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Computing End Points

Computing is composed of these four elements:

- **Computer science.** Using computational thinking and problems solving using a logical method;
- **Information Technology.** Being able to use technology;
- **Digital Literacy.** How we can use the technology to create and meet our needs;
- E-**Safety.** How we can be safe online and treat others respectfully.

Early Years

These are the most relevant statements from Development Matters age ranges for Three and Four-Year-Olds and Reception as well as highlighting the statements within the ELGs which feed into the programme of study for computing.

3 and 4 year olds	PSED	Remember rules without needing an adult to remind them.
	Physical Development	Match their developing physical skills to tasks and activities in the setting.
	Understanding the World	Explore how things work.
Reception	PSED	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.
ELG	PSED Managing Self	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly.
	Expressive Arts and Design Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

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Computer Science

Key stage 1

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

- To be able to create short sets of sequenced instructions.
- To be able to write and follow detailed step-by-step instructions;
- To be able to draw squares and rectangles;
- To be able to create simple algorithms using a number of different blocks.

Pupils should be taught to create and debug simple programs

- To be able to open the ScratchJr app and start a new project;
- To be able to create step-by-step instructions using pictures;
- To be able to add new characters and backgrounds;
- To be able to use blocks for movement in different directions;
- To be able to turn a floor turtle using rt 90 and lt 90;
- To be able to use the repeat and green flag blocks in Scratch to control algorithms

Pupils should be taught to use logical reasoning to predict the behaviour of simple programs

- To be able to direct a Bee-Bot (or similar programmable toy) to a toy;
- To be able to program a Bee-Bot (or similar programmable toy), one instruction at a time, using the arrow buttons.

Key Stage 2

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

- To be able to create and debug algorithms to draw regular polygons using the repeat command/ block (Turtle Logo and Scratch);
- To be able to draw shapes with spaces between using penup and pendown (Turtle Logo)
- To be able to change and alter the pen settings (Scratch);

- To be able to write a program which accomplishes a specific goal.
- To be able to create a program that includes a logical sequence.
- To be able to change the colour of the pen.
- To be able to write text using the label command.
- To be able to move and edit blocks as part of an algorithm
- To be able to create instructions with actions and consequences.
- To be able to create a program to control a simple sequence.
- To be able to create flowcharts for multiple inputs and outputs.
- To be able to follow instructions given in the Kodu programming environment.
- To be able to describe the actions of a sequence of Kodu commands.
- To be able to use tools to change the size of the ground and raise or lower the landscape.
- To be able to decompose code into smaller parts and explain it in their own words.
- To be able to create a race track with an end goal for a game.
- To be able to Program a character to follow a path.
- To be able to select appropriate sprites to fit within a scene and use costume changes for motion effect.
- To be able to use the broadcast message and receive block to structure and control the timing of events.

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- To be able to select appropriate sprites and backdrops and plan a sequence of an animated story using timings.
- To be able to order a series of backdrops to create a story narrative and narrate events with required timings.

Pupils should be taught to use sequence, selection, and repetition in programs; work with variables and various forms of input and output

- To be able to use repetition and selection commands.
- To work with variables and adjust these depending on the effect they wish to create.
- To understand and use the duplicate function.
- To be able to demonstrate that they understand how to combine a range of different effects to create their own quiz;
- To be able to use decisions and subroutines.
- To be able to program inputs and outputs
- To be able to insert the show and hide block into an algorithm and locate the correct place to make a sprite appear visible.

Pupils should be taught to use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- To debug algorithms to draw regular polygons using the repeat command/ block (Turtle Logo and Scratch);
- To modify symbols in a flowchart for effect..
- To debug a program they have written;
- To write procedures using simple algorithms;
- To program an algorithm as a sequence of game;
- To be able to record a sound to enhance an animated story and insert blocks to play the recorded sounds.

Information Technology

Key Stage 1

Pupils should be taught to recognise common uses of information technology beyond school

- Log on and log off on a computer independently.
- Manipulate an application window by moving and resizing it.
- To identify examples of technology used in different settings.
- To describe how they use technology in their lives and explain the benefits of doing so.
- To identify some ways in which technology has changed over time.
- To be familiar with the work of a number of people who have been significant in shaping the world of information technology.
- To use prior knowledge to produce creative designs for the information technology of the future.

Key Stage 2

- Pupils should be taught to use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.
  - To use a search engine to find information and implement strategies to improve results when searching online, including using keywords.
  - To use a search engine to copy and paste images across to a blank document.

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- To search for information using appropriate search engines and can refine their search terms by using keywords.
- To refine their searches using Boolean operators with some guidance. · Children can use strategies to check the reliability of information on web pages.
- To explain how search engines work using key vocabulary, such as web indexing and web crawlers.
- To understand that search results are ranked and can explain how page ranking works.
- To explain what search engine optimisation (SEO) is and can suggest some SEO improvements for a web page.

Pupils should be taught to 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

- To 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
- To identify what the Internet is and how it works, including how packets of data move along routes and the different connections that can be used.
- To know how to cross-reference using tabs and can identify reliable links through looking for a secured padlock in the URL address bar..
- To know how to bookmark or favourite an appropriate web page.
- To be confident in recognising different methods of online communication and can identify the positives and negatives of communicating online.
- To can identify and recognise features of email and demonstrate an understanding of spam emails and phishing.
- To be able to send emails using the CC feature.
- Children will be able to demonstrate their understanding of attachments.
- Children understand what a cloud storage service is and can explain how the tools available are used to collaborate online, considering the positives and negatives.
- Children can demonstrate their understanding of opening and editing a shared document using online collaborative tools and suggest how to be respectful online.
- To describe what a computer network is and identify what devices connect to a network.
- To identify three types of networks (LAN, MAN, WAN), explain how networks are defined and list two network topologies
- To list protocols and explain what they are used for and provide an example IP address.
- To explain the difference between the Internet and World Wide Web.
- To explain what cloud computing is and provide examples of what cloud computing is used for.
- To explain ways to communicate online and explain what streaming is.
- To identify different types of malware and explain how these can affect a computer network.

Computer Literacy

Key Stage 1

Pupils should be taught to use technology purposefully to create, organise, store, manipulate and retrieve digital content

- To be able to save their paintings in their folder.
- To be able to fill an area with a colour.
- To be able to undo and redo.

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- To be able to add text.
- To be able to save their work in their folder.
- To be able to edit text using backspace, delete and the arrow keys.
- To be able to format the font.
- To be able to select single words.
- To be able to click, double-click and drag objects;
- To be able to save and open files;
- To be able to make shapes [in Paint software] the size they desire;
- To be able to position shapes correctly;
- To be able to select and compare different brush types
- To be able to recreate a piece of art using a computer program;
- To be able to manipulate shapes and objects to recreate an art style.
- To be able to create folders.
- To be able to print files.
- To be able to add images.
- To be able to format text and text boxes

Key Stage 2

Pupil should be taught to 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

- To be able to create a hyperlink to another slide.
- To be able to use slide transitions · insert audio and video files (where possible).
- To be able to record audio onto a slide.
- To be able to plan a branching story.
- To be able to create simple slide templates.
- To be able to copy and organise slides as required.
- To be able to order and group objects.
- To able to move, resize and arrange text boxes and images effectively.
- To be able to select single words.
- To be able to cut, copy and paste text.
- To be able to format the font.
- To be able to insert images.
- To be able to copy a screenshot into another application.
- To be able to use a secure password.
- To be able to use keyboard shortcuts.
- To be able to use some of the main keyboard shortcuts;
- To be able to suggest ways to improve a layout;
- To be able to apply specific effects to an image;
- To be able to add a spelling to the spelling dictionary;
- To be able to add or delete rows or columns in a table;
- To be able to suggest ways to change a table;
- To be able to type at an appropriate speed;
- To be able to choose a relevant website to link a document to;
- To be able to create a hyperlink.
- To be able to describe one or more traditional methods of animation.
- To be able to make slight changes to an image using onion skinning, understanding the term.
- To be able to use a time slider to find a specific point in a film clip to insert or edit an object.

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- To be able to edit and refine images in a stop motion animation short film clip.
- To be able to compare different animation software by looking at its advantages and disadvantages.
- To be able to listen to and improve on their own recordings by re-recording
- To be able to locate and download existing sound files to be imported into recording software.
- To be able to combine two or more tracks to make a new, original recording.
- To be able to plan and record appropriate audio content for a podcast.
- To be able to evaluate what features makes good quality audio content.
- To be able to enter formulae into cells.
- To be able to input data and discuss the effect on results.
- To be able to use further functions including AVERAGE, MIN and MAX.
- To be able to create graphs.
- To be able to design their own spreadsheet for a specific purpose.

e-Safety

Key Stage 1

- To be able to type their name and the date on a piece of work they have created; · choose the correct Safe Search filter when using a search engine;
- To be able to make links between the online and offline world;
- To be able to recall all of the SMART rules for Internet safety;
- To be able to recognise which personal information they should keep safe from strangers;
- To be able to help to construct an email.
- To be able to explain what 'digital footprint' means;
- To be able to know how people can use the information they put online;
- To be able to know that a digital footprint contains information about a person;
- To be able to know how to use keywords to give better search results;
- To be able to use a website to search for information;
- To be able to identify possible dangers online; explain how to identify websites suitable for their age;
- To be able to know when and how to ask an adult for advice about accessing a website;
- To be able to explain what to do if a website makes them uncomfortable;
- To be able to know what people might want to know about a website in order to determine its usefulness;
- To be able to explain their likes and dislikes about a website;
- To be able to identify who a website could be aimed at;
- To be able to identify unkind online behaviour;
- To be able to know the course of action to take if they think someone is being unkind to them online;
- To be able to safely search for information online;
- To be able to choose appropriate websites for their age.

Key Stage 2

- To recognise and identify safe people to report cyberbullying to;
- By understanding how cyberbullying can happen via a range of devices;
- To identify a range of targeted online adverts;
- To explain how companies, use websites to promote products;
- To create a strong password, explaining why it is important;
- To explain what privacy settings are and how to use them safely;
- To recognise and define cyberbullying and the affect it has;

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- To give examples of people they can report cyberbullying to and explain why they are good choices;
- To identify a range of targeted online adverts and how they are used;
- To create a strong password, explaining why it is important and giving tips to help others create a strong password;
- To explain what privacy settings are, why they are important and how they can be used safely;
- To discuss the benefits and disadvantages of email as a form of communication;
- To explain how to identify an email that may be unsafe to open;
- To write a clear email, explaining why an address and subject is important, and know how to send it;
- To explain what an online community is and how people belong to them;
- To identify and explain different forms of online communication;
- To share and explain what they have learnt about online safety, recalling key facts;
- To be able to communicate their ideas with a group clearly, listening to others' contributions, making connections and suggesting improvements;
- To choose and apply their learning to a planning activity.
- To identify comments or messages that may be hurtful to others;
- To edit their own messages and comments to make sure they are kind;
- To understand that search results are ranked; · choose an appropriate number of words for a search term;
- To explain how to use other people's work respectfully;
- To explain why it may be dangerous to share private information;
- To identify a dangerous spam email;
- To be able to create multiple strong passwords for use across different platforms;
- To be able to spot citations online;
- To alter a photograph.
- To be able to look in the address bar of a website so check for security;
- To identify the lock symbol in an address bar;
- To explain why someone might have an online friendship;
- To explain what the SMART acronym means;
- To explain what a stereotype is and compare gender stereotypes.