

Computing Curriculum Summary

Through ICT lessons, the computing curriculum aims to teach children the skills both to use information and communication technology to enhance their learning across subjects and also to understand and use computer programming techniques appropriately and effectively. They are able to retrieve information that has been stored, use text, images and sound to develop ideas and know how to select from and add to texts. They learn to explore and use their imaginations, share ideas, present work effectively, review, describe and talk about their work and gather information from a range of sources safely. The schemes of work enable the children to recognize technology in the world around them. They are introduced to a number of different concepts and applications such as computer control, design and modelling, music composition, multimedia story writing, digital imaging and video editing. The digital literacy skills taught in ICT lessons are embedded across the wider curriculum. There is a strong emphasis on computational thinking for problem solving in general and to enable the children to plan increasingly complex computer programs in a variety of different languages such as Scratch, Flowol and Python. The children at Senior House use the Raspberry Pi program, adapted and tested for Primary age children by us at St John's, to carry out complex computer programming.

Skills and Content

Pre-prep

Topics:

The curriculum in the pre-prep follows the interests and experiences of the children, so it changes from year to year. Computing work is always linked in an integral way to the other subjects being studied in the curriculum and is used in a meaningful context. Discrete computer science lessons are taught and there are a range of devices in the classrooms, so children are able to practice their skills in a collaborative and cross-curricular way.

Kindergarten (KG)

Key Skills include:

- Manipulate images on screen
- Develop hand-eye co-ordination
- Create content using various programs.
- Use the iPad keyboard to type simple words such as their names
- Perform basic algorithms through a range of unplugged activities.
- Recognize that the internet can be used as a source of information
- Recognize that a range of technology is used in places such as homes and schools
- Select and use technology for a particular purpose
- E-Safety

Transition 1 (T1)

Key Skills include knowing how to:

- Handle a range of equipment and devices
- Use the trackpad, shift key, space bar and return buttons effectively
- Being aware of how to save, retrieve and print their work
- Search for a range of apps and how to launch them independently
- Format text, including changing the size, shape, style and colour
- Add an image to a piece of work

- Use the internet safely to research simple information and pictures.
- Copy and paste digital images into another app.
- Perform basic algorithms through a range of apps and unplugged activities
- Program an avatar on screen to follow a set of clear instructions
- Create their own digital images using appropriate apps
- Use a digital device to take photographs and video.
- E-Safety

Transition 2 (T2)

Key Skills include knowing how to:

- Load, save and print work using a range of programs on a range of different devices including laptops and iPads
- Format and edit text, including changing the font size, colour and style
- Perform more complex algorithms through a range of apps, online resources and unplugged activities.
- Program toys
- Use digital cameras and create animations using video editing techniques
- Create electronic presentations including images, text, voice tags.
- Search child friendly websites to access information
- Be aware of digital communication
- E-Safety

Form 1

Key Skills include knowing how to:

- Navigate to apps and software programs on a range of devices (chromebooks, iPads and laptops)
- Print, save and retrieve their work
- Keep themselves safe online, protect their personal information and understand the importance of strong and weak passwords
- Format text, manipulate text boxes and add images to their work
- Be able to discriminate between data (words, letters, numbers and information), enter data into a database with a predetermined structure and use it to answer straightforward questions and produce bar charts
- Capture and download still photos and video using the digital cameras
- Demonstrate an awareness of their audience and use some of the features of a Google Slides to help them match their work to their audience

Topics:

- File handling / Use technology safely
- Online safety
- Digital presentations
- Toy based coding and control.
- The internet and research
- Databases and Data handling
- Physical computing and control

Form 2

ICT skills are being taught through STEM lessons, in which science, technology and computing are taught in a cross-curricular way.

Key Skills include:

- Access to Google accounts from Chromebooks.
 - Internet safety
- Google Doc skills including taking and inserting photographs and videos.
- Using Google sheets for data storage and data handling including the production of charts and graphs.
- File handling using Google drive.
- Computer aided design using West Point Bridge Designer.

- Scratch programming using looping, variables and conditional statements.
- Understand the risks involved in using the internet and how to stay safe.
 - computer control (lighthouse project)

Topics:

- Orientation.
- Structures and bridge design challenge.
- Lighthouse research and design
- Seed germination investigation.
- Flight.
- Forces investigations

Form 3

Key Skills include:

- Network accounts and network security.
- Understand the risks involved in using the internet and how to stay safe.
- Have a good understanding of, and abide by, the Digital Devices guidelines.
- Use internet search engines to carry out research.
- Google accounts for communication - send and receive emails safely, with attachments.
- Understand the role of, and use, computer software in design and manufacture.
- Capture and edit video clips, adding captions and effects.
- Use data loggers to capture data, enter data into a database and use it to answer questions, using a variety of graphs.
- Understand commands and programming constructs and program a vehicle.
- Programming in LOGO using a range of constructs including variables and functions.

Topics:

- Induction.
- Google accounts.
- Computer Aided Design and Computer Aided Manufacture, used to make ball mazes in DT.
- Digital video and video editing (Live Movie Maker) - creating science videos.
- Data handling.
- LOGO programming

Form 4

Key Skills include:

- Use of Typequick to enhance text entry skills.
- Enter data and use databases to retrieve information through the use of queries and reports.
- Understand the risks involved in using the internet and particularly in social networking and how to use and create social networking pages safely and abide by the Digital Devices Guidelines.
- Understand how to use the internet for publishing information and its advantages and disadvantages.
- Understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- 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
- 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
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 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

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

Topics:

- Study skills and project work management
- Computer control.
- Australia database.
- Computer programming and modelling – Scratch
- Internet research, Web publishing and online safety.

Forms 5 and 6 Computing Enrichment

Key Skills include:

- Problem solving using computational thinking.
- Algorithm design.
- Computer hardware.
- Setting up and using a BBC micro:bit.
- MakeCode programming.
- Physical computing.
- System design.

Topics:

There are no discrete Computing lessons in Forms 5 and 6. All of the computing work that the children do is via a context taken from the wider curriculum. For example, science experiments that make use of the micro:bit for data capture and processing.

Contribution to Spiritual, Moral, Social and Cultural Development

There are a wide range of ways in which Computing contributes to SMSC, including:

- Preparing children to live in a technology rich, interconnected world
- Teaching children about the ethical and safe use of technology
- At St John's we use technology in a highly collaborative way and children become skilled at working well in groups, sharing their discoveries
- Making it easier to see and understand life in other parts of the world
- Wonder at the skills and technical ability of those who have invented computer programmes and computing
- Discussion of questions about when and how much it is appropriate to use technology and the invasion of technology on home life and relationships
- Discussion of how technology can be used to help others around the world

When teaching ICT, teachers have regard to *The Prevent Duty: Departmental advice for schools and childcare providers*, DfE, June 2015 and this policy is reflected in the curriculum.