HCAT

Computing Curriculum

EYFS Year 1 Year 2 Year3 Year 4 Year 5 Year 6

Computing Curriculum

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

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.

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
- 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.

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
- 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 Year3 Year 4 Year 5 Year 6

Area	Transition	Lower KS1	Upper KS1	Lower KS2	Upper KS2
Organising and searching (using the internet) **INCERTS: G**	I am aware of ways to find out information using technology (discussion & observations around using the Internet and commonly used search engines)	I know how to open an internet search engine. I know how to enter key words into a search engine. I know how to use search engines to locate information. I know how to scan a QR code to access information (Seesaw). I know how to recognise uppercase letters on the keyboard	I know how to enter a URL to find a website. I know how to use search technologies with greater accuracy. I know how to locate specific information from the internet.	I know how to use a search engine to find information and realise the importance of choosing key words to find information effectively. I know how to select and refine search results accurately and have an understanding for how these are ranked.	I know how to evaluate digital content. I know how to give evidence to support an evaluation of content. (Boolean logic)
Using Software **INCERTS: D**	I know how to use the mouse to control the cursor. I am beginning to understand the cause and effect of moving the mouse. I know how to click and select objects. I know how to use click and drag. I know how to move items on screen. I know how to select and use simple paint tools. I know how to become familiar with the keyboard. I know how to explore parts of the computer. I am beginning to recognize uppercase letters (to access the keyboard).	I know how to open a new document. I know how to use the keyboard to enter text (touch or physical). I know how to save my work to an appropriate location. I know how to print my work. I know how to use 'Save as' to save changes. I know how to re-open a document. I know how to select a font, word and edit it. (style, size, colour). I know how to change the font. I know how to change the size of the font. I know how to change the colour of the font. I know how to use exported photos within documents and apps. I know how to name parts of the PC/Desktop (mouse, keyboard, monitor, tower unit). <u>PC</u> I know how to log in and out of a computer. I know how to start up and shut down a computer correctly. I know how to open and close programmes. <u>Tablet</u> I know how to select and start an app. I know how to use the home button to return to the home screen. I know how to log out and close apps. I know how to use the volume control and mute buttons.	I know how to change the page size. I know how to use the spell check tool. I know how to save my work to a specific location. I know how to use find and replace. I know how to select a sentence or paragraph and edit it. (style, size, colour) I know how to cut, copy and paste within a document. I know how to cut copy and paste across documents. I know how to highlight text. I know how to use bullet points. I know how to insert an image. I know how to use the undo/redo tab. I know how to add animation to my slides. I know how to open a template document. I know how to insert a text box and enter text. I know how to use chosen apps to support my learning in curriculum areas. I know how to begin to explore the use of special keys on the keyboard (Tab, enter, space bar, shift key, caps lock) <u>PC</u> I understand why I log in and out of a computer. I understand why it is important to shut down a computer correctly. I know how to explore appropriate software to present ideas to an audience (Prezi, PowerPoint, Smart Notebook, Adobe, Word) <u>Tablet</u>	I know how to edit a paragraph within my document (e.g., using save as to redraft and rename). I know how to edit the page layout. I know how to insert a table. I know how to insert a picture and edit the layout using text wrap, forward and backward. I know how to insert a sound or music file into my presentation. I know how to insert a video file into my presentation. I know how to create multimedia pages (slides) and show an awareness of purpose and audience. I know how to format the background of my document. I know how to insert a new page into my document. I know how to edit the boarders within my document (thickness and colour). I know how to use special keys on the keyboard for purpose. <u>PC</u> I know how to use the appropriate software to present my ideas to an audience (Prezi, PowerPoint, Smart Notebook, Adobe, Word). <u>Tablet</u> I know how to use the appropriate software to present my ideas to an audience (KeyNote, Explain Everything, Comic Life, SeeSaw, Adobe, Book creator, Clips, Do ink/iMovie, Pages). <u>Data</u>	I know how to edit the header and footer. I know how to insert a hyperlink. I know how to use previously taught skills effectively within my document. I know how to choose, use and combine the most appropriate software programs to present my work. I know how to create hyperlinks to pages within presentations. I know how to make a homepage for a website that contains links to other pages (Adobe) I know how to evaluate multimedia pages (slides) and recognise the features of good page design to improve my own work. I know how to use publishing software to create documents for a given purpose/ audience. My work includes: Video, Images, Visual effects, Sound and Animation, to convey meaning and purpose. I know how to combine a variety of software on digital devices to create an end goal. <u>PC</u> I know how to select and choose an appropriate software for impact and justify my decision. <u>Tablet</u>

		I know how to independently access the iPads to enhance my learning. I know how to return the tablet to charge.	I know how to use more than one app purposefully to create digital content (eg, using a pic collage into a presentation). I know how to use the search tool to locate and open apps. I know how to access settings: turning on Wi-Fi, adjust brightness, airdrop and airplay. <u>Data</u> I know how to collect information and present my findings (2 simple)	I know how to collect and sort data and enter it onto Excel or/and Numbers.	I know how to edit my video recordings using iMovie, Clips (or similar editing software) I know how to consider my audience when editing a simple film. I know how to prepare and present a simple film (iMovie). <u>Data</u> I know how to collect, sort and analyse data in Excel/Numbers that I have created. I know how to evaluate data I have recorded in Excel/Numbers.
E-Safety **INCERTS: R**	I know to seek adult permission when accessing technology. I know how to follow e-safety rules. <u>USEFUL RESOURCES</u> Penguin book National Online Safety (website – EYFS Lesson Plans and Bundle)	I know how to follow e-safety rules and understand the importance of these. I know how to use the search engines agreed by my school. I know what to do if I see anything I am unhappy with or receive a message I do not like. I know what to do if I find something inappropriate online. I know that any personal information (home address or any other information that could be used to identify me) should not be shared online. I know how to act responsibly and respectfully and understand the consequences when using the internet or iPads. I know how to navigate age appropriate websites. I know not everything on the internet is true. I know how to recognise advertising on websites and appropriately evaluate when to ignore this. I understand people can communicate with other people online (through online forums, email, gaming, blogging). I know how to send and receive emails as a class. I know how to use a username and password to use any secure network. I know how to use the internet with care and respect <u>USEFUL RESOURCES</u> Childnet.com My activity passport – Dfe NOS – National online safety bbc.com/ownit net-aware.co.uk The internet matters National Online Safety (website)	I am aware of e-safety rules and adopt these when using the internet and other technologies. I am aware of rules and understand that they exist to help keep me safe when online. I am aware of the consequences of not following the rules. I know I should behave online as I would in the real world: respecting other people's views. I understand the importance of keeping personal information private. I know to identify when emails should not be opened and when an attachment may not be safe. I know how to and demonstrate when to use emails safely. I know how to explain and demonstrate how to use the internet safely. I know how to explain and demonstrate how to use apps and gaming safely. I know how to use different search engines safely. I know how to use a username and password to use any secure network. I know how to explore the difference in communicating face-to-face and online. I know how to use technologies in ways that minimize risk (e.g. responsible use of online discussions etc.). I know how to understand the phrase screen time and can discuss its impact on my well-being. <u>USEFUL RESOURCES</u>	I am aware of e-safety rules and adopt these when using the internet and other technologies. I am aware of rules and understand that they exist to help keep me safe when online. I am aware of the consequences of not following the rules. I know I should behave online as I would in the real world: respecting other people's views. I understand the importance of keeping personal information private. I am aware of the negative impact cyber bullying can have on its victims and am aware of where I can go for help and advice if I need to. I know how to explore the validity of information on the internet. I know how to make sensible and considered judgments about whether or not to trust online content I know how to independently, and with regard to E-Safety, select and use appropriate communication tools to solve problems by collaborating and communicating with others, with and beyond school. I know that content put online is extremely difficult to remove. I understand the positive and negative impact of the use of ICT. <u>USEFUL RESOURCES</u>

				INTERLAND bbc.com/ownit net-aware.co.uk The internet matters National Online Safety (website)	SRE links bbc.com/ownit net-aware.co.uk The internet matters
Algorithms and Programming **INCERTS: A,B,C,E,F**	I know how to create and follow a set of simple instructions using Bee-Bots. I know how to understand left and right.	I know how to begin to follow a series of simple instructions to move around a course and understand that this is an algorithm. (learn 2 code 1- teacher guide). I know how to begin to predict the behavior of simple programs when buttons are pressed on a device or icons/objects are clicked on a computer screen. I know how to create a simple series of instructions (using forwards, backwards, up, down, left and right). I know how to record my route. I know how to put two instructions together to control a programmable device. I know how to begin to plan and test my journey, using a range of devices such as remote-control toys and Bee-Bots. <u>USEFUL APPS</u> • Daisy the Dino • Code Spark • Bee-Bot <u>USEFUL DEVICES</u> • Big Trak (Available at WCPS) • Bee-Bots (Available across trust) <u>USEFUL RESOURCES</u> • Learn 2 code (apple iBook/free!) • Barefoot Computing (website- free!)	I am beginning to understand specific vocabulary linked to coding (algorithm, command, sequence, debug) I know how to create a sequence of instructions to control a programmable device and I understand that this is an algorithm. I know how to give an onscreen character directional instruction (A.L.E.X- app) I know how to use right angle turns and repeat commands. I know how to control a real or virtual device using appropriate buttons, and estimate distances and turns. I know how to use logical reasoning to predict the behavior of simple programs when buttons are pressed on a device or icons/objects are clicked on a computer screen. I know how to test my program and amend a set of instructions. I know how to debug simple errors. <u>USEFUL APPS</u> • Tynker • Swift Playground • Fix the factory • Scratch Jr • A.L.E.X • Busy things – Busy bundle <u>USEFUL DEVICES</u> • BB8 • Sphero <u>USEFUL RESOURCES</u> • Learn 2 code 1&2 (apple iBook/free!) • 2 Go (PC) • Barefoot Computing	<u>Y3</u> I know how to use specific vocabulary linked to coding (algorithm, command, sequence, debug, programming, logic, creating, tinkering, input, output, function, loop) I am beginning to give reason for how some simple algorithms work. I know how to plan a sequence of instructions for a device using more complex commands (functions and loops). I am beginning write and debug programmes that accomplish specific goals. I am beginning to use a variety of software to create programmes, systems and content (using scratch to develop games) I am beginning to realise that problems can be solved with real or virtual devices by breaking them down in to smaller parts. (identify errors in a sequence of instructions). I know how to create an instruction or set of instructions with the shortest number of commands to create a desired effect by using procedures. <u>Y4</u> I know how to use and understand specific vocabulary linked to coding (algorithm, command, sequence, debug, programming, logic, creating, tinkering, input, output, function, loop, decomposition) I know how to use logical reasoning to explain how some simple algorithms work. I am beginning to use 90 degrees and 45 degree turns. I know how to draw a squares, rectangles and other regular shapes on screen, using commands (Hour of code- Artist) I know how to further develop the planning of a sequence of instructions for a device using more complex commands (functions and loops).	<u>Y5</u> I am beginning to reason about errors in algorithms and programmes (Swift) I am beginning to identify input and output devices in real life situations. I am beginning to refine and combine procedures to solve more complex problems. I am beginning to write a sequence of instructions to control input and output devices using real (if possible) or virtual on-screen devices (Flowol) I am beginning to apply my knowledge of control sequences in terms of inputs and outputs and draw simple flow diagrams to explain what is happening. I am beginning to make outputs react to conditions met by inputs e.g. if it gets dark, turn lights on. I am beginning to copy or repeat commands to make code as short as possible. I am beginning add conditions to events in a program e.g. if your car drives over an odd number, end the game I am beginning to create a game for an audience considering level of difficulty. I am beginning to refine a game based on audience feedback. I am beginning to solve simple problems on real or virtual devices by breaking them down in to smaller parts. (identify errors in a sequence of instructions). <u>Y6</u> I know how to explain and reason why errors occur in algorithms and programmes. I know how to identify input and output devices in real life situations. I know how to refine and combine procedures to solve more complex problems. I know how to write a sequence of instructions to control input and output

				I know how to write and debug programmes that accomplish specific goals. I know how to combine commands for simple effects such as moving and turning a character, with a specific goal. I understand that problems can be solved with real or virtual devices by breaking them down in to smaller parts. (identify errors in a sequence of instructions). I know how to plan a set of instructions using standard programming notation (flow charts symbols- Flowol (PC) I know how to use a variety of software to create programmes, systems and content. I know how to experiment with variables to control virtual devices. <u>USEFUL APPS</u> • Swift Playground (Y3/4) • A.L.E.X (Y3/4) • Hour of code- classic maze (Y3) • Scratch Jr (Y3/4) • Tinkle <u>USEFUL DEVICES</u> • Sphero • Big Trak (Y3/4- Available at WCPS) • Code for life (Y3/4) (PC) <u>USEFUL RESOURCES</u> • Barefoot Computing (Y3/4) • Learn 2 code (apple iBook/free) • Flowol • Minecraft Education	devices using real (if possible) or virtual on screen devices. I know how to apply my knowledge of control sequences in terms of inputs and outputs and draw simple flow diagrams to explain what is happening. I know how to make outputs react to conditions met by inputs e.g. if it gets dark, turn lights on. I know how to copy or repeat commands to make code as short as possible. I know how to add conditions to events in a program e.g. if your car drives over an odd number, end the game I know how to create a game for an audience considering level of difficulty. I know how to refine a game based on audience feedback. I know how to solve problems on real or virtual devices by breaking them down in to smaller parts. (identify errors in a sequence of instructions). <u>USEFUL APPS</u> • Swift Playground • A.L.E.X • Bloxel • Scratch/ Jr (Y5/6) <u>USEFUL DEVICES</u> • Code for life (Y5/6) • Kodu <u>USEFUL RESOURCES</u> • Flowol • Minecraft Education • Barefoot Computing (Y5/6)
Uses of Technology **INCERTS: H**	I know how to explore and identify IT in the environment. (uses electrical power) I know how to develop hand-eye co-ordination with the mouse	I know how to discuss some uses of ICT beyond school.	I know how to recognise some common uses of ICT beyond school.	I am beginning to understand that computer networks, including the internet, can provide multiple services. I am beginning to understand that computer networks offer opportunities for communication and collaboration (e.g. Facetime, Email, YouTube, Blogging, Vlogging, Music/video streaming).	I understand that computer networks, including the internet, can provide multiple services. I understand that computer networks offer opportunities for communication and collaboration (e.g. Facebook, Email, YouTube, Blogging, Vlogging, Music/video streaming).
