

Computing Skills Progression

Key Stage 1: National Curriculum Expectations

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

Key Stage 2 : National Curriculum Expectations

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.

EYFS - the Early Learning Goals that link most closely to the National Curriculum

EYFS

The 'Technology' strand has now been removed from 'Understanding the World' and has not been replaced with any updated guidance. However, technology in the Early Years remains vitally important and can mean:

- taking a photograph with a camera or tablet
- searching for information on the internet
- playing games on the interactive whiteboard
- exploring an old typewriter or other mechanical toys
- using a Beebot
- watching a video clip
- listening to music

Allowing children the opportunity to explore technology in this carefree and often child-led way, means that not only will they develop a familiarity with equipment and vocabulary but they will have a strong start in Key Stage 1 Computing and all that it demands.

	Year 1 & 2	Year 3 & 4	Year 5 & 6
<p>Computer Science (CS)</p> <p>Pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming.</p>	<p><u>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</u></p> <p><u>Create and debug simple programs.</u></p> <p><u>Use logical reasoning to predict the behaviour of simple programs.</u></p> <p>Programming with Scratch Jr</p> <ol style="list-style-type: none"> 1. Program movements. 2. Program outputs for audio or text. 3. Find errors in a program. 4. Program inputs. 5. Program selection/conditions (if one sprite hits another). <p>Introduction to Programming</p> <ol style="list-style-type: none"> 1. Place instructions into the correct order (sequence) to make something work. 2. Use direction arrows to move an on-screen object (character/sprite) to achieve an objective. 3. Predict a route and sequence direction commands (algorithm) to achieve an objective. Correct the errors if necessary (debug). 4. Predict a route and sequence distance commands to program an on-screen object to achieve an objective. 5. Predict and sequence movement and pen commands to program the drawing of different 2D shapes. 6. Sequence code blocks, including movements and execute (start program) 	<p><u>Design, write and debug programs that accomplish specific goal, including simulating physical systems.</u></p> <p><u>Use sequence and repetition in programs; work with various forms of input.</u></p> <p>Programming with Scratch</p> <ol style="list-style-type: none"> 1. Design, write and debug programs that accomplish specific goals. (Including outputs) 2. Use repetition in programs. 3. Work with various forms of inputs; keyboard, mouse and touch screen. 4. Write programs to simulate physical systems. <p><u>Design, write and debug programs that accomplish specific goals.</u></p> <p><u>Use sequence, selection, and repetition in programs; work with various forms of input and output.</u></p> <p><u>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</u></p> <p>Programming with Scratch</p> <ol style="list-style-type: none"> 1. Program inputs with loops, selection and sensing for interactions. 2. Work with variables and various forms of input and output. 3. Debug programs that accomplish goals. (correcting errors) 4. Use selection, data variables and operators. 5. Program a virtual robot using Scratch blocks. 	<p><u>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems.</u></p> <p><u>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</u></p> <p>Physical Devices (Makey Makey)</p> <ol style="list-style-type: none"> 1. Understand that computers use physical inputs and outputs and give examples. 2. Program physical inputs, outputs (e.g program LED lights) and random variables. 3. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. <p><u>Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts.</u></p> <p><u>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</u></p> <p><u>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</u></p> <p>Scratch Programming</p> <ol style="list-style-type: none"> 1. Program inputs for control, selection (conditions) and sensing for interaction and data variables for scoring and a game timer. 2. Program distance sensing and movement. 3. Program Inputs, outputs, loops, conditions, sensing and variables. 4. Program list variables that chooses randomly. <p>Scratch Programming</p>

	<p>blocks to write a program to achieve an objective.</p> <p>Develop Programming</p> <ol style="list-style-type: none">1. Create and debug simple programs by selecting code blocks, placing them in the correct sequence and executing a program.2. Use logical reasoning to predict the behaviour of simple programs.3. Simplify a program by using a loop.		<ol style="list-style-type: none">1. Program keyboard/touch screen inputs, selection (conditions), loops and random variables for unpredictability (operators).2. Program inputs, selection, sensing, random variables, operators for direction and data variables for scoring.3. Use inputs, selection, loops, sensing, costume changes and broadcasts.4. Work with multiple sprites to send broadcast messages between them.
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<p>Information Technology Pupils learn to use technology to create programs, systems and a range of content.</p>	<p><u>Use technology purposefully to create digital content.</u></p> <p>Mouse and Keyboard Skills</p> <ol style="list-style-type: none"> 1. Move the mouse or trackpad and left click to select an object. 2. Drag and drop with mouse or trackpad to move objects around the screen. 3. Find letters or numbers on a keyboard. 4. Begin touch typing with home row keys. <p>Digital Art</p> <ol style="list-style-type: none"> 1. Change the colour of individual pixels to accurately re-create basic artwork. 2. Make changes where required. 3. Change the colour of individual pixels to accurately re-create detailed artwork. 4. Use zoom controls to help fill small shapes. <p>Comic Creation</p> <ol style="list-style-type: none"> 1. Add, resize and organise colour or picture backgrounds. 2. Add, resize, organise characters/object to different panels. 3. Add narration using text and direct speech using speech bubbles. <p><u>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</u></p> <p>Digital Art</p>	<p><u>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.</u></p> <p>Typing</p> <ol style="list-style-type: none"> 1. To be able to locate the letters and punctuation keys on a keyboard 2. To begin to touch type using frequently used letter 3. Experiment with keyboard short cuts <p>E Book Creator</p> <ol style="list-style-type: none"> 1. Choose a suitable page shape and add a title and subtitle. 2. Change the background colour/texture of a page. 3. Add, resize and change the colour of a shape then copy and paste it. 4. Search for and add suitable images then resize and position them. 5. Create another page with a background, image, shapes and text. 6. Add an audio recording of the page text, including hiding it behind an object. 7. Use hyperlinks for navigation between the pages. <p>Design</p> <ol style="list-style-type: none"> 1. Understand and use 3D space on a grid. 2. Design cities/towns for a purpose and to a budget. 3. Re-create or design familiar 3D models using cubes, such as tables and chairs. 4. Use chisel tool to improve and adapt models. 5. Colour individual blocks or whole models. <p>Music Creation</p> <ol style="list-style-type: none"> 1. Create ascending and descending scales. 2. Add chords evenly across the scales. 3. Add arpeggios and melodies. 	<p><u>Select, use and combine a variety of software on a range of digital devices to create content that accomplish given goals</u></p> <p>Image Editing</p> <ol style="list-style-type: none"> 1. Adjust the colours, brightness and contrast to improve a photo. 2. Create a before and after slide in presentation software. 3. Take and crop a screenshot. 4. Add drawing and text layers. 5. Import new images as layers and resize them to fit. 6. Add colour elements to a black and white image using layers and eraser tools. <p>Operating Systems</p> <ol style="list-style-type: none"> 1. Understand the importance of an operating system and its key features. 2. Demonstrate important operating system skills (organising files etc), if possible, across multiple operating systems. <p><u>Design and create digital content to accomplish goals.</u></p> <p>Graphic Design</p> <ol style="list-style-type: none"> 1. Add, adjust and fill shapes. 2. Group shapes to improve accuracy and speed. 3. Add and customise gradient effects. 4. Adjust transparency/opacity for a purpose. 5. Use a colour picker correctly. 6. Accurately rotate shapes <p><u>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</u></p>
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1. Use lines and fill tools to make interesting patterns.
2. Add a variety of shapes (outlines and fill) and label them with text.
3. Re-create graphics using pixels with different colours.

Introduction to Animation

1. Add a background and objects to a frame (including text)
2. Copy/clone a frame and move objects to create an animation, including flipping objects.
3. Create an animation with multiple objects moving simultaneously.
4. Create screen-recording animation (*optional, requires iPad*).
5. Create stop-motion animation with photos (*optional, requires iPad*).
6. Create animated drawings of characters by cropping photos and adjusting points of movement.

Text and Images

1. Change the background colour of a page.
2. Add, resize and position images (pictures) on a page.
3. Type and position text on a page, if possible using capital letters and punctuation.
4. Label pictures with text.
5. Use word-banks for writing sentences about pictures.

E-book Creation

1. Add a book cover with title,

4. Add a steady and even rhythm.
5. Use sampled sounds to create an effective mix.
6. Build beats, melody (tones) and effects.

Comic Creation

1. Add, resize and organise colour or picture backgrounds.
2. Add, resize, organise characters/objects to different panels.
3. Add narration using text and direct speech using speech bubbles.
4. Save comic with name and title.
5. Add audio recordings (optional).

Animation

1. Create a stop-motion video by duplicating slides that include backgrounds and shapes.
2. Create animation using transition and animation effects (morph, motion paths, pulse etc), including taking and editing a screenshot.
3. Animate individual elements of objects.
4. Create animated GIF files by animating pixels.

Digital Art

1. Use various lines and fill tools plus copy/paste and rotation to create pattern effects.
2. Use shapes, fill, copy/paste, zoom and flip to create reflective symmetry effects.
3. Use stamps, copy/paste, layers and multiple frames to create animated GIF computer game graphics.

3D Design

1. Understand 3D spatial awareness.
2. Add 3D shapes, resize, adjust height, duplicate and use the different perspective.
3. Re-create different types of buildings using 3D shapes.

accomplish given goals.

Image Editing

1. Adjust the colours, brightness and contrast to improve a photo.
2. Create a before and after slide in presentation software.
3. Take and crop a screenshot.
4. Add drawing and text layers.
5. Import new images as layers and resize them to fit.
6. Add colour elements to a black and white image using layers and eraser tools.

Computers past, present and future

1. Adjust the colours, brightness and contrast to improve a photo.
2. Create a before and after slide in presentation software.
3. Take and crop a screenshot.
4. Add drawing and text layers.
5. Import new images as layers and resize them to fit.
6. Add colour elements to a black and white image using layers and eraser tools.

App Design

1. Adjust slide size to mimic a phone/tablet size.
2. Add text and images to a slide.
3. Add icons and text to use as navigation.
4. Duplicate slides to create multiple pages of the app.
5. Create hyperlinks to create navigation.

3D Design

	<p>author, colour and image.</p> <ol style="list-style-type: none"> 2. Add multiple pages based on a theme. 3. Add text on different pages. 4. Add images on different pages to match the theme/text. 5. Add voice recordings to match the text and theme. <p>Design</p> <ol style="list-style-type: none"> 1. Change the colour and pattern of elements. 2. Position and rotate objects on a design. 3. Position objects in relation to each other. 4. Resize, rotate, flip and arrange objects behind/in front of each other. 	<ol style="list-style-type: none"> 4. Create roads/paths by adjusting the height of 3D shapes. 5. Add windows and door shapes. <p>E-Book Creation</p> <ol style="list-style-type: none"> 1. Choose a suitable page shape and add a title and subtitle. 2. Change the background colour/texture of a page. 3. Add, resize and change the colour of a shape then copy and paste it. 4. Search for and add suitable images then resize and position them. 5. Create another page with a background, image, shapes and text. 6. Add an audio recording of the page text, including hiding it behind an object. 7. Use hyperlinks for navigation between the pages. <p><u>Collecting, analysing, evaluating and presenting data and information.</u></p> <p>Data Handling</p> <ol style="list-style-type: none"> 1. Change appearance of cells in a spreadsheet (fill colour and border) then add and align text. 2. Find and add data to a spreadsheet, resize cells and use the software to create a suitable chart with a title. 	<ol style="list-style-type: none"> 1. Add, move, change colour and duplicate a brick. 2. Rotate bricks. 3. Use sloping bricks and special bricks for a purpose. 4. Change the transparency of bricks. <p>Video Editing</p> <ol style="list-style-type: none"> 1. Add scene images. 2. Add scripted voiceover audio, adjust the volume and crop clips (including splitting a clip). 3. Add more clips and use transition effects. 4. Add titles. 5. Use elements such as shapes. 6. Add music background music and adjust the volume. 7. Export a project. <p>Web Design</p> <ol style="list-style-type: none"> 1. Create a static homepage. 2. Choose a suitable theme for your website. 3. Change the site identity to a suitable title, tagline and website icon. 4. Upload a suitable header and/or background image. 5. Adjust the website sidebar and add suitable widgets. 6. Add text and images to a page and edit them. 7. Add multiple pages and edit the navigation, including sub-menus. 8. Provide constructive feedback for your classmates' websites. <p><u>evaluating and presenting data and information.</u>Select, use and combine a variety of software (including internet services). <u>Collecting, analysing,</u></p> <p>Data Detectives</p>
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<p>Digital Literacy Pupils learn to use technology to express themselves and develop their ideas.</p>	<p><u>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.</u></p> <p>E-Safety</p> <ol style="list-style-type: none"> 1. Understand what the internet is and how people use it. 2. Understand what personal information is and why we keep personal information private. 3. Why do websites want personal information. 4. Identify when and where to go for help when concerned. <p>E- Safety</p> <ol style="list-style-type: none"> 1. What are the dangers of sharing photos online? 2. People online are not always who they say they are. 3. Trusting information online. 4. Using the Internet responsibly. 5. Being respectful. <p>Digital Literacy Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they</p>	<p><u>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</u></p> <p>E-Safety</p> <ol style="list-style-type: none"> 1. Understand what to do if something upsets you online. 2. Understand why and how people can be nasty online. 3. Describe the term ‘sharing online’ and why we need to get permission to share photos and videos of other people. 4. Understand why people pretend to be someone else online. 5. Understand why we only talk to people we know in the real world, when online. 6. Understand why we should not always trust what we read online and how to check 7. Understand the importance of being kind in the real world and also online. 8. Understand the importance of using avatars and how to make them. <p>E-Safety</p> <ol style="list-style-type: none"> 1. Understand what to do if something upsets you online. 2. Understand why and how people can be nasty online. 3. Describe the term ‘sharing online’ and why we need to get permission to share photos and videos of other people. 	<p><u>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</u></p> <p>E-Safety</p> <ol style="list-style-type: none"> 1. Keep personal information private. 2. Respect and protect against online bullies. 3. Understand the consequences of sharing photo/videos online. 4. Understand the term digital footprint. 5. How can we check online content is trustworthy. 6. How and where and who can we report concerns we have to. 7. Understand the pitfalls of in-app purchases. <p>E-Safety</p> <ol style="list-style-type: none"> 1. Keep personal information private. 2. Respect and protect against online bullies. 3. Understand the consequences of sharing photo/videos online. 4. Understand the term digital footprint. 5. How can we check online content is trustworthy. 6. How, where and who can we report concerns we have to. 7. Use suitable usernames and passwords for online accounts. 8. Understand the pitfalls of in-app purchases. 9. Understand how and why companies/people

	<p>have concerns about content or contact on the internet or other online technologies.</p> <ol style="list-style-type: none"> 1. Understand how a web-page displays information in different ways; text, images, videos and interactive elements. 2. Use a web-page to answer questions. 	<ol style="list-style-type: none"> 4. Understand why people pretend to be someone else online. 5. Understand why we only talk to people we know in the real world, when online. 6. Understand why we should not always trust what we read online and how to check 7. Understand the importance of being kind in the real world and also online. 8. Understand the importance of using avatars and how to make them. <p><u>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</u></p> <p>Inside a Computer</p> <ol style="list-style-type: none"> 1. Understand what important parts of inside a computer or mobile device do to help with the performance (CPU, Fan, Hard Drive, RAM, Graphics Card). 2. Understand that memory is measured in bytes and gigabytes. 3. Use search filters on websites to find suitable information. <p>Internet Research</p> <ol style="list-style-type: none"> 1. Use search technologies to find specific pieces of information. 2. Understand features of an Internet Browser. 3. Reference the correct source of information. 4. Be discerning in evaluating digital content. 5. Check the internet for fake news by cross-referencing facts. 	<p>track our online behaviour and how we can prevent it.</p> <p><u>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.</u></p> <p>Computer Networks and the Internet</p> <ol style="list-style-type: none"> 1. Understand Computer Networks, Internet and Cloud Computing and how they help us. 2. What is email and how can we use it safely? 3. Understand how and why we collaborate online (including blogging).
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