Sunningdale School

Subject Overview: Computing across the Curriculum

The school Is ambitious in its pursuit of the best possible outcomes for its pupils. Sunningdale School is committed to providing a broad and balanced curriculum that remains wholly appropriate to the needs of each learner. A multi-tiered curriculum model is utilised so that content and pedagogy can be closely matched to the needs of pupils. This approach is arranged across 3 theoretical pedagogical pathways that begin on transition from the Early Years Foundation Stage and run through Key Stages 1 and 2 until the pupils' transition to relevant secondary provisions at the end of year 6. The pathways are the Pre-formal Pathway, the Semi-formal Explore Pathway and the Semi-formal Play Pathway.

The subjects taught within each curriculum pathway are closely matched to the developmental needs of the learners accessing that pathway, enabling them to develop the appropriate baseline level of knowledge, understanding and the skills required to access the next pathway approach or to prepare them for life beyond the school, secondary school and adulthood.

The curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge to build on prior learning and prepare pupils for their next steps. Strong links are made with Preparation for Adulthood (PfA) outcomes and Computing Across the Curriculum builds cumulatively towards supporting these: Employment, Independent Living, Community Inclusion, Health.

Through Computing Across the Curriculum, we aim to ensure that all of our pupils are responsible, competent, confident and creative users of information and communication technology and that they are able to understand and apply the fundamental principles and concepts of computer science at their own developmental level.

The key concepts of computational thinking we want to develop in Computing Across the Curriculum, are:

- **Logical Reasoning** – understanding why something happens and developing mental models of the way things work.
- **Abstraction** – being able to identify important information while ignoring unrelated or irrelevant details.
- **Pattern recognition** - making connections between similar problems and experiences.
- **Algorithms** – using and designing simple steps to solve problems.
- **Decomposition** - being able to break down complex problems into smaller, simpler problems.
- **Evaluation** – Judging the quality, effectiveness and efficiency of systems and processes. Deciding whether something is fit for purpose.

Understanding/ Developing Computing Across the Curriculum supports pupil's development and understanding of British Values

The school promotes British Values through our spiritual, moral, social, and cultural learning that permeates through the school's curriculum and supports the holistic development of the child so that they can 'be more', and skills learnt can be used in a variety of contexts.

Computing across the Curriculum supports pupils' ability to be responsible, respectful, active citizens who contribute positively to society, developing their understanding of fundamental British values, including (but not limited to);

- Understanding the freedom that technology, the internet and computers offer us in discovering information and connecting us with the world.
- Understanding the rules and laws that govern society – why things are the way they are.
- Using logical reasoning to predict the outcomes of our actions and how they will affect others.

Our Curriculum Intent: Computing Across the Curriculum

Computing Across the Curriculum has been carefully designed and sequenced to provide pupils with a secure, coherent knowledge of computational thinking and the use of digital technology across all subjects. At all stages, the curriculum links to previous content and concepts and identifies later links.

Computational thinking and the use of technology is prevalent in all areas of our curricula and supports the delivery and understanding of other subjects. The subject is arranged in seven broad areas in order to aid coherence with the wider curriculum subjects:

- **Computational Thinking:**
  Using Logical reasoning, Abstraction, Pattern Recognition, Algorithms, Decomposition and Evaluation to analyse and solve problems in our daily lives. This will not necessarily involve the use of any technology, but at later stages of development will be essential in understanding how computers work.
  (This links closely to *Thinking and Problem Solving* and *Mathematics*)

- **Tinkering:**
  Tinkering is trying out something new to discover what it does and how it works. It's the "hands on" element of logical reasoning and heavily involves the areas of engagement.
  Beginning with experiences of cause and effect, Tinkering progresses towards play-based experimentation, full of questions and surprises. Ideas which may seem wrong can be tried, just to see what happens.
  As pupils progress, tinkering becomes more-purposeful exploration and creation, often through trial and improvement.
  Tinkering helps pupils to see their use of technology as being about developing their own understanding, rather than getting a "right" answer. It helps pupils to be open to novel and innovative solutions.
  (This links closely to *Play and Leisure* and *Thinking and Problem Solving*)

- **Digital Communication → Digital Storytelling:**
  Digital communication involves the use of digital technology to communicate our wants and needs and to comment on the world around us. As pupils' skills develop, they will begin to use technology to present and publish their own stories and narratives. This will progress to film and animation.
  (This links closely to *Communication* and *Stories and Narratives*)

- **Digital Audio**
  The use of digital technology to create, generate, record, edit, manipulate, store, broadcast and transmit sounds.
  (This links closely to *Music*)

- **Digital Art and Design:**
  The use of digital technology in Art and Design. Access to computers, mobile devices, scanners, digital cameras, printers, the internet, augmented reality and virtual reality (AR and VR) and fabrication technology such as 3D printers can give pupils opportunities to express their ideas and be creative in new and exciting ways.
  (This links closely to *Expressive Arts*)

- **Digital Independence**
  Digital independence focuses on developing the skills and understanding to be able to use devices functionally and independently in everyday life in preparation for adulthood, e.g., making a phone call, using a microwave, using a streaming service.
  (This links closely to *Independence*)

- **Digital Safety**
  Digital safety focuses on pupils' safe use of technology - particularly around developing understanding of online safety.
  (This links closely to *RSE*)

Computing Across the curriculum is carefully planned to ensure concepts are taught in optimal order to support children's understanding. Medium term plans are tailored to the needs of each class, adapting the learning areas and opportunities to the interests, needs and level of learning of the class. They consist of basic mapping of concepts, resources, activities and content link to the termly curriculum connector theme. This is actioned at a pupil level through the use of a highly personalised planning system supported by specific Personalised Learning Plans (PLPs). PLPs are used these to set very small-stepped targets across a range of areas (including communication, interaction, emotional development and social skills) so that pupils make consistent progress towards their aspirational targets outlined in their Education Health and Care Plan (EHCP) and linked to Preparation for Adulthood outcomes.

At the earliest stages, the sequence of learning begins with engagement with simple cause and effect activities within the pupils' holistic curriculum. Pupils will explore experiences and begin to realise simple mental models of the way things work – "when I push this, this happens!" They will begin to show anticipation of the effects of their actions.

Staff will model and facilitate the use of digital technology in all subject areas and will use their knowledge of individual motivators to engage pupils with a variety of experiences and devices.

As computational thinking becomes more developed children will begin to apply these skills through tinkering with devices during their play and exploration of the classroom. Engaging in purposeful exploration, experimentation, and creation, often through trial and improvement.

Pupils will begin to show an interest in the use of technology to create and communicate and to assist them in carrying out familiar tasks independently. They will evaluate the effectiveness of systems and processes and determine the best device to use for a task.

As their understanding of computational thinking and their skills in using technology becomes more secure, pupils will begin to apply these concepts in more complex ways. Creating and following algorithms for familiar tasks and using simple code to control devices. They will recognise errors in algorithms and code and begin to debug them.

Computing Across the Curriculum prepares pupils for future learning and transition to Key Stage 3 by giving a sound and secure understanding of the fundamental concepts of computational thinking which serve as the foundation for coding and computing. By providing rich opportunities to apply these concepts and use a broad range of technology in meaningful, functional contexts, we aspire to enable our pupils to apply their technological understanding in the wider community to allow them to live fulfilling and independent lives, both now and in adulthood.