Computing

'At Ellington Primary School, computing is the use of technology to solve problems, create content and understand the digital world we live in, and how to stay safe in it.'

Computing Overview

At Ellington Primary School, we recognise the significant role that computing plays in the world, and in line with the National Curriculum, we believe that all the pupils we teach should have a broad and balanced experience of technology. In our computing lessons, pupils are encouraged to develop their computational thinking skills, providing them with the ability to approach problem solving activities with confidence across a range of other subjects, including maths, science and history.

From the very youngest year groups, children are taught key skills within the different strands of computing: computing systems and networks, programming, data and information, and creating media. Through these strands, we ensure that pupils experience and become confident with a wide range of software and hardware, including physical computing components. Woven through this teaching and linking with our PSHE curriculum is a deep-rooted understanding of online safety, which is absolutely essential to ensure pupils' navigation through our digital world.

We cover the statutory aims of the National Curriculum for computing, which can be found here.

Computing: Intent, implementation, impact

Intent

Our computing curriculum is underpinned by our curriculum drivers:

Aspirations
Engaging in a meaningful computing curriculum at primary school level undoubtedly raises aspirations amongst pupils. Understanding the principles of computer science and mastering a range of computational thinking skills by the time pupils leave year six opens up a world of possibilities as they progress through the education system, allowing them to engage with the modern world effectively. We believe that it is particularly important to ensure that all children have an equal opportunity to engage with computing at school, regardless of gender or social economic background.

Wider World
Developing children's digital literacy is essential to ensuring that they have an appreciation of the wider world. Children engage regularly in activities which help them to understand how their actions online can affect others and to take responsibility for their behaviour in the digital world, which extends across international borders. Computing helps children to connect with the wider world and gives them access to a wealth of information about different cultures, and we constantly strive to ensure that they are turning into responsible digital citizens as they explore this online content.

Independent Thinking
Independent thinking is constantly fostered through our computing curriculum. From a young age, children are presented with problem solving activities which they tackle either collaboratively or

independently. The very nature of engaging with technology in lessons means that children are frequently required to evaluate their own success in what they are aiming to achieve, and take responsibility for making progress.

At Ellington Primary School, our vision is to cultivate a deep-rooted enjoyment for Computing among all our pupils, fostering confidence, passion, and responsibility in their use of technology both within and beyond the school environment. Through interesting, relevant and inclusive lessons, they will be able to leave Year 6 with a good understanding of how computers and the Internet work, along with being able to complete tasks on them creatively, independently and reflectively for a range of purposes and audiences.

The Computing curriculum at Ellington is designed to empower students in embracing and harnessing the potential of emerging technologies. By imparting essential knowledge, principles, and concepts, our curriculum cultivates a deep understanding of Computing. As the renowned theoretical physicist and cosmologist **Stephen Hawking** aptly stated, *"Whether you want to uncover the secrets of the universe, or you want to pursue a career in the 21st century, basic computer programming is an essential skill to learn."* In today's dynamic landscape, pupils must not only adapt but thrive amidst rapid technological advancements. Our curriculum ensures that pupils are not only proficient in current tools but also equipped with the adaptability and creativity required to navigate future career opportunities with confidence.

In an era where technology permeates every facet of our lives, its role in shaping pupils' experiences is undeniable. Therefore, it becomes imperative for us to instil in our pupils the skills and mindset necessary to harness technology positively, responsibly, and safely. Our aim is to cultivate a generation of creators rather than mere consumers of digital content. This ethos is reflected in our comprehensive curriculum, which encompasses *'Coding & Computational Thinking,' 'Information Technology,' 'Computing Systems & Networks,'* and *'Online Safety.'* We endeavour to empower our pupils with the understanding that they always have a choice in how they utilise technology. As a school, we lead by example, demonstrating positive use of technology in our practices. Moreover, we recognise that education is the most effective means of addressing the myriad of challenges posed by technology and social media. Thus, we prioritise education as the cornerstone of our approach to mitigating these issues.

Technology provides opportunities for accessibility for our pupils and also enables them to share their learning in creative ways. Our curriculum, rich in knowledge, is balanced with opportunities for pupils to apply their skills creatively. This, in turn, helps our pupils become proficient computer scientists. We aim for our pupils to fluently utilise a range of tools to express their understanding.

By Upper Key Stage 2, we envision children having the independence and confidence to select the most suitable tool to meet the tasks and challenges set by their teachers.

Implementation

Computing skills are taught explicitly at Ellington with every pupil receiving dedicated Computing lessons throughout each half-term. Each half-term has a focus on either *Information Technology, Coding & Computational Thinking or Computing Systems & Networks with Online Safety* lessons also included throughout each half-term. The skills acquired are then embedded throughout the curriculum.

Learning is sequenced to build knowledge, skills and vocabulary. Throughout the units of work

teachers encourage children to make links between past learning and new content. We recognise prior learning and build upon it with memorable learning experiences and provide targeted support where necessary. The units address the requirements of the National Curriculum and are broken down to cover all elements of the different strands of Computing.

We have created a comprehensive curriculum to best embed and cover all elements of the Primary Computing curriculum. The progression of knowledge and skills statements build year on year to deepen and challenge our learners. We use **Purple Mash** as the core of our curriculum tied with **Teach Computing** and activities from both **Project Evolve** and **Barefoot Computing** to create a comprehensive curriculum providing full curriculum coverage and a variety of skills for our children.

Purple Mash is a child friendly computing system that mirrors a lot of programmes seen in the 'real' word *(e.g. font buttons are the same, email formats are the same).* By using Purple Mash we are exposing the children to real-word systems but giving them freedom to explore using a child-friendly interface. It is also safe in terms of who and what they can access. Purple Mash is used for most **'Information Technology'** lessons and also provides a clear progression in **'Coding & Computational Thinking'** for our KS1 and KS2 pupils through the use of 2Code.

We believe that the **Teach Computing** curriculum is the best resource for delivering the *'theory'* element of the curriculum and helping children to understand *'how things work'* and so we use this for the **'Computing Systems & Networks'** strand of the curriculum. Some of the Teach Computing Units are also used with KS1 and KS2 pupils to introduce them to coding robots and to give a physical output for their programs *(e.g. use of Micro:Bits with Y6).*

Barefoot Computing provides some great *'unplugged'* lessons for EYFS pupils, and we have utilised this resource by including half-termly activities which introduce our youngest children to the concepts of coding.

'Online Safety' lessons are mapped to the *'Education for a Connected World'* framework and some of these activities are reinforced via PSHE lessons and during assemblies. We have identified **Project Evolve** as the best resource to deliver our Online Safety lessons and to cover the requirements of the Education for a Connected World framework. Each half-term has a focus on a specific strand of the Education for a Connected World framework, with *'Online Bullying'* then covered additionally during the week of *'Anti-Bullying Week'* week in Autumn [2] each year and *'Online Relationships'* covered additionally during the week of 'Safer Internet Day' in Spring [1]. The *'Knowledge Maps'* from Project Evolve are used at the start and end of the units to identify which objectives to focus upon and then to assess impact. Additional 'optional' Online Safety lessons and activities are included within our curriculum, which can be utilised where appropriate and when incidents occur which need addressing.

We carefully considered and then picked these different resources as we believe they best cover and deliver each of the individual strands of Primary Computing. This has helped create a cohesive structure with clear activities that match our progression of skills documents.

Whole class floor books are used to evidence computing work and allow children to reflect on their learning throughout the year. Summative end of unit questions are used to assess children's retention of key skills taught through the units and these are combined with teacher assessment.

Impact

The impact of our Computing curriculum is that we provide pupils with a set of skills to embed a lifelong love of learning and that they build on the knowledge and skills from previous learning. We ensure that every child can become a confident user of technology, while being able to use it to accomplish a wide variety of goals, both at home and in school. Children will have a secure and comprehensive knowledge of how technology works in the world around them and will develop their understanding of how to deal with online situations safely. Children will become confident global citizens.

Through the explicit teaching of Computing skills, both the teachers and the pupils assess their learning continuously throughout the units. To help children get to a deep level of understanding we use quizzes and knowledge organisers that we return to again and again. This is known as interleaving. The knowledge organisers outline what we want the children to know within each unit.

By nature Computing is going to be practical and hands on. We use *'floor books'* to record the learning the children have provided in Computing, as well as giving the children the opportunity to record individually their responses to key questions. Teachers ensure that children understand and apply the correct vocabulary linked to different elements of the curriculum and this is also recorded within the floor books. Prior and future learning links are also included, so that there is a clear sequence in relation to the progression of skills and activities.

Special Educational Needs and Computing

How do we ensure all children can access Computing lessons?
Although a child may have been identified as having a special educational need, they may not have a special educational need in Computing. Effective quality first teaching is the key to enabling all children to participate and develop their historical knowledge and skills. Differentiation within lessons is a vital component to ensure that a balance of support and challenge are achieved for all abilities. This is the same in every subject and differentiation is adjusted as expectations of individual pupils rise through progress.

Challenge and support specific to Computing may include:
- Open ended tasks allowing for children to explore as far as comfortable.
- First-hand and hands-on experiences.
- Teaching advance and specific vocabulary, which can be pre-taught as required.
- Using videos, small group or 1:1 recapping of programmes.
- Pupil knowledge organisers.
- Crash Courses to allow for catch-up of skills.

Pupils not secure within a lesson sequence are noted and adjustments made to the differentiation or level of support given. Similarly, added challenge is given if pupils are identified as requiring it. This may be noted by the teacher through questioning, by work produced by the pupils or via the end of unit summative assessment quizzes. Using an interleaving approach means that pupils continually revisit their learning, gradually building a deeper understanding. The way Computing also appears in other subjects allows those skills to be consistently revisited in different context

British Values in Computing

Democracy

In Computing we learn to understand and be considerate to the views of other online users. We understand that we are each part of the democracy of the Internet and that we can each, in our own small way, affect the way the Internet exists.

The Rule of Law

In Computing we understand the need for rules in relation to the use of different websites and apps, such as age limits for different social media platforms and games and what we are allowed to post and share. We understand that there are rules are to keep others and ourselves safe and to help make the online world an enjoyable and engaging place.

Individual Liberty

In Computing we understand how to use our right to freedom of speech in a respectable and thoughtful way, being considerate of how this speech will affect others. We understand the freedom the Internet and digital devices offer us in discovering information and connecting us with the world.

Mutual Respect

In Computing we appreciate and understand the views of others, our right to challenge, question and discuss opinions and views, and to do this in a respectable and thoughtful way. We understand that as we are connected with the world while accessing the Internet, we are exposed to the widest range of views, and we are learning to respect them.

Tolerance of Those of Different Faiths and Beliefs

In Computing we understand that we are connected to people across the whole world. We understand that these are people from different communities, cultures, faiths and beliefs. We use the opportunities offered in Computing to question, challenge and understand people with these different characteristics to support and develop our tolerance of them.

What will I see if I visit a computing lesson at Ellington?

Knowledge Check: An opportunity at the start of the lesson to revisit prior learning to support with the recall and retention of key knowledge as well as addressing misconceptions.

Creative Quality First Teaching: Teachers use and adapt the 'Teach Computing' units of work to ensure that they are delivering high quality and inclusive computing teaching for all children in their class. SEND pupils are supported by strategies specific to computing lessons, such as supportive paired work, scaffolded resources and visual aids. Children take part in regular paired and group tasks which stimulates classroom dialogue, articulation of concepts and development of shared understanding.

Clear Instruction: Children are supported in each stage of learning via clear instruction from the teacher. Complex computing concepts are introduced in small steps, ensuring that terms and vocabulary are fully embedded before moving on to higher levels of understanding.

Skilful teacher questioning: Teachers use effective questioning to uncover misconceptions and address them as they occur.

Work we are proud of: Physical computing activities ensure children's understanding of applications of technology away from screens. Programming activities are often combined with arts and crafts to provide a creative and engaging context to explore and apply computing topics.

Creative, safe and supportive environment: Children and adults work together to make classrooms safe and happy places to be. Mistakes are celebrated and seen as opportunities to learn. Children are reminded of personal safety and risk assessment. We use the Zones of Regulation to support children in making positive choices around their behaviour and refer to class charters and school rules.

Links to our curriculum drivers and school values: Wherever possible, teachers highlight links to curriculum drivers and school values so that children recognise their importance and support their learning, for example links may be made to careers.

Lock It In: Completed in the plenary, this activity is an opportunity to assess key learning from the lesson and is used to support future planning.