



East Ayton Primary School



Computing Skills Progression Map

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| Early Years | Personal, Social and Emotional Development | Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'. |
| | Physical Development | Develop their small motor skills so that they can use a range of tools competently, safely and confidently. |
| | Expressive Arts and Design | Explore, use and refine a variety of artistic effects to express their ideas and feelings. |

| Key Stage 1 National Curriculum Expectations | Key Stage 2 National Curriculum Expectations |
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| <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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. |

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Coding and Programming | <p>National curriculum: Children understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. They create, debug and use logical reasoning to predict the behaviour of simple programs.</p> | | <p>National curriculum: Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> | | <p>National curriculum: Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> | |
| | <p>1.1 We are treasure Hunters (algorithm using Beebots)</p> <p>Pupils learn:</p> <ul style="list-style-type: none"> ● that a programmable robot can be controlled by inputting a sequence of instructions ● to develop and record sequences of instructions as an algorithm ● to program a robot to follow their algorithm ● to debug programs ● to predict how their programs will work. | <p>2.1 We are astronauts (Scratch Junior app)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● plan a sequence of instructions to move sprites in ScratchJr ● create, test and debug programs for sprites in ScratchJr ● work with input and output in ScratchJr ● use repetition in their programs | <p>3.1 We are programmers (Scratch)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● plan and create an algorithm for an animated scene in the form of a storyboard ● write a program in Scratch to create the animation, including characters, dialogue, costumes, backdrops and sound ● review their animation programs and correct mistakes. | <p>4.1 We are software developers (Scratch)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● develop an educational computer game using selection and repetition ● understand and use variables ● start to debug computer programs ● recognise the importance of user interface design, including consideration of input and output. | <p>5.1 We are game developers (Scratch)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● create original artwork and sound for a game ● design and create a computer program for a computer game, which uses sequence, selection, repetition and variables ● detect and correct errors in their computer game ● use iterative development techniques (making and testing a series of small changes) to improve their game. | <p>6.2 We are computational thinkers (Google Maps and Scratch)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● develop the ability to reason logically about algorithms ● understand how some key algorithms can be expressed as programs ● understand that some algorithms are more efficient than others for the same problem ● understand common algorithms for searching and sorting a list. |

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| Technology in our lives | <p>National curriculum: Children recognise common uses of technology beyond school. They use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p> <p>Children can:</p> <ol style="list-style-type: none"> 1) recognise ways that technology is used in the home and community, e.g. taking photos, blogs, shopping; 2) use links to websites to find information; 3) recognise age-appropriate websites; 4) use safe search filters | | <p>National curriculum: Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content.</p> <p>Children can:</p> <ol style="list-style-type: none"> 1) explain ways to communicate with others online; 2) describe the world wide web as the part of the internet that contains websites; 3) add websites to a favourites list; 4) use search tools to find and use an appropriate website and content; 5) use strategies to improve results when searching online | | <p>National curriculum: Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content.</p> <p>Children can:</p> <ol style="list-style-type: none"> 1) search for information using appropriate websites and advanced search functions within Google; 2) use strategies to check the reliability of information (cross-check with another source such as books); 3) talk about the way search results are selected and ranked; 4) check the reliability of a website, including the photos on site; 5) tell you about copyright and acknowledge the sources of information | |
| | <p>1.2 We are TV chefs (instructions using iMovie video)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● use a video camera to capture moving images ● edit a video to include an audio commentary ● develop collaboration skills ● discuss their work and think about how it could be improved. | <p>2.3 We are photographers (iPad photo and editing apps)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● consider the technical and artistic merits of photographs ● review, reject or pick the images they take ● edit and enhance their photographs | <p>3.6 We are opinion pollsters (Google forms)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● understand some elements of survey design ● understand some ethical and legal aspects of online data collection ● use the Internet to facilitate data collection ● use charts to analyse data ● interpret results. | <p>4.6 We are meteorologists (Google sheets)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● understand different measurement techniques for weather – both analogue and digital ● use computer-based data logging to automate the recording of some weather data ● use spreadsheets to create charts ● analyse data, explore inconsistencies in data and make predictions ● practise using presentation and video software. | <p>5.2 We are cryptographers (Scratch)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● be familiar with semaphore and Morse code ● understand the need for private information to be encrypted ● encrypt and decrypt messages in simple ciphers ● appreciate the need to use complex passwords and to keep them secure ● have some understanding of how encryption works on the Internet. | <p>6.1 We are toy makers (Scratch/ MakeCode MicroBit)</p> <p>Pupils learn:</p> <ul style="list-style-type: none"> ● how computers use stored programs to connect input to output ● how to generate and evaluate designs in response to a brief ● to work with physical components of a system ● how to design and write a program for an embedded system ● to use criteria to provide others with feedback on their work. |

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| Multimedia, Data Handling & Software – Text & Images | National curriculum: Children use technology purposefully to create, organise, store, manipulate and retrieve digital content. | | National curriculum: Children 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. They 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. | | National curriculum: Children 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. | |
| | <p>1.3 We are digital artists (art using Brushe Redux iPad app)</p> <p>Pupils learn:</p> <ul style="list-style-type: none"> ● how to select and set brushes and colours ● to create artwork in a range of styles on iPads ● to use the undo function if they make mistakes, and to encourage experimentation ● to use multiple layers in their art ● to transform layers ● to paint on top of photographs. | <p>2.3 We are photographers (iPad photo and editing apps)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● consider the technical and artistic merits of photographs ● use the iPad camera app ● take digital photographs ● review, reject or pick the images they take ● edit and enhance their photographs | <p>3.4 We are who we are (Google slides)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● create a number of structured presentations ● narrate presentations ● consider issues of trust and privacy when sharing information. | <p>4.5 We are artists (Google Draw)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● develop an appreciation of the links between geometry and art ● become familiar with the tools and techniques of a vector graphics package ● develop an understanding of turtle graphics ● experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers ● develop some awareness of computer-generated art. | <p>5.3 We are architects (3D design software – Trimble Sketchup)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● understand the work of architects, designers and engineers working in 3-D ● develop familiarity with a simple CAD (computer-aided design) tool ● develop spatial awareness by exploring and experimenting with a 3-D virtual environment ● develop greater aesthetic awareness. | <p>6.3 We are publishers (Google Docs)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● manage or contribute to large collaborative projects, facilitated using online tools ● write and review content ● source digital media while demonstrating safe, respectful and responsible use ● design and produce a high-quality print document. |

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| Sound & Motion | <p>1.2 We are TV chefs (instructions using iMovie video)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● use different features of a video camera ● use a video camera to capture moving images ● edit a video to include an audio commentary ● develop collaboration skills ● discuss their work and think about how it could be improved. | <p>2.5 We are animators (Stop motion app iPads)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● understand how animation works ● use storyboards to plan an animation ● create their own original characters, props and backgrounds for an animation ● film, review and edit a stop-motion animation ● record audio to accompany their animation ● provide constructively critical feedback to their peers. | <p>Children can:</p> <ol style="list-style-type: none"> 1) use software to record, create and edit sounds and capture still images; 2) change recorded sounds, volume, duration and pauses; 3) use software to capture video for a purpose; 4) crop and arrange clips to create a short film; 5) plan an animation and move items within each animation for playback | <p>Children can:</p> <ol style="list-style-type: none"> 1) collect audio from a variety of resources including own recordings and internet clips; 2) use a digital device to record sounds and present audio; 3) trim, arrange and edit audio levels to improve quality; 4) publish their animation and use a movie editing package to edit/refine and add titles |
| | Data Handling | <p>Children can:</p> <ol style="list-style-type: none"> 1) talk about the different ways data can be organised; 2) sort and organize information to use in other ways; 3) search a ready-made database to answer questions | <p>4.6 We are meteorologists (Google sheets)</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> ● use computer-based data logging to automate the recording of some weather data ● use spreadsheets to create charts ● analyse data, explore inconsistencies in data and make predictions ● practise using presentation and video software. | <p>Children can:</p> <ol style="list-style-type: none"> 1) construct data on the most appropriate application; 2) know how to interpret data, including spotting inaccurate data and comparing data; 3) use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets; 4) add data to an existing database |

Online Safety

For each *Switch On Computing* unit there are links made to online safety coverage on the *online safety road map* page.

SMART online

During Autumn 1 the SMART acronym needs to be taught and each area covered. Each term and every computing lesson feed in areas of staying smart online to any relevant learning using computer equipment and internet services. Each term an assembly focusing on E-safety will take place.

<https://www.childnet.com/resources/video-lessons>

Online Safety

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

Children can:

- 1) identify what things count as personal information;
- 2) identify what is appropriate and inappropriate behaviour on the internet;
- 3) agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- 4) seek help from an adult when they see something that is unexpected or worrying;
- 5) demonstrate how to safely open and close applications and log on and log off from websites

National curriculum: Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact.

Children can:

- 1) reflect on their own digital footprint and behaviour online;
- 2) identify what is appropriate and inappropriate behaviour on the internet, recognising the term cyberbullying;
- 3) agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- 4) seek help from an adult when they see something that is unexpected or worrying;
- 5) demonstrate understanding of age-appropriate websites and adverts

National curriculum: Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact.

Children can:

- 1) protect their password and other personal information;
- 2) be a good online citizen and friend;
- 3) judge what sort of privacy settings might be relevant to reducing different risks;
- 4) seek help from an adult when they see something that is unexpected or worrying;
- 5) discuss scenarios involving online risk