

Computer Science End Points

	Declarative Knowledge Pupils understand/know that...	Procedural Knowledge Pupils know how to ...
EYFS	<ul style="list-style-type: none"> • instructions are directions or orders that tell you what to do you give instructions and follow them • you can use computers to do things patterns are things that repeat • charts are a way of showing information • people and computers can follow instructions you can change instructions • you can give some toys instructions • you can make choices on-screen • you can sort things • pictures on a pictogram represent numerical values pictures on a pictogram represent numerical values • you can predict what might happen by looking at a set of instructions before following them • you can change instructions and predict what will make them if you followed them • you can fix instructions if you predict or find out that they're wrong you can make instructions better • patterns are repeated designs, sequences, or arrangements that can be found in objects, numbers, behaviour and sounds • graphs and charts can help you answer questions 	<ul style="list-style-type: none"> • follow and give simple instructions with help (algorithms) make a programmable toy move but not always as planned (programming) • use a limited set of software and tools to make something happen on screen but not always according to those planned • identify simple repeating patterns • sort a small set of objects according to criteria, sometimes with support • organise data into simple charts and graphs with support answer questions using data with support • give and follow simple instructions in order (algorithms) create a short sequence of instructions (algorithms) • change instructions to create a different outcome (algorithms) • make a programmable toy move (programming) • use simple software and tools to make something planned happen • make choices on-screen using buttons and pictures create, recreate and continue patterns • read a set of instructions and predict the outcome (algorithms) • write/draw a set of simple instructions in order (algorithms) • make changes to instructions and predict how the outcome will change (algorithms) • plan a set of instructions for a programmable toy and make it move (programming) • correct mistakes if instructions are incorrect (debugging) talk about how their instructions could be improved describe patterns and relationships • sort objects into sets according to one or more criteria compare data using simple charts and graphs • suggest different ways data could be organised or displayed • use graphs to answer a range of questions • create own questions that could be answered by interpreting data on a graph • make comparisons between data on a graph
Year 1	<ul style="list-style-type: none"> • instructions can be followed to do something • humans and computers follow instructions • instructions need to be precise to follow them correctly • computers follow instructions given in a precise way • computers have no intelligence 	<ul style="list-style-type: none"> • read a set of instructions and sometimes predict the correct outcome • produce instructions but sequence them incorrectly or make assumptions • read a set of instructions and usually predict the correct outcome • produce a set of instructions that others can usually follow • read a set of instructions and predict the correct outcome • produce an accurate set of instructions using agreed language that others can follow

<p style="text-align: center;">Year 2</p>	<ul style="list-style-type: none"> programming applications can be given commands to produce specific effects on screen not all devices need a wire <u>information travels through a network</u> devices have an address recognise that a network is two or more devices connected 	<ul style="list-style-type: none"> <u>identify some devices on a network with support</u> produce a sequence of blocks that achieves a simple effect (eg. move a sprite around the screen) plan and give direct instructions to make things happen (e.g. playing robots)
<p style="text-align: center;">Year 3</p>	<ul style="list-style-type: none"> connections can be wired or wireless each device on a network has its own address each device has a unique address called an IP address website addresses are nicknames for IP addresses information travels through a network in a variety of ways 	<ul style="list-style-type: none"> can identify different devices within a network model how information travels through a network using switches and routers produce a sequence of instructions that result in planned outcomes. program a short a sequence of commands that results in a planned effect program and test a simple program create algorithms to solve simple problems demonstrate that a network is two or more devices connected explain why networks are used and what they're used for identify a range of wired and wireless devices on a network explain the role of devices on a network explain that networks connect to the internet through routers and telephone wires
<p style="text-align: center;">Year 4</p>	<ul style="list-style-type: none"> algorithms are instructions, which are in order and some instructions can be repeated the outcome of algorithms and programs can be predicted algorithms and programs can contain errors errors can be corrected and this is called debugging A variable is a value that changes The internet is used by lots of different services (e.g. email, video chat) a computer takes input, processes it and produces output 	<ul style="list-style-type: none"> write an algorithm to produce a given effect using repetition accurately predict the outcome of a range of algorithms and programs test, debug and refine algorithms and programs use sequence and basic selection and repetition in computer programs explain how a programmed effect has been achieved talk about improvements that could be made to programs explain how a programmed effect has been achieved Write and amend computer programs Use repetition, variables and conditional statements in computer programs test, debug and refine algorithms and programs identify some common internet services that use the internet (e.g. online gaming or voice over internet) identify a variety of computing devices and a number of inputs and outputs (e.g. touch, sound) identify a variety of computing devices and a number of inputs and outputs (e.g. touch, sound) computers store and manipulate data as a series of ones and zeros and that this is called binary

Year 5	<ul style="list-style-type: none"> • abstraction is taking the detail out of a problem • decomposition is splitting a problem down into smaller parts to make it easier to solve • procedures help you reuse code • variables can be text, numbers and lists • webpages are constructed using a language called HTML • you can change how things look on a webpage 	<ul style="list-style-type: none"> • Write and amend more complex programs to create a variety of outcomes • Program algorithms that achieve a range of specified outcomes • create efficient programs by designing solutions using abstraction (Eg. using procedures in the form of 'My blocks' and/or broadcasts in Scratch) • create a simple webpage • Test, debug and refine computer programs
Year 6	<ul style="list-style-type: none"> • the same 'problem' can be solved in different ways • programming commands can be given in shorter form • decomposition means splitting a problem down into smaller parts to make it easier to solve • pattern spotting makes it easier to solve problems and write code • algorithms and programs need to be tested • finding and fixing errors in programs is called debugging <ul style="list-style-type: none"> • web pages are written using HTML • HTML organises content using tags <ul style="list-style-type: none"> • a procedure is chunks of code that can be used more than once • ☒ abstraction is taking the detail out of a problem to help create solutions • ☒ a condition in programming is a choice • ☒ webpages can be styled using CSS 	<ul style="list-style-type: none"> • write or amend computer programs to produce specific actions • use iteration (repeats and loops) in algorithms and programs • create a simple webpage using HTML • show you a HTML tag on a webpage <ul style="list-style-type: none"> • Write and amend more complex computer programs to create a variety of outcomes • decompose 'problems' by splitting them into smaller 'problems' and designing solutions for each part • Use iteration(repeats and loops), variables and conditional statements (if..then) in computer programs • Test computer programs and correct most errors <ul style="list-style-type: none"> • Create & use efficient methods of iteration, & nested conditional statements (if..then..else..if etc.) • Systematically test computer programs for bugs and make them work as expected • ☒ Critically analyse algorithms and programs and suggest more elegant solutions - e.g. by using abstraction to suggest single solution that could be used to solve a number of problems (i.e. procedures) • Create procedures that call on other procedures (e.g. by using 'My blocks' and/or broadcasting blocks)

Information Technology End Points

	Declarative Knowledge Pupils understand/know that...	Procedural Knowledge Pupils know how to ...
EYFS	<ul style="list-style-type: none"> • a keyboard is a way of entering letters and numbers in to a device you can make choices on a device using a mouse and by touch you can use computers to make things • some games you play on a computer are realistic • you can make things that look like real life things using computers (e.g. draw a person) • you can make choices using devices • computers can be used to represent real life situations you can move things on screen using a mouse and touch you can learn things about and with computers • you can play with and using computers • you can use a model to explore options (e.g. decorate a room) • a mouse or touch helps you make choices and move around a screen a keyboard can be used to write using a computer • you can save your work so that you can go back to it again • a computer can be used to represent real life and imaginary situations 	<ul style="list-style-type: none"> • use a keyboard sometimes with support • use a mouse or touch to make choices with help have created simple digital content with support • have explored a limited range technology, digital content and tools be able to relate some computer models to real life • with support explore simple computer models • use a keyboard to make choices • use the mouse or touch to select icons and items move onscreen objects • talk about the technology used at home and in school operate digital equipment • use technology and digital content to play and learn • explore simple computer models and talk about what happens if... • use a mouse or touch to select, tap/click and drag objects around a screen • enter simple words using a keyboard and made choices have created and saved their work • have printed work experienced a wider range of technology and tools to play and learn • explore a variety of computer models

<p style="text-align: center;">Year 1</p>	<ul style="list-style-type: none"> • a keyboard is used to enter words into a computer • a mouse is selecting things on screen • work needs to be saved to go back to it later • art can be created using a computer • digital art can be made with shapes • different paint tools do different jobs <ul style="list-style-type: none"> • computer work can be printed • websites can be moved around (navigated) using buttons and links <ul style="list-style-type: none"> • you can create and save different versions of your work • websites have their own address • websites have links, buttons and image links 	<ul style="list-style-type: none"> • use a keyboard • use a mouse to point, click and drag objects around a screen with help. • create digital content using IT tools • save a file with support • use a limited range of tools • access a website using desktop shortcuts • navigate simple websites with support • create simple digital drawings • choose appropriate shapes for digital art <ul style="list-style-type: none"> • enter simple sentences using a keyboard • use a mouse or touchscreen to point at, select and move objects around a screen • print work • save work with assistance • navigate a website using buttons and image links • use shape and line tools effectively • use appropriate shape and colours in digital art <ul style="list-style-type: none"> • create and save different versions of their work • compare creating their work using IT with manual methods • explain why a particular tool has been chosen and its effect • access a website by typing a simple url • navigate a website using hyperlinks, buttons and image links • use a range of digital paint tools to create particular effects
<p style="text-align: center;">Year 2</p>	<ul style="list-style-type: none"> • you can delete words • you can use a computer to present your work • there are different tools you can use for different purposes • you can save different versions of your work • websites have a unique address • you can favourite or bookmark websites 	<ul style="list-style-type: none"> • navigate a document using arrow keys and a mouse • use the backspace button and the delete button to remove text • use tools to create simple presentations that communicate meaning • make choices about applications and tools to use for a particular purpose • locate, edit and save different versions of their work • navigate around a website using hyperlinks and the back button • type web addresses into a web browser • create Internet favourites

<p style="text-align: center;">Year 3</p>	<ul style="list-style-type: none"> • you can combine images and text using a computer • make different effects • copy text and images • use appropriate effects and resize graphics • copy text from a webpage to a document • copy images from a webpage • you move around online using links • you can undo and redo work 	<ul style="list-style-type: none"> • combine graphics with text • use appropriate effects and re-size graphics • copy text from an internet page to a document • copy images from an internet page • save, print and retrieve work • use software, computers and devices to make simple presentations and create things • enter a URL for a website with support • identify some links within web content and navigate with purpose • use bold, italic and underline • know how to undo and redo • align text left, right, centre and justify and know to use them • insert images and to manipulate them • assign desktop shortcuts to applications and work
<p style="text-align: center;">Year 4</p>	<ul style="list-style-type: none"> • an email uses the internet to send and receive messages and files • databases store ordered information • databases can be searched and sorted • information in the form of text, sound and pictures can be combined to create digital content and communicate with an audience 	<ul style="list-style-type: none"> • use the more advanced features of applications (Eg. word processing or presentation software) to help them match their work to their audience • send an email. • reply to an email • use the search facility in a database to find the answer to questions • carry out searches involving more than one condition to find • answers to a variety of questions, sometimes with help • confidently enter URLs into an address bar of a browser • recognise the audience when designing and creating digital content • create digital content that incorporates text and image • choose and use the appropriate advanced features of word processing or presentation software to increase their efficiency when matching their work to their audience • carry out multi-conditioned searches in databases to find answers to a variety of questions with assistance • use the sort facility of a database to answer questions • create own questions to be answered by searching a database

Year 5	<ul style="list-style-type: none"> digital content needs to be planned to take account of the intended audience, the content and the layout of information 	<ul style="list-style-type: none"> discuss the rationale behind their digital creations including content, media used and layout develop and refine digital content for a specified audience
Year 6	<ul style="list-style-type: none"> information in the form of text, sound and pictures can be combined to create digital content ☒ sound is called audio ☒ pictures are called images ☒ text can be manipulated ☒ a font is styled text ☒ a network is things that are connected <ul style="list-style-type: none"> The internet can be accessed by wires or wirelessly ☒ there are lots of types of networks ☒ the internet is the biggest computer network in the world ☒ a spreadsheet contains and organises data ☒ you can search spreadsheets ☒ you can sort spreadsheets <ul style="list-style-type: none"> computers on networks (incl. the internet) have unique addresses (IP addresses) ☒ data is transmitted over a network as packets 	<ul style="list-style-type: none"> create digital content (e.g. a webpage) that incorporates text, images and sound ☒ visit websites using URLs ☒ create simple web content ☒ identify a network (e.g. social network) <ul style="list-style-type: none"> plan, design and create digital content that incorporates text, images and sound and communicates with an audience ☒ discuss the rationale behind their designs develop and refine digital content ☒ add to, search and sort a spreadsheet ☒ create a simple webpage ☒ identify the main parts of a computer network <ul style="list-style-type: none"> create digital content that incorporates images, sounds and text and is organised into pages that matches the needs of a specified audience ☒ critically analyse digital content and makes judgements about its suitability for a specific audience ☒ create a more complex webpage using HTML and CSS and hyperlinks

Digital Literacy (incl E-Safety) End Points

	Declarative Knowledge Pupils understand/know that...	Procedural Knowledge Pupils know how to ...
EYFS	<ul style="list-style-type: none"> • you can use computers to make things happen you can use computers to draw • we can get information from pictures and video as well as words ⇒ you should get permission from an adult before going online ⇒ they should not talk to anyone they do not know online ⇒ they need to be careful using computers and devices • you can draw and write using computers • you can get information from pictures, words, video and sound • you can use computers to communicate through text, images and sound • you can record sound and play it back <ul style="list-style-type: none"> ⇒ you can search for things using computers you should ask an adult before going online ⇒ you should tell an adult if you find anything worrying online ⇒ you should not talk to anyone they do not know online ⇒ you should be kind to friends • audio can convey information • you can play back, fast forward and pause audio using a device • you can present information using computers you can find things out online <ul style="list-style-type: none"> ⇒ going online can pose a range of risks ⇒ you should ask permission before going online or using technology 	<ul style="list-style-type: none"> • interact with multimedia software to make something happen on screen • explore, access and make choices with digital content create basic shapes using digital tools with support record basic sounds (audio) with support <ul style="list-style-type: none"> ⇒ share computers and devices with others but not always fairly ⇒ use computers and devices but are sometimes careless • have created shapes and text using digital tools used technology to show learning • talk about different kinds of information such as pictures, words, video and sound • create simple compositions and record/playback audio • find information using a basic search <ul style="list-style-type: none"> ⇒ talk about how much time they spend using computers and devices ⇒ be careful using computers and devices share when using computers and devices • access a website using short cuts • navigate a website using buttons and obvious links • talk about information they have found out from images, text, video and sound • explore the features of digital audio recording devices/tools use a combination of simple and drawing to demonstrate their learning • put together simple presentations with multimedia aspects to communicate ideas • obtain information online • make choices about the kind of information they collect online <ul style="list-style-type: none"> ⇒ always ask for permission before going online seek support when they are unsure about digital content ⇒ talk about the time they spend using computers and devices and the content they view/use

<p style="text-align: center;">Year 1</p>	<ul style="list-style-type: none"> • some information is personal (Eg. name & address) • ☒ some characteristics of trustworthy/untrustworthy people but give inappropriate justification (eg. trustworthy because they are being nice) • ☒ personal information should only be given to trusted people but the trust can be misplaced (see above) • various information is personal (Eg. hobbies) • ☒ trustworthy people have characteristics • ☒ personal information should only be given to trusted people • 	<ul style="list-style-type: none"> • find simple information online • use digital drawing tools to express something use IT ⇒ to create sentences that communicate meaning • find answers to simple questions using a website • use drawing and text tools to impart information ⇒ talk about how they have used the computer to create things •
<p style="text-align: center;">Year 2</p>	<ul style="list-style-type: none"> • you can make choices about the kind of information you collect from websites • ☒ a wider range of information is personal (eg. regular attendance at a specific place) • ☒ personal information should only be given to trusted people 	<ul style="list-style-type: none"> ⇒ identify a variety of characteristics of trustworthy people and justifies opinions appropriately • talk about how they found information online • use a combination of text and drawing to make simple presentations

Year 3

- some websites are more useful than others
 - you can find things out online
 - you can use specific tools to help you with your work
 - you can present information using ICT
- ⇒ You need to be respectful and stay safe online

- some information is private and personal to you
 - ☒ some information should not be shared
- ⇒ ☒ passwords protect your computer and apps

- people can communicate and collaborate online
 - ☒ you can search for things online
- ⇒ ☒ Information online needs to be checked
- ⇒ ☒ some information available online may be misleading or inaccurate and that it needs to be checked

- choose a website based on how useful it is for a specific purpose
 - demonstrate how they found specific information in a website
 - be discerning about the information collected from websites
 - select appropriate applications to help them achieve a specific task
 - can identify suitable information to present
- ⇒ identify some ways they can keep themselves safe when using ICT
- ⇒ use ICT to communicate, identify some of the risks and act to minimise them
- use a range of applications on computers and devices independently
 - talk about how useful particular websites and/or applications have been to their work
- create digital content that communicates meaning

- a wider range of information is personal (Eg. regular attendance at a specific place)
 - identify some of the ways to use computers safely
- know the need for passwords and that they should be kept safe.
- ⇒ follow e-safety guidelines

- use search technology to find things out
 - uses a range of tools to communicate and express ideas
- ⇒ cross check information found on one website against another source
- ⇒ carefully select information from a range of websites
- ⇒ recognise what is acceptable/unacceptable behaviour when using technology and online

<p style="text-align: center;">Year 4</p>	<ul style="list-style-type: none"> • a computer network means connected computers • you can use the internet for activities other than web browsing • not all information available online is reliable and needs to be checked • you can use the internet for activities other than web browsing • not all information available online is reliable and it needs to be checked but does not always do so • internet search engines give a list of websites based on search terms <p>⇒ not all information provided on the world wide web is correct and that it needs to be checked</p> <p>⇒ You need to use secure passwords and keep them private</p> <ul style="list-style-type: none"> • You need to use secure passwords and keep them private 	<ul style="list-style-type: none"> • find information by navigating around a number of websites using hyperlinks and buttons <p>⇒ cross-check information provided on one website against that provided on another</p> <p>⇒ demonstrate the use of basic safety measures when using technology and working online (Eg. logging out)</p> <p>⇒ use ICT to communicate and collaborate, identify some of the risks and act to minimise them</p> <p>⇒ use appropriate search criteria to find relevant information and check its usefulness</p> <ul style="list-style-type: none"> • suggest a range of activities you can do using the internet, including web browsing • find information by navigating around a number of websites using hyperlinks and buttons • question the credibility of information given on website • cross-check information provided on one website against that provided on another • use search technology to find things out <ul style="list-style-type: none"> • suggest a number of activities that you can use the internet for (e.g. online gaming, voice over internet, email etc.)
<p style="text-align: center;">Year 5</p>	<ul style="list-style-type: none"> • a computer network consists of a number of computers and devices that are connected • internet search engines give a list of websites based on key words <ul style="list-style-type: none"> • personal information should only be given to trusted sources <ul style="list-style-type: none"> • some information on the internet may be misleading or inaccurate and that it needs to be checked 	<ul style="list-style-type: none"> • improve their work based on feedback and can comment on the success of their work • create digital content for specific purposes by combining software applications and internet services to communicate with an audience (e.g. creating webpages) • discuss opportunities for communication and collaboration online <p>⇒ use internet services other than web browsing (e.g. voice over internet or email)</p> <p>⇒ identify a range ways they can keep themselves safe using technology and online services and know how to report any concerns</p> <p>⇒ communicate effectively and safely online</p> <p>⇒ use search criteria efficiently find information online and check it for accuracy and reliability</p>

Year 6

- internet search engines find information and list search results in order of popularity
- some search results are adverts
- search criteria should be specific
- search results are not always relevant, reliable or accurate

- internet search engines use algorithms to find web content (e.g. web crawling)
- search results are organised in order of popularity
- programs and web content need to be designed

- how internet search results are ranked
- ⇒ a number of risks associated with work and leisure in a digital society and act to minimise them

- how internet search results are ranked

- use internet services other than web browsing (e.g. voice over internet or email)
- discuss opportunities for communication and collaboration online
- find relevant information online and make some checks for accuracy and reliability
- remix simple web content, sometimes with support
- recognises an audience when creating digital content

⇒ identify a range ways they can keep themselves safe using technology and online services and know how to report any concerns

⇒ communicate effectively and safely online

⇒ use search criteria efficiently to find information online and check it for accuracy and reliability

- communicate and collaborate using technology and online services
 - create simple web content using basic HTML
 - use search technology and clear search terms to view web pages and obtain data
 - use a number of internet services (e.g. voice over internet, email etc.)
 - create digital content for specific purposes and audiences
 - use feedback to improve digital content
- ⇒ find information online and check it for accuracy and reliability
- ⇒ use digital tools to communicate and collaborate effectively online
- ⇒ identify some of the risks associated with work and leisure in a digital society and act to minimise them

- design and create webpages using HTML and CSS
- design criteria for evaluating digital content
- identify improvements and refine their own and other's work