Computing Curriculum - overview and skills

Aims and purpose of study/why we are learning about computer sciences.

- 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.

These skills are embedded across the curriculum in all subjects when using ICT.

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (E-safety).
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Computing Curriculum - overview and skills

National curriculum.

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.

Purple – Computing objectives.

Blue – ICT/digital literacy objectives

Grey – E-safety objectives.

Not highlighted – digital networks.

Computing Curriculum - overview and skills

Year 1	Statutory programmes of study	Ideas	Resources/trips
Autumn 1	E safety use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		*Hectors world - http://www.thinkuknow.co.uk/
Autumn 2	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Switching a computer on/off, Logging on/off, Saving work, Printing, Copy and pasting images/saving images. Resizing images.	Laptops, Ipads, Word, PowerPoint, Publisher.
Spring 1	Computer science *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*	Bee bots – writing algorithms on flashcards then programming the beebots. Debug (fix) algorithms where necessary to achieve desired goal.	*Kodable.? Hour of Code https://hourofcode.com/us
Spring 2	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Typing skills, correcting spellings automatically. Switching on, closing Apps, saving images, downloading and deleting Apps.	Powerpoint, Word, Publisher Computers/laptops. Ipads,
Summer 1	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Researching for information independently, Using key words for refined results '**Lion facts for kids**' will bring back more appropriate content. Opening multiple web pages for more searches. Coping and pasting text Emoticons which are used to convey meaning. ☺ ☹ :'(:x :/	Yahoo for kids, kids click, *internet Laptops/Ipads
Summer 2	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Researching information independently Filtering results for specific images and content.	

Computing Curriculum - overview and skills

Year 2	Statutory programmes of study	Ideas	Resources/trips
Autumn 1	E safety use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		*Hectors world - http://www.thinkuknow.co.uk/
Autumn 2	Digital literacy and ICT# *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Word processing and presentation software Using an Ipad/Ipod/device Recording sounds, create a video, take a screen shot.	Powerpoint, Word, Publisher Ipads.
Spring 1	Computer science	Bee bots – writing algorithms on flashcards then programming the beebots. Debug (fix) algorithms where necessary to achieve desired goal. Talk through algorithms with children, predicting what will happen.	*Beebots, Flashcards (premade algorithms), Flashcards (to write algorithms),
Spring 2	Digital literacy and ICT *Recognise common uses of information technology beyond the classroom.*	Using the school website. Creating a Class Blog	Class blog Leave a comment on the school website.??
Summer 1	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*	Researching for information independently, Creating documents using the internet and publishing software (Word, Publisher, Powerpoint). Formatting the document appropriately to present information.	Laptops/Ipads
Summer 2	Digital literacy and ICT *use technology purposefully to create, organise, store, manipulate and retrieve digital content*		

Computing Curriculum - overview and skills

Year 3	Statutory programmes of study	Ideas	Resources/trips
Autumn 1.	1. <u>E-safety and core skills.</u> use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 2. Individual programming lessons (having a go at new resources for their year group/age appropriate). *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*	1. Internet safety display, CEOP video resources, Create a 'how to be safe online' presentation using Videolicious App. Being safe using mobile phones and multimedia devices. 2. Predicting what will happen – talking through an algorithm. Flashcards for algorithms 'getting up and going to school' algorithm. Algorithms created for favourite pop songs, '*Jam sandwich*' - clear, concise and precise instruction 'algorithms – children given language to choose from.	CEOP website. *Smart rules. http://www.saferinternet.org.uk/ http://www.chatdanger.com/ *Beebots
Autumn 2.	<u>Digital Literacy and ICT (70% of computing curriculum)</u>	'using ICT and exploring it'.	

Computing Curriculum - overview and skills

	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	*Provide opportunities to explore (the internet).	
Spring 1	<u>Computer science (25% of computing curriculum).</u> *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*	Alogithms, Predicting what will happen – talking through an algorithm. Flashcards for algorithms, Algorithms created for favourite pop songs, '*Jam sandwich'* - clear, concise and precise, instruction 'algorithms – children given language to choose from Debugging (fixing) problems.	*lightbot *purple mash *Hour of code *Code academy
Spring 2	<u>Digital Literacy and ICT</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*	*Provide opportunities to explore (the internet). How to search for information, How the searched information is sorted, How to find a specific picture,	*word, *powerpoint, *Publisher. *Using key words to find a given/obscure picture.

Computing Curriculum - overview and skills

	accomplish given goals, including collecting, analysing, evaluating and presenting data and information	What the numbers mean on a picture (picture resolution/size). Texts boxes, Clip art, Formatting, Changing text types; fonts and sizes	
Summer 1	<u>Digital Literacy and ICT</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, including collecting, analysing, evaluating and presenting data and information*	Exploring the internet, refining searches. Coding programmes with increasing complexity (including 'if, when' statements).	*Purple mash coding. *Internet
Summer 2.	<u>Digital Literacy and ICT</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, including collecting, analysing, evaluating and presenting data and information*	Exploring the internet, refining searches. Coding programmes with increasing complexity (including 'if, when' statements).	*Purple mash coding.

Computing Curriculum - overview and skills

Year 4	Statutory programmes of study	Ideas	Resources/trips
Aut 1	1. <u>E-safety and core skills.</u> use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 2. <u>Individual programming lessons (having a go at new resources for their year group/age appropriate).</u> *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*	Fake accounts, false information. We want children to spot unacceptable behaviour; this cannot be done without exposing them to unacceptable behaviour. They need to develop a moral compass in real life as well as online life and identities. More advanced coding applications – link with flashcards, writing out the code explicitly.	Tell children to find out about the tree octopus – set up and designed as a fake website story. Teach the children to use common sense rather than rely on what the internet tells us. http://zapatopi.net/treeoctopus/ *Smart rules *lightbot *purple mash *Hour of code *Code academy
Aut 2	<u>Digital Literacy and ICT (70% of computing curriculum)</u> *select, use and combine a variety of software*	Research information on a theme (Carl Linnaeus in Science/topic links) Search for appropriate pictures – save, edit, format them.	*Ipads *Videolicious

Computing Curriculum - overview and skills

	(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	Word process a script of what you will say in the video Create professional videos to explain and inform on a topic.	
Spring 1	<u>Computer science (25% of computing curriculum).</u> *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*	Create flowcharts for favourite pop songs (algorithms), Talk through each step, predicting the behaviour of code – what effect it will have. Algorithms for simple tasks, Programme another human to do 'the time warp, make a sandwich' write algorithms on flashcards, debag and manipulate where necessary.	*lightbot *purple mash *Hour of code *Code academy *Hikatzu app. *Beebot app. More able – introduced to scratch (secured in upper key stage 2).
Spring 2	<u>Digital Literacy and ICT</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* *use search technologies effectively,*	Searching for specific images/content, Search races, searching for an image in class on internet – who and how will it be found? Refine search criteria etc…	Show children a very specific image on screen, children 'race' each other online to find it using vocabulary in search engines. Search for the same images on different search engines, how/why do they not appear in the same places?

Computing Curriculum - overview and skills

	appreciate how results are selected and ranked, and be discerning in evaluating digital content		http://www.code-it.co.uk/netintsearch.html *purple mash coding.
Summer 1	Digital Literacy and ICT *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*	Research information on a theme (Carl Linnaeus in Science/topic links), focused searches. Search for appropriate pictures – save, edit, format them. Word process a script of what you will say in the video. Use word processed script to create professional videos to explain and inform on a topic (imovie/Videolicious).	*Ipads/Laptops *Ipads *Videolicious
Summer 2	Digital Literacy and ICT *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*	Make simple sprites/characters, Complete simple commands for the character to follow,	*Purple mash coding - Moving onto scratch coding (preparing for upper key stage 2).

Computing Curriculum - overview and skills

Year 5	Statutory programmes of study	Ideas	Resources/trips
Autumn 1	E safety use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		http://www.childnet.com/resources/young-people-and-social-networking-sites http://www.digizen.org/
Autumn 2	Digital literacy and ICT	Searching information, using and refining searches Importing sounds, images and media *into Keytone App. Creating professional presentations on Keynote	*Keynote app/Ipads
Spring 1	Computer science *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*	Scratch Complete 'if/when' statements online. Debug (fix) programmes/algorithms, Programmes of increasing complexity. Starting to write out code using technical coding language.	**purple mash – starting to introduce Scratch. *Hikatzu app. A.L.E.X app. *Faulty algorithms which need fixing (on computers and not on computers – flashcards?)

Computing Curriculum - overview and skills

Spring 2	<u>Digital Literacy and ICT</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* *use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content*	Searching for specific images/content. Search races, searching for an image in class on internet – who and how will it be found? Refine search criteria etc…	Show children a very specific image on screen, children 'race' each other online to find it using vocabulary in search engines. Search for the same images on different search engines, how/why do they not appear in the same places? *purple mash coding.
Summer 1	Digital literacy and ICT		
Summer 2	Digital literacy and ICT		

Year 6	**Statutory programmes of study**	**Ideas**	**Resources/trips**
Autumn 1	<u>E safety</u> use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Year 6 E-safety. Social media? Evaluate effectiveness of school website for e-safety.	*Take a picture of your teacher, see how far you can send it in the space of your lesson by emailing, sharing it etc... http://www.childnet.com/resources/young-people-and-social-networking-sites http://www.digizen.org/

Computing Curriculum - overview and skills

Autumn 2	Digital literacy and ICT *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.*	Evaluate effectiveness of school website for target audience, Children write questionnaire for Mrs McGrow to give to parents, Show children an image, create keywords #hashtags, write a sentence about the picture and group the hashtags together. Are all of the sentences on a similar theme?	*internet/school website
Spring 1	Computer science *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*	Focus on writing elaborate algorithms, debugging (fixing) as you go. Hikatzu runs both coding bottons and javascript – focus more towards writing the javascript.	*Scratch. *introduce Hikatzu app and programming language/javascript. A.L.E.X app. Faulty algorithms which need fixing (on computers and not on computers – flashcards?) Scratch planning: http://www.code-it.co.uk/csplanning.html
Spring 2	Digital literacy and ICT *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*		*scratch: http://www.code-it.co.uk/csplanning.html

Computing Curriculum - overview and skills

	information		
Summer 1	Digital literacy and ICT *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*	Writing out code using technical coding language.	*Scratch: http://www.code-it.co.uk/csplanning.html
Summer 2	Digital literacy and ICT *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*	Writing out code using technical coding language.	*Scratch: http://www.code-it.co.uk/csplanning.html