



Computing policy

Last updated by subject leader

September 2021

**Last reviewed by Principal and
Headteacher**

September 2021

Next review due

September 2022

Overview of the subject

Our vision for the IT and Computing Curriculum at St. John's Prep and Senior School is to provide all pupils with a supportive and challenging learning experience that balances all aspects of IT and computing. With technology playing such a significant role in society today, we believe that 'Computational Thinking' is a skill that pupils must be taught if they are to be able to participate effectively and safely in a digital world.

Our core aim for pupils, upon completion of the curriculum, is for them to be digitally literate so that they can express themselves and develop their ideas through information and computer technology, at a level that is suitable for the future workplace and as active participants in the digital world.

Computing at St. John's Prep and Senior School is taught weekly. At the Prep School pupils receive one 50-minute lesson a week from EYFS to KS2. At the Senior School pupils in KS3 receive one 50-minute lesson a week. In KS4 the pupils receive three 50-minute lessons a week. In KS5 students receive five 50-minute lessons a week.

There are three computing teachers at St. John's Prep and Senior School. The Head of Computing at the Prep school teaches EYFS to KS2. The teaching at the Senior School is split between two Computing teachers across KS3, KS4 and KS5. The Head of Computing at the Senior school teaches some aspects to year 9, KS4 and KS5. All teachers are subject specialists, with first degrees related to Computing, IT and/or Computer Science. All teachers have expert knowledge in the field.

At the Senior school, pupils have the opportunity to complete GCSE: AQA 8525 and A Level: Eduqas A500.

The computing teacher at the Prep. School liaises with the computing teachers at the Senior School at least termly.

This policy is supported by suitably-sequenced schemes of work from EYFS through to KS5 as well as a visual learning journey which maps out all of the units covered in a spiral curriculum until they reach KS4 and KS5, where pupils begin to specialise in Computer Science and IT.

The curriculum reflects the requirements of the National Curriculum programmes of study and ensures that pupils are thoroughly taught all national curriculum aims, ensuring they:

- 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.

Intent

Computing is an integral part of everyday modern life – the skills, knowledge and thinking methods gained through high-quality engagement with this subject will have a great impact on our pupils' futures. As such, at St. John's Prep and Senior School we aim to equip all pupils with the practical and creative abilities to design, produce and evaluate across all areas of computer science and information technology, as well as becoming digitally literate across all subjects and areas of school life. Pupils will understand how computing can enhance all areas of learning and be empowered to develop their individual talents through a range of enrichment opportunities; sharing these achievements with the wider community whilst ensuring they can negotiate these safely and responsibly. Through computing, we enable pupils to become confident, independent and responsible users of technology, not just to embrace a thriving and fulfilling future, but to lead in our ever advancing technological world.

The teaching in Computing has been planned based on a spiral curriculum from EYFS to the end of KS3. As the pupils move through the School they will build on their understanding of the concepts previously taught, allowing them to develop their understanding and advance their knowledge of the three main areas, IT, Computer Science and Online Safety. When the pupils reach KS4 and KS5 they will continue to develop their previous knowledge and skills but will have the opportunity to specialise further as they prepare for computing at University and beyond.

For the computing curriculum to be successful, teachers aim for pupils to achieve specific end points. By the end of each key stage, pupils need to be able to do the following:

Early Years Foundation Stage (EYFS)

It is important in the EYFS to give children a broad, play-based experience of IT and computing in a range of contexts, including off-computer activities and outdoor play. Computing is not just about computers. Early years learning environments should feature IT scenarios based on experience in the real world, such as using electronic equipment in role-play. Children gain confidence, control and language skills through opportunities such as 'programming' each other using directional language to find toys/objects, creating artwork using digital drawing tools and controlling programmable toys. Outdoor exploration is an important aspect and using digital recording devices such as video recorders, cameras and microphones can support children in developing communication skills.

Key Stage 1

By the end of KS1 pupils are taught to:

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions
- Write, test and debug simple programs.
- Use logical reasoning to predict and computing the behaviour of simple programs

- Create, organise, store, manipulate and retrieve data in a range of digital formats
- Communicate safely and respectfully online, keeping personal information private
- 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 are taught to:

- 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; 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
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Key Stage 3

By the end of key stage 3 pupils are taught to:

- Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- Understand several key algorithms that reflect computational thinking, use logical reasoning to compare the utility of alternative algorithms for the same problem
- Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- Understand simple Boolean logic and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers.

- Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
- Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns.

Key stage 4

By the end of key stage 4 pupils who have chosen Computing should be taught to:

All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career.

All pupils are taught to:

- Develop their capability, creativity and knowledge in computer science, digital media and information technology
- Develop and apply their analytic, problem-solving, design, and computational thinking skills
- Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns.

Teachers have ensured that all schemes of work are fully aligned with the 2014 National Curriculum for Computing, and each provides detailed individual lesson plans with learning objectives, lesson summaries, comprehensive lesson descriptions, activities with all resources, open questions to aid assessment, formative assessment and tracking pupils' progress. As the pupils reach KS4 and KS5 they will begin to work towards nationally-recognised examinations. These examinations require specific topics to be covered in order to achieve intended end points. At St. John's Prep and Senior School, we teach a spiral curriculum to ensure that the pupils have reinforced previous knowledge and skills and build upon them as they move through the school.

Implementation

At St. John's Prep and Senior School pupils follow a computing, IT and digital literacy programme taught over the key stages. The curriculum is innovative, featuring digital resources and opportunities to build practical, thinking and digital etiquette skills. The curriculum ensures that a breadth of resources are used and meaningful assessment is given. The assessment for pupils is set in the form of digital or written progression tests and later on building on exam question practice for KS4 and KS5. Learning is embedded through the development of knowledge and skills over time and through a spiral curriculum where there is an overlapping of concepts from EYFS to KS5. Progression is mapped and allows for effective differentiation, marking and feedback and stretch for more able pupils. Pupils have access to an online resources which supports their learning in the lesson and at home. Regular 'long answer' questions support pupils' literacy. Throughout the key stages pupils are exposed to the importance of communicating safely and respectfully online, and the need for keeping personal information private; teaching them to know what do when concerned about content or being contacted and to become responsible users of technologies and online services.

Teachers check pupils' understanding through effective formative and summative assessment as well as classroom discussions. This enables teachers to correct misunderstandings and/or provide further teaching to enable pupils to grasp the given concepts. To ensure that pupils have a solid understanding of the concepts and skills taught, the curriculum revisits topics and skills but each time expecting the pupils to build upon their previous knowledge. This enables the teacher to see who has understood the previous units and allows them to target specific groups to ensure they make the required progress.

Teachers ensure that pupils embed key concepts in their long-term memory through repetition of theory and skills. The spiral curriculum allows for numerous opportunities for the same skills to be covered through the key stages allowing for the pupils to build their knowledge and skill sets over time.

Impact

Through specialist teaching, implementation of our spiral curriculum, and effective assessment, it is evident the pupils are able to remember and do more at the end of a key stage than at the beginning. This is apparent through their increased abilities and successful completion of assessments. Assessing computing is an integral part of teaching & learning and key to best practice. Assessment is process orientated - reviewing the way that techniques and skills are applied purposefully by pupils to demonstrate their understanding of computing concepts. As assessment is part of the learning process, it is essential that pupils are integrally involved. Assessment can be broken down into: - Formative assessments and Summative assessment which informs the teachers current and future lesson plans as well as end goal attainment levels. This enables the teachers to see the impact of learning as the year progresses.

All learning leads to an end point as at the end of each key stage the pupils need to achieve specific targets to develop further in the following key stage. The end points

which are in line with the national curriculum which provides an understanding of how the pupils have progressed.

Series of lessons provide the pupils with sufficient time to develop the necessary skills and gain knowledge of the topic they are studying. However, this is different for Online Safety where stand alone lessons enable teachers to address key topics and talking points without disrupting the flow of other topics.

The work produced by the pupils throughout the key stages is of a consistently good quality and pupils typically achieve exceptionally well in this subject.

Cultural Capital

Within the department, we recognise that along with teaching the content of the curriculum, we are tasked with enabling our pupils to function as well-informed individuals after they leave our school.

We understand that exposure to culture and situations which pupils might not have previous experience of, is key to improving an individual pupil's cultural capital.

Computing, IT, Computer Science and Online Safety perhaps more so than any other subjects, demonstrate the value of creating cultural capital. The rising number of technology companies and their growing influence on the world both socially and economically has led to the creation of many technology billionaires.

From the outset we focus on ensuring our pupils are aware of the ethical, moral and legal issues relating to computer systems, business and digital design. As well as being regularly reminded of the personal safety issues which arise in our interconnected world.

A solid understanding of how technology affects the real world is vital for pupils to be able to succeed once they leave us.

Parents/carers are encouraged to support the implementation of IT and Computing where possible by encouraging use of IT and computing skills at home for pleasure, through Home-Learning tasks, Google classroom and use of the school website. Parents/carers will be made aware of issues surrounding Online safety and encouraged to promote this at home (see Online Safety Policy for further details). Parents/Carers will be responsible for the amount of time spent on devices at home, and for utilising unplugged activities away from devices when required.

We further expose and nurture pupils' interest and understanding of computing through workshops, whole-school assemblies and competitions.