Computing Policy

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Farndon Primary SchooL

EQUALITY SCHEME EQUALITY IMPACT ASSESSMENT FOR COMPUTING POLICY	
Staff / Committee involved in development:	Teaching and Learning Committee; Headteacher
For use by:	Staff, Governors and Parent/Carers
This policy relates to statutory guidance:	
Key related Farndon Policies:	Science Policy Maths Policy On-Line Safety Policy Teaching, Learning and Assessment Policy

Equality Impact Assessment: Does this document impact on any of the following groups? If YES, state positive or negative impact, and complete an Equality Impact Assessment Form or action plan, and attach.

Groups:	**Yes/ No**	**Positive/Negative impact**
Disability	No	
Race	No	
Gender	No	
Age	No	
Sexual Orientation	No	
Religious and Belief	No	
Gender Reassignment	No	
Marriage & Civil Partnership	No	
Pregnancy & Maternity	No	
Other	No	

Reviewed by	Teaching and Learning

Intent

In line with the 2014 National Curriculum for Computing, our aim is to provide a high-quality computing education which equips children to use computational thinking and creativity to understand and change the world. The curriculum will teach children key knowledge about how computers and computer systems work, and how they are designed and programmed. 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 Farndon Primary, 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). The objectives within each strand support the development of learning across the key stages, ensuring a solid grounding for future learning and beyond.

Substantive and disciplinary knowledge in computing

Substantive knowledge in computing is understanding how to use technology, how to be safe and knowing how to program.
This is developed through deliberate practice and by children applying their knowledge of how to be computational thinkers.
"Computational thinking is an important life skill, which all pupils now need to develop. It is central to both living in and understanding our digitally enriched world. It is a cognitive process involving logical reasoning by which problems are solved across the whole curriculum and through life in general." In order to develop as computational thinkers, children engage with computational concepts and approaches:

Concepts:
Logic: predicting and analysing
Algorithms: making steps and rules
Decomposition: breaking down into parts
Patterns: spotting and using similarities
Abstraction: removing unnecessary detail
Evaluation: making judgements

Approaches:
Tinkering: experimenting and playing
Creating: designing and making
Debugging: fixing and finding errors
Persevering: keeping going
Collaborating: working together

Disciplinary knowledge in computing is the use and interpretation of substantive knowledge in order to develop original digital content and programs.

Implementation

At Farndon Primary, computing is taught using a blocked curriculum approach. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. Teachers use the 'Switched On: Computing' scheme, published by Rising Stars, as a starting point for the planning of their computing lessons, which are often richly linked to

engaging contexts in other subjects and topics. Knowledge and skills are mapped across each topic and year group to ensure systematic progression. We have a class set of Chrome Books and two class sets of i-pads to ensure 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.

The implementation of the curriculum 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 Scratch Junior, 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, predominantly through Scratch. For our Online Safety curriculum, we follow the on-line programme - E Aware. This assesses the pupils' knowledge and allows teachers to deliver the content that the children need. It concentrates on areas such as cyber bullying, friends, passwords, time online, private information and digital footprint.

Impact

Our approach to the curriculum results in a fun, engaging, and high-quality computing education. The quality of children's learning is evident on the school's digital platform where pupils can share and evaluate their own work, as well as that of their peers. Evidence such as this is used to feed into teachers' future planning, and as a topic-based approach continues to be developed, teachers are able to revisit misconceptions and knowledge gaps in computing when teaching other curriculum areas. This supports varied paces of learning and ensures all pupils make good progress.
Much of the subject-specific knowledge developed in our computing lessons equip pupils with experiences which will benefit them in secondary school, further education and future workplaces. From research methods, use of presentation and creative tools and critical thinking, computing at Farndon Primary gives children the building blocks that enable them to pursue a wide range of interests and vocations in the next stage of their lives.

Curriculum

The children undertake a broad and balanced programme that takes into account children's abilities, needs as well as their emotional and intellectual development. Through computing, the children will learn a range of skills and knowledge to become digitally literate and understand how to use technology safely. We follow the Rising Stars scheme of work using their cyclical pedagogy to ensure our pupils know more, remember more and are able to do more with their computing knowledge and skills. For On-line safety, we follow the E-Aware programme.

Early Years

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. Computing is not just about computers. Early years learning environments should feature Computing scenarios based on experience in the real world;, such as role play. Children gain confidence, control and language skills through opportunities to explore using non-computer based resources such as metal detectors, controllable traffic lights and walkie-talkie sets. Recording devices can

support children to develop their communication skills. This is particularly useful with children who have English as an additional language.

Key Stage 1

By the end of key stage 1 pupils should be taught to:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
- Create and debug simple programs.
- Use logical reasoning to predict the behaviour of simple programs.
- Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
- Recognise common uses of information technology beyond school.
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Key Stage 2

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.
- 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.

Spiritual, moral, social and cultural development

Spiritual development:

Students are taught to be accepting and respectful of others points of view and personal opinions, whilst also being given the opportunity to express their own throughout the curriculum. There are often times where students are guided to discuss and evaluate

contentious issues such as the use of CS technologies to communicate ideas and how these can be exploited in both positive and negative ways. Within a variety of topics, students are required to challenge stereotypes, question their own beliefs and to actively listen to others. Students are encouraged to be responsible digital citizens throughout their learning and how to identify undesirable behaviours of others such as cyber bullying, cyber addiction and engagement with illegal or morally ambiguous online communities.

Moral development:

Within the course, students are encouraged to critically evaluate moral issues in relation to computer science technologies and their uses. Students have the opportunity to debate divisive issues within a class wide or grouped task setting in order to be exposed to multiple points of view regarding moral issues. Key themes are explored such as an institution's moral duty to keep private information about its customers and staff safe, if students agree with digital surveillance by governments and if the work of hacking collectives to expose confidential data is right or wrong. Further to this, students learn about multiple legal issues in relation to Computer Science technologies and the importance of them.

Social development:

The way that computer science technologies have impacted how modern society operates is a reoccurring theme throughout the curriculum. In order to understand the need / desire for technological advancements and the reasons for their success, students are directed to explore how key areas of modern society operated before particular technologies were available such as the World Wide Web, online banking and easy access social media and if the technological advancements have wielded positive or negative results. Students also develop their understanding of different methods of communication, how these have developed whilst ensuring they have an up to date knowledge emerging technologies and any associated risks in engaging with them. Within the learning environment students are encouraged to work collaboratively whilst developing key practical skills, to share research findings and to peer assess each other's work to highlight strengths and areas of development.

Cultural development:

A wide variety of cultural factors are explored within the curriculum. The digital divide is a significant area of discussion and allows students to broaden their horizons regarding digital inequality within local, national and an international setting. The way that computer science technologies shaped the way that many people live their lives and the concept of total digital reliance in the first world is explored to assess the importance of key technologies and the roles that they play. Digital youth culture is also explored in detail, identifying how a student would identify their "digital self" and how many young people are able to find a sense of belonging within the online world that they may struggle elsewhere.

School Technician

The school buys into the support package offered by the Local Authority. We have one Computing Technician who visits school once every two weeks. Their specific roles relate to the provision of support in computing. This support takes a variety of forms, including:

- Supporting lessons using computing equipment in the computing suite and around the school;
- Dealing with technical queries relating to software and hardware;
- Carrying out rudimentary and routine maintenance and repairs of hardware ;
- Purchasing and updating equipment;
- Supporting teachers in the use of ICT in other curriculum areas;
- Supporting admin staff with the use of ICT within their roles;

Planning and Resources

We have a 2 computer trollies containing a suite of computers. We also have 2 iPad trollies containing. These are timetabled for use by all children. Computers around the school are networked and have Internet access with some exceptions. We keep resources for ICT and computing, including software, in the teaching street within the Juniors. Interactive screens are available for all children to access daily.

Assessment and Recording

Key objectives to be assessed are taken from the National Curriculum. Teachers regularly assess capability through observations, discussions with pupils and looking at completed work. Regular assessment of 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 ICT and 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: These are carried out during and following short focussed tasks and activities. They provide pupils and teaching staff the opportunity to reflect on their learning in the context of the agreed success criteria. This feeds into planning for the next lesson or activity.

Summative assessment: We review pupils' capability and provide a best fit level. Use of independent open ended tasks, provide opportunities for pupils to demonstrate capability in relation to the term's work. There should be an opportunity for pupil review and identification of next steps. Summative assessment should be recorded for all pupils in the Wider Curriculum Tracker – showing whether the pupils have met, exceeded or not achieved the age related learning objectives.
We assess the children's work in computing by making informal judgements as we observe and talk to the children during lessons. Once the children complete a unit of work, we make a summary judgement of the work for each pupil as to whether they have yet to obtain, obtained or exceeded the expectations of the unit. On completion of each unit of work, an example of the integrated task for each ability group is placed in the digital portfolio of

Children's Work for which the computing subject leader is responsible. This demonstrates the expected level of achievement in computing for each age group in the school.

Monitoring

Monitoring takes place regularly through sampling children's work, and teacher planning, through a book scrutiny, lesson observations and pupil voice.

Equality

At Farndon Primary school, we are committed to providing a teaching environment which ensures all children are provided with the same learning opportunities regardless of social class, gender, culture, race, special educational need or disability. Teachers use a range of strategies to ensure inclusion and also to maintain a positive ethos where children demonstrate positive attitudes towards others.

Inclusion

Computing teaching considers the needs of different individuals and groups for learners and tasks are designed and differentiated as appropriate to ensure an appropriate level of challenge. Supporting adults are also deployed effectively to ensure focussed support where this is necessary.

Teachers use a range of inclusion strategies, including paired work, open questions and direct, differentiated questioning and the activation of prior knowledge and contextual learning. This support the inclusion and motivation of all learners ensuring that optimum progress is made throughout each part of the lesson.

Roles and Responsibilities

The subject is led by Laura Wyllor. Each year time is set aside to review standards and monitor curriculum provision and ensure training and resources are up to date.

Health and Safety

The school is aware of the health and safety issues involved in children's use of ICT and computing. An electrical inspection is carried out in school every five years. Portable electrical equipment in school is tested every twelve months. It is advised that staff should not bring their own electrical equipment in to school but if this is necessary, then the equipment must be PAT tested before being used in school. This also applies to any equipment brought in to school by, for example, people running workshops, activities, etc. and it is the responsibility of the member of staff organising the workshop, etc. to advise those people. All staff should visually check electrical equipment before they use it and take any damaged equipment out of use. Damaged equipment should then be reported to the computing technicians.

- Children should not put plugs into sockets or switch the sockets on.
- Trailing leads should be made safe behind the equipment.

- Liquids must not be taken near the computers.
- Safety guidelines in relation to IWBs will be displayed in the classrooms.
- E-safety guidelines will be set out in the E-safety policy.

Role of Computing Leader:

The subject leader's responsibilities are:

- To ensure the high profile of the subject and provide a strategic lead and direction for Computing in the school.
- To maintain and ensure use of the central supply of Computing resources, in accordance with those specific to each year group and topic
- To support colleagues in their teaching of computing and support the CPD of others
- To ensure progression of the key knowledge and skills identified within each unit and that these are integral to the programme of study and secure at the end of each age phase.
- To monitor books and ensure that key knowledge is evidenced in outcomes, alongside and as supported, by SMT
- To monitor planning and oversee the teaching of Computing
- To lead further improvement in and development of the subject as informed by effective subject overview
- To ensure that the Computing curriculum enables the progress and raises the attainment of all pupils, including those who are disadvantaged or have low attainment
- To ensure that the Computing curriculum take account of the school's context, promotes children's pride in the local area and provides access to positive role models from the immediate and wider local area to enhance the Computing curriculum.
- To ensure that approaches are informed by and in line with current identified good practice and pedagogy; to attend regular opportunities for CPD, including borough forums.
- To establish and maintain existing links with external agencies and individuals with specialist expertise to enrich teaching and learning in Computing.

Role of the Head Teacher:

- To lead, manage and monitor the implementation of the scheme of learning.
- With the Computing leader and responsible governor, keep the governing body informed about the progress of the subject and the scheme of work.
- Ensure that Computing remains a high profile subject in the school's development work.

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Signed: 

Milestone 1 Computing		
Superheroes	**It Began in Africa**	**Ahoy there**
To Connect Networks – Information all around us **To Communicate** Digital photography of superheroes!	**To Code** Programming – debugging algorithms **To Collect** Collect data to create pictograms	**To Communicate** Using digital media to create music **To Code** Programming with Scratch Junior to make a quizz
Pole to Pole	**Fire Fire**	**Once Upon a Time…**
To Connect Technology all around us and use of devices **To Communicate** Create own media of digital hot and cold landscapes through digital paitning	**To Code** Moving a robot with Scratch Junior and floor robots **To Collect** To use grouped data to create charts and graphs	**To Communicate** Create own pieces of digital writing **To Code** Have sprites linked to fairy tales and speak with each other on Scratch Jnr.
Milestone 2 Computing		
All Started in a Cave	**Survival**	**They Came, They Saw they conquered!**
To Connect What is the internet **To Communicate** Creating media – audio production	**To Code** Programming – repetition in shape through repeating a loop **To Collect:** Data logging	**To Communicate** Creating Media – photo editing **To Code** Programming using Scratch – repetition in games with an infinite loop
Dungeons and Dragons	**Streetwise**	**It's All Greek to Me**
To Connect Connecting computers and understanding a network of computers and the internet **To Communicate** Creating Media – Stop Go Animation	**To Code** Programming – sequencing sounds **To Collect** Branching Databases	**To Communicate** Creating Media – desktop publishing and e-book creator for own myth **To Code** Use Scratch to make events and actions in programmes
Milestone 3 Computing		
Walk Like an Egyptian	**Out of this World**	**Traders and Raiders**
To Connect Computer networks – systems and searching **To Communicate**	**To Code** Programming with scratch using a conditional loop **To Collect**	**To Communicate** Creating media with graphic vectors **To Code**

Video production using I-Movie	Data handling with flat file databases	Programming – modifying a condition in creating a quiz
Endangered	**Child in our Time**	**The Ship of Dreams**
To Connect Communication and collaboration - Internet devices and data transfer **To Communicate** Web creation – making their own web sites	**To Code** Use Scratch to use variables in a game **To Collect** Introduction to spreadsheets	**To Communicate** Creating media through 3D Modelling with Tinkercad **To Code** Use scratch to create algorithms with sensing – If and then…
Knowledge Curriculum Plans Milestone 1 (including EYFS)		Computing Curriculum Milestone
Knowledge Curriculum Plans Milestone 2		Computing Curriculum Milestone
Knowledge Curriculum Plans Milestone 3		Computing curriculum milestone 3

FARNDON'S CORNERSTONES TO LEARNING

Setting the right culture: Habits and Routines

Environment	*Adults*	*Behaviour and Attitude*
• Working walls reflect current • Celebrate Mistakes visually. • Sticky Facts being learnt that term through display or knowledge organiser. • Share with the pupils what a good one looks like (WAGOLL). • Celebrate pupils' work from different areas of the curriculum.	• Welcome at the class door. • Always be the adult and combine assertiveness with warmth. • Model calm, controlled and caring behaviour. • Be consistent with consequences, maintaining certainty over severity. • At the point marking with verbal feedback (record VF). • Feed forward using whole class feedback book.	• Reinforce 3 step processes: re-direct, challenge and correct. • Constantly positively reinforce good behaviour and attitudes. • Respond consistently to reward, set expectation and sanction. • Promote good learning attitudes: **work hard**; **push themselves**; **don't give up**; **concentrate**.

Think *Fluency / Recall*	**1**	Begin each theme **retrieving** from memory what they already know about that programme / device / app. At the start of each session, revisit previous substantive knowledge and concepts taught through cold calling questioning. Read Knowledge Organiser for pre-learning.
	2	Start each session with a shared **purpose.** What new knowledge will they learn? Objectives are on the sheet or shared on the board. Give pupils the knowledge needed for the task. New knowledge broken down step by step to avoid cognitive overload.
Learn *Understanding*	**3**	Teacher models. Use principle **I do….We do… You do…..** Show the skills and a **WAGOLL**. Use worked examples. Teacher models "how to think" like and Computational Thinker by thinking aloud their own thought processes (**meta-cognitive modelling**) We teach the PRIMM method: Predict; Run; Investigate; Modify; Make.
	4	Check for pupil understanding. Use techniques to involve all pupils such as **cold calling** and **think; pair; share**. Ask deeper questions using Q matrix and Bloom's matrix for enquiry type questioning. Encourage better responses – **"Say it again but better."**
	5	Provide **scaffolds** to either support pupils in their learning so that it is accessible, or to help them to effectively plan and organise it. **Feedback** should be understood, accepted and actionable. Verbal feedback should highlight success and specific areas to improve. Acknowledge mark against the objective if working in the book. Whole class feedback used to feed forward in the next lesson.
Explore *Performance*	**6**	Before independence, use **guided practice** and check pupils have a certain level of confidence. Gradually remove any scaffolds. Embed knowledge through **independent practice.** Once new knowledge is embedded, look to **apply** in their own "project".

Evaluate ***Recall***	**7**	Pupils encouraged to **review** their work. End each session with a review of the knowledge learnt that session using quizzing, elaborate interrogation or peer to peer assessment. At the end of each theme / unit, re-read, recall and check with knowledge organisers and complete fluent in five summary assessments.