

COMPUTING POLICY

Introduction

The use of information and communication technology is an integral part of the national curriculum and is a key skill for everyday life. Computers, tablets, programmable robots, digital and video cameras are a few of the tools that can be used to acquire, organise, store, manipulate, interpret, communicate and present information. At Saltersgate Junior School, we recognise that pupils are entitled to quality hardware and software and a structured and progressive approach to the learning of the skills needed to enable them to use it effectively. The purpose of this policy is to state how the school intends to make this provision.

Computing Curriculum Intent, Implementation and Impact Overview

The National Curriculum Purpose of Study states that:

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. 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. Computing also ensures 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.

Whilst the Computing Curriculum has an increased focus on Computer Science including developing pupils' programming skills and their understanding of what happens 'behind the scenes', it is important that they also continue to develop their Digital Literacy and e-safety capability and our school curriculum is designed to reflect this.

As a school, we embrace the national vision for Computing and appreciate that, to achieve this, pupils must have access to a curriculum, which is 'balanced and broadly based'. Our aim is to produce learners who are confident, discerning and effective users of technology and who have a good understanding of computers and how computer systems work, and how they are designed and programmed.

At Saltersgate Junior School, we strive to:

- Meet, and build on, the minimum requirement set out in the National Curriculum as fully as possible and helping all children to achieve the highest possible standards of achievement
- Help all children to develop the underlying skills and capabilities which are essential to developing Computing capability (such as problem solving, perseverance, learning from mistakes) and apply them elsewhere.
- Help all children to develop the necessary skills to exploit the potential of technology and to become autonomous and discerning users.
- Help all children to evaluate the benefits and risks of technology, its impact on society and how to manage their use of it safely and respectfully.
- Celebrate success in the use of technology.
- Use computing as a tool to enhance learning throughout the curriculum.
- To respond to new developments in technology.
- To equip pupils with the confidence and capability to use computing throughout their later life.
- To enhance learning in other areas of the curriculum using computing.
- Support all children in using technology with purpose and enjoyment
- Provide a relevant, challenging and enjoyable curriculum for computing for all pupils.

School has identified key intentions that drive our Computing curriculum. At Saltersgate Junior School our Computing curriculum intentions are:

Intent	Research Link	Implementation	Impact
<p>At our school, we intend to prepare our pupils for their future by developing them into 'digital thinkers of the future' through a broad, ambitious and relevant curriculum that continually embeds, revisits and progresses upon computer science, information technology and digital literacy skills. We are aware that technology is everywhere and will play a pivotal</p>	<p>https://www.computingschool.org.uk/data/uploads/CASPrimaryComputing.pdf</p> <p>"Computing is concerned with how computers and computer systems work, and how they are designed and programmed. Pupils studying computing will gain an understanding of computational</p>	<p>Computing at Saltersgate Junior School is taught through discrete computing lessons and is complemented and extended through the wider curriculum. We have adapted our scheme of work from the 'Teach Computing' Curriculum and have ensured it covers the national curriculum. We have chosen to use this as a basis for our scheme of learning as it is</p>	<p>We encourage our children to enjoy and value the curriculum we deliver. Children will have developed the knowledge, skills and understanding to help them access and use a range of technology in a safe and creative way. Children will have developed skills that equip them to use computational thinking and creativity to understand and change the world.</p>

<p>part in our students' live; therefore, we aim to equip our pupils to use computational thinking and creativity to enable them to become active and responsible participants in an ever-changing digital world. It is important that our children are able to use technology to express themselves so that they are computing creators not just consumers, and can use technology not only as a tool for learning, but to drive the generation into the future. We aim to create an awareness in our children of the opportunities that can arise beyond our school when their skills and understanding continue to be developed and progressed upon year on year. Our knowledge rich curriculum has to be balanced with the opportunity for pupils to apply and develop what they have learnt across wider learning in the curriculum and beyond, which will in turn helps our pupils become independent, skilful computer scientists and future digital leaders</p> <p>We want our pupils to be masters of</p>	<p>systems of all kinds, whether or not they include computers. Computational thinking provides insights into many areas of the curriculum, and influences work at the cutting edge of a wide range of disciplines. “</p> <p>“Why is computational thinking so important? It allows us to solve problems, design systems, and understand the power and limits of human and machine intelligence. It is a skill that empowers, and one that all pupils should be aware of and develop competence in. Pupils who can think computationally are better able to conceptualise, understand and use computer-based technology, and so are better prepared for today’s world and the future.”</p> <p>“Computing is a practical subject, in which invention and resourcefulness are encouraged. The ideas of computing are applied to understanding real-world systems and creating purposeful products. This combination of principles, practice and invention makes computing an extraordinarily useful and intensely creative subject,</p>	<p>created by subject experts, based on the latest pedagogical research, supports staff with developing subject knowledge and uses an innovative, interconnected spiralled progression framework (split into concepts, knowledge, skills and objectives). This overarching areas are revisited and progressed upon within year groups, in successive year groups and across the key stage.</p> <p>Every lesson in our scheme has been individually evaluated so that it can be effectively taught using the infrastructure we have in place at school and so that it can meet the needs of all our pupils. Having discreet lessons means that the children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. Lessons allow opportunities for children to revisit previous skills to ensure these are strongly embedded into their understanding. Where appropriate, meaningful links will be made between the computing curriculum at the wider curriculum.</p>	<p>Children’s skills will have progressed to enable them to not only have met the requirements of the National Curriculum but to also enjoy using technology to develop knowledge and ideas as well as express themselves safely and creatively as responsible citizens</p> <p>We will constantly ask the WHY behind their learning and not just the HOW.</p> <p>We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and wellbeing. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils showcase, share, celebrate and publish their work will best show the impact of our</p>
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<p>technology and not slaves to it, and understand that there is always a choice when using technology. As a school, we model the safe use of technology to ensure pupils understand the advantage and disadvantages associated with digital experiences to enable them to take a proactive role in preventing a lot of the issues we currently see in the digital world. We want our children to develop into responsible, respectful and self-assured users of technology whilst being conscious of the steps that can be taken to keep themselves and others safe online.</p>	<p>suffused with excitement, both visceral ('it works!') and intellectual ('that is so beautiful')."</p> <p>QS Teaching Document on Teaching Approaches in Schools</p> <p>Educational theory can be mined for insights into how a new subject like computing might be taught. The pragmatic teacher is likely to draw on a blend of these approaches.</p> <p>Experimenting: Provide pupils with a chance to explore and tinker with new software or hardware when they first encounter it, so they can figure out their own mental model for how it works. This can be particularly effective with younger pupils.</p> <p>Making: A lot can be learnt through the process of making things to show to or share with others. This might be computer code, but it might also be PowerPoint presentations, web pages, edited video, digital photographs, etc.</p> <p>Discussion: Make the most of pupils' different insights, experiences and backgrounds by allowing them to</p>	<p>Discreet computing lessons will focus on the curriculum skills of information technology, digital literacy and computer science. We have ensured that any resources / technology needed is provided for the children. This includes: iPads, laptops, a computer suite, tablets, VR goggles, micro:bits, crumble controllers and more. We continually evaluate long, medium and short term planning to ensure we remain at the forefront both pedagogically and technologically.</p> <p>Children's progress will be assessed with the use of the children's Computing journals, where they assess themselves against our progression of skills. Teachers then use this and their judgement to assess learning. Children will be given feedback and ways to improve their work either verbally, through their journals or in through the adaptation of future planning.</p>	<p>curriculum.</p> <p>We also look for evidence through reviewing pupils' knowledge and skills digitally through various tools. Progress of our computing curriculum is demonstrated through outcomes and the record of coverage in the process of achieving these outcomes.</p>
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share their ideas with one another and with others. Paired programming activities in class and online discussion forums are just two ways to facilitate this.

Connecting: Learning from others need not be limited to the classroom: encourage pupils to explore others' solutions to problems on the Kodu or Scratch community sites, for example, or to search online for solutions to problems.

Direct instruction: For some ideas in computing, the traditional, direct instruction approach can work well. Complex ideas such as variables, how the internet works or how search engines operate could be learnt using discovery-based approaches, but direct teaching is likely to be more effective.

Practise: Don't assume that once pupils have demonstrated they can do something or understand an idea that their learning is secure. Provide opportunities for them to practise applying their skills, knowledge and understanding.

Brown, D., Ofsted National Lead for Computing, 'Inspecting computing' slides (Barefoot Computing Conference).

David Brown recommended that:

- it is informed by excellent subject knowledge and understanding of continuing developments in teaching and learning in computing
- it is rooted in the development of pupils' understanding of important concepts and progression within the lesson and over time; it enables pupils to make connections between individual topics and to see the 'big picture'
- lessons address pupils' misconceptions very effectively; teachers' responses to pupils' questions are accurate and highly effective in stimulating further thought
- teachers use a very wide range of innovative and imaginative resources and teaching strategies to stimulate pupils' active participation in their learning and secure good or

better progress across all aspects of the subject.

When commenting on pupils' achievement in computing, David Brown suggested that this would be good or outstanding if:

- pupils demonstrate excellent understanding of important concepts in all three strands of the computing curriculum and are able to make connections within the subject because they have highly developed transferable knowledge, skills and understanding
- pupils show high levels of originality, imagination, creativity and innovation in their understanding and application of skills in computing

but would be regarded as inadequate if:

- pupils rarely demonstrate creativity or originality in their use of computing

Pedagogy

In Computing, like all other subjects, we recognise the importance of the methods and practice of teaching (the pedagogy) we choose to use in enabling pupils to know more, understand more and remember more. In Computing, the following approaches will be used, and be evident in pupils' books, in order to ensure that the Computing learning opportunities are as effective as possible and that pupils progress throughout the year and across year groups during their Computing experiences in school:

Teaching Sequence in Computing	<u>Computer Science</u>	Possible pedagogical approaches used in Computing	Behaviourism	<ul style="list-style-type: none"> • Direct teacher instruction; modelling of skills and techniques; • demonstration
	Design, write and debug 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	
	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs		Use logical reasoning to explain how some simple algorithms work 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		Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web	

	Appreciate how [search] results are selected and ranked			
	<u>Information Technology</u> Use search technologies effectively Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information		Constructivism	<ul style="list-style-type: none"> • Inquiry-based learning; outdoor learning
	<u>Digital Literacy</u> Understand the opportunities [networks] offer for communication and collaboration Be discerning in evaluating digital content Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact		Social Constructivism	<ul style="list-style-type: none"> • Teacher modelling; questioning; mix of individual, paired and group instruction
			Liberationism	<ul style="list-style-type: none"> • Pupil-led learning; opportunities to showcase learning
			Learning, working and talking like a 'digitally literate citizen'	<ul style="list-style-type: none"> • Being introduced to the key vocabulary that a someone working with technology would use; • defining the key vocabulary that someone working with technology would use; high expectations • of pupils 'talking' like a someone working with technology; high expectation of pupils researching, • interpreting and presenting like

E-safeguarding

At Saltersgate Junior School, we believe that the use of technology in schools brings great benefits. To live, learn and work successfully in an increasingly complex and information-rich society, our children must be able to use technology effectively. The use of these exciting and innovative technology tools in school and at home has been shown to raise educational standards and promote pupil achievement. Yet at the same time, we recognise that the use of these technologies can put young people at risk within and outside the school. The Computing policy and scheme of work adheres to the whole school E-safeguarding Policy.

Equal Opportunities

Computing follows the school's Equality Policy.

Links to other Subjects

The teaching of Computing contributes to teaching and learning in all curriculum areas. It also offers ways of impacting on learning, which are not possible with conventional methods. Teachers use software to present information visually, dynamically and interactively, so that children understand concepts more quickly. For example, graphics work links in closely with work in art, and work using databases supports work in mathematics, while role-play simulations and the Internet prove very useful for research in humanities subjects. Computing enables children to present their information and conclusions in the most appropriate way. Much of the software we use is generic and can therefore be used in several curriculum areas.

English

Computing is a major contributor to the teaching of English. Children's reading development is supported through talking stories. As the children develop mouse and keyboard skills, they learn how to edit and revise text on a computer. They have the opportunity to develop their writing skills by communicating with people electronically. They also learn how to improve the presentation of their work by using desktop publishing software. There is in addition a variety of software, which targets specific reading, phonics knowledge, grammar and spelling skills.

Mathematics

Children use computing in mathematics to collect data, make predictions, analyse results, and present information graphically. There is a range of software available for children to develop their mental skills, answer questions and practise learned strategies.

Science

Software is used to animate and model scientific concepts, and to allow children to investigate processes, which it would be impracticable to do directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Digital microscopes are used to enable the whole class to examine very small materials and specimens.

Links to Spiritual, Moral, Social and Cultural Development

Computing makes a contribution to the teaching of Spiritual, Moral, Social and Cultural Development in that children in computing classes learn to work together in a collaborative manner. They also develop a sense of global citizenship by using the Internet and e-mail. Learning to use the internet efficiently and safely is therefore a key component of computing teaching. The scheme of work aims to develop a set of safe and discriminating behaviours for pupils to adopt when using the Internet and other technologies. Through discussion of safety and other issues related to electronic communication, the children develop their own view about the use and misuse of computing, and they also gain an insight into the interdependence of computing users around the world.

Organisation of Teaching

Computing at Saltersgate Junior School is taught in discrete lessons, as well as being integrated throughout the wider curriculum. Computing skills knowledge and attitudes are taught through a half-termly focus/project. These are planned to ensure children are challenged to progress throughout all year groups.

Teaching Methods

When delivering the National Curriculum for Computing, teachers are expected to employ a range of strategies and to use their professional judgement to decide on the most appropriate teaching and learning style for the class, groups of pupils or individual pupils.

Approaches and strategies used may include:

- An 'unplugged' approach in order to develop their understanding of some of the underlying concepts of Computer Science
- 'Plugged' activities which allow pupils to practise and demonstrate their levels of understanding
- Using presentation technology to demonstrate something to a group of pupils or the whole class
- Leading a group or class discussion about the benefits and risks of technology
- Individual or paired work
- Collaborative group work
- Pupil led demonstrations / peer mentoring. NB - Where one pupil is used to demonstrate or teach a skill to others, the teacher must feel confident that this is of benefit to all those involved.
- Differentiated activities planned to allow different levels of achievement by pupils or to incorporate possibilities for extension work.
- Teacher intervention where appropriate to support a pupil, reinforce an idea, teach a new point or challenge pupils' thinking

Reasonable Adjustments in Computing

All children have equality of access to appropriate technology in order to develop their personal Computing capability. When children are working in groups, we endeavour to ensure that their hands-on experience is equitable. We check resources, software and documentation to ensure that gender and ethnicity are reflected in a balanced way without stereotyping. The SENCO and Computing Subject Leader jointly advise teachers on examples of technology which can be provided to support individual children with particular physical, linguistic and educational needs, including gifted and talented pupils. Where appropriate, an external specialist is used to assess a child's specific needs. Children with access to technology at home are encouraged to use it for educational benefit and e-safety guidance is offered to both pupils

and parents where appropriate. The school has identified those pupils who have limited or no access to appropriate technology outside of school and provide additional opportunities for these pupils to gain access during the school day / after school.

Access for all

At our school, we teach computing to all children, whatever their ability and individual needs. Computing forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our computing teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the child to learn more effectively (e.g. a lot of software can be differently configured for different ability ranges). Assessing progress against the National Curriculum levels of attainment allows us to evaluate each child's progress against expected levels. This ensures that our teaching is matched to the child's needs. We enable pupils to have access to the full range of activities involved in learning computing. We have a range of software, which is designed to include all learners. Our hardware can accept a range of input devices catering to pupils with specific difficulties.

Planning

Key Skills can be delivered through discrete teaching sessions and can also be applied in all other aspects of the curriculum when required. As of the 21/22 academic year, the school will use the NCCE Teach Computing curriculum as a base for its Computing teaching, learning and assessment. We will adapt this to ensure it meets the needs of our pupils and community. The Computing leader has mapped out the skills progression across year group and the key stage. The Computing leader will ensure this scheme of work is kept up to date so that it matches the needs of our children, and that each teacher has access to the relevant planning and resources. The computing subject leader is responsible for reviewing plans for Key Skills, computing sessions and for monitoring the rest of the curriculum to ensure that computing is being applied where appropriate. The class teacher is responsible for adapting the short-term plans with the possible computing components of each lesson and for daily inclusion within mathematics and English where appropriate. The topics studied in computing are planned to build

on prior learning. While we offer opportunities for children of all abilities to develop their skills and knowledge in each unit, we also plan progression into the scheme of work, so that the children are increasingly challenged as they move up through the school.

Assessment

The Computing Subject Leader follows a systematic and regular programme of evaluation and monitoring of the Computing curriculum, across the school.

This is so that they can:

- Check that the full curriculum is being delivered effectively
- Evaluate the success (or otherwise) of curriculum planning and delivery
- Have an awareness of impact and be able to demonstrate progression and attainment
- Have an overview of resource and staff training needs
- Monitoring is completed via a variety of methods including:
 - Observations
 - Collecting and analysing planning
 - Work scrutiny
 - Gathering information from observations of other subjects
 - Pupil interviews / pupils voice
 - Staff interviews / feedback

At Saltersgate Junior School, assessment in Computing comprises of teacher assessment during the delivery of lessons. Children are given tasks linked to the NC, and assessed against these. It is the responsibility of each individual class teacher to implement this through planning activities linked to the Computing National Curriculum. At the end of each full term, pupils self-assess understanding in their Computing journals, and teachers judge children against age related expectations to be at, above or below these expectations. This data is then analysed by the Computing subject leader. The Computing subject lead will also assess whole school coverage and progression through a range of pupil voice, evidence of work checks and dialogue with class teachers.

Targets

At Saltersgate Junior School, we aim for the majority of pupils to:

- Be at age related expectations for Key stage 2 by the end of year 6
- Be aware of the risks and opportunities of technology in the wider world.
- Be technologically literate.

Responsibilities

The Computing subject leader is responsible for:

- Monitoring the teaching and learning of Computing.
- Overseeing, reviewing and implementing the Computing policy.
- Writing an annual action plan for The School Improvement Plan and evaluating progress throughout the year.
- Attending INSET and providing staff with appropriate feedback.
- Attending courses to keep knowledge up to date and feedback to staff upon return.
- Each class teacher is responsible for delivering Computing to their class and being aware of where extra lessons may be needed.
- Presenting exemplary practice in the teaching of Computing
- Advising colleagues on planning, delivering and assessing Computing
- Monitoring the effective use of technology and giving advice where appropriate
- Ensuring progression in Computing
- Suggesting purchasing plans for hardware and software
- Organising Computing resources
- Identifying what support / CPD is needed by individual staff / groups of staff / the whole school
- Creation of a school portfolio of evidence

Responsibilities carried out by an ICT Support Technician:

- All equipment is supported and maintained through a fortnightly visit from a technician who works under the direction of the Computing Subject Leader.

Staff Development

Over the course of the academic year, the Computing subject leader monitors and evaluates:

- The attainment and progress of pupils in Computing
- The pupils' response and attitude to Computing
- The quality of Computing teaching in school
- The quality of children's work in Computing

This is achieved through:

- Classroom observation of Computing, including learning walks, with written feed back
- Questioning of children during these observations
- Discussions with pupils
- Carrying out regular scrutiny of work, and feeding this scrutiny back to teachers.
- Looking at Computing displays in classrooms and corridors.
- Monitoring each teacher's Computing planning every term, as appropriate, and providing written feedback.
- Keeping all staff informed on changes that effect Computing in school.
- Attending any Computing Subject Leader meetings arranged by the LA or other providers.

As a result of monitoring, appropriate CPD opportunities are provided for staff on an individual, group and whole school basis in line with the school's wider CPD policy, School Development Plan and Strategic Technology Development Plan.

Subject Development

Over the next academic year, the Computing leader will write and execute the school development plan in Computing.

In addition to this, the Computing leader will also:

- Ensure the subject of Computing meets statutory requirements of the national curriculum.
- Continue to monitor the implementation of the Computing scheme of work and Computing policy documents.
- Continue to monitor staff development in Computing, through classroom observations if appropriate, staff questionnaires, monitoring and feeding back on medium term planning and children's work.
- Attend appropriate courses, if available, to develop personal knowledge and expertise, and to share this in school.
- Complete pupil discussions with pupils from a range of classes, on how Computing is delivered in our school.
- Maintain the Computing courses for staff and for children.
- Maintain the Computing section of the school website for all stakeholders.
- Monitor and evaluate the quality of Computing resources in school, and bring in new resources as appropriate.

For a detailed description of the development of Computing in the next academic year, please see the 2019 – 2020 School Development Plan.

Review

This policy is a live document, being constantly updated. Computing has long, medium and short-term development plans, which forms part of the overall School Development Plan, drawn up and executed by the Computing Subject Leader. This plan will affect the contents of this policy, and it is the responsibility of the Computing Subject Leader to maintain this.