

Skills and knowledge progression - Computing

National Curriculum Aims and purpose

School aims - skills, attitudes and knowledge that we would like all children to develop on their journey through the school

Equipping pupils to use computational thinking and creativity to understand and change the world. Pupils are taught the principles of information and computation, how digital systems work, and how to put the knowledge to use. Building on this, pupils are equipped to use IT to create programs and a range of content, and to be digitally literate.

Aims:

- Understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- Analyse problems in computational terms and have repeated practical experience of writing computer programs in order to solve such problems.
- Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- Are responsible, competent, confidence and creative users of information and communication technology

We want to help our children to become confident, independent users of IT across the curriculum and in their life beyond school.

At SSPP, children in every class and year group will be given opportunities to discover how IT can support.

them in their learning and will be encouraged to enthusiastically try out new technologies, apps and software. They will gain the transferable skills needed to adapt to ever-changing software and be as prepared as they can be for the technologies that they will encounter as they grow up, the vast majority of which probably haven't even been invented yet. Crucial to much of this is the ability to think logically and to break ideas down into discrete steps, as recognised in the National Curriculum, and these computer science skills are therefore a vital strand in our teaching.

Our children will also know how to use all of this safely and responsibly, know who to talk to when they come.

across something that doesn't seem right, fair, acceptable or appropriate, and know when to turn off the

technology and walk away. They will be taught to treat others with respect, too, and recognise that behaviour online should be no different to behaviour in 'real life'.

Links to learning in EYFS:

Understanding the World: Technology

- Knows how to operate simple equipment.
- Shows an interest in technological toys with knobs.
- or pulleys, or real objects such as cameras or mobile phones
- Shows skill in making toys work by pressing parts or lofting flaps to achieve effects such as sound, movements or new images.
- Knows information can be retrieved from computers.
- Completes a simple program on a computer or iPad.
- Uses ICT hardware to interact with age-appropriate computer software

Experiences every child should have:

- Creating videos, vlogs or news reports and sharing them with friends and family
- Seeing something move in response to their commands.
- Produce something of their own that makes them go 'Wow!'
- Chances to try things out, go wrong & discover that the computer doesn't blow-up, and the internet doesn't shut down as a result.
- Create something using a 3D printer

Knowledge progression

EYFS

Personal, Social and Emotional Development

I can wait a short amount of time for something I want e.g.: a computer loading / an App to work.
 I know how to complete a familiar task independently and with support will try new things. E.g.: a computer programme / Beebots.
 I can select tools and resources that I need to complete a task of my own choosing.
 I know how to be safe online.
 I know that a password is secret.

Physical Development

I know how to use an iPad or tablet appropriately.
 I know how to use my fingers on a touch screen, and control a mouse/touchpad on a computer

Understanding the World

I know how to use a camera i.e.: on an iPad.
 I know how to work a simple programable toy.
 I can select and use technology for purposes.
 I know how technology is used in my own home.
 I know that technology has changed since my adults were young.

Expressive Art and Design

Children can safely use a range of technology for a purpose.

Key stage 1

| | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
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| Year 1 | NCCE: Computing systems and networks – Technology around us | Creating media – Digital painting | Creating media – Digital photography |
| | Vocabulary Google, website, search, online, login, password | Vocabulary Landscape, portrait, save, design, illustration, digital | Vocabulary Landscape, portrait, save, design, illustration, digital |
| Year 1 | Programming A – Moving a robot | Data and information – grouping data. | Programming B – Introduction to animation |

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| | Vocabulary Control, program, code, predict, mistake, turn, instructions | Vocabulary Google, website, search, online, login, password | Vocabulary Control, program, code, predict, mistake, turn, instructions |
| Year 2 | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
| | NCCE: Computing systems and networks – IT around us | Creating media – Digital photography | Creating media - Digital writing |
| | Vocabulary Personal information, link, icon, username, | | |
| | Programming A – Robot algorithms | Data and information – pictograms | Programming B - An introduction to quizzes |
| | Vocabulary Algorithm, program, software, code, predict, distance, | | Vocabulary Algorithm, program, software, code, predict, distance, |
| Key Stage 2 | | | |
| Year 3 | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
| | NCCE Computing systems and networks – Connecting computers. | Creating media – Animation | Creating media – Desktop publishing |
| | Vocabulary Search, import, internet, network, browser, avatar, footprint | Vocabulary Green screen, spreadsheet, graph, data, QR code, copy, cut, paste, insert, save, resize | Vocabulary Green screen, spreadsheet, graph, data, QR code, copy, cut, paste, insert, save, resize |
| | Programming A – Sequence in music | Data and information – Branching databases | Programming B – Events and actions |

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| | <p>Vocabulary Algorithm, error, bug, sequence, repeat, motion, repeat, loop, computational thinking, command, block, sprite, script</p> | | <p>Vocabulary Algorithm, error, bug, sequence, repeat, motion, repeat, loop, computational thinking, command, block, sprite, script</p> |
| Year 4 | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
| | <p>NCCE Computing systems and networks – The Internet</p> | <p>Creating media – Audio editing</p> | <p>Creating media – Photo editing</p> |
| | <p>Vocabulary Search, import, internet, network, browser, avatar, footprint</p> | | |
| | <p>Programming A – Repetition in shapes</p> | <p>Data and information – Data logging</p> | <p>Programming B – Repetition in games</p> |
| | <p>Vocabulary Debug, selection, decompose, conditional, logical, command</p> | <p>Vocabulary Search, import, internet, network, browser, avatar, footprint</p> | <p>Vocabulary Debug, selection, decompose, conditional, logical, command</p> |
| Year 5 | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
| | <p>NCCE Computing systems and networks – Sharing information.</p> | <p>Data and information – Flat-file databases</p> | <p>Programming B – Selection in quizzes</p> |
| | <p>Key vocabulary System, connection, digital, input, process, output, searching, search engine, refine, index, web crawler, bot, content creator, selection, ranking, ordering, links, algorithm, search engine optimisation (SEO)</p> | | <p>Vocabulary Simulation, nested, rotate, forever, loop, LED, wait, abstraction</p> |

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| | Creating media – Vector drawing | Creating media – Video editing | Project Evolve – online safety |
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| Year 6 | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
| | NCCE Computing systems and networks – Communication | Creating media - 3D Modelling | Creating media – Web page creation |
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| | Programming A – Variables in games | Data and information - Spreadsheets | Programming B – Sensing |
| | Vocabulary Variables, random, generate, animate, evaluate | | Vocabulary Variables, random, generate, animate, evaluate |

Skills Progression

| | Computing systems and networks Digital literacy | Creating media Information technology | Data and information Information technology | Programming Computer science |
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| EYFS | <ul style="list-style-type: none"> I can tell you about technology that is used at home and in school. I can operate simple equipment. I can use a safe part of the Internet to play and learn. | <ul style="list-style-type: none"> I can move objects on a screen. I can create shapes and text on a screen. I can use technology to show my learning. I can use simple age-appropriate programs. | <ul style="list-style-type: none"> I can tell you about different kinds of information such as pictures, video, text and sound. | <ul style="list-style-type: none"> I can make a floor robot move. I can use simple software to make something happen. I can make choices about the buttons and icons I press, touch or click on. |
| Year 1 | <ul style="list-style-type: none"> I can recognise and name a range of digital devices, e.g., laptop, phone, games console. I can log on to the school computer / unlock the school tablet with support. I can identify the basic parts of a computer, e.g., mouse, keyboard, screen. I can use a suitable access device (mouse, keyboard, touchscreen, switch). I can explain why we use passwords and recognise examples of personal information. I know who to tell if concerned about content | <ul style="list-style-type: none"> I can select basic tools/options to change the appearance of digital content, e.g., filter on an image / font / size of paintbrush. I can combine media with support to present information, e.g., text and images. I can type text using a keyboard. | <ul style="list-style-type: none"> I can describe objects using labels. I can find objects with similar properties. I can answer questions about groups of objects. I can decide how to group objects to answer a question. I can record and share what I have found. | <ul style="list-style-type: none"> I can create a simple program e.g., to control a floor robot. I can predict the outcome of a simple algorithm or program. I can explain what an algorithm is and create one. I can debug an error in a simple algorithm or program e.g., for a floor robot. |
| Year 2 | <ul style="list-style-type: none"> I can explain how IT is used at home. I can explain how IT is used in different places. I can use a simple password to log onto the computer or a website. I can identify rules for acceptable use of technology in school. I know what personal information is and the need to keep it private. I can recognise that some information found online may not be true. | <ul style="list-style-type: none"> I can create simple digital content for a purpose, e.g., digital art. I can capture, edit and improve my photos. Present ideas and information by combining media, e.g., text and images. I can identify which photos are real and which have been changed | <ul style="list-style-type: none"> I can recognise charts and pictograms and explain why we use them. I can explain information shown in a simple chart or pictogram. I can modify simple charts/pictograms, e.g., add title, item or labels. I can identify the key features of a chart or pictogram. I can collect and present data on a topic | <ul style="list-style-type: none"> I can predict the outcome of an algorithm or program with multiple steps. I can identify and correct errors in a given algorithm or program and recognise the term debugging. I can explain what an algorithm and program are. I can plan out a program by creating an algorithm and evaluate its success. |

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| Year 3 | <ul style="list-style-type: none"> I can describe what a computer is (input > process > output). I can recognise that school computers are connected. Keeping password safe When not to share personal info Games/films have age ratings. | <ul style="list-style-type: none"> I can present ideas and information by combining media independently, e.g., text and images. I can design and create simple digital content for a purpose/audience, e.g., poster. I can edit digital content to improve it, e.g., resize text. | <ul style="list-style-type: none"> I can use a branching database. I can create a branching database. I can identify the features of a good question in a branching database. I can evaluate a given branching database and suggest improvements | <ul style="list-style-type: none"> Modify an existing program, Create examples of algorithms containing count-controlled loops. Use a forever loop in a program to keep something happening. Identify errors in a block or text-based program and correct them. Recognise that different inputs can be used to control a program |
| Year 4 | <ul style="list-style-type: none"> Remember and use an individual password. Recognise what kinds of websites are trustworthy sources of information. Recognise the benefits and risks of different apps and websites. Recognise that the media can portray groups of people differently. Can rate a game or film they have made and explain their rating | <ul style="list-style-type: none"> Collect, organise and present information using a range of media. Design, create and edit digital content for a specific purpose. Identify the features of a good piece of digital content and apply these in own design. Know where to find copyright free content, e.g., creative images. Collaborate with peers using online tools | <ul style="list-style-type: none"> Draw conclusions from information stored in a database, chart or table. Design a questionnaire and collect a range of data on a theme. Choose appropriate formats to present data to convey information. | <ul style="list-style-type: none"> Create a program using a range of events/inputs to control what happens. Explain when to use forever loops and count-controlled loops and use them in programs. Recognise selection in a program or algorithm. Use selection in algorithms in programs e.g., if...then... Design a program for a purpose. Recognise common mistakes in programs and how to correct them. |
| Year 5 | <ul style="list-style-type: none"> I can explain the difference between the internet and the World Wide Web; and between a search engine and a web browser. I can perform a complex search for information. Know where to find copyright free images and audio, and why this is important. - Critically evaluate websites for reliability of information and authenticity. | <ul style="list-style-type: none"> Use different drawing tools to create images. Create images by layering and duplicating images to create more complex pieces of work. Evaluate and improve their own designs | <ul style="list-style-type: none"> I know the difference between data and information. I can perform a search to answer questions about data. I can create graphs and charts from data | <ul style="list-style-type: none"> Name a range of sensors in physical systems. Predict what will happen in a program or algorithm when the input changes. Use two-way selection i.e., if... then...else... Recognise variables in a program. Create programs including 'repeat until' loops. Create and use simple variables, e.g., to keep score. Create an algorithm for a physical system (with sensor) |

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| Year 6 | <ul style="list-style-type: none"> • Explain what makes a strong password and why this is important at school and in the wider world. • Explain how algorithms are used to track online activities with a view to targeting advertising and information. • Know that there are laws around the purchase of games; the production, sending and storage of images; what is written online; and around online gambling | <ul style="list-style-type: none"> • Select, combine and remix a range of media to create original content. • Consider all steps of the design process when creating content (e.g., identify problem, plan, create, evaluate, share.) • Identify the most effective tools to present information for a specific purpose. | <ul style="list-style-type: none"> • Recognise what a spreadsheet is and what it is used for. • Use simple formulae in a spreadsheet to find out information from a set of data. • Collect data for a purpose and plan out a spreadsheet to present it effectively, using relevant formulae. • Produce graphs from data in a spreadsheet to answer a question. • Analyse and evaluate data and information in a spreadsheet, chart or database. | <ul style="list-style-type: none"> • Design and program a system that uses sensors. • Recognise and use procedures (sub-routines) in programs. • Plan out a program in detail, including task, algorithm, code and execution level. • Use nested selection statements in a program. • Combine a variable with relational operators (< = >) to determine when a program changes • Recognise key concepts (sequence, selection, repetition and variables) |
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