



# Seamer and Irton CP School

## Progression of knowledge and skills in Computing

### Programming A – Spring 1 & Programming B – Summer 2



The Programming stand is taught twice a year, with the same concept revisited and covered in more depth. The following year incorporates the previous skills, whilst progressing onto a new concept.

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Programming A:</b>  <b>Spring 1</b>	<b>Story sequencing</b>  Pupils will identify and sequence events from a familiar story or song they are learning. In this way they will learn that the order of events is important.	<a href="#">Programming A - Moving a robot</a>  Writing short algorithms and programs for floor robots, and predicting program outcomes.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>	<a href="#">Programming A – Robot algorithms</a>  Creating and debugging programs, and using logical reasoning to make predictions.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>	<a href="#">Programming-a-sequence-in-music</a>  Sequencing sounds Creating sequences in a block-based programming language to make music.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>	<a href="#">Programming-a-repetition-in-shapes</a>  Repetition in shapes Using a text-based programming language to explore count-controlled loops when drawing shapes.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>	<a href="#">Programming-a-selection-in-physical-computing</a>  Selection in physical computing Exploring conditions and selection using a programmable microcontroller.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>	<a href="#">Programming-a-variables-in-games</a>  Variables in games Exploring variables when designing and coding a game.  No. of lessons: 6 Overview: <a href="#">Unit Guide</a>  Skills and Concept Progression <a href="#">Learning Graph</a>
<b>Vocabulary</b>		Bee-bot, forwards, backwards, turn, clear, go, commands,	Instruction, Sequence, Clear, Order, Commands,	Programming, Scratch, Blocks, Code, Sprite, Costume, Stage,	Commands, code, snippet, pattern repetition repeat value trace	Programming, Circuit, Electricity, Microcontroller, Code, LED,	Variable, Change, Name, Value, Set, Design, Event,

		instructions, directions, plan, algorithm, program, route	Prediction, Design, Route, Debugging	Backdrop, Motion, Point in direction, Go to, Event, Task, Run the code, Order, Note, Chord, Bug	decompose procedure	Algorithm, Motor, Modify, Debugging	Code, Task, Test, Motion, Callout
<b>Careers Education</b> Including links to Equity, Diversity and Inclusion		<p><b>Ada Lovelace</b></p> <p>Regarded by some computer historians as being the world's first computer programmer.</p> <p><a href="#">Ada Lovelace - Little People, BIG DREAMS (littlepeoplebigdreams.com)</a></p>	<p><b>Alan Turing</b> (with retrieval of Ada Lovelace)</p> <p>His ideas shaped the development of the first electrical computers</p> <p><a href="#">Significant individuals: A comparison between Ada Lovelace and Alan Turing - BBC Teach</a></p>	<p><b>Joanne Armitage</b></p> <p>Leeds-based algorithmic composer and winner of British Science Association Award for digital innovation</p> <p><a href="#">Meet the female coders pushing electronic music into the future - Features - Mixmag</a></p> <p><b>Daphne Oram and Delia Derbyshire</b></p> <p>Paved the way for electronic music - and inspired everyone from The Beatles to Aphex Twin.</p> <p><a href="https://www.bbc.co.uk/ideas/videos/the-bbc-women-who-pioneered-electronic-music/p05tdppi?playlist=amazing-women-in-stem-">https://www.bbc.co.uk/ideas/videos/the-bbc-women-who-pioneered-electronic-music/p05tdppi?playlist=amazing-women-in-stem-</a></p>	<p><b>Anne-Marie Imafidon</b></p> <p>A tech leader, passionate about breaking down stereotypes.</p> <p><a href="#">Anne-Marie Imafidon - child genius to tech leader - BBC Ideas</a></p>	<p><b>Limor Fried (Ladyada)</b></p> <p>An American electrical engineer and owner of the electronics hobbyist company Adafruit Industries</p> <p><a href="#">Adafruit Industries, Unique &amp; fun DIY electronics and kits</a></p>	<p><b>Carol Shaw</b></p> <p>Believed to be the first ever female video game designer</p> <p><a href="#">Carol Shaw: A Look At Video Games' First Female Developer   #InternationalWomensDay - YouTube</a></p>

				<a href="#">you-need-to-know-about</a>			
<p><b>Local Community experts</b> (Visitors and visits)</p> <p>Supplemented by STEM ambassador visits and online opportunities linked to the termly focus as and when available</p>					<p><b>Online visitor – Catherine Woolley</b></p> <p><a href="#">Catherine Woolley - Game Designer (catmoo.co.uk)</a></p>	<p><b>Visitor from S6F</b></p> <p><a href="#">IT: Software Development and Design - L3 Applied General - Scarborough Sixth Form College (s6f.org.uk)</a></p>	<p><b>Visitor from Coventry University (Scarborough Campus)</b></p> <p><a href="https://www.coventry.ac.uk/cus/course-structure/hnc-hnd-degree/computing-science/">https://www.coventry.ac.uk/cus/course-structure/hnc-hnd-degree/computing-science/</a></p>

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Programming B</b></p> <p><b>Summer 2</b></p> <p><b>EYFS</b> To complete 3rd of 3 Barefoot Computing units based on the seasons</p> <p><b>Early Learning Goals and Development Matters Links</b> Active learning Creating and thinking critically Understanding the World Communication and Language Mathematics</p>	<p><a href="#">Early Years   EN   Barefoot Computing</a></p> <p>Children explore their surroundings and get creative, take a journey and make a map, and discover seaside tangrams, in these three fun activities.</p> <p><b>Early Learning Goals and Development Matters Links</b> Active learning Creating and thinking critically Understanding the World Communication and Language Mathematics</p>	<p><a href="#">Programming B - Programming animations</a></p> <p>Programming animations Designing and programming the movement of a character on screen to tell stories.</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>	<p><a href="#">Programming B - Programming quizzes</a></p> <p>Programming quizzes Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>	<p><a href="#">Programming-b-events-and-actions</a></p> <p>Events and actions in programs Writing algorithms and programs that use a range of events to trigger sequences of actions.</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>	<p><a href="#">Programming-b-repetition-in-games</a></p> <p>Repetition in games Using a block-based programming language to explore count-controlled and infinite loops when creating a game</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>	<p><a href="#">Programming-b-selection-in-quizzes</a></p> <p>Selection in quizzes Exploring selection in programming to design and code an interactive quiz</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>	<p><a href="#">Programming-b-sensing</a></p> <p>Sensing movement Designing and coding a project that captures inputs from physical devices.</p> <p>No. of lessons: 6 Overview: <a href="#">Unit Guide</a></p> <p>Skills and Concept Progression <a href="#">Learning Graph</a></p>
		ScratchJr, command, sprite, compare, programming, area, block, joining,	sequence, command, program, run, start, outcome, predict, blocks, design,	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up,	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop,	Selection, condition, true, false, count-controlled loop, outcomes,	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection,

		start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.	actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	pen, design, action, debugging, errors, setup, code, test, debug, actions.	count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.	conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.
<b>Careers Education</b> Including links to Equity, Diversity and Inclusion		<b>Lotte Reiniger</b> Credited with directing the first feature-length animated film <a href="#">Lotte Reiniger: The animation genius you've probably never heard of   BBC Ideas (youtube.com)</a>	<b>Grace Brewster Murray Hopper</b> Invented the first compiler for a programming language and was one of the first programmers of the Harvard Mark I computer. She also popularized the term "debugging"  <a href="#">Who is Grace Hopper? Meet the Queen of Code (youtube.com)</a>  Read p60 Good Night Stories for Rebel Girls	<b>Margaret Hamilton</b> The woman behind the moon landing software  <a href="https://www.youtube.com/watch?v=wD7GmF2mzdc">https://www.youtube.com/watch?v=wD7GmF2mzdc</a>  Read p108 Good Night stories for Rebel Girls		<a href="#">How to become a games designer: Rhianne's story - BBC Bitesize</a>	<b>Katherine Johnson (Dorothy Vaughan and Mary Jackson)</b>  made important contributions to the United States space program (NASA). Her work helped send astronauts to the Moon.  <a href="#">KS1/KS2 History: Katherine Johnson - NASA mathematician - BBC Teach</a>  Read The Extraordinary Life of Katherine Johnson  Read p82

							Good Night Stories for Rebel Girls 2
<p><b>Local Community experts</b> (Visitors and visits)</p> <p>Supplemented by STEM ambassador visits and online opportunities linked to the termly focus as and when available</p>			<p>2024 My Job at Google (KS1/4-7) Part of the STEM Ambassadors - webinars for schools collection</p> <p>Meet a STEM Ambassador who is an industrial design engineer at Google, to find out about their job, and ask your questions!</p>				