

## Information and Communication Technology (ICT) 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**

#### **Kindergarten (KG)**

Key Skills include:

- Manipulate images on screen
- Develop mouse control and hand-eye co-ordination
- Draw and paint using a variety of programs
- Use the keyboard to type simple words such as their names
- Control programmable toys
- Use simple programs to carry out basic research
- Recognize that a range of technology is used in places such as homes and schools
- Select and use technology for a particular purpose

Topics:

The curriculum in KG 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. There is a bank of iPads and several computers in the KG classrooms, so groups of children are able to practice their skills on the computer in a collaborative and cross-curricular way.

#### **Transition 1 (T1)**

Key Skills include knowing how to:

- Handle a range of equipment included iPads and laptops
- Use the trackpad, shift key, space bar and return buttons effectively
- Log-on and how to save, retrieve and print their work
- Search for a range of apps or programs 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 find simple information and pictures
- Copy and paste digital photography into another document
- Create simple pictograms

- Program a floor robot with a clear set of instructions (up to 6)
- Program an avatar on screen to follow a set of clear instructions (up to 6)
- Create their own digital images using appropriate apps
- Use a digital camera

Topics:

- Story Making
- Data collection and handling
- Control – toy and on screen
- Creating digital art
- On-line and equipment 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
- Use computer design and modelling programs to move programmable toys and on screen avatars with up to 12 instructions
- Program toys to respond to sensors
- Use digital cameras and create animations using video editing techniques and software
- Create electronic presentations including images and text
- Create and use pictograms on the computer
- Search child friendly websites to access information
- Use digital communication methods - including email
- Keep themselves safe whilst online

Topics:

- Google docs
- Programming (LOGO and Textease Turtle)
- Finding information and creating a poster
- Story making
- Cameras and still photos
- Video and animation (Zu3D)

### **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 and import and edit content into a short film
- Demonstrate an awareness of their audience and use some of the features of a PowerPoint to help them match their work to their audience
- Program screen avatars and understand how to use Scratch Junior
- Compose basic tracks using garageband, include some simple information on tempo, pitch and key
- Communicate online and how to use email to send a message and add an attachment.

Topics:

- Combining text and graphics

- Databases and Data handling
- Computer modelling (simulations)
- Digital images (Movie Maker)
- E-Safety
- Writing for different audiences
- Music composition

### **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.
- Google Doc skills including taking and inserting photographs and videos.
- Making short 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.

Topics:

- Orientation.
- Particles and change of state.
- Structures and bridge design challenge.
- Internet safety
- Flight.
- Plant investigation.
- Human skeleton.

### **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.
- Counting using the binary system.
- Computer hardware.
- Setting up and using a Raspberry Pi computer.
- Raspberry Pi GPIO programming.
- The fundamentals of programming in Python.
- Understand and abide by the digital devices guidelines.
- How the Internet and search engines work.

Topics:

- The history of the computer
- Computational thinking
- Data processing
- Computer hardware
- Programming constructs
- Raspberry Pi - set up, file handling and GPIO
- Control programming in Python
- Object oriented programming
- Programming with functions
- Hacking a text based adventure game

**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 *The Prevent Duty: Departmental advice for schools and childcare providers*", DfE, June 2015 and this policy is reflected in the curriculum.**