Subject Overview

Computing

Here, children thrive...

Computing curriculum intent

Through our computing curriculum, we intend to equip pupils with the knowledge, skills and understanding to use computers and technology to benefit the world; capitalising on close cross curricular links with mathematics, science and DT.

We aim to impart the core, essential knowledge of computer science which includes; information & computation, digital systems and how they work; and how to amalgamate such areas through programming. As children move through school, they will learn how to use taught skills to create programs, programs and varied content. We aspire for children to become accomplished at using technology to solve problems, express themselves and develop their own ideas; in order that they can thrive within this ever developing arena in the future.

Through our study of Computing, we aim to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation,
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems,
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems,
- are responsible, competent, confident and creative users of information and communication technology

Implementation

Curriculum structure & sequencing
We appreciate that not all teachers have the same level of expertise and confidence in delivering Computing lessons. As such, we have invested in a high quality scheme of work, Purple Mash, to ensure the Computing curriculum is structured effectively and delivered consistently across school. Wherever possible, we link Computing learning to work being done in another topic such as History or Geography, however all computing projects are meaningful and tangible in nature with clear end goals at their heart.

Content & concepts
The curriculum is broken into three areas: computer science, information technology and digital literacy. By constructing our curriculum in this way, children learn about computing in exciting and practical ways and have the opportunity to focus on specific areas such as hardware and programming; whilst also learning about broader areas such as networks and data, embedding such learning through assessment and project work.

Enrichment and personal development:
We enrich our curriculum through innovative and exciting technologies used for learning. These include iPads, BeeBots, 2 in 1 devices and virtual reality. We also offer extra curricular Computing through participation in our Digital Wizards club.

A core thread of progressive e-safety learning runs parallel to the curriculum and is delivered to each year group from Reception to Year 6, building on learning they have undertaken and developing to align with current and national initiatives. This is key to children's personal development as they grow up in a word where reward and threat from technology is becoming increasingly equal.

Assessment and next steps
We assess Computing in a variety of ways, giving pupils the opportunity to explain their reasoning and metacognition of a topic as well as their accumulation of knowledge. This may be done through practical exercises, group tasks, quizzes or discussion. It is our intention that we equip children with the skills and knowledge required that they can further their own learning within Computing, applying what they have been taught at a foundational level to more complex and bespoke scenarios as would be required later in life.

Computing in the Early Years Foundation Stage

Computing in the Early Years Foundation Stage (EYFS) is integrated not as a standalone subject, but as a part of the holistic learning experience for children aged 0-5 years. At Boughton Heath, we teach Computing to children within EYFS, using the same scheme we use to deliver the KS1 & KS2 schemes of work. This is because we understand the prevalence of technology within children's lives within modern day life, and believe educating them to use this is paramount to their development and safety.

Computing also supports communication and language development as children learn to follow and give instructions, and express their experiences with technology. At Boughton Heath, we believe that it is important that these interactions are age-appropriate, guided by adults, and balanced with a range of non-screen activities that promote physical activity and social interaction.

Our primary goal in relation to Computing is to utilise technology as a means to enhance learning and creative expression, not as an end point in itself. By teaching Computing within EYFS as we do for the rest of the school, we lay the groundwork for building essential digital literacy skills appropriate for the modern era as children move throughout each year group; whilst also ensuring our children learn how to use technology safely and responsibly.

- Using and responding to technology
- Talking about technology and how it can be used
- Creating content with technology

Technology in the Early Years Foundation Stage

At Boughton Heath Academy, the integration of technology into the Early Years Foundation Stage (EYFS) curriculum significantly enhances the teaching and learning experience across the 7 areas of learning. The use of digital tools, such as interactive storybooks and multimedia resources, brings storytelling to life, captivating young minds and fostering a deeper engagement with narratives and characters. This interactive approach not only enriches the storytelling experience but also aids in the development of listening and comprehension skills.

Additionally, the school employs a variety of specialist apps and online tools specifically designed for early education. These resources play a crucial role in advancing learning in key areas such as Literacy, Phonics, and Mathematics. Through engaging and age-appropriate digital content, children are able to grasp fundamental concepts in a fun and interactive manner.

Furthermore, the use of digital devices like BeeBots, iPads, and talking tins is a testament to the school's commitment to nurturing critical thinking and independence among its pupils. These tools provide hands-on learning experiences that encourage problem-solving, creativity, and autonomous learning within directed tasks and child led activities. The use of such technology in the Reception class at Boughton Heath Academy exemplifies a forward-thinking approach to early childhood education, where technology and its safe and appropriate use, is seamlessly woven into the fabric of teaching and learning.

Inclusion within Computing

We are an inclusive school and as such, do not believe in narrowing the curriculum for any learner. Our curriculum is designed with inclusion of all at heart, and our curriculum intent is therefore the same for all children.

However we are mindful that there are an abundance of factors which need to be considered in order for all learners to be able to access learning according to their individual needs; perhaps none more so than for those learners with Special Educational Needs and Disabilities (SEND).

Therefore, whilst our curriculum intent is the same for all learners; our implementation of the curriculum may well look different for different groups of pupils. Teachers will plan, scaffold, challenge and embed learning through activities which are amended to meet children's needs – we call this amended implementation. This is to ensure that our curriculum can be met by all within an inclusive environment, mindful and responsive to children's needs.

We use guidance set out within the NASEN teacher handbook to assist us in amending our implementation within Computing. Examples of this, though not an exhaustive list, can be seen to the right. Note, these are suggestions of what may be implemented but all teachers will amend according to learner need.

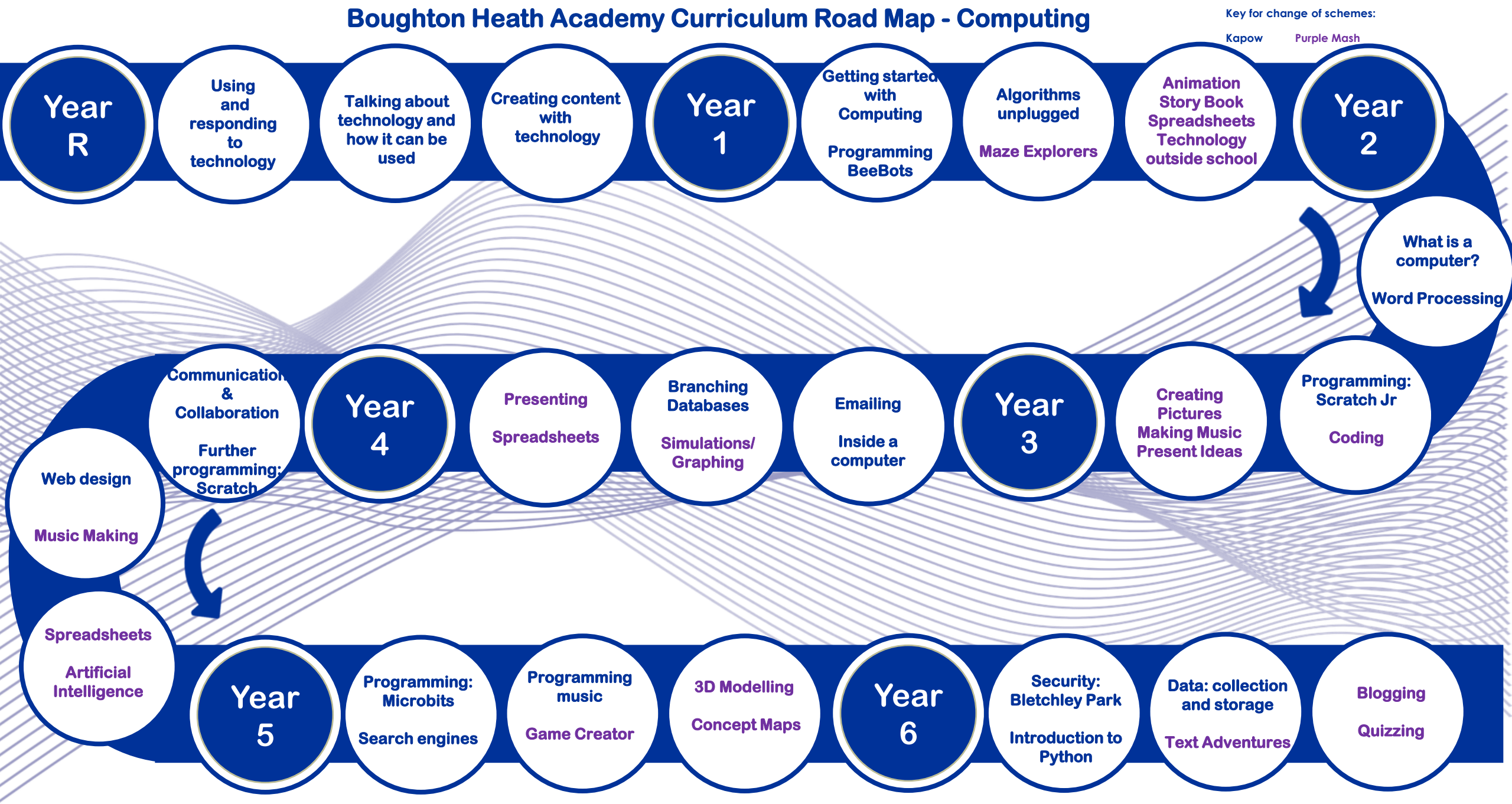
Same intent, adapted implementation

- Make regular references to relevant language throughout the lesson and school day using tools such as working and display walls.
- Regular retrieval opportunities of prior learning and language to recap and enable further learning to be developed.
- Worked examples provided to children to generate discussion around topics studied and the opportunity to ask questions of this.
- Implement longer teaching times for new content, in order that ample time can be dedicated to helping learners understand new concepts.
- Use small group teaching opportunities to dedicate more time and support to provide additional learning opportunities to learners working towards a planned objective.

Boughton Heath Academy Curriculum Road Map - Computing

Key for change of schemes:

Kapow Purple Mash



Computing Endpoints

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using and responding to technology	Getting started with Computing Programming BeeBots	What is a computer? Word Processing	Emailing Inside a computer	Communication & Collaboration Further programming: Scratch	Programming: Microbits Search engines	Security: Bletchley Park Introduction to Python
To engage safely with different types of technology to have fun, learn and complete tasks.	To successfully log in to a computer and use a mouse to drag, click and select desired objects To describe what an algorithm is, give an example of one and how they can be combined to complete actions.	To articulate what a computer is, giving lots of examples of different types of computer devices and their uses. To use algorithms on and offline, creating algorithms that involve looping to solve problems.	To describe how computers can communicate and send information to and from each other, giving examples of when this happens in their lives. To use more complex algorithms, loops and characters to create a story, animation or game in Scratch.	To combine word processing, imaging and web browsing skills to work collaboratively with others on a single document / project accessed on separate devices. To create and programme a game within Scratch which records a user's score based on at least one variable.	To articulate the trustworthiness of content on webpages, using web browsers to search and locate information on the internet. To use algorithms within Scratch to create a piece of electronic music which is in a particular style.	To describe what makes a password secure and the dangers of insecure passwords when using computers and the internet. To use basic python programming language involving loops, and mathematical calculations.
Talking about technology and how it can be used	Algorithms unplugged Maze Explorers	Programming: Scratch Jr Coding	Branching Databases Simulations/ Graphing	Web design Music Making	Programming music Game Creator	Data: collection and storage Text Adventures
To talk about the different ways technology can be used, both in and out of school.	To use mouse skills and typing to accurately record information about a specific thing. To gain proficiency in utilizing directional keys, creating, debugging, and extending algorithms, and setting challenges for peers, as evidenced by their ability to access and complete peer-assigned challenges known as 2Dos.	To use the keyboard to create word processed documents that contain pictures and formatting such as bold, italic and underline. To understand the concept of algorithms, create and debug simple computer programs, understand collision detection, timed sequences, object properties, event functions, and button functionalities.	To use word processing and web browsing skills to communicate with another peer using email. To understand, explore, analyze, and evaluate simulations, gaining a deeper understanding of their purpose and functionality. To be able to enter data into a graph and answer questions. To solve an investigation and present the results in graphic form.	To describe the main features of webpages, designing their own before using template software to create this. To be able to discuss music elements, experimenting with rhythm and tempo, creating melodies, and composing music electronically.	To articulate what inputs, processes and outputs are; and understand simple binary code, its uses and limitations. To be able to plan, design, create, and share a game, while also engaging in self and peer evaluation of their work.	To collect, analyse and present data in different forms such as barcodes and QR codes, describing their pros and cons. To explore text adventures, planned and created story-based adventures using 2Connect and 2Create a Story, understood and modified code for text adventure games, and enhanced their games through debugging and improvements.
Creating content with technology	Animation Story Book Spreadsheets Technology outside school	Creating Pictures Making Music Present Ideas	Presenting Spreadsheets	Spreadsheets Artificial Intelligence	3D Modelling Concept Maps	Blogging Quizzing
To make creations using letters, sounds and pictures by using technology.	To use e-books and the 2Create a Story tool, add animations and sounds to their stories, create more complex narratives with backgrounds, and share their e-books on a class display board. To recognize a spreadsheet program, locate and use 2Calculate in Purple Mash, enter data, add clipart, and utilize control tools in their spreadsheets To explore their local community to identify and record instances of technology usage outside of school environments.	To understand and utilize the 2Paint a Picture tool while exploring different art styles such as Impressionism, Pointillism, Mondrian's style, William Morris's patterns, and surrealism through digital collage. To create music digitally using 2Sequence, edit and refine compositions, and use various sounds, including environmental ones, to express emotions and create tunes in Purple Mash. To present stories in various formats, create quizzes and fact files on different topics, and confidently deliver presentations to the class.	To grasp the uses of PowerPoint and develop proficiency in creating pages, adding media, animations, and timings to presentations, applying these skills to design and create engaging presentations. Tp compare values using symbols, create graphs using 2Calculate, and explore cell references in advanced mode.	will format cells, calculate averages, create spreadsheet activities, model real-life situations, and automate calculations using formulas in spreadsheets. To understand artificial intelligence, recognize its everyday applications, contemplate its future, and explore its use in creating music and art.	To learn computer-aided design with 2Design and Make, create and refine 3D models, and explore moving points' effects in designing. To understand the significance of visual representation for complex ideas, create concept maps using appropriate vocabulary, and utilize them to retell stories and present information collaboratively to an audience.	To learn why blogs are written, understand what makes a successful blog, plan and write their own blog posts, contribute to existing blogs, and appreciate the importance of commenting on blog posts. To create picture-based quizzes for young children using 2Quiz, explore different question types and grammar quizzes, design quizzes that involve searching a database, and develop quizzes.

Progression of Skills and Knowledge

Computer Science		
EYFS		
• Learning how to operate a camera to take photographs of meaningful creations or moments. • Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. • Recognising and identifying familiar letters and numbers on a keyboard. • Developing basic mouse skills such as moving and clicking. • Using logical reasoning to understand simple instructions and predict the outcome. • Representing data through sorting and categorising objects in unplugged scenarios. • Representing data through physical pictograms. Exploring branch databases through physical games.	• 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 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. • Using a simple online paint tool to create digital art. • Learn different uses of technology in play and learning.

Progression of Skills and Knowledge

Computer Science: KS1	
Year 1	Year 2
• I can apply a logical process when sorting and grouping a range of objects • I can explain that an algorithm is a set of instructions. • I know that a computer program turns an algorithm into code that the computer can understand. • I can work out what is wrong when the steps are out of order in instructions. • I can say that if something does not work how it should it is because my code is incorrect. • I can try and fix my code if it isn't working properly. • I can make good guesses of what is going to happen in a program. For example, where the turtle might go.	• I can explain an algorithm is a set of instructions to complete a task. • I know I need to carefully plan my algorithm so it will work when I make it into code. • I can design a simple program using 2Code that achieves a purpose. • I can find and correct some errors in my program. • I can say what will happen in a program. • I can spot something in a program that has an action or effect (does something).

Progression of Skills and Knowledge

Computer Science: Lower KS2	
Year 3	Year 4
• I can make a real-life situation into an algorithm for a program. • I can design an algorithm carefully, thinking about what I want it to do and how I can turn it into code. • I can identify an error in my program and fix it. • I can experiment with timers in my programs. • I can identify the difference in using the effect of a timer or repeat command in my code. • I know that a variable stores information while a program is running (executing). • I can identify 'If' statements, repetition and variables. • I can read programs with several steps and predict what they will do.	• I can turn a real-life situation to solve into an algorithm, using a design that shows how I can accomplish this in code. • I can use repetition in my code. For example, using a loop that continues until a condition is met such as the correct answer being entered. • I can use timers within my program designs more accurately to create repetition effects. For example, I can create a counting machine. • I can use selection (decision) in my programming. For example, using an 'if statement' for a question where the program takes one of two paths. • I can use variables within my program and know how to change the value of variables. • I can use the user inputs and output features within my program, such as 'Print to screen'. • I can identify errors in my code using methods including stepping through lines of code. • I can read programs that contain several steps and predict the outcomes with increasing accuracy. • I recognise the main component parts of hardware which allow computers to join and form a network.

Progression of Skills and Knowledge

Computer Science: Higher KS2	
Year 5	Year 6
• I can make more complex real-life problems into algorithms for a program. • I can test and debug my programs as I work. • I can convert (translate) algorithms that contain sequence, selection and repetition into code that works. • I can use sequence, selection, repetition, and some other coding structures in my code. • I can organise my code carefully, for example, by naming variables and using tabs. I know this will help me debug more efficiently. • I can use logical methods to identify the cause of any bug with support to identify the specific line of code.	• I can turn a complex programming task into an algorithm. • I can identify the important aspects of a programming task (abstraction). • I can decompose important aspects of a programming task in a logical way, identifying appropriate coding structures that would work. • I can test and debug my program as I work on it and use logical methods to identify a cause of a bug. • I can identify a specific line of code that is causing a problem in my program and attempt a fix. • I can translate algorithms that include sequence, selection and repetition into code and nest these structures within each other. • I can use inputs and outputs within my coded programs such as sound, movement and buttons and represent the state of an object • I can interpret (understand) a program in parts and can make logical attempts to put the separate parts together in an algorithm to explain the program as a whole. • I can explain the difference between the internet and the World Wide Web. • I can explain what a WAN and LAN is and describe the process of how access to the internet in school is possible.

Progression of Skills and Knowledge

Digital Literacy: KS1		
EYFS	Year 1	Year 2
• Recognising that a range of technology is used for different purposes. Learning to log in and log out. • To know that you should tell a trusted adult if you feel 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 they are. • To know that to stay safe online it is important to keep personal information safe. • To know that 'sharing	• I can say what technology is. • I can say what examples of technology are in school. • I can say what examples of technology are at home. • I know that a chair uses old technology and a smartphone uses new technology. • I can keep my login information safe. • I can save my work in a safe place such as 'My Work' folder	• I can find the information I need using a search engine. • I know the consequences of not searching online safely. • I can share work and communicate electronically – for example, using 2Email or the display boards. • I can report unkind behaviour and things that upset me online, to a trusted adult. • I can see where technology is used at school such as in the office or canteen. • I understand that my creations such as programs in 2Code, need similar skills to the adult world. e.g. The program used for collecting money for school trips.

Progression of Skills and Knowledge

Digital Literacy: Lower KS2	
Year 3	Year 4
• I can create a secure password. • I can explain the importance of having a secure password and not sharing it with others. • I can explain the negative consequences of not keeping passwords safe and secure. • I understand the importance of keeping safe online and behaving respectfully. • I can identify different ways that the internet can be used for communication. • I can use email such as 2Email to respond to others appropriately and attach files. • I can report unacceptable content and contact online in more than one way to a trusted adult. • I can use communication tools such as 2Email respectfully and use good etiquette	• I have a good understanding of the online safety rules we learn at school. • I can demonstrate how to use different online technologies safely. • I can demonstrate how to use a few different online services safely. • I know I have a right to privacy both on and offline. • I recognise that my wellbeing can be affected by how I use technology. • I can report with ease any concerns with content and contact online and know immediate strategies to keep safe

Progression of Skills and Knowledge

Digital Literacy: Upper KS2	
Year 5	Year 6
• I recognise the main dangers that can be perpetuated via computer networks. • I can explain what personal information is and know strategies for keeping this safe. • I can use the most appropriate form of online communication according to the digital content. For example, use 2Email, 2Blog and Display Boards. • I have a clear knowledge of online safety rules taught at school. • I can demonstrate the safe and respectful use of different online technologies and online services. • I always relate appropriate online behaviour to my right to have personal privacy. • I know how to not let my mental well-being or others be affected by the use of online technologies and services	• I can demonstrate safe and respectful use of a range of different technologies and online services. • I can identify more discrete inappropriate behaviours online. For example, someone who may be trying to groom me or someone else. • I can use critical thinking to help me stay safe online. • I know the value of protecting my privacy and others online. • I can design and create my own online blogs ensuring that my content is appropriate

Progression of Skills and Knowledge

Information Technology: KS1		
EYFS	**Year 1**	**Year 2**
• To know that sorting objects into various categories can help you locate information. • To know that using yes/no questions to find an answer is a branching database. • To know that a pictogram is a way of showing information.	• I can know what sound, pictures and text are. • I can add sound, pictures and text to a program such as 2Create a Story. • I can change content on a file such as text, sound and images • I can name my work. • I can save my work. • I can find my work.	• I can organise data – for example, using a database such as 2Investigate. • I can find data using specific searches – for example, using 2Investigate. • I can use several programs to organise information – for example, using binary trees such as 2Question or spreadsheets such as 2Calculate. • I can edit digital data such as data in music composition software like 2Sequence. • I can name, save and find my work. • I can include photos, text and sound in my creations.

Progression of Skills and Knowledge

Information Technology: Lower KS2	
Year 3	Year 4
• I can carry out searches to find digital content on a range of online systems, such as within Purple Mash or on an internet search engine. • I can collect data and input it into software. • I can analyse data using features within the software, such as formulae in 2Calculate (spreadsheets). • I can present data and information using different software such as 2Question (branching database) or 2Graph (graphing tool). • I can consider what the most appropriate • software to use when given a task by my teacher. I can create purposeful (appropriate) content and attach this to emails.	• I can create and improve my solutions to a problem based on feedback. For example, create an effective animation or musical composition. • I can review solutions that others have created, using a checklist of criteria. • I can work collaboratively to create content and solutions. • I can share digital content using a variety of applications such as: 2Blog, 2Email and Display Boards. • I understand the purpose of a search engine and the main features within it. • I can look at the information on a webpage and make predictions about the accuracy of the information contained within it.

Progression of Skills and Knowledge

Information Technology: Upper KS2	
Year 5	Year 6
• I can make appropriate improvements to the digital work I have created. • I can comment on how successful a digital solution is that I have created. For example, a program built in 2Code that sorts decimals numbers. • I can work collaboratively with others creating solutions to problems using appropriate software such as 2Code. • I can use collaborative modes such as within 2Connect to work with others and share it. • I can search precisely when using a search engine. For example, I know I can add additional words or remove words to help find better results. • I can explain in detail how accurate, safe and reliable the content is on a webpage. • I know the importance of computer networks and how they help solve problems and enhance communication.	• I can use filters when searching for digital content. • I can explain in detail how accurate and reliable a webpage and its content is. • I can compare a range of digital content sources and rate them in terms of content quality and accuracy. • I can consider the intended audience carefully when I design and make digital content. • I can use criteria to evaluate the quality of my own and others digital solutions, suggesting refinements.

Assessment within Computing

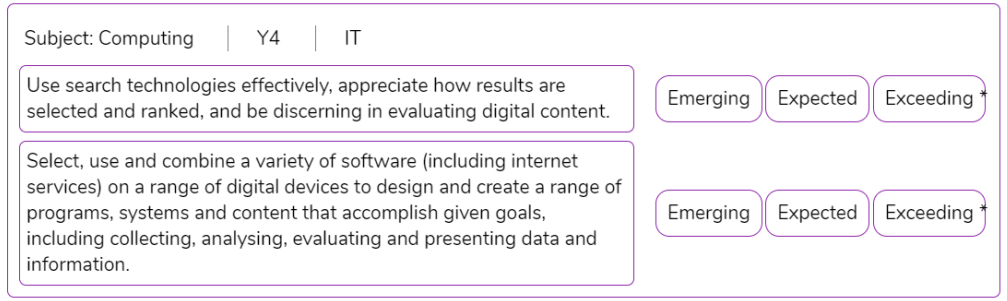
We place great emphasis on the importance of assessing children's knowledge, understanding and skillset within Computing

When assessing Computing, it is first essential to clearly articulate two important areas:

1. The specific endpoint for the unit being delivered,
2. The substantive and disciplinary knowledge to be taught to reach this endpoint.

At Boughton Heath Academy, we have clearly mapped out all endpoints for all the Computing units to be delivered, before specifying what substantive and disciplinary knowledge is to be taught within each unit to reach this endpoint. It is this knowledge and understanding that we assess children upon, believing accurate assessment can only be a reflection of what is taught to children .

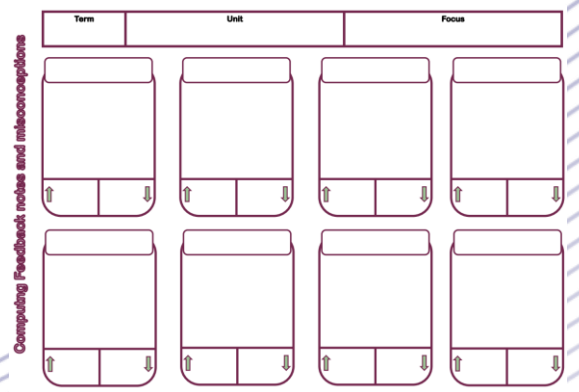
At the end of each lesson, teacher can apply their teacher judgements to everybody's work individually against the national curriculum statements covered.



* = multiple judgements selected on these files

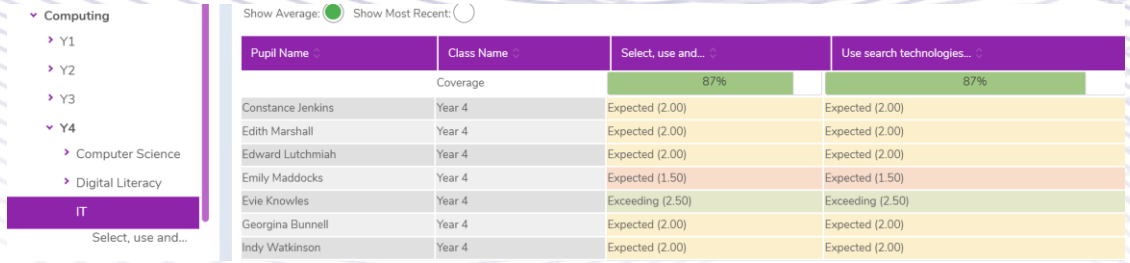
Making judgements – formative assessment

When delivering lessons; teachers record notes, comments and reflections they feel pertinent to the formative assessment of their teaching and learning of Computing, recording these in their feedback files (see right). Such feedback is then delivered at the start of the following lesson, in order for children to recap prior learning undertaken before building upon this; as well as to give them opportunities to address misconceptions develop greater understanding of concepts and what has been taught.



Making judgements – summative assessment

With the unit endpoint in mind, Purple Mash will form a summative assessment for each child within a particular unit. This will be either, working towards / working at / working above the expected standard.



It is defined based on the teacher judgements and scores achieved on the end of unit quizzes. The data shown is articulating what would classify a pupil who may be working below / above this. Purple Mash evidences the judgements against each national curriculum statements under the 3 key areas – information technology, digital literacy and computing science.