Sandon Primary Academy – Computing: Year 5

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	**Computer Science: Computer Systems and Networks**	**Information Technology: Data Handling**
Applying programming skills to create sounds and melodies leading to a battle of the bands performance.	Learning what a search engine is and understanding why keywords and phrases are important, identifying inaccurate information and recognising the terms 'copyright and 'fair use'. Children make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.	Identifying some of the types of data that the Mars Rover collects and explaining how the Mars Rover transmits the data back to Earth. Children will read binary numbers, and understand binary addition as well as identifying input, processing and output on the Mars Rovers.

Autumn Term

Key Objectives:

Lesson 1: Online Safety: Health and Wellbeing
- I recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals.

Lesson 2: To Tinker: Tinkering with Scratch Music Elements
- I know that Scratch is a coding application that has music elements
- I can predict what I think different code blocks will do
- I can explore Scratch independently
- I can explain what I found from tinkering

Lesson3: To Create a Program that Plays Themed Music: Scratch Soundtracks
- I can use Scratch's basic sound commands
- I can include a loop in my program
- I can debug simple errors in my code

Lesson 4: To Plan a Soundtrack Program
- I can decompose a story
- I can plan my program by tinkering
- I can explain how my program will add to the story

Lesson 5: To Program a Soundtrack
- I can work from a plan
- I can use a range of programming commands
- I can explain how my program enhances the scene

Lesson 6: To Program Music: Battle of the Bands
- To program music
- I can combine known commands
- I can code music with a purpose
- I can use repetition in a program
- I can use various forms of output [sound]

Spring Term

Key Objectives:

Lesson 1: Online Safety: Online Bullying
- I can identify a range of ways to report concerns and access support both in school and at home about online bullying.

Lesson 2: To Understand What a Search Engine is and How to Use it: Searching Basics
- I can explain what a search engine is
- I can use a search engine to navigate the web
- I can suggest keywords for searching

Lesson 3: To be Aware That not Everything Online is True: Inaccurate Information
- I recognise that not everything online is true
- I understand anyone can create a website
- I can suggest ways of checking validity

Lesson 4: To Search Effectively: Web Quest
- I understand the importance of keywords
- I can use the acronym TASK
- I can use my search skills to answer focused questions

Lesson 5: To Create an Information Poster: Information Poster
- I have a clear poster title
- I can type at least five facts
- I can choose appropriate pictures, colours and designs
- I can consider fair use
- I can credit people for information, images and videos I use

Lesson 6: To Understand how Search Engines Work: Web Crawlers
- I understand the role of a web index
- I can explain what web crawlers are
- I can discuss page rank

Summer Term

Key Objectives:

Lesson 1: Online Safety: Online Reputation
- I can describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect

Lesson 2: To Identify How and Why Data is Collected From Space: Mars Rover
- I can recall the meanings of 'data' and 'transmit'.
- I can identify a type of data that the Mars Rover may transmit back to Earth.
- I can identify the challenges of transmitting data over large distances.
- I can explain why data is being collected from the Mars Rover.

Lesson 3: To Read and Calculate Numbers Using Binary Code: Binary Code
- I can identify binary as the most basic way that computers communicate.
- I can read binary numbers up to eight characters.
- I can recall that each number (one or zero) is referred to as a bit.
- I can calculate binary numbers, knowing each digit is worth double the one that precedes it.

Lesson 4: To Identify the Computer Architecture of the Mars Rover: Computer Architecture
- I can identify sensors.
- I can identify the difference between computer input and output.
- I can explain how the size of random-access memory (RAM) affects the processing of data (CPU).

Lesson 5: To Use Simple Operations to Calculate Bit Patterns: Using Binary Numbers
- I can recall how binary is used to represent numbers up to 255.
- I can recall that computers use binary mathematically to calculate data.
- I can carry out binary addition.

Lesson 6: To Represent Binary as Text: Using Binary Text
- I can recall that binary is the main means of all data transfer.
- I can identify that data transfer needs a common language.
- I can use binary to create a written message.

Autumn Key Vocabulary

Key Vocabulary:
- **Basic Commands** – The simplest instructions that can be used.
- **Bug** – A mistake/error in code, stopping the program from working as intended.
- **Code (Computer)** – A set of instructions written in programming language, to tell a computer what to do.
- **Code (Verb)** – To write in programming language (code)
- **Code Block** – A visual representation for a section of code that performs a certain job. They can be snapped together to build a program.
- **Debug** – To remove and repair the error/mistake in computer code.
- **Error** – A mistake or fault in software.
- **Live Loop** – Like loops, but instead of repeating a number of times, they go on forever. You can also have multiple running at the same time.
- **Loop** – A repeated sequence of instructions.
- **Pitch (Music)** – A musical term which refers to how high or low a note is.

Spring Key Vocabulary

Key Vocabulary:
- **Algorithm:** A sequence of instructions which, when followed, solve a problem.
- **Company Logo** – Symbol used to represent an organisation which is easily identifiable.
- **Data Leak** – When information is released without approval from the owner/creator.
- **Data Privacy** – Right to keep information private and away from those you do not wish to have access.
- **Fake News** – False and inaccurate information that is shared in a convincing way.
- **Inaccurate Information** – When information is false/untrue.
- **Index** – A computer saves key information about previously searched results, to make this quicker next time they are accessed.
- **Keywords (Internet)** – Set of words used to define and produce an accurate search engine result.
- **Network** – More than one electrical device is connected in a network through the internet/local connection in order to share files/information.

Cross-Curricular Links:

Autumn: Music: Listen and Appraise
: Improvise and Compose
: Play and Perform
Literacy: Reading/Comparisons
Spring: RSHE: Online Relationships
Summer: Maths: Data Handling

Enrichment:

Autumn: Hold a year group Battle of the Bands competition, using specialist music teacher to judge.
Spring: To teach Year 4 how search engines work by sharing their information posters (Lesson 4).
Summer: Chn to write a message using Binary Code for Tech Team to crack.

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),
- Digital Literacy: e-safety, collaboration, creativity, critical thinking and evaluation, functional skills, effective communication, the ability to find and select information.

Online Safety:

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

Key Computing Days:

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

- **Program Language** – The particular library of code which a piece of software is written in.
- **Rhythm –** Musical term that refers to the 'pattern' of long/short notes.
- **Scratch** – A coding program in which you can develop interactive games and animations
- **Sprite** – Visual objects that can be manipulated through code, for example to move, respond, appear or disappear.
- **Soundtrack –** A music recording that accompanies a film/TV show.
- **Tempo (Music) –** A musical term which refers to the speed of the music.
- **Timbre (Music) –** A musical term which refers to the characteristic trait of a sound.

- **Online** – When a person is accessing the internet through an electronic device.
- **Page Rank** – Webpages are sorted in an order to give the user the most suitable results at the top of the list.
- **Search Engine** – Search the internet's database of information.
- **TASK** – Title, Author, Summary, Kids
- **Web Crawler** – Program which uses keywords to search the WWW in a logical and systematic way to find suitable results.
- **Website** – A series of webpages which can be discovered on an internet browser, that all belong to a single domain name.
- **WWW** – World Wide Web. Found at the beginning of the URL.

Resources (IT):
- Online Safety: https://projectevolve.co.uk/sign-in/
  Username: lcolclough@sandonprimary.org.uk
  Password: Sandon123! (Lesson 1)
- Laptops/iPads – Scratch (Lesson 2-6)
- Website: https://video.link/w/gybe (Lesson 2)
- Website: https://scratch.mit.edu/projects/editor/?tutorial=getStarted (Lesson 2)
- Website: https://video.link/w/0eaGb (Lesson 4)
- Website: https://scratch.mit.edu/projects/473916372/ (Lesson 5)
- Website: https://scratch.mit.edu/projects/473921260/editor/ (Lesson 6)

Resources (IT):
- Online Safety: https://projectevolve.co.uk/sign-in/
  Username: lcolclough@sandonprimary.org.uk
  Password: Sandon123! (Lesson 1)
- iPads for Research (Lesson 2)
- Website: https://video.link/w/B6t1 (Lesson 3)
- Website: https://www.allaboutexplorers.com/hunts/ (Lesson 3)
- Website: https://video.link/w/KQce (Lesson 3)
- Website: https://video.link/w/SQce (Lesson 4)
- Website: https://video.link/w/Owdad (Lesson 5)
- Website: https://wordpress.org/openverse/search/?referrer=creativecommons.org&q=tudor%20houses (Lesson 5)
- Website: https://www.canva.com/ / https://sketch.io/sketchpad/ (Lesson 5)

Resources (IT):
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  Username: lcolclough@sandonprimary.org.uk
  Password: Sandon123! (Lesson 1)
- iPad/Laptop (Lesson 2-6)
- Website: https://video.link/w/VQbe (Lesson 2)
- Website: https://spaceplace.nasa.gov/mars-rovers/en/ (Lesson 4)
- Website: https://video.link/w/jRbe (Lesson 5)
- Website: https://video.link/w/ZZ9dd (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