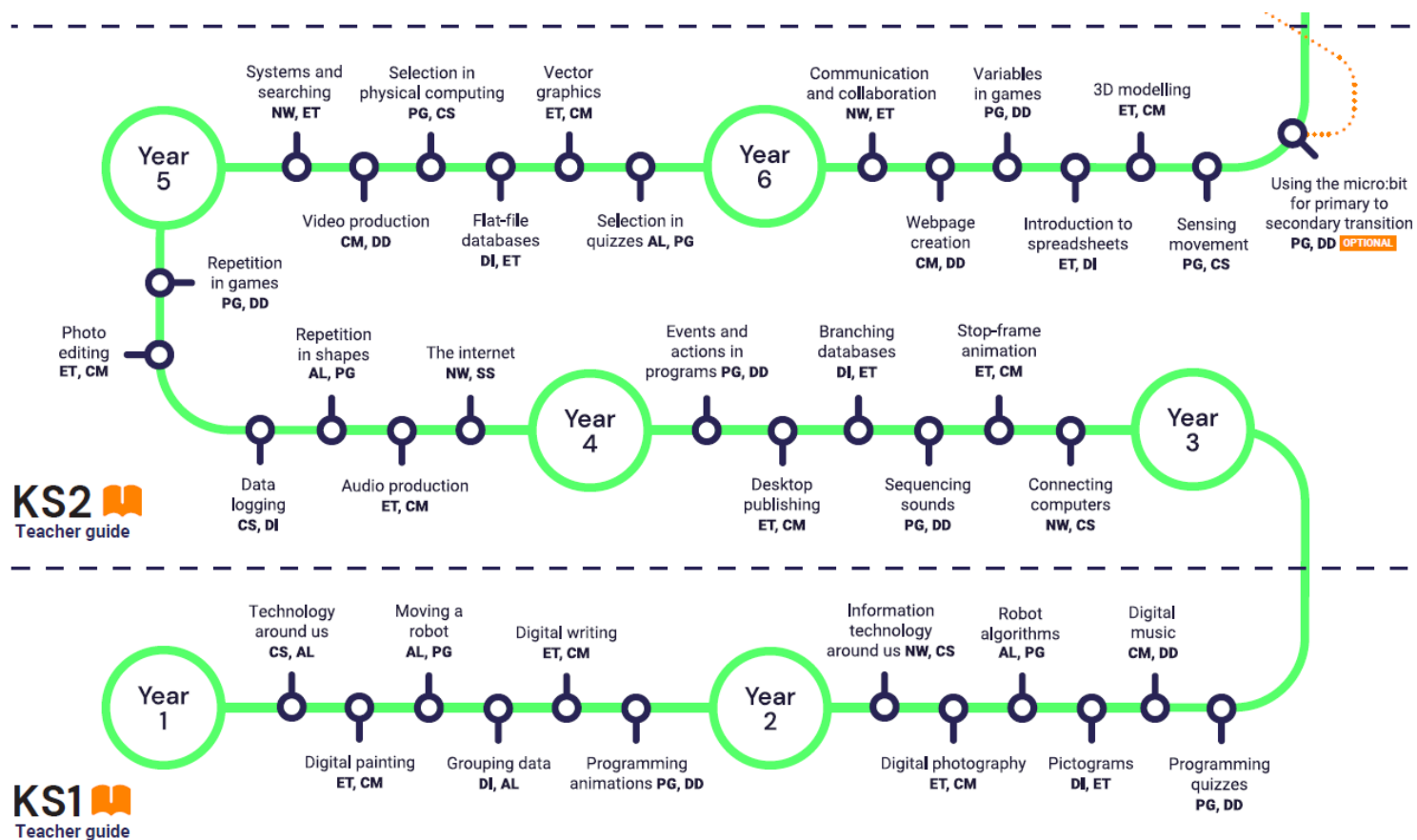
Relevant skills in EYFS which to technology and computing

- To investigate how things work
- To use construction blocks to build
- To use objects to create something new
- To match physical skills to tasks and activities in class
- To use technology to solve problems
- To use a variety of artistic effects to express your ideas and feelings
- To safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function
- To recognise are a number of objects (up to five) without counting
- To count confidently

The Teaching Computing Primary Journey showing which strand each teaching unit links to

Strands	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algorithms (AL)	Technology around us Moving a robot Grouping data	Robot algorithms		Repetition in shapes	Selection in quizzes	
Computing systems (CS)	Technology around us	Information technology around us	Connecting computers	Data logging	Selection in physical computing	Sensing movement
Creating media (CM)	Digital painting Digital writing	Digital photography Digital music	Stop-frame animation Desktop publishing	Audio production Photo editing	Video production	Webpage creation 3D modelling
Data & information (DI)	Grouping data	Pictograms	Branching databases	Data logging	Flat-file databases	Introduction to spreadsheets
Design & development (DD)	Programming animations	Programming quizzes	Sequencing sounds Events and actions in programs	Repetition in games	Video production	Webpage creation Variable in games Using the microbit (optional)
Effective use of tools (ET)	Digital painting Digital writing	Digital photography Digital music	Stop-frame animation Branching databases Desktop publishing	Audio production Photo editing	Systems and searching Flat-file databases	Communication & collaboration Introduction to spreadsheets 3D modelling
Networks (NW)		Information technology around us	Connecting computers	The Internet	Systems and searching	Communication & collaboration
Programming (PG)	Moving a robot Programming	Robot algorithms Pictograms	Sequencing sounds Events and actions in	Repetition in shapes Repetition in games	Selection in physical computing	Variable in games Sensing movement

Strands	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	animations	Programming quizzes	programs		Selection in quizzes	Using the microbit (optional)
Safety & security (SS)	Thoughtful Thursday	Thoughtful Thursday	Thoughtful Thursday	The Internet / Thoughtful Thursday		



Unit summaries (taken from the Teach Computing [KS1](#) and [KS2](#) teacher guides)

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 1	Technology around us Recognising technology in school and using it responsibly.	Digital painting Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	Moving a robot Writing short algorithms and programs for floor robots, and predicting program outcomes.	Grouping data Exploring object labels, then using them to sort and group objects by properties.	Digital writing Using a computer to create and format text, before comparing to writing non-digitally.	Programming animations Designing and programming the movement of a character on screen to tell stories.
Year 2	Information technology around us Identifying IT and how its responsible use improves our world in school and beyond.	Digital photography Capturing and changing digital photographs for different purposes.	Robot algorithms Creating and debugging programs, and using logical reasoning to make predictions.	Pictograms Collecting data in tally charts and using attributes to organise and present data on a computer.	Digital music Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	Programming quizzes Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 3	Connecting computers Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks	Stop-frame animation Capturing and editing digital still images to produce a stop frame animation that tells a story	Sequencing sounds Creating sequences in a block-based programming language to make music.	Branching databases Building and using branching databases to group objects using yes/no questions.	Desktop publishing Creating documents and modifying text, images and page layouts for a specific purpose.	Events and actions in programs Writing algorithms and programs that use a range of events to trigger sequences of actions.
Year 4	The internet Recognising that the internet is a network of networks including the WWW, and why we should evaluate online content.	Audio production Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	Repetition in shapes Using a text-based programming language to explore count-controlled loops when drawing shapes.	Data logging Recognising how and why data is collected over time, before using data loggers to carry out an investigation,	Photo editing Manipulating digital images, and reflecting on the impact of the changes and whether the required purpose is fulfilled,	Repetition in games Using a block-based programming language to explore count-controlled and infinite loops when creating a game.

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 5	Systems and searching Recognising IT systems in the world and how some can enable searching on the internet.	Video production Planning, capturing, and editing video to produce a short film.	Selection in physical computing Exploring conditions and selection using a programmable microcontroller.	Flat-file databases Using a database to order data and create charts to answer questions.	Introduction to vector graphics Creating images in a drawing program by using layers and groups of objects.	Selection in quizzes Exploring selection in programming to design and code an interactive quiz.
Year 6	Communication and collaboration Exploring how data is transferred by working collaboratively online.	Webpage creation Designing and creating webpages, giving consideration to copyright, aesthetics and navigation.	Variables in games Exploring variables when designing and coding a game.	Introduction to spreadsheets Answering questions by using spreadsheets to organise and calculate data.	3D modelling Planning, developing, and evaluation 3D computer models of physical objects.	Sensing movement Designing and coding a project that captures inputs from physical devices.

Skills Progression in Computing through each theme (concept) - Years 1-6

COMPUTER SYSTEMS AND NETWORKS (Autumn 1)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Technology around us	Information technology around us	Connecting computers	The Internet	Systems and searching	Communication and collaboration
To describe some uses of computers	To describe some uses of computers	To identify input and output devices		To describe the input and output of a search engine	To outline methods of communicating and collaborating using the internet
To identify the main parts of a computer	To identify information technology in school	To explain that a computer system accepts an input and processes it to produce an output		To demonstrate that different search terms produce different results	To choose methods of internet communication and collaboration for given purposes
To use a mouse in different ways	To identify information technology beyond school	To explain how a computer network can be used to share information		To evaluate the results of search terms	To evaluate different methods of online communication and collaboration
To use a keyboard to type	To show how to use information technology safely	To explain the role of a switch, and wireless access point in a network			To decide what you should and should not share online
To use the keyboard to edit text		To identify network devices around me			
To show how to use technology safely		To explain how networks can be connected to other networks			

CREATING MEDIA (Autumn 2)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital painting	Digital photography	Stop-frame animation	Audio production	Video production	Web page creation
To create a picture using freehand tools	To capture a digital image	To plan an animation using a storyboard	To record sound using a computer	To use different camera angles	To review an existing website (navigation bars, header)
To use shape and line tools when precision is needed	To take photographs in both landscape and portrait format	To set up the work area with an awareness of what will be captured	To play recorded audio	To use pan, tilt and zoom	To create a new blank web page
To use a range of paint colours	To view photographs on a digital device	To capture an image	To import audio into a project	To identify features of a video recording device or application	To add text to a web page
To use the fill tool to colour an enclosed area	To decide which photographs to keep	To use the onion skinning tool to review subject position	To delete a section of audio	To combine filming techniques for a given purpose	To set the style of text on a web page
To use the undo button to correct a mistake	To hold the camera still to take a clear photograph	To move a subject between captures	To change the volume of tracks in a project	To determine what scenes will convey your idea	To change the appearance of text
To combine a range of tools to create a piece of artwork	To use zoom to change the composition of a photograph	To review a captured sequence of frames as an animation		To choose to reshoot a scene or improve later through editing	To embed media in a web page
	To consider lighting before taking a photograph	To remove frames to improve an animation		To decide what changes I will make when editing	To add web pages to a website
	To use simple editing tools to change the appearance of a photograph	To add media to enhance an animation		To use split, trim and crop to edit a video	To preview a web page (different screen sizes)
	To improve a photograph by retaking it	To review a completed project			To insert hyperlinks between pages

					To insert hyperlinks to another site
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PROGRAMMING A (Spring 1)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Moving a robot	Robot algorithms	Sequencing sounds	Repetition in shapes	Selection in physical computing	Variables in games
To enact a given word	To choose a series of words that can be enacted as a sequence	To build a sequence of commands	To list an everyday task as a set of instructions including repetition	To create a condition-controlled loop	To identify a variable in an existing program
To predict the outcome of a command on a device	To choose a series of instructions that can be run as a program	To combine commands in a program	To use an indefinite loop to produce a given outcome	To use a condition in an 'if...then...' statement to start an action	To experiment with the value of an existing variable
To list which commands can be used on a given device	To create a program	To order commands in a program	To use a count-controlled loop to produce a given outcome	To use selection to switch the program flow in one of two ways	To choose a name that identifies the role of a variable to make it easier for humans to understand it
To run a command on a floor robot	To trace a sequence to make a prediction	To create a sequence of commands to produce a given outcome	To plan a program that includes appropriate loops to produce a given outcome	To use a condition in an 'if...then...else...' statement to produce given outcomes	To decide where in a program to set a variable
To choose a command for a given purpose To choose a series of words that can be enacted as a	To run a program on a device		To recognise tools that enable more than one process to be run at the same time (concurrency)		To update a variable with a user input

program					
To choose a series of commands that can be run as a program	To debug a program that I have written		To create two or more sequences that run at the same time		To use an event in a program to update a variable
To build a sequence of commands in steps					To use a variable in a conditional statement to control the flow of a program
To combine commands in a program					To use the same variable in more than one location in a program
To run a program on a device					

DATA AND INFORMATION (Spring 2)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Grouping data	Pictograms	Branching databases	Data logging	Flat-file databases	Introduction to spreadsheets
To identify some attributes of an object	o show I can enter data onto a computer	To create questions with yes/no answers	To use a digital device to collect data automatically	To choose different ways to view data	To calculate data using a formula for each operation
To collect simple data	To recognise that people, animals and objects can be described by attributes	To choose questions that will divide objects into evenly sized subgroups	To choose an appropriate timeframe when collecting data automatically	To choose which attribute and value to search by to answer a given question (operands)	To use functions to create new data
To show that collected data can be counted	To use a computer to view data in different formats	To repeatedly create subgroups of objects	To use a set of logged data to find information	To ask questions that need more than one attribute to answer	To use existing cells within a formula

To describe the properties of an object	To use pictograms to answer single-attribute questions	To identify an object using a branching database	To use a computer program to sort data by one attribute	To choose which attribute to sort data by to answer a given question	To choose suitable ways to present spreadsheet data
To choose an attribute to group objects by	To use a computer to answer comparison questions (graphs, tables)	To retrieve information from different levels of the branching database	To export data in different formats	To choose multiple criteria to search data to answer a given question (AND and OR)	
To group objects to answer questions				To select an appropriate graph to visually compare data	
To explain that objects can be grouped by similarities (attribute)				To choose suitable ways to present information to other people	
To describe a group of objects (based on commonality)					

CREATING MEDIA (Summer 1)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital writing	Digital music	Desktop publishing	Photo editing	Introduction to vector graphics	3D modelling
To use letter, number, and Space keys to enter text into a computer	To experiment with musical patterns on a computer	To show that page orientation can be changed	To recognise that digital images can be manipulated	To add an object to a vector drawing	To position 3D shapes relative to one another
To use punctuation and special characters	To experiment with different sounds on a computer	To organise text and image placeholders in a page layout	To recognise that digital images can be changed for different purposes	To select one object or choices made multiple objects	To use digital tools to modify 3D objects
To select text	To use a computer to create a musical pattern	To add text to a placeholder	To choose the most appropriate tool for a particular purpose	To delete objects	To combine objects to create a 3D digital artefact

To change the appearance of text on a computer	To use a computer to compose a rhythm and a melody on a given theme	To add and remove images to and from placeholders	To consider the impact of changes made on the quality of the image	To move objects between the layers of a drawing	To use digital tools to accurately size 3D objects
To choose options to achieve a desired effect	To use a computer to play the same music in different ways (e.g. tempo)	To edit text in a placeholder		To duplicate objects using copy and paste	To construct a 3D model which reflects a real world object
To position the text cursor in a chosen location	To evaluate a musical composition created on a computer	To move resize and rotate images		To modify objects	
To use the Backspace key to remove text	To improve a musical composition created on a computer	To choose fonts and apply effects to text		To reposition objects	
To use Undo		To review a document		To group and ungroup selected objects	
				To combine options to achieve a desired effect	
				To create a vector drawing for a given purpose	

PROGRAMMING B (Summer 2)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programming animations	Programming quizzes	Events and actions in programs	Repetition in games	Selection in quizzes	Sensing movement
To choose a series of words that can be enacted as a program	To choose a series of words that can be enacted as a sequence	To build a sequence of commands	To list an everyday task as a set of instructions including repetition	To choose a condition to use in a program	To identify a variable in an existing program
To choose a series of commands that can be run as a program	To explain what happens when we change the order of instructions	To combine commands in a program	To use an indefinite loop to produce a given outcome	To create a condition-controlled loop	To experiment with the value of an existing variable

To run a program on a device	To choose a series of commands that can be run as a program	To order commands in a program	To use a count-controlled loop to produce a given outcome	To use a condition in an 'if... then...' statement to start an action	To choose a name that identifies the role of a variable to make it more usable (to humans)
	To trace a sequence to make a prediction	To create a sequence of commands to produce a given outcome	To plan a program that includes appropriate loops to produce a given outcome	To use selection to switch program flow	To decide where in a program to set a variable
	To test a prediction by running the sequence		To recognise tools that enable more than one process to be run at the same time (concurrency)	To use 'if... then... else...' to switch program flow in one of two ways	To update a variable with a user input
	To create and debug a program that I have written		To create two or more sequences that run at the same time		To use an event in a program to update a variable
	To run a program on a device				To use a variable in a conditional statement to control the flow of a program
					To use the same variable in more than one location in a program

Knowledge organisers give further detail on each area of learning and can be found at:

<https://www.hollybush.herts.sch.uk/computing-1/>

Adaptations for SEND children

We pride ourselves on providing learning opportunities that are accessible and ambitious for all learners, enabling all children to make progress and have a sense of achievement. We achieve this through sequential planning, allowing skills to be scaffolded and extended as appropriate. We also create an ethos of not being afraid to make 'mistakes,' but instead, for children to be risk-takers, problem solvers and to develop resilience.

To support children with SEND to access the curriculum we will:

- Help all pupils achieve the best of their abilities, despite any special educational need or disability they may have.
- Ensure that staff are aware of and sensitive to the needs of individual pupils and that teaching is appropriate to meet those needs.
- Make suitable adaptations to the curriculum for children with SEND to fully develop their abilities, interests and aptitudes and gain maximum access to the curriculum.

Depending on the specific needs of each child, further adaptations may include, but are not limited to:

- Provide repeated opportunities for pupils to revisit this content in different ways.
- Identify any likely misconceptions and address these explicitly in lessons.
- Pre-teach the essential vocabulary for each unit, provide learners with a word list supported by images and use the vocabulary regularly throughout the unit with a consistent definition.
- Break down complex tasks and routine skills for using software and hardware into smaller steps and create pictorial instructions for children to follow.
- Provide a template for pupils to modify – removing the fear of the blank page and helping to build confidence.
- Consider if difficulties in other areas, such as writing or maths, present barriers to completing a task and if so, modify the task to help mitigate these.
- Use the [PRIMM](#) framework.
- Increase engagement and make learning more relevant by incorporating pupils' special interests.
- Use unplugged activities to help make computing concepts more relevant and understandable for learners.
- Break down the planning process into smaller parts which can be ticked off as each one is completed.
- Time spent revisiting digital skills, e.g. logging onto a computer and using a keyboard efficiently across all units is important

to develop fluency.

- Alternative resources eg. access to a you tube clip in place of a written hand out.
- Flexibility in group work eg. option to work alone if preferred

Assessment for Computing

Computing at Hollybush is assessed against the overall progress of a child through a whole unit. This can be a combination of formative and summative assessments that the teacher uses to make an overall judgement.

Assessment takes two forms:

Formative assessment - every computing lesson includes formative assessment opportunities for teachers to use. These opportunities are listed in the lesson plan and are included to ensure that misconceptions are recognised and addressed if they occur. They vary from **teacher observation** or **questioning**, to **marked activities**. These assessments are vital to ensure that teachers are adapting their teaching to suit the needs of the pupils that they are working with, and teachers are encouraged to change parts of the lesson, such as how much time you spend on a specific activity, in response to these assessments. The learning objectives and success criteria are introduced in the slides at the beginning of every lesson. At the end of every lesson, pupils are invited to assess how well they feel they have met the learning objectives **using thumbs up, thumbs down, or thumbs sideways**. This gives pupils a reminder of the content that has been covered, as well as a chance to reflect. It is also a chance for teachers to see how confident the class is feeling so that they can make changes to subsequent lessons accordingly.

Summative assessment - every unit includes an optional summative assessment framework in the form of either a **multiple choice quiz** (MCQ) or a **rubric**. Pedagogically, when we assess, we want to ensure that we are assessing a pupil's understanding of computing concepts and skills, as opposed to their reading and writing skills. Therefore, the assessments in key stage one are mostly rubric-based, though MCQs are introduced in year 2. A rubric is a tool to help teachers assess learning and highlights whether the pupil is approaching (emerging), achieving (expected), or exceeding the expectations for computing in their age group.

Teachers can find our summative assessment tracking grid for computing here: [Assessment for computing](#)