Computing and ICT

"Computer Science is no more about computers than astronomy is about telescopes." — *Edsger W. Dijkstra*

COMPUTING AND ICT

New technologies have become integral to the lives of children and young people in today's society, both within schools and in their lives outside school. The internet and other digital information and communications technologies are powerful tools, which open up new opportunities for everyone. These technologies can stimulate discussion, promote creativity and stimulate awareness of context to promote effective learning. St Dunstan's College recognises the ever-increasing centrality of digital literacy to success in the modern educational, commercial, and social world.

Computing and ICT are taught both as specific knowledge and skill sets in dedicated lessons, and also within subject specific areas of the curriculum. It is the College's strong belief that whilst the development of digital literacy might be possible via dedicated Computing lessons, digital fluency is best achieved when pupils use and develop their ICT knowledge and skills within the wider curriculum and broader aspects of their learning.

The development of digital fluency amongst pupils at the College is evident in the following ways.

At **Key Stage 1** pupils are taught to:

- Use programmable toys, developing and recording sequences of instructions as an algorithm. This is then developed further to creating and predicting simple algorithms on programs and spotting and fixing bugs within a program
- Develop their use of recording equipment by using different features of a digital video camera and sound recording equipment and begin to edit and enhance photos and videos
- Use painting programs and toys appropriately to create and change images, whilst developing their ability to save, retrieve and change their work
- Begin to use the internet to find images and sort them into particular criteria. Pupils then begin to use the internet appropriately to research a topic
- Develop basic keyboard and mouse skills, alongside sills in combining text and images
- Explore how computer games work, using logical reasoning to make predictions and test these predictions
- Use simple chart software to collect and represent data in a digital way

At **Key Stage 2** pupils are taught to:

- Write a program to create an animation, a simple educational game, an interactive toy/game and a mobile app
- Find and correct bugs in a program by building up resilience and strategies for problem solving
- Further develop their recording skills by shooting live video, review and edit clips by setting in/out points, produce digital music and …..
- Explore computer networks, including the internet, understanding the physical hardware connections necessary for computer networks to work
- Communicate and be safe online
- Collect, record and analyse data using the internet and data logging hardware. From this pupils then present their findings in a digital format
- Edit and write HTML using HTML tags and hyperlinks to connect ideas and sources. Pupils use these skills to produce their own page on an information research website open to editing and create a website about cyber safety. Pupils also develop their understanding of, and create, a blog
- Become familiar with the tools and techniques of a vector graphics package to fuse geometry and art. Pupils then develop their skills in creating a virtual 3D space
- Encrypt and decrypt messages in simple ciphers

At **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 and understand several key algorithms that reflect computational thinking
- Use two or more programming languages, at least one of which is textual (Python), to solve a variety of computational problems; make appropriate use of data structures, design and develop modular programs that use procedures or functions
- Understand simple Boolean logic and some of its uses in circuits and programming; and 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.
- 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, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability. Pupils are given opportunities throughout KS3 to develop multiple products for a specific purpose and audience including digital artwork and animation projects.
- 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.

Computer Science was introduced at **Key Stage 4** in September 2018 using the Cambridge National iGCSE qualification. This course allows pupils to develop:

- Computational thinking i.e. thinking about what can be computed and how.

- Understanding of the main principles of solving problems by using computers
- Understanding that every computer system is made up of sub-systems, which in turn consist of further sub-systems
- Understanding of the component parts of computer systems and how they interrelate, including software, data, hardware, communications and people
- Skills necessary to apply understanding to solve computer-based problems using a high-level programming language (Python)

Computer Science will be introduced at **Key Stage 5** in September 2020, using the Cambridge National A Level specification. The course will be designed to develop pupils' knowledge and understanding of computer science through entry to higher education and provide the necessary skills and knowledge to seek employment in areas that use computer science.

PROMOTING GOOD AND CONSTRUCTIVE USE OF ICT

St Dunstan's College is committed to pupils' entitlement to safe internet access at all times. The school's safeguarding and behaviour policies and procedures will endeavour to ensure that pupils will be responsible users and stay safe while using the internet and other communications technologies for educational, personal and recreational use.

The College ICT systems and users are protected from accidental or deliberate misuse that could put the security of the systems and users at risk. Pupils agree to be responsible users, to ensure that there is no risk to their safety or to the safety and security of the systems and other users. Specifically, they must:

- Only use ICT at the College for school purposes.
- Only use their personal login and password and never share these with others.
- Ask permission before using a memory stick or other storage device (including phones and tablets) on a College computer due to recent GDPR and security regulations
- Only open and delete their own files.
- Ensure that the messages they send, including emails, instant messages, Snapchat, Instagram, etc. will be polite and sensible.
- Never give out their own or other people's name, address (including email) or phone number online.
- Never upload any images of school activities to any social networking site.
- Not deliberately look for, save or send anything that could be construed as obscene, hateful, threatening or offensive.
- Understand that sending a message with the deliberate intention of making another person feel offended, embarrassed, threatened or hurt is bullying, and will be dealt with according to the College Anti-bullying policy.
- Tell a member of staff, their parents or other appropriate adult straight away, if they see anything they are unhappy with on the computers or other devices.
- Understand that the College can check their computer or other devices and that their parents/carers can be contacted if College staff are concerned about their e-safety.

- Understand that they must check their College email account regularly (at least once per day) and that they must attempt to respond to or acknowledge email messages in a timely manner.
- Understand that the sanctions for misuse of ICT will be in line with the Expected Pupil Behaviour Policy, and may include a call-back, detention, suspension of ICT privileges or more serious sanctions for actions such as bullying or possessing or sending offensive material.

COMPUTING AT ST DUNSTAN'S COLLEGE

High levels of digital literacy are promoted by the availability of desktop computers, tablets and other computing technology across both the Junior and Senior School, so that learning using ICT is embedded most effectively in all subjects.

Pupils across the school, understand that technology can be found everywhere and not just in the ICT suite at school. They are familiar with a broad range of digital skills and technology and how they encounter them in everyday life including:

- NFC technology when using contactless payments (travelling to and from school)
- ATM's to withdraw cash from savings accounts and how the processing of this transaction occurs
- Sensors e.g. humidity and pressure (cars), temperature (Air Conditioning), magnetic field (traffic lights)
- Input and output devices for disabled computer users including voice recognition, screen readers and other ergonomic equipment.
- Processes, practices and technologies designed to protect networks, computers, programs and data from attack, damage or unauthorised access. Pupils develop an understanding of Cyber Security, using '*Cyber Discovery*'; HM Government's Cyber Initiative for Schools.

NETWORK SECURITY and FACILITIES

The following systems are in place to enable the Foundation to monitor and filter web content and emails:

1. Web Screen is the Foundation's web filter.
2. Sophos is the Foundation's PC anti-virus.
3. MailProtect is the Foundation's third-party email spam filter.

These systems are provided to the Foundation by the London Grid for Learning, who also ensure the usability, uptime and availability of these systems. Any person that logs on to a Foundation device, should pick up these filtering and monitoring systems.

The school uses a virtual learning platform, **Firefly**, as a way of communicating, sharing and providing content for both pupils and parents. The platform can be accessed from home and allows information, events, photographs and videos to be accessed and shared easily; a window in to the school day and a way to share and preserve key learning experiences throughout the academic year.

Internet safety is taught across every year group and at multiple times throughout the academic year. St Dunstan's offers a safe online environment through filtered internet access, we recognise the importance of teaching children about online safety and their

responsibilities when using communication technology. This forms part of the curriculum in Computing and is discussed as part of some PSHEE provision. External speakers are also invited to discuss the appropriate use of technology in and outside of school.

A range of software applications are used throughout the entire curriculum and the ICT Support team ensures all relevant applications are up to date and that staff and pupils can access these throughout the school. Some examples include, Microsoft Office (whole-school), Adobe Photoshop (Art & Design), ProDesktop (Design Technology), Google Earth (Geography), Garageband (Music), QLab (Drama) and Python IDLE (Computing).

EQUALITY ACT 2010 and SEND

For pupils at St Dunstan's College with specific educational needs, equal access to ICT as their peers is provided in line with our responsibilities under the Equality Act 2010. Teachers may liaise with the Computing teacher on the use of ICT to improve pupil involvement in the curriculum e.g. to improve writing and presentation, to practise skills or to focus on the interpretation of graphs.

The benefits of using ICT for some pupils (with or without diagnosed SEND) may include:

- Increased motivation
- Opportunities for collaborative activities
- Improvements in accuracy and appearance of work
- Easier access to information
- Opportunities for increased independent learning
- Strengthening and consolidation of Fine Motor Skills
- As a tool for communication for children with Speech and Language difficulties

At St Dunstan's, those who require support with their processing or speed of handwriting have been given an option to use a laptop. The use of these devices is assessed by the SENDCo department and the College has a BYOD (Bring Your Own Device) policy.

Where appropriate (and with teacher's permission), the SENDCo encourages the use of assistive technology should a pupil require organisational support (theory and/or practical).
Pupils with a hearing impairment use a piece of equipment that holds a wireless microphone, and connects to their hearing aids (known as a Roger Pen or Radio). This allows the pupils to hear what is being said by the individual or group talking without a large amount of background noise. Currently, no pupils require a reader pen or any technology to help write (other than a laptop).

COPYRIGHT AND DATA PROTECTION

The school ensures that we have a legal licence for all our software and does not undertake any illegal copying. Our software inventory is kept by the ICT Support team. We do not re-publish any scanned or digitised images without checking copyright and/or permission from the author. Parental consent is sought to include images of their children on our school website and social media platforms.

Computing and ICT			
Author/s:	Andrew Johnson Paul Cozens	**Date Reviewed:**	Michaelmas 2019
Date Ratified:	Michaelmas 2019	**Next Review Date:**	Lent 2020
Committee:	N/A	**Clerk to the Governors** **Signature:**	N/A