Sandon Primary Academy – Computing: Year 6

Where we improve our knowledge and understanding of technology to enable us to participate and change technological world around us in a safe way.

Autumn Term	Spring Term	Summer Term
Computer Science: Programming Learning the fundamentals of the programming language of Python, they will test, change and explain what their program does. Children use loops and explain what repeats do and what the parts of the loop do while recognising that computers choose random numbers and decompose the program into an algorithm.	**Computer Science: Computer Systems and Networks** Discovering the history of Bletchley Park, historical figures, and computer science. Children learn about code-breaking and password hacking as well as decoding messages. Children present information about historical figures.	**Information Technology: Creating Media** Writing, recording and editing radio plays set during WWII, looking back in time at how computers have evolved and designing a computer of the future.
Key Objectives: **Lesson 1: Online Safety: Health and Wellbeing** • I can assess and action different strategies to limit the impact of technology on health (e.g. night-shift mode, regular breaks, correct posture, sleep, diet and exercise). **Lesson 2: To Tinker with a New Piece of Software: Tinkering with Logo** • I can predict what I think something new will do • I can explore something independently • I can explain what I found **Lesson 3: To Understand Nested Loops: Nested Loops** • I can explain what a loop is • I know why we use loops • I can explain how a nested loop works **Lesson 4: To Understand Basic Python Commands: Using Python** • I can decompose a picture • I can 'remix' a project by tinkering • I can choose Python commands for a purpose **Lesson 5: To Use Loops When Programming: Using Loops in Python** • I can explain what a loop is • I can suggest an appropriate place to use a loop • I can use the syntax for a loop **Lesson 6: To Understand the Use of Random Numbers: Coding Mondrain** • I can identify the need for random numbers • I can decompose a program • I can write an algorithm	**Key Objectives:** **Lesson 1: Online Safety: Online Bullying** • I can explain how someone would report online bullying in different contexts. **Lesson 2: To Understand That There are Lots of Different Types of Secret Codes: Secret Codes** • I can understand why codes might be valuable • I can identify some common secret codes • I can decipher some secret codes • I can write a message using a secret code **Lesson 3: To Understand the Importance of Having a Secure Password: Brute Force Hacking** • I know what is meant by brute force hacking • I understand why it is important to have a secure password • I understand why a longer password is more secure than a short one **Lesson 4: To Understand the Importance of Bletchley Park to the WW2 War Effort: Bletchley Park** • I know that Bletchley Park was important during WWII • I know what the first computer was built for • I can create an information poster about Bletchley Park **Lesson 5: To Understand About Some of the Historical Figures that Contributed to Technological Advances: Computing Heroes** • I know some of the people who contributed to computing history • I can identify what some historical achieved • I can research one historical figure in detail **Lesson 6: To Research and Present Information about Historical Figures in Computing: Computing Heroes Part 2** • I can identify why historical figures were influential in creating modern computers • I can present information using a presentation software • I can explain why a historical figure is important	**Key Objectives:** **Lesson 1: Online Safety: Online Reputation** • I can explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity. **Lesson 2: To Tinker with sound: Playing with Sound** • I can identify the key features of a radio play. • I can record sounds to sound recording software. • I can add tracks in order to include sound effects into my recording. **Lesson 3: To Record, Edit and Add Sound Effects to a Radio Play: Radio Plays** • I can plan and record a radio play. • I can edit my radio play to remove any mistakes. • I can add sound effects to my radio play to make it more interesting. **Lesson 4: To Understand How Computers Have Changed and the Impact This Has Had on the Modern World: First Computers** • I can identify how computers have evolved over time. • I understand that computers are everywhere in modern life. • I can recognise some of the earliest computers and • how they impacted the modern world. **Lesson 5: To Research One of the Computers That Changed the World and Present Information About it to the Class: Computers that Changed the World** • I can present information about one device that changed the world. • I can research information carefully. • I can recognise whether information is reliable. • I can cite and record sources found on the internet. **Lesson 6: To Design a Computer of the Future: Future Computer** • I can recognise the components of a computer and why they are important. • I can identify how computers have evolved over time. • I can use my understanding of historic computers to design a computer of the future.
Key Vocabulary: • **Algorithm** – A sequence of instructions which, when followed, solve a problem. • **Code (Computer)** – A set of instructions written in programming language, to tell a computer what to do. • **Computer Command** - To give an order or instruction to a computer, to complete a particular task. • **Decompose** – To break something down into smaller chunks. • **Import (Software)** – To pull another file into software, to place, edit and manipulate. • **Indentation (Programming)** – In programming (e.g Python), indentation, is used to define a block of code. • **Loop** – A repeated sequence of instructions. • **Nested Loop** – A loop, within a loop. • **Random Numbers** – An unpredictable sequence or reveal of numbers. • **Remix** – Something that has been reworked to produce a carrying version of the original. • **Script Libraries** – A series of pre-written, functional codes that can be accessed and imported into a program to save time.	**Key Vocabulary:** • **Acrostic Code** – A type of code where the first letter of each word, line or paragraph when put together spells a message. • **Brute Force Hacking** – When someone (known as a hacker) uses different types of methods, such as trial and error, to crack entry into secured information. • **Caesar Cipher** – A way in which every letter is replaced with another letter in a fixed number of places down from the alphabet. • **Chip and Pin System** – A payment system to buy something securely which can be accessed by entering a PIN. • **Cipher** – Information that is written in a secret way, known as a code. • **Date Shift Cipher** – A code derived from the date that tells you how many spaces to move each of the letters in the coded message. • **Encrypt** – Converting information/data into a secret code/message, to avoid unauthorised access. • **Invention** – A new device or process that solves a problem. • **Nth Letter Cipher** – A type of code where you choose the Nth letter of the text/code again and again until the text ends.	**Key Vocabulary:** • **Background Noise** – A (secondary) sound that is there but your focus is not fully on it as you are focussed on another (primary) sound. • **Byte** – A byte is made up of 8 bits. One bit contains a single binary value of 0 or 1. • **Computer** – Electronic machines that accept and process information to produce an output and then store the results. • **CPU** – Central Processing Units are the brains of a computer and deal with all of the data is receives from input and output devices, as well as programs ran within the computer. • **Memory Storage** – A portable, compact form of digital storage used for transfer files from one device to another or keep safe. • **Mouse** – A Handheld hardware input device that can move and select text, icons, files and folders on your computers. • **Operating Systems (OS)** – Base software needed on a computer for it to manage basic commands, hardware and software and provide a user-friendly interface. • **Radio Play** – Scripts written for broadcasting on-air. • **RAM (Random Access Memory)** – hardware that allows data to be recalled or stored within a computer.

Cross-Curricular Links:

Autumn: Literacy: Prediction
Art: Piet Mondrian: Digital Art
Spring: History: Chronological Knowledge
Maths: Problem Solving/Reasoning
RSHE: Online Safety
Literacy: Composition
Summer: Music: Digital Music
Literacy: Radio Play

Enrichment:

Autumn: Art Gallery
Spring: Trip to Bletchley Park
Summer: Showcase Future Computers in Dragon's Den style pitch to the 'Tech Team'

Key Computing Skills which can be revisited throughout other Subject Areas:

- Information Technology: logging in and out, using a mouse/mouse pad, developing touch typing skills and keyboard shortcuts, navigating popular websites/programs with confidence, typing for a purpose, saving and retrieving files, creating a range of digital content (posters, slideshow, videos), creating files to store files appropriately.
- Digital Literacy: e-safety, collaboration, creativity, critical thinking and evaluation, functional skills, effective communication, the ability to find and select information, cultural and social understanding.

Online Safety:

- **Autumn**: Health and Wellbeing
- **Spring**: Online Bullying
- **Summer**: Online Reputation

Key Computing Days:

- National Coding Week - September
- Safer Internet Day – February

• **Variable** – This could be a number or text, that can change each time the program is run and often in combination with selection to change the end result of the program.	• **Password** – A unique combination of letters, numbers or symbols that protect personal information online. • **Pigpen Cipher** – A substitution code, where letters are exchanged for symbols, which are part of a specific grid. • **Technological Advancement** – When scientific discoveries are made that can lead to the development of technologies. • **Trial and Error** – To test a method of resolving something, and if the fails, to try another method and continue this process until success has been achieved.	• **ROM (Read Only Memory)** – Information stored within ROM can only be read and not edited. • **Sound Effects** – Sounds to enhance an event or bring fantast aspects to life in a film. • **Touch Screen** – Allows the user to use their finger to control the device via the screen. • **Trackpad** – An input device found on laptops. It is used to move the cursor with the touch of your finger.
Resources (IT): • Online Safety: https://projectevolve.co.uk/sign-in/ Username: lcolclough@sandonprimary.org.uk Password: Sandon123! (Lesson 1) • Laptops/iPads (Lesson 2-6) • https://turtleacademy.com/ (Lesson 2-3) • https://trinket.io/python/afc54a3e64 (Lesson 4) • https://trinket.io/python/3aa9351fc6 (Lesson 5) • https://trinket.io/python/593bc13fbf (Lesson 5) • https://trinket.io/python/00b9be52e0 (Lesson 5) • https://trinket.io/python/205c283a59 (Lesson 6)	**Resources (IT):** • Online Safety: https://projectevolve.co.uk/sign-in/ Username: lcolclough@sandonprimary.org.uk Password: Sandon123! (Lesson 1) • Laptops (Lesson 3-6) • Website: https://scratch.mit.edu/projects/236230906/editor (Lesson 3) • Website: https://forms.office.com/Pages/ShareFormPage.aspx?id=cNnvLYNqtU6FgImLcdsIWDQNzrV9t9BsNbcPSOiWJZUM0g0TDFYQUpaMEE1WDhCTkVZT1BLSzVRSi4u&sharetoken=XesHXdDuk3NhLt67IXsw (Lesson 4) • Website: https://bletchleypark.org.uk/ (Lesson 4) • Website: https://forms.office.com/Pages/ShareFormPage.aspx?id=DQSIkWdsW0yxEjajBLZtrQAAAAAAAAAAAAO__c4NHCtUQTRMWFpPQkRWTVRESlpHQVc4TUYwNU82US4u&sharetoken=gbHbUU9nmO0y9EsN1oIT (Lesson 6)	**Resources (IT):** • Online Safety: https://projectevolve.co.uk/sign-in/ Username: lcolclough@sandonprimary.org.uk Password: Sandon123! (Lesson 1) • Laptops - (Lesson 2-6) • Audacity (Lesson 2-3) • https://www.bbc.co.uk/sounds/play/p07smjtx (Lesson 2) • https://video.link/w/IFy_0xVIG0M (Lesson 2) • https://sound-effects.bbcrewind.co.uk/ (Lesson 2) • https://video.link/w/hd8e (Lesson 3) • https://froggerclassic.appspot.com/ (Lesson 4) • https://www.bbc.co.uk/bitesize/topics/zymykqt/articles/ztrq7ty (Lesson 4) • Smartphone (Lesson 5) • https://video.link/w/YnNqTHxowqk (Lesson 5) • https://microbit.org/get-started/user-guide/overview/#new-micro:bit-with-sound (Lesson 6)	

National Curriculum: By the end of KS2, pupils will be able 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
- 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.
- 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
- 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