



COMPUTING

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.

Aims

The national curriculum for computing aims to ensure that all pupils:

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

Area of focus	Year 2	Year 3	Year 4	Year 5	Year 6
Multimedia	<p>Graphics: Use ICT to generate ideas for their work. Save, retrieve and print work.</p> <p>Text: Begin to use two hands when typing. Use spacebar, backspace, delete, arrow keys, return.</p> <p>Sound and Music: Record sounds using ICT software.</p>	<p>Graphics: Search and download images from the internet for a particular purpose. Use 'print screen' function to capture an image or information.</p> <p>Text: Type at a laptop or tablet using two hands. Use a variety of font sizes, styles and colours. Word process short texts to present</p> <p>Sound and Music: Record sounds using ICT software. Save, retrieve and edit sounds.</p>	<p>Graphics: Search for images on the internet for a particular purpose and download/store these images. Crop, rotate, resize an image or print screen. Save work on cloud based/internet storage system.</p> <p>Text: Type at a laptop or tablet using two hands. Choose font size, style and colour for a purpose. Align text left, right and centre.</p> <p>Sound and Music: Record sounds using ICT software. Change sounds that have been recorded.</p>	<p>Graphics: Use ICT to create a 3D representation related to their topic (TinkerCad). Select part of an image and crop, rotate, invert this selection. Create a simple animation to tell a story.</p> <p>Text: Type at a laptop or tablet using two hands making minimal errors in spellings and grammar. Word process writing in order to present or display (e.g. short story, advert, poster). Use advanced tools in word processing such as tabs, line spacing to create presentations.</p> <p>Sound and Music: Record sounds using ICT software.</p>	<p>Graphics: Use ICT to create a 3D representation, changing the style, colour, texture of a model (TinkerCad). Make a short-animated film using a variety of photos and own images (Toontastic, Animoto).</p> <p>Text: Type at a laptop or tablet using two hands making minimal errors in spellings and grammar. Create an extended piece of writing using word processing skills. Use advanced tools in word processing such as tabs, line spacing to create appropriate presentations for a known audience.</p> <p>Sound and Music: Edit and refine work in order to improve outcomes.</p>

	<p>Video: Capture video Discuss which videos are kept and which to delete.</p> <p>Presentation: Choose a subject to collect information upon. Present the information to a group.</p>	<p>Video: Capture video Discuss which videos are kept and which to delete. Arrange clips to create a short film (iMovie).</p> <p>Presentation: Change/choose the layout of a slide (PowerPoint). Create a title slide and choose a style (PowerPoint).</p>	<p>Order simple sounds in the form of music or a movie trailer.</p> <p>Video: Capture video for a purpose Discuss which videos are kept and which to delete. Trim and arrange clips to convey meaning. Add titles, credits to a film.</p> <p>Presentation: Insert an image/text/graph from the internet. Decide upon and use effective transitions.</p>	<p>Create a multi-track recording using effects (GarageBand) Save, retrieve and edit sounds.</p> <p>Video: Storyboard and capture videos for a purpose. Trim, arrange and edit audio levels to improve the quality of the outcome. Add titles, credits to a film, slide transitions.</p> <p>Presentation: Work independently to create a multi-slide presentation. Use transitions and animations to improve the quality of the presentation.</p>	<p>Collect audio from a variety of resources including own recordings and internet clips.</p> <p>Video: Storyboard and capture videos for a purpose. Plan for and use of special effects and transitions. Export the topic-related video.</p> <p>Presentation: Work independently to create a multi-slide presentation that uses speaker notes. Include sounds and moving graphics into slides.</p>
E-Safety	<p>Talk about websites they have been on.</p> <p>Explore a website and discuss the information that it shows.</p> <p>Recognise an email address.</p> <p>Contribute to a class email.</p> <p>Explain the use of the CEOP button.</p>	<p>Type in a URL to access a website.</p> <p>Use a</p> <p>Navigate, view and comment on their class blog (DB Primary).</p> <p>Locate and use the @ key on the keyboard correctly. Compose an email to a peer using appropriate formatting.</p>	<p>Add websites to a favourites list.</p> <p>Use appropriate search terms that is linked to the topic related question that wishes to be answered.</p> <p>Compose an email to a peer using appropriate formatting with attachments.</p>	<p>Use 'boolean operators' to search the internet quicker and with precision (and, or, not).</p> <p>Show an understanding that all information on the internet is not accurate (e.g. Wikipedia).</p> <p>Use knowledge of domain names to aid judgement of the validity of websites.</p>	<p>Independently and with due regard for safety, search the internet using a variety of techniques to find suitable information on a specific topic.</p> <p>Further understanding of how to be safe on social media (use of privacy settings, usernames, unknown friends etc.)</p>

		<p>Recognise online behaviours that would be unfair.</p> <p>Explain the use of the CEOP button.</p>	<p>Download attachments from an email and access this file.</p> <p>Recognise social networking sites and apps and their purposes.</p> <p>Identify dangers when presented with scenarios based on social media.</p> <p>Explain the use of the CEOP button.</p>	<p>Further understanding of how to be safe on social media (use of privacy settings, usernames, unknown friends etc.)</p> <p>Show awareness of ways in which social media and the internet can be dangerous.</p> <p>Embed hyperlinks, photos, videos, into emails and blog posts.</p> <p>Explain the use of the CEOP button.</p>	<p>Use appropriate methods to validate information to check for bias and accuracy.</p> <p>Show awareness and understanding of the term 'encryption' (via websites, social media).</p> <p>Discuss and explain scenarios involving technology and social media and how they can be resolved.</p> <p>Upload/download a file to a cloud-based system safely.</p> <p>Explain the use of the CEOP button.</p>
Networks	<p>Understand that networks allow people to communicate with others (e.g. email, tablets).</p>	<p>Explain what a computer network is and give some examples of when they are used.</p>	<p>Explain how information needs to be converted into numbers in order to travel through a network.</p>	<p>Understand how data packets are routed from one computer to another on a separate network which is connected to the internet.</p>	<p>Understand how mobile phone and other networks operate.</p>

Coding and Programming

BeeBots:

Give commands, including forwards/backwards and turn one at a time.

Explore what happens when a sequence of instructions is given.

Give a set of simple instructions to follow a task and create simple shapes.

Scratch/Lego (Fix the Factory):

Navigate the Scratch programming environment.

Choose a background and change the sprite.

Add basic inputs to control the sprite/character.

Explain the steps taken to control a sprite or a character.

Scratch/ Lego (Fix the Factory):

Navigate the Scratch programming environment.

Use conditional statements within the program to control the sprite (if... then...)

Improve and change the sequence of commands for efficiency.

Explain how a rule-based algorithm works in their own words.

Scratch/Arcade:

Add sounds and own media to Scratch that link to the chosen topic.

Design a game using block language (Scratch/Arcade) based on their own ideas.

Use sequencing and repetition as part of a game.

Create a 3D building or model (link to **Graphics**).

Scratch/Arcade:

Debug (check for errors) in a simple coding game and explain how they were found and fixed.

Use the keyboard and mouse to give a sprite controls (input through keyboard/mouse and output through screen/sound effects or narration).

Create a 3D building or model with a specific purpose (link to **Graphics**).

Discuss potential consequences of actions and chosen commands (Scratch).

Data and statistics

Know that an image gives information.	Put data into a program (Excel).	Choose information to put into a database.	Create data collection forms and enter data accurately from these.	Begin to use formulas when using a spreadsheet that (Excel).
Explain what a pictogram is.	Analyse what a pictogram is showing.	Recognise what information is suitable for a topic.	Create graphs from data on a spreadsheet.	Create a range of advanced graphs using collected data.
Create a table in order to sort information (e.g. Yes/No 'Tree diagram').	Design a questionnaire to collect information (Word processing).	Sort and organise collected information to use.	Set up and use a spreadsheet model to explore patterns and relationships.	Identify opportunities for data logging and carrying out own experiments.
	Begin to use a data logger to sense physical data (sound, light, temperature).	Create and search a database from information that has been selected.	Interpret the information provided by a data logger.	Understand the appropriateness of devices used to collect and analyse data.
		Begin to use a data logger to sense physical data (sound, light, temperature).	Understand the problems that can occur when using technology to collect data.	