

Bricknell Primary School



Computing Policy



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Subject Lead : Hannah Schofield



Curriculum Intent

At Bricknell Primary School, we strive to deliver a high quality Computing curriculum which allows our pupils to recognise the significance of digital technology in their everyday lives. We explicitly teach pupils the skills and knowledge they need to become creative, digitally literate, computational thinkers. We encourage curiosity about digital technology and encourage our pupils to ask questions about the digital systems around them. We explore how technology is used in the real world and how to use it in a safe and responsible way. We ensure that all children are exposed to high quality computing teaching and a range of learning experiences.

By teaching Computing, we intend to impart knowledge, understanding, confidence, attitudes, values and skills to pupils that they need in order to reach their full potential as individuals in an increasingly technological society and in the digital community.

At Bricknell Primary School, the teaching of the Computing curriculum has been carefully considered to enable our pupils to become digital citizens. At Bricknell, we teach the curriculum using the Teach Computing scheme. Our highly skilled subject leader has carefully worked to create a Curriculum Overview Document which demonstrates the sequencing and mapping of their subject to ensure our pupils are given the acquired skills and knowledge to further their education journey into KS3 and life beyond the classroom.

Our aim is to provide inclusive and aspirational environments and learning experiences in which pupils thrive and build the cultural capital they need to make aspirational choices about their own futures, overcoming any barriers. In order to achieve this, our curriculum is underpinned by the principles highlighted in our Aspiration Curriculum.



Within the Computing Curriculum Overview Document, our progressive objectives identify what pupils should know by the end of each year group and link to prior learning. These enable teachers to identify and plug gaps in pupil knowledge and skills. Within Computing, pupils will develop a deep understanding of Key Concepts and Second Order Concepts. These Key Concepts have been carefully considered and identified as the core knowledge, skills and confidence to engage with technology required to successfully achieve in a digital world. The Key Concepts are revisited and developed as the pupils move through the school to ensure that the knowledge, skills and confidence to engage with technology are firmly embedded within the long term memory. These Key Concepts compliment work carried out across the school in line with the Aspiration Curriculum. The expectation is that, by the end of primary school, children will know and understand these Key Concepts and have the ability to use technology and understand its uses in readiness for KS3.

In addition to first order Key Concepts, the subject leader has identified subject specific Second Order Concepts. These can be used across all aspects of the subject to organise the substantive knowledge and skills taught.

First Order Key Concepts :

COMPUTER SCIENCE: This focuses on programming & algorithms and data & information. This will provide pupils with the foundational knowledge needed to understand the rest of the curriculum.

1. Programming :

Pupils will learn how to interpret, create and evaluate algorithms. They will be taught to program to accomplish specific goals and to detect and correct

2. Data and Information :

Pupils will learn how to collect, analyse, evaluate and present data and information

INFORMATION TECHNOLOGY: Studying this aspect will give children the knowledge of how computers are used in society. They will also explore how computers are used to create digital artefacts such as videos, animations or 3D models.

3. Computing Systems and Networks :

Pupils will learn about computer systems, networks and how they are used. They will also learn about the internet and different types of hardware and software.

4. Creating Media

Pupils will learn about the design and development of digital media in different forms. They will learn how to collaborate online, evaluate online content and how to communicate, create and present content in a respectful and responsible way.

5. Digital literacy:

This is woven through the key concepts above, ensuring pupils know how to operate devices, how to search and select information, and how to use digital devices safely and responsibly.

Second Order Concepts :

Second order concepts are fundamental knowledge and skills which are transferable across a range of curriculum subjects. For example, we introduce pupils to the concept of 'similarity and difference' early in their education, developing the observational skills and language needed to make comparisons. This is developed and applied as pupils move through the school so they can confidently apply this in all areas of the curriculum by upper Key Stage Two.

A summary of the second order concepts and how they apply to Computing are provided in the table below.

Curriculum subject	Significance	Similarity and difference	Cause and consequence	Continuity and change	Responsibility	Communication (Oracy & Written)	Enquiry
Computing	Significant inventions and figures from the world of computing	Making comparisons, finding patterns, noticing differences, drawing conclusions	Inputs and outputs, programming	Changes in technology over time, future technology	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying, cyber security, passwords	Using correct terminology, coding language, programming, using technology to communicate and present information	

In Computing, by the end of EYFS, children will be able to :

Recognise that a range of technology is used in places such as homes and schools. They will be able to select and use technology for particular purposes. This includes operating software and technology and completing a range of simple programmes with an understanding of what they can achieve.

In Computing, by the end of KS1, children will be able to :

Develop the basic skills of computer science in order to create simple programmes which employ the use of algorithms with an understanding of what algorithms are. Pupils will be able to find errors in their programmes and predict outcomes. As digital citizens, pupils will know how to keep themselves safe online in a range of ways including how to respond to inappropriate contact and content. They will also understand how to keep their information private and also be able to identify cyber bullying, knowing what actions to take if they encounter it. Pupils will have a secure understanding and range of information technology skills. They will be able to locate and handle information from a range of digital sources including the online world.

In Computing, by the end of KS2, children will be able to :

As computer scientists, pupils will develop further skills to create and manipulate programmes, using elements such as variables and debugging and be able to talk about intended and specific outcomes. Pupils will have a secure understanding of the role of algorithms and be able to successfully use them. As digital citizens, pupils will have a secure understanding of how to keep themselves safe online. This includes identity and password security, identifying inappropriate and inaccurate content and being aware of cyber bullying and knowing how to respond to it. It is essential that pupils have a sound knowledge of how to be a positive and responsible member of the online community. In the use of information technology, pupils will be able to select and manipulate software and online resources to create their own digital content. Pupils will have a range of skills including being able to analyse, evaluate and present information on a range of devices for specific purposes.

Any child working below their age related expectation, will receive a tailored curriculum with personalised objectives taken from the Curriculum Assessment Toolkit, (CATs). This will enable all children to build the skills and knowledge needed to bridge the gap between themselves and their peers, enabling them to reach their full potential.

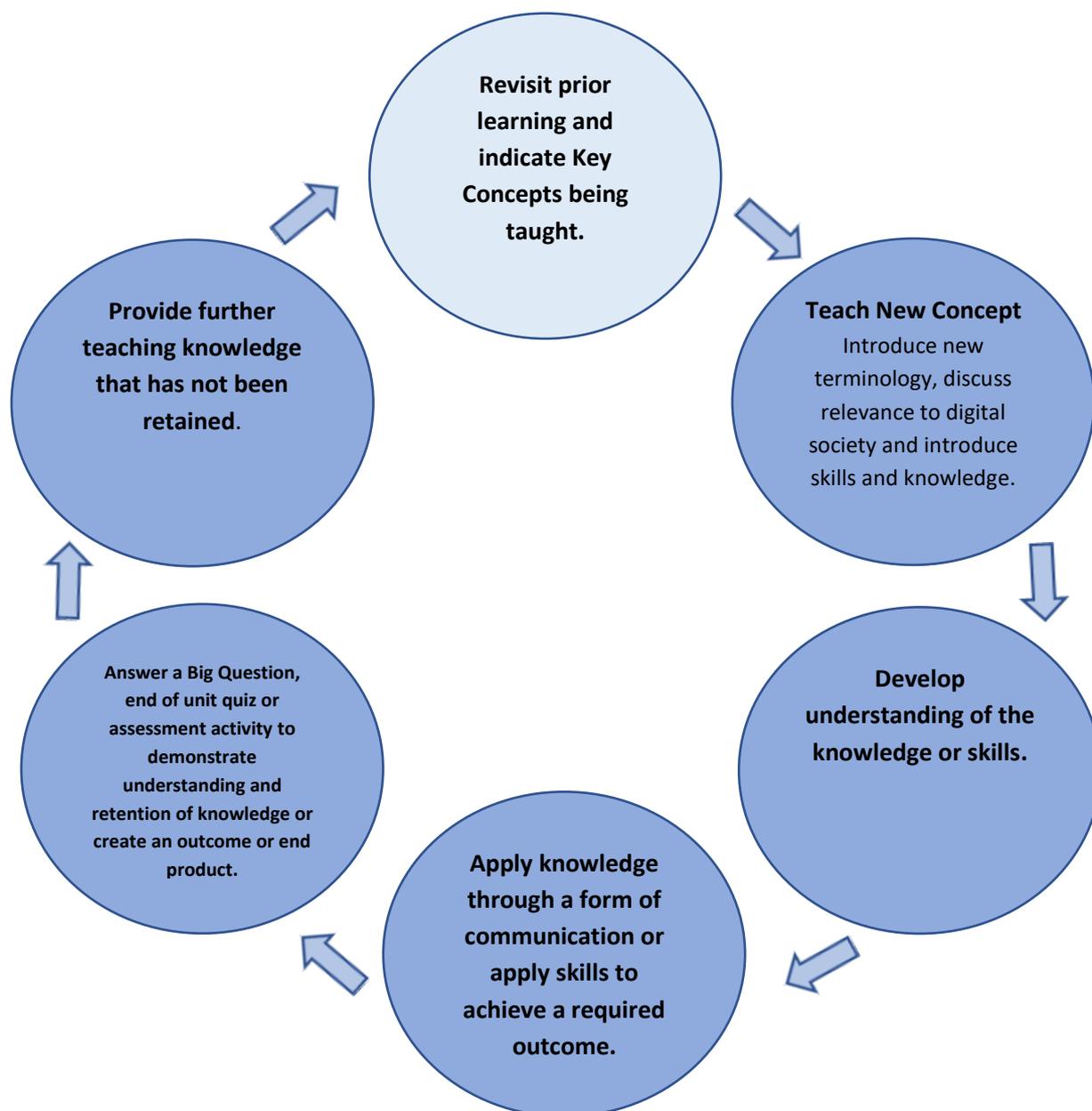
Curriculum Implementation

At Bricknell Primary School, our curriculum is carefully mapped out into a Long Term Plan by our highly skilled subject lead. This enables links between subjects to be identified and carefully planned for to support pupils' retention of knowledge, acquisition of skills and the development of the confidence to engage with technology.

The academic year is mapped out below:

Computing Key Concepts Year Group Mapping			
	Autumn	Spring	Summer
EYFS Understanding the World	<p>In EYFS pupils are taught Computing through the strand Understanding the World. Throughout the year pupils will be taught:</p> <p>Computer Systems and Networks: How to use a computer, mouse and keyboard. Understanding how a tablet is different to a computer.</p> <p>Creating Media: listen to digital audio, take photographs, videos and audio using a digital device.</p> <p>Data and information: group objects by type, discuss data and information and understand categories using labels and create tally charts.</p> <p>Programming: programme a floor robot to follow a set of simple instructions.</p>		
Year 1	<p>Computer Systems and Networks: Information Technology Around Us</p> <p>Creating Media: Digital Painting</p>	<p>Programming: Floor Robots</p> <p>Data and information: Grouping Data</p>	<p>Creating Media: Digital Writing</p> <p>Programming: Programming Animations</p>
Year 2	<p>Computer Systems and Networks: Information Technology Around Us</p> <p>Creating Media: Making music</p>	<p>Creating media: Digital photography</p> <p>Programming: Robot algorithms</p>	<p>Data and information: Pictograms</p> <p>Programming: Introduction to quizzes</p>
Year 3	<p>Computer Systems and Networks: Connecting computers</p> <p>Programming: Sequencing music</p>	<p>Creating Media: Desktop publishing</p> <p>Data and information: Branching data bases</p>	<p>Creating media: Stop frame animation</p> <p>Programming: Events and actions</p>
Year 4	<p>Computing Systems and Networks: The internet</p>	<p>Programming: Repetition in games</p>	<p>Creating media: Audio editing</p>
Year 5	<p>Computer Systems and Networks: Sharing information</p> <p>Programming: Selection in quizzes</p>	<p>Creating media: Vector drawing</p> <p>Creating media: Video editing</p>	<p>Programming: Selection in physical computing</p> <p>Data and information: Data logging</p>
Year 6	<p>Computer Systems and Networks: Communication</p> <p>Creating media: 3d modelling</p>	<p>Programming: Sensing</p> <p>Creating media: Web page creation</p>	<p>Data and information: Introduction to spreadsheets</p> <p>Programming: Variables in games</p>

At Bricknell, all Computing lessons will follow the same teaching sequence outlined below.



In light of Covid 19 and Bricknell’s Recovery Curriculum, the subject lead has identified Key Concepts across the curriculum which need to be prioritised in each year group to ensure that pupils have the knowledge required to access their next progressive steps in their education and enable them to access the National Curriculum.

Curriculum Impact

The successful, collaborative approach to the teaching of Computing across the Constellation Trust results in an engaging, high quality education that allows pupils to understand the world around them and encourages them to explore digital technology further as they leave primary school. A wide range of strategies are used to measure the impact of our Computing curriculum. Our teaching sequence allows children to respond to a ‘Big Question’ in the knowledge based aspects of the curriculum as well as other end products being used as a basis for assessment in the skills based strands. The impact of our curriculum is monitored at the end of each unit. Teachers use assessment to ensure our pupils have gained the

intended knowledge and skills, can use these effectively and know more, remember more and are able to do more.

By the end of the primary school education, pupils will :

1. Be able to understand how to use algorithms to solve problems.
2. Be able to use a computer programme to write code to perform a task.
3. Be able to use mathematical and logical concepts to solve problems.
4. Be able to understand different networks and how they communicate.
5. Be able to understand how to work safely and responsibly online and how to recognise and report security issues and concerns.
6. Be able to explain the different hardware in computers and how they work together.
7. Be able to evaluate real world issues by using personal experiences and real life examples.

Our pupils develop the knowledge, skills and cultural capital needed to ensure they successfully progress onto the next stage in their education and life and develop into responsible, respectful and resilient citizens.

Our subject lead will also monitor the effectiveness of the Computing curriculum through carrying out regular subject 360 evaluations. These evaluations are quality assured by the Senior Leadership Team and Governors.

The effectiveness of Computing is also monitored through pupil and parental voice throughout the course of the year.

Extra-Curricular

At Bricknell, we offer a wealth of extra-curricular activities and ensure that all pupils are given equal opportunities to access these. There is a diverse offer for our pupils which allows all talents and abilities to be celebrated, giving opportunities for children to aspire to be the best that they can be.

As part of this offer, Bricknell offers a weekly Code Club for pupils in KS2 during which pupils develop their computing skills, with a particular focus on programming. The club uses the national Code Club materials and participates in many of their national schemes and events. Children can study Computing as part of the Graduate Awards Club and graduate with the skills and knowledge they have acquired.

Cross Curricular Connections

Computing offers boundless opportunities for use across the curriculum and can be used to support and enhance learning in any subject. For example, movie and presentation apps offer an ideal opportunity to create presentations and guides in all subjects. There are many planning tools that offer pupils an opportunity to organise and edit their ideas in different ways, enhancing their learning experiences and also developing skills that are used in the digital environment. Graphic work links in closely with work in art, and work using databases supports work in mathematics. The Internet proves very useful for research in all subjects.

Computing supports many of the objectives taught in English. Through the development of keyboard skills and the use of computers, children learn how to edit and revise text. They have the opportunity to develop their writing skills by communicating with people over the Internet, and they are able to join in discussions with other children throughout the world through the medium of video conferencing. They learn how to improve the presentation of their work by using desk top publishing software.

Many computing activities build upon the mathematical skills of the children. Children can use computing in mathematics to collect data, make predictions, analyse results, and present information graphically. They also acquire measuring techniques involving positive and negative numbers, and including decimal places. The use of flow diagrams in games design links directly with sorting activities in Maths and Science and the use of algorithms in coding offers an ideal opportunity to develop directional language and geometry skills.

Computing makes a contribution to the teaching of PSHE and Citizenship as children learn to work together in a collaborative manner. They develop a sense of global citizenship by using the Internet and e-mail. Through the discussion of moral issues related to electronic communication, children develop a view about the use and misuse of ICT.

Equality

The approach of our school in terms of computing affords children the opportunity to build and expand on their competence in computing. Each child has weekly access to the computer room as well as other technology.

In lessons we provide learning opportunities that are matched to the needs of children in the class. Computing can have a considerable impact on the quality of work that children produce; it increases their confidence and motivation.

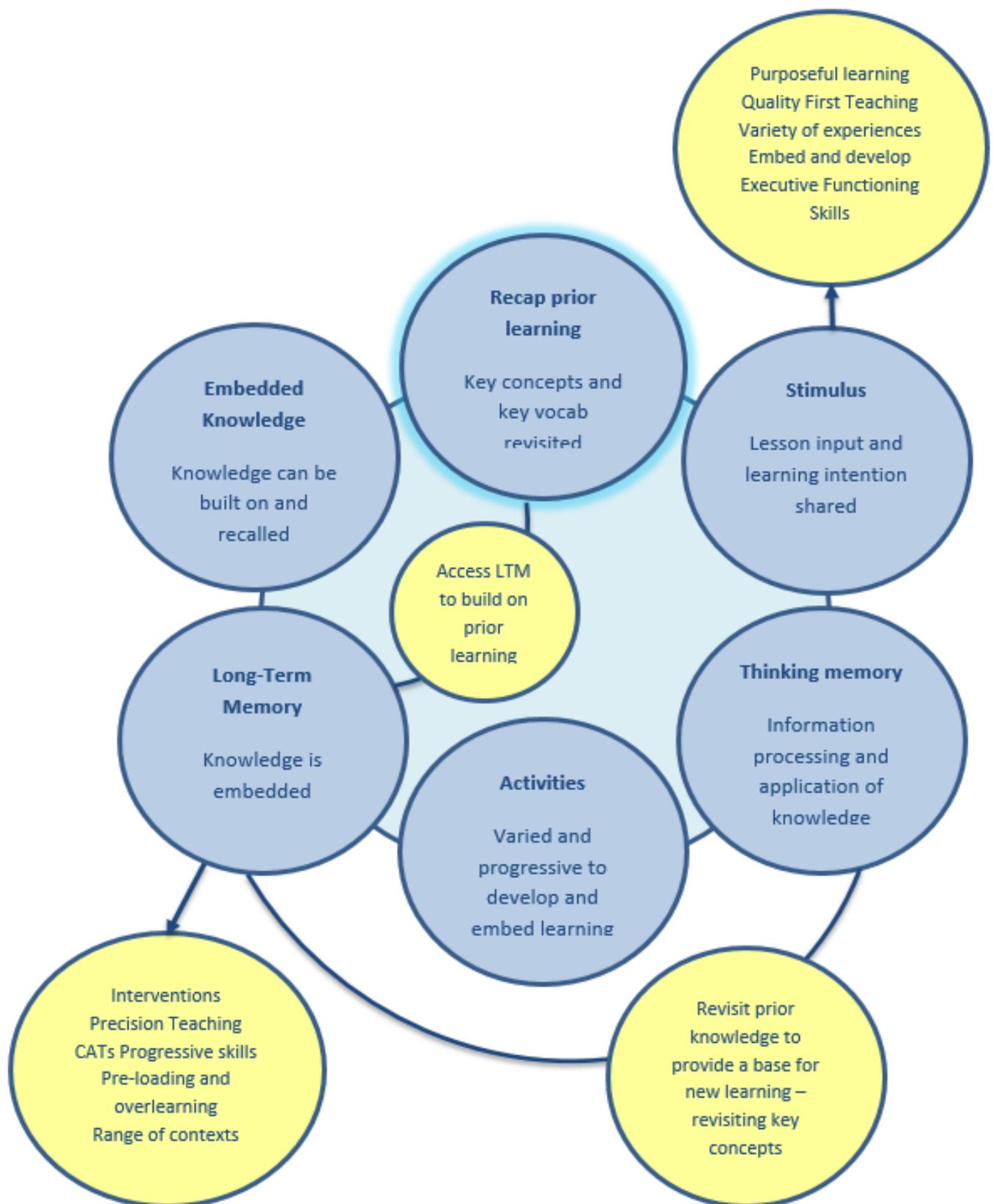
SEND

At Bricknell, we have a high SEND population and our pupils are fully immersed into the broad and balanced curriculum. However, we tailor the curriculum to meet the individual needs of SEND pupils. Where a child's need prevents them from accessing the age related expectations for subjects, planning is tailored to meet the individual needs of all pupils using the CATs document. This document breaks down each objective across the curriculum to enable all pupils to achieve success at an appropriate level for their needs. This ranges from P4 to Year 6 to ensure that there is no ceiling on any child's learning. In addition to this, some pupils are given the opportunity to take part in an AQA life skills programme. This programme consists of a sequence of skills that children work towards and develop their independence. This programme has been developed by the external agency IPASS and is tailored to meet the individual needs of our pupils. Each skill, when mastered, is rewarded with a qualification and certificate. Prior to the children starting this at the age of seven, pupils take part in the CATs Computing scheme of work which was developed alongside a local special school. This programme aims to plug gaps and remove barriers to learning.

Metacognition

Metacognition relates to thinking about thinking. It is a mechanism to enhance student learning, both for immediate outcomes and for helping students to understand their own learning processes. Metacognitive strategies are embedded into all areas of our curriculum and opportunities are planned to develop these skills over time. These skills include self-questioning, meditation, reflection, developing an awareness of strengths and weaknesses and an awareness of personal learning styles. Developing this metacognitive understanding is a skill for life. When learners "think about their thinking" they are more capable of independent self-improvement. At Bricknell, metacognitive strategies are learned, practiced and made into habits in order to improve learning, self-understanding and thinking skills, impacting both the present and future.

Our metacognition and working memory model is shown below :



All staff have had extensive CPD, in collaboration with the Educational Psychologist, to support their understanding of child development and metacognition strategies to enable them to develop the knowledge and skills required to enable children to learn progressively over time.

Evaluation

In evaluating the effectiveness of our computing teaching, we should be aware of the following :

- Do we have a full understanding of the digital world in which children are growing up in and is our knowledge base and teaching enabling children to develop their skills to access this?
- Do we allow children to choose which media or program to use to best fit the task in front of them, allowing them to be discerning users of technology?
- Do we provide children with opportunities to practice their skills outside of the computing lessons in other subjects?
- Are we providing significant challenge to pupils whose experiences of computing may be well above what is expected for a child of their age?
- Do we give children access to a variety of programs to increase their all-round competency?
- Can we give examples of where in the curriculum you teach programming in each year?
- How do we ensure that pupils become fluent in a programming language?
- How does pupil knowledge of E-Safety build over time from EYFS to Year 6?
- How do we ensure that the children remember the most crucial content, e.g. programming?
- Which parts of the curriculum do pupils with SEND find difficult to learn?
- How are inexperienced or struggling staff supported?

Resources

At Bricknell, the computer suite is equipped with 16 computers and each class room has at least one computer, all networked to the school's shared server. Also, we have 3 laptop trollies, with a class set of laptops, which are shared and rotated throughout each year group. There are additional resources which are to be used to give real world contexts to computing skills. These include Bee-Bots and Pro-Bots, Microbits and other additional resources which are required to teach and deliver a broad computing curriculum.

Staff CPD

At Bricknell Primary School, we invest heavily in CPD to ensure all staff feel empowered to deliver lessons, across all curriculum subjects, and have the ability to embed and assess the metacognition strengths of all pupils.