



# Sedbergh Primary School

## Computing Subject Progression Grid

Computing - Curriculum Subject Statement			
Core Values	Early Years Foundation Stage	Key Stage 1	Key Stage 2
Connection, Awareness & Health	Children are exposed to a range of technology within the classroom and recognise that technology is used all around us. Children are able to select and use technology for a particular purpose and have an appropriate level of understanding regarding how to keep safe online.	Children build on their understanding of how to stay safe when using digital and online resources. Children are introduced to the basics of programming (coding) working with toys and on-screen 'sprites' to create effects. Children research, present data and information using a range of different software linking their learning to other curriculum areas.	Children secure their knowledge of online safety and how they can keep safe. They learn about systems that protect them and their information. The children develop their programming skills and use simulations to explore outcomes. The children build on their presentation skills and ability to combine information (text, pictures, graphics and sound) in a range of curriculum contexts. The children further develop their understanding of how the internet and the world wide web were developed and how they operate.

### Purpose of Study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

### National Curriculum Subject Aims

- Children can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- Children can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- Children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- Children are responsible, competent, confident and creative users of information and communication technology.

## National Curriculum Subject Content

Key Stage 1	Key Stage 2
<ul style="list-style-type: none"><li>• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li><li>• Create and debug simple programs</li><li>• Use logical reasoning to predict the behaviour of simple programs</li><li>• Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li><li>• Recognise common uses of information technology beyond school</li><li>• 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.</li></ul>	<ul style="list-style-type: none"><li>• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li><li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li><li>• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li><li>• 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</li><li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li><li>• 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.</li><li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li></ul>

## Topic Progression Grid

Computing Subject Overview Grid						
Year Group/Class	Elder EYFS	Spruce Year 1 & 2	Yew Year 3	Ash Year 4	Beech Year 5	Oak Year 6
<b>Autumn 1</b>	E Safety Maps & Locations	Online Safety Coding – Bee bots & Scratch (coding motion)	Online Safety Research Skills	Online Safety Word Processing	Online Safety Coding Models	Online Safety Internet Research Skills (WW2) Coding – Scratch (algorithms, creating storyboards)
<b>Autumn 2</b>	Multimedia Paint Programs	Online Safety Coding – Bee bots & Scratch (coding motion)	Networks Multimedia Internet Research	Word Processing Video Stories	Presentations – Photo Story	Online Safety Coding – Scratch (algorithms, creating storyboards)
<b>Spring 1</b>	Algorithms Computer Science – Multi-media	Word Processing Presentations	Coding	Graphic Design Presentations	Presenting Data	Information Technology Keyboard Skills Multimedia
<b>Spring 2</b>	Explore technology used by people who help us	Multimedia	Simulations	Research Multimedia Data/Spreadsheets	Presentations	Data Handling
<b>Summer 1</b>	Programmable toys – ‘Beebots’	Data Handling	Data and Spreadsheets	Data Handling Coding with Scratch	Online Safety Internet Research	Coding and Programming
<b>Summer 2</b>	Digital Maps - Earth	Multimedia	Online Safety Internet Research	Research Presentations	Coding	Multimedia Presentations

## Curriculum Progression in Computing

	Year 1	Year 2	Year 3/4	Year 4/5	Year 5/6
<b>Text and Multimedia</b>	Work with others and with support to contribute to a digital class resource which includes text and graphics.	Generate their own work, (with help where appropriate with multimedia) combining text, graphics and sound.  Save and retrieve and edit their work.	Record and present information integrating a range of appropriate media combining text and graphics in printable form and sound and video for on-screen presentations which include hyperlinks.  Begin to show an awareness of the intended audience and seek feed-back.	Use advanced tools in word processing software such as tabs, appropriate text formatting, line spacing etc. appropriately to create quality presentations appropriate for a known audience.	Multimedia work shows restrained use of effects that help to convey meaning rather than impress.
<b>Digital Images (photos, paint, animation)</b>	Use a range of simple tools in a paint package / image manipulation software to create / modify a picture.	Use a range of tools in a paint package / image manipulation software to create / modify a picture to communicate an idea.	Manipulate digital images using a range of tools in appropriate software to convey a specific mood or idea.	Make a short film / animation from images (still and / or moving) that they have sourced, captured or created.	Use images that they have sourced / captured / manipulated as part of a bigger project (eg presentation or document).
<b>Electronic Communication</b>	Contribute ideas to a class email to another class / school etc.	Work collaboratively by email to share and request information of another class or story character.	Begin to understand the need to abide by school e-safety rules when communicating.	Share ICT work they have done electronically by email, VLE, or uploading to authorised sites. Where possible seek and respond to feedback.	Abide by school rules for e-safety.
<b>Research and E Safety</b>	As a class exercise children explore information from a variety of sources (electronic, paper based, observations of the world around them, etc.).  They show an awareness of different forms of information.	Children use a search engine to find specific relevant information to use in a presentation for a topic.  They save and retrieve their work.	Using another curriculum area as a starting point, children ask their own questions then use ICT sources to find answers, making use of search engines, an index, menu, hyperlinks as appropriate. Children use the information or resources they have found.  Children talk about using ICT to find information / resources noting any frustrations and showing an emerging understanding of internet safety.	Make use of copy and paste, beginning to understand the purpose of copyright regulations and the need to repurpose information for a particular audience.  They show an understanding that not all information on the internet is accurate. Develop a growing awareness of how to stay safe when using the internet (in school and at home) and that they abide by the school's internet safety policy.	Independently and with due regard for safety, search the internet using a variety of techniques to find a range of information and resources on a specific topic.  Use appropriate methods to validate information and check for bias and accuracy.  Repurpose and make appropriate use of selected resources for a given audiences, acknowledging material used where appropriate.

<p><b>Control (algorithms)</b></p>	<p>Control simple everyday devices to make them produce different outcomes.</p>	<p>Control a device, on and off screen, making predictions about the effect their programming will have. Children can plan ahead and predict the effect of their coding.</p>	<p>Children are able to type a short sequence of instructions and to plan ahead when programming devices on and off screen.</p>	<p>Engage in Scratch based problem solving activities that require children to write procedures etc. and to predict, test and modify. Use control software to control devices (using output commands) or to simulate this on screen. Predict, test and refine their programming.</p>	<p>Independently create sequences of commands to control devices in response to sensing (i.e. use inputs as well as outputs). Design, build, test, evaluate and modify the system; ensuring that it is fit for purpose.</p>
<p><b>Handling information (databases and graphs)</b></p>	<p>As a class or individually with support, children use a simple pictogram or painting program to develop simple graphical awareness / one to one correspondence.</p>	<p>Use a graphing package to collect, organise and classify data, selecting appropriate tools to create a graph and answer questions. Enter information into a simple branching database, database or word processor and use it to answer questions. They save, retrieve and edit their work.</p>	<p>Children use a simple database (the structure of which has been set up for them) to enter and save and save information on a given subject. They follow straight forward lines of enquiry to search their data for their own purposes. They talk about their experiences of using ICT to process data compared with other methods.</p>	<p>Children work as a class or group to create a data collection sheet and use it to setup a straight forward database to answer questions. Enter information and interrogate it ( by searching, sorting, graphing etc). Begin to reflect on how useful the collected data and their interrogation was and whether or not their questions were answered.</p>	<p>Independently solve a problem by planning and carrying out data collection, by organising and analysing data involving complex searches using a database, and by drawing conclusions and presenting findings. The need for accuracy is demonstrated and strategies for spotting implausible data are evident. Children should be able to talk about issues relating to data protection and the need for data security in the world at large (eg health, police databases).</p>
<p><b>Modelling and simulations (spreadsheets, adventure games and simulations)</b></p>	<p>Make simple choices to control a simple simulation program.</p>	<p>Children are able to play an adventure game and use a simple simulation, making choices and observing the results. Their conversation shows they understand that computers are good at replicating real life events and allowing them to explore contexts that are otherwise not possible.</p>	<p>Use models and simulations to find things out and solve problems. Recognise that simulations are useful in widening experience beyond the classroom. Make simple use of a spreadsheet to store data and produce graphs.</p>	<p>Set up and use a spreadsheet model to explore patterns and relationships. Make predictions. Know how to enter simple formulae to assist this process.</p>	<p>Set up and use their own spreadsheet, which contains formulae to investigate mathematical models. Ask "what if ..." questions and change variable in their model. Understand the need for accuracy when creating formulae and check regularly for mistakes, by questioning results. Relate their use of spreadsheets to model situations to the wider world.</p>

<b>Data logging (science and maths)</b>			Begin to use a data logger to sense physical data (sound, light, temperature).	Use a data logger confidently, connected to the computer or remotely, to capture continuous or intermittent data readings. Interpret the results and use these in their investigations. Realise the advantages of using ICT to collect data that might otherwise be problematic.	Children are able to identify their own opportunities for data logging and carry out their own experiments. They check and question results and are able to spot trends in data and identify when problems may have occurred.
<b>Understanding Technologies (individual technologies)</b>	Show an awareness of the range of devices and tools they encounter in everyday life	Show an awareness of a range of inputs to a computer (IWB, mouse touch screen, microphone, keyboard, etc.)	Begin to show discernment in their use of computing devices and tools for a particular purpose and explain why their choice was made.	Make choices about the devices and tools they use for specific purposes and explain them in relation to the context. Begin to show an awareness of specific tools used in working life.	Evaluate the tools available to them including any that are unfamiliar or new and use them to solve problems. Demonstrate an awareness of the appropriateness of outcomes depending on choices regarding tools and devices.
<b>Understanding Technologies (networks)</b>	Show an awareness that what they create on a computer or tablet device can be shown to others via another device (e.g. printer, projector, Apple TV)	Begin to show an awareness that computers can be linked to share resources	Show an understanding that their password is the key to accessing a personalised set of resources and files (e.g. My Documents).  Show an awareness of where passwords are critical in everyday use (e.g. parents accessing bank details)	Show an understanding of the school network and how it links computers to resources in school and beyond.  Compare this with other networks they may encounter at home or in the wider world (e.g. banks)	Show an understanding of how filtering and monitoring tools affect their use of the school network and Internet and compare this with their experience of access outside school.
<b>Understanding Technologies (the internet)</b>		Use websites and demonstrate an awareness of how to manage their journey around them (e.g. using the back/forward button, hyperlinks)	Show an awareness that not all the resources/tools they use are resident on the device they are using.  Begin to show an understanding of URLs.	Perform a search using different search engines and check the results against each other, explaining why they might be different. Show an awareness of the need for accuracy in spelling and syntax to search effectively.	Use collaborative tools and e-mail showing a sensitivity for this type of remote collaboration and communication