COMPUTING AT SEC

NATIONAL CURRICULUM – KS1

Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

- create and debug simple programs

- use logical reasoning to predict the behaviour of simple programs

- use technology purposefully to create, organise, store, manipulate and retrieve digital content

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

NATIONAL CURRICULUM – KS2

Key stage 2

Pupils should be taught 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; 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.

Intent:

At St Edmund Campion, we aim to model and educate our pupils on how to use technology positively, responsibly and safely. We want pupils to understand that when using technology there is a choice; particularly when it comes to online presence.
We provide our pupils with a broad and balanced curriculum that will enable them to be creators and masters of technology in order for them to successfully navigate their way in an ever-increasing technological world.

IMPLEMENTATION

Implementation:

Computing at St Edmund Campion provides challenging and enjoyable 'plugged' and 'unplugged' activities through the three core strands: Computer Science, Information Technology and Digital Literacy.

Staff use the KAPOW condensed curriculum to ensure coverage and progression. KAPOW will enable us to ensure the Computing knowledge and skills are at the heart of each Computing lesson as they will be taught discretely.

The Digital Literacy strand is embedded whenever the children use technology but also taught in stand alone sessions such as on Safer Internet Day. Staff and parents also have access to the National Online Safety platform in order to further support the children in an ever-changing digital world.

Each classroom has two computers, Key Stage Two classrooms have 9 iPads in a lockable cabinet and Key Stage One has shared access to 30 iPads, to allow children constant access to technology.

KAPOW Curriculum Mapping

Key Stage One

National Curriculum Objective	Where is it covered?
• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	Year 1 – Bee-Bots, Algorithms unplugged Year 2 – What is a computer? Algorithms and debugging, Data Handling: International Space Station
• Create and debug simple programs	Year 1 – Bee-Bots, Algorithms unplugged Year 2 –Algorithms and debugging
• Use logical reasoning to predict the behaviour of simple programs.	Year 1 – Bee-Bots, Digital imagery Year 2 - Algorithms and debugging
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Year 1 – Bee-Bots Year 2 – Word processing, Scratch Jr
• Recognise common uses of information technology beyond school	Year 1 – Data Handling: Introduction to data, Improving mouse skills Year 2 – What is a computer? Online safety
• Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Year 1 – Improving mouse skills Year 2 – Online safety

Key Stage Two

National Curriculum Objectives	Where is it covered?
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Year 3- Journey inside a computer, Scratch Year 4- HTML, Computational thinking, Further coding with Scratch Year 5- Sonic PI Year 6- Python
• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Year 3- Scratch Year 4- HTML, Computational thinking, Further coding with Scratch Year 5- Sonic PI Year 6- Python
• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Year 3- Journey inside a computer, Scratch Year 4- HTML, Computational thinking, Further coding with Scratch Year 5- Sonic PI Year 6- Python
• 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	Year 3- Journey inside a computer, Networks and the internet Year 4- Collaborative learning Year 5- Search engines, Mars Rover Year 6- Bletchley Park, Big data 1, History of computers
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Year 3- Journey inside a computer, Networks and the internet, Creating media: Video trailers Year 4- Online Safety (additional unit) Year 5- Search engines, Online Safety Year 6- Bletchley Park
• 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	Year 3- Scratch, Networks & the internet, Video trailers Year 4 – HTML, Computational Thinking, Further coding with Scratch, Collaborative learning Year 5 – Sonic Pi, Mars Rover, Online Safety Year 6 – Python, Bletchley Park, Big data 1, History of computers
• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Year 3 – Online Safety (additional unit) Year 4 – HTML Year 5 – Search engines, Online Safety Year 6 – Bletchley Park, Big data 1

OVERVIEWS OF THE YEAR/ PROGRESSION OF SKILLS

Computing
St Edmund Campion

To provide children with complete coverage, the three Computing strands have been further broken down.

Computer Science

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Explore and tinker with hardware to develop familiarity and introduce vocabulary.	Explore and tinker with hardware to find out how it works.	Understand what a computer is and that it's made up of components.	Understand what components do and how they work together.		Learn that external devices can be programmed by a separate computer.	Design a computer of the future.
Recognise and identify letters and numbers on a keyboard.	Recognise that some devices are input and others are output.	Know that technology is doing what we want it to do via its output.	Draw comparisons across different types of computers.		Recognise how the size of RAM affects the processing of data.	Learn about history of computers and how they have evolved over time.
Develop basic mouse skills such as moving and clicking.	Learn where keys are located on the keyboard.	Develop confidence with the keyboard and the basics of touch typing.	Know the purpose of routers.			Identify barcodes, QR codes and RFID and devices and applications that can scan them.
	Operate a device to take photos and videos.	Recognise that buttons cause effects.				
		Using greater control when taking photos with cameras, tablets or computers.				

Hardware	Networks and data representation		Computational thinking	Programming
Using software	Using email and internet searches		Using data	Wider technology

			Networks and data representation	Computational thinking	Programming	
			Identify and understand the role of the key components of a network.

Understand that websites and videos are files that are shared from one computer to another.

Recognise links between networks and the internet.

Learn how data is transferred. | Understand that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. | Learn the vocabulary data and transmit.

Recognise that computers transfer data in binary.

Relate binary signals to the character-based language.

Learn that messages can be sent by binary code. | |
| Use logical reasoning to understand instructions and | Use logical reasoning to predict the behaviour of simple programs. | | Use logical reasoning to explain how simple algorithms work. | Use past experiences to help solve new problems. | Predict how software will work based on previous experience. | Use past experiences to help solve new problems. |

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predict outcome.	Learn that decomposition means breaking a problem down into smaller parts. Use decomposition to solve unplugged challenges. Develop skills associated with sequencing in unplugged activities. Follow a basic set of instructions. Assemble instructions into a simple algorithm.	Explain what decomposition is. Decompose a game to predict the algorithms used to create it. Explain what an algorithm is. Follow an algorithm. Create a clear and precise algorithm. Learn that programs execute by following precise instructions. Incorporate loops within algorithms. Learn that there are levels of abstraction.	Use decomposition to explore the code behind an animation. Explain the purpose of an algorithm. Form algorithms independently. Use repetition in programs.	Use decomposition to solve a problem by finding out what code was used. Use decomposition to understand the purpose of a script of code. Identify patterns through unplugged activities. Use abstraction to identify the important parts when completing both plugged and unplugged activities.	Decompose a program into an algorithm. Write increasingly complex algorithms for a purpose.
				Write more complex algorithms for a purpose.	

Hardware	Networks and data representation	Computational thinking	Programming
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EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Follow instructions as part of practical activities and games. Learn to give simple instructions. Experiment with programming a Bee-bot and learn how to give simple commands. Learn to debug instructions, with the help of an adult, when things go wrong.	Programme a floor robot to follow a planned route and use programming language to explain how a floor robot works. Learn to debug instructions when things go wrong, including in an unplugged scenario.	Use logical thinking to explore software, predicting, testing and explaining what it does. Use an algorithm to write a basic computer program.	Use logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporate loops to make code more efficient. Continue existing code. Make reasonable suggestions for how to debug code.	Create algorithms for a specific purpose. Code a simple game. Use abstraction and pattern recognition to modify code, incorporating variables. Remix existing code.	Repeat and develop programming as you work. Write code to create a desired effect. Use a range of programming commands. Confidently use loops in programming. Use repetition within a program. Use a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.	Change a program to personalise it. Evaluate code to understand its purpose. Predict code and adapt it to a chosen purpose. Program using the language Python. Use and adapt nested loops. Remix existing code to explore a problem. Debug quickly and effectively to make a program more efficient.

Information Technology

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Use a simple online paint tool to create digital art.	Use a basic range of tools within graphic editing software.			Build a web page and creating content for it.	Use logical thinking to explore software more independently, making predictions based on	Use logical thinking to explore software independently, iterating ideas and

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	Develop control of the mouse through dragging, clicking and resizing of images to create different effects.	Develop word processing skills, including altering text, copying and pasting and using keyboard shortcuts.			their previous experience.	testing continuously. Use search and word processing skills to create a presentation.
	Develop understanding of different software tools.	Use word processing software to type and reformat text.	Use software to edit and enhance their video adding music, sounds and text on screen with transitions.	Use online software for documents, presentations, forms and spreadsheets. Use software to work collaboratively with others.	Identify ways to improve and edit programs, videos, images etc. Use software programme Scratch to create music.	Create and edit sound recordings for a specific purpose.
	Take and edit photographs.	Create and label images.	Take photographs and recording video to tell a story.			
	Recognise devices that are connected to the internet.			Understand that information found by searching the internet is not all grounded in fact.	Develop searching skills to help find relevant information on the internet. Learn how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.	Understand how search engines work.
Represent data through sorting and	Understand that technology can be used to represent	Collect and input data into a spreadsheet.				Create formulas and sorting data

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categorising objects in unplugged scenarios. Represent data through physical pictograms. Explore branch databases through physical games.	data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Use representations to answer questions about data. Use software to explore and create pictograms and branching databases.	Interpret data from a spreadsheet. Learn how computers are used in the wider world.		Understand that software can be used collaboratively online to work as a team.	Understand how data is collected in remote or dangerous places. Understand how data might be used to tell us about a location. Learn about different forms of communication that have developed with the use of technology.	within spreadsheets. Gather and analyse data in real time. Understand how barcodes, QR codes and RFID work. Learn how 'big data' can be used to solve a problem or improve efficiency.

Digital Literacy

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Learn to log in and log out.	Log in and out and save work on account.	Learn how to create a strong password. Understand how to stay safe when talking to people online and what to do if they see or hear something			Identify possible dangers online and learning how to stay safe.	

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		online that makes them feel upset or uncomfortable Identify whether information is safe or unsafe to be shared online. Learn to be respectful of others when sharing online and ask for their permission before sharing content. Learn strategies for checking if something they read online is true.		Recognise what appropriate behaviour is when collaborating with others online. Recognise that information on the internet might not be true or correct and that some sources are more trustworthy than others. Learn to make judgements about the accuracy of online searches. Identify forms of advertising online.	Learn what to do if they experience bullying online. Learn to use an online community safely. Recognise that information on the internet might not be true or correct and learning ways of checking validity. Evaluate the pros and cons of online communication.	Use search engines safely and effectively.

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RODOCODO

- RodoCodo is an online platform which allows pupils to complete coding activities in a fun and exciting way.

- Teachers are provided with lesson plans and resources in order to accurately teach the Computer Science strand of the National Curriculum

- Areas revisit prior learning from other year groups and lessons

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
Year 1	Introduction to movement Use commands to walk	Rotation Use commands to walk and rotate	Pick up Use commands to walk, rotate and pick up	Buggy code See what is wrong and fix it	Looping movement Use loops to walk multiple steps	Learn functions Understand the commands in the F box are executed on the F command
Year 2	Mastering sequences Develop precise sequencing skills for complex problems	Buggy code Learn a systematic way to debug programs	Looping movement Improve programs by adding loops	Learn functions Know functions execute specific sequences more than once	Basic loops Spot patterns and turn them into loops	Fixing bugs Use 'step' button to fix more complex bugs
Year 3	Mastering basic loops Use a combination of loops	Using functions Use functions provided and improve them	Spotting patterns Identify patterns and use a single loop in a level	Fixing bugs Use correct technique to debug faulty code	Creating functions Create own functions	Trickier patterns Identify smallest repeatable parts and loop through it
Year 4	Spotting patterns Identify patterns in more complex problems	Creating functions Create own functions in more complex problems	Trickier patterns Identify smallest repeatable parts in more complex problems	Horrible bugs Optimise programs to use fewer commands	Nested loops Understand inner loops are placed inside outer loops	If statements Use if statements under specific conditions
Year 5	Horrible bugs Optimise programs to use fewest possible commands	Custom solutions Choose either loops for functions for the best solution	Nested loops Use at least one nested loop per program	If statements Use a combination of if statements and loops	Repeat until Focus on stopping an action rather than repeating it	Tracking changes Use variables to help measure value changes
Year 6	Horrible bugs Optimise programs to use fewest possible commands	Custom solutions Choose either loops for functions for the best solution	Nested loops Use at least one nested loop per program	If statements Use a combination of if statements and loops	Repeat until Focus on stopping an action rather than repeating it	Tracking changes Use variables to help measure value changes

Sequencing   Debugging   Loops   Functions   Selection   Variables

MEDIUM TERM PLAN

SEC COMPUTING PLANNING

Prior learning:

- Create a series of instructions (Year 1)
- Test and amend a set of instructions (Year 2)
- Discern when it is best to use technology and where it adds little or no value (Year 3)
- Understand that programs require precise instructions (Year 2)
- Present information (Year 3)
- Search for information on the web in different ways (Year 3)
- Manipulate digital content (Year 2)
- Use technology respectfully and responsibly (Year 3)
- Know the school's internet rules (Year 1)

Autumn 2	Objective	Activities	Resources
1			
2	Select and use software to accomplish given goals	Create a mood board for DT project	Computing lab
3	De-bug a program to ensure specific goals are accomplished	Barefoot River Crossing activity	Character cards
4	Give an on-screen robot specific instructions that takes them from A to B and identify patterns in complex problems	Rodocodo Lesson 1- Spotting patterns Share video as a group and discuss with the children	RodoCodo lesson plan Computing lab Passwords
5			
6	Understand why it is important to consider your audience when presenting your work	Research St Edmund Campion and present information on a Word Document, inserting borders and images	Computing lab
7	Understand the need for caution when searching for images and what to do if an unsuitable one is found	Create a poster of pictures showing the physical features of Hamelin and Eyam	Computing lab

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IMPACT

Impact:

The wide range of cross-curricular activities provided for our children allows them opportunities to develop their computing skills and strengthen their awareness of online safety and online presence.

Children will use a range of subject-specific vocabulary, be able to work collaboratively and feel confident in applying their Computing understanding to range of contexts and real-life situations.

THANK YOU FOR YOUR TIME