Computing

Policy

Newburgh Primary School

Policy on Information and Communication Technology (ICT)

Curriculum Intent Statement

'A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world.'

Computing programme of Study, DfE, 2013

As subject leaders we strive to adopt and construct a curriculum that is ambitious and aspirational; designed to give all learners and groups of learners, including the most disadvantaged and those with SEND and higher levels of needs, the knowledge and cultural capital they need to succeed in their future lives.

We aim to prepare our children for a rapidly changing world through the use of technology at Newburgh Primary School. Our computing curriculum is designed to enable them to use computational thinking and creativity to further understand our world. All pupils at Newburgh have the right to have rich, deep learning experiences that balance all the aspects of computing. We differentiate our curriculum to ensure all children can access computing. With technology playing such a significant role in society today, we believe 'Computational thinking' is a skill children must be taught to provide them essential knowledge that will enable them to participate effectively and safely in the digital world beyond school.

At the core of our computing curriculum 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. Our pupils are introduced to a wide range of technology, including laptops, iPads and interactive whiteboards, allowing them to continually practice and improve the skills they learn. Building on this knowledge and understanding, we intend for our children to use information technology to create programs, systems and a range of content.

Learners will have the opportunity to gain an understanding of computational systems of all kinds, whether or not they include computers. By the time they leave Newburgh, children will have gained key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully).

Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. We aim to ensure 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.

Purpose of Study
A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. 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.

Aims - Overview

The national curriculum for computing aims 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.

Aims – Strands

Computer Science

- To enable children to become confident coders on a range of devices.
- To create opportunities for collaborative and independent learning.
- To develop children's understanding of technology and how it is constantly evolving.

Digital Literacy

- To enable a safe computing environment through appropriate computing behaviours.
- To allow children to explore a range of digital devices.
- To promote pupils' spiritual, moral, social and cultural development.

Information Technology

- To develop computing as a cross-curricular tool for learning and progression.
- To promote learning through the development of thinking skills.
- To enable children to understand and appreciate their place in the modern world.

Objectives

In order to develop the Computing capability and understanding of each child we will provide through our planning:

- Computing through all three strands taught within the classroom.
- Continuity throughout the school to ensure that experience and skills are developed in a cohesive and consistent way.
- Access to Laptops/Chromebooks and iPads within class or in designated communal areas.
- Experience of a variety of well-planned, structured and progressive activities.

- Experience cross-curricular links to widen children's knowledge of the capability of computing including safe use of the Internet and other digital equipment.
- Opportunities for children to recognize the value of computing in their everyday lives and their future working life as active participants in a digital world.

By doing this we will fulfil the requirements of the National Curriculum.

Objectives by Stage

EYFS

It is important in the foundation stage to give children a broad, play-based experience of computing in a range of contexts, including outdoor play. Children should use computers to interact with age-appropriate software, create content such as stories or draw pictures on screen. As their digital literacy skills improve, they should be able to access information from the internet and retrieve information that interests them with adult guidance.

Early years learning environments should feature computing scenarios based on experience in the real world, such as in role play. Children gain confidence, control and language skills through opportunities to 'paint' on the whiteboard or drive a remote-controlled toy.

By the end of key stage 1 pupils should be taught that programs execute by following a sequence of instructions:

- write and test simple programs;
- use logical reasoning to predict and computing the behaviour of simple programs organise, store, manipulate and retrieve data in a range of digital formats; and
- communicate safely and respectfully online, keeping personal information private, and recognise common uses of information technology beyond school.

By the end of key stage 2 pupils should be taught to:

- design and write programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs;
- work with variables and various forms of input and output; generate appropriate inputs and predicted outputs to test programs and use logical reasoning to explain how a simple algorithm works and to detect and correct errors in algorithms and programs understand computer networks including the internet; how they can provide multiple services, such as the world-wide web; and the opportunities they offer for communication and collaboration; describe how internet search engines find and store data; use search engines effectively; be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely
- Select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Implementation

Teaching and learning

At Newburgh, computing is taught as a discrete subject as well as an integral part of the wider curriculum. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. We use the 'National Centre for Computing Education' scheme as a starting point for the planning of our computing lessons, which are often richly linked to engaging contexts in other subjects and topics.

We have laptops/Chromebooks which will be used in the classrooms and for computing lessons. Each classroom has an interactive whiteboard which is attached to a teacher laptop. This ensures that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum, as well as in discrete computing lessons. Employing cross-curricular links motivates pupils and supports them to make connections and remember the steps they have been taught.

Planning

The implementation of the curriculum using the National Centre for Computing Education (NCCE) planning also ensures a balanced coverage of computer science, information technology and digital literacy. The children will have experiences of all three strands in each year group, but the subject knowledge imparted becomes increasingly specific and in depth, with more complex skills being taught, thus ensuring that learning is built upon. For example, children in Key Stage 1 learn what algorithms are through the use of bee-bots, which leads them to the design stage of programming in Key Stage 2, where they design, write and debug programs, explaining the thinking behind their algorithms.

A minority of children will have particular teaching and learning requirements which go beyond the provision for that age range and if not addressed, could create barriers to learning. This could include G&T children, those with SEN or those who have EAL. Teachers must take account of these requirements and plan, where necessary, to support individuals or groups of pupils to enable them to participate effectively in the curriculum and assessment activities. This is in line with the school inclusion policy.

Health and Safety

The school takes very seriously and is aware of the health and safety issues surrounding children's use of computing. We ensure that pupils have a safe environment in which to learn. We ensure effective filters are in place to safeguard pupils. As such, we will ensure that:

- All fixed and portable appliances in school are tested by an approved contractor every twelve months.

- Damaged equipment is reported to the computing leaders and office manager who will arrange for repair or disposal.

- E-safety is discretely taught each term by class teachers, through assemblies delivered by school staff and through parent presentations annually. There is also a link on our school website to direct parents to further information on how to keep children safe online.

Children learn about rights and responsibilities when using the Internet.

Impact

Assessment and record keeping

Teachers regularly assess capability through observations and looking at completed work. Key objectives to be assessed are taken from the national curriculum to assess key computing skills each term. Assessing computing work is an integral part of teaching and learning and central to good practice. It should be process orientated – reviewing the way that techniques and skills are applied purposefully by pupils to demonstrate their understanding of the concepts of computing. As assessment is part of the learning process it is essential that pupils are closely involved.

Assessment can be broken down into:

- Formative assessments are carried out during and following short focused tasks and activities usually at the end of a unit. Use of independent open-ended tasks, provide opportunities for pupils to demonstrate capability in relation to the unit of work. They provide pupils and teaching staff the opportunity to reflect on their learning in the context of the agreed success criteria.

- Summative assessment should review pupils' capability and provide a best fit level. As part of the NCCE programme of study, pupils will undertake short questionnaires which aim to check their knowledge and learning in relation to a unit of work.

- Digital Leader interviews allow children to feedback to the subject leader on a termly basis.

- Using whiteboard/jamboard/padlet as an initial / final assessment tool demonstrates children's starting and finishing knowledge and how effective the unit of learning has been.

There should be an opportunity for pupil review and identification of next steps.

Monitoring and evaluation

The subject leader is responsible for monitoring the attainment and standards of children in computing. This may be through lesson observations, work scrutiny or looking at data for the subject. The subject leader is also responsible for supporting colleagues in the teaching of computing, for being informed about current developments in the subject, and for providing a strategic lead and direction for the subject in the school.

Security, Legislation, Copyright and Data Protection

We ensure that the school community is kept safe by ensuring that:

- Warwickshire County Council is responsible for regularly updating anti-virus software.

- All children are aware of the school rules for responsible use when logging on to the school network and will understand the consequence of any misuse.

- Reminders for safe and responsible use of computing and the Internet will be displayed in school.

- Software/apps installed onto the school network server must have been vetted by the subject leader for suitable educational content before being purchased and installed. No personal software is to be loaded onto school computers.

- Further information can be found in the school's Data Protection policy and Information Security Policy.