KS1 and EYFS curriculum map

The Computational Thinker: Concepts & Approaches

Barefoot Computing

COMPUTING AT SCHOOL

Concepts

- **Logic** — predicting & analysing
- **Algorithms** — making steps & rules
- **Decomposition** — breaking down into parts
- **Patterns** — spotting & using similarities
- **Abstraction** — removing unnecessary detail
- **Evaluation** — making judgement

Approaches

- **Tinkering** — experimenting & playing
- **Creating** — designing & making
- **Debugging** — finding & fixing errors
- **Persevering** — keeping going
- **Collaborating** — working together

www.barefootcas.org.uk

EYFS

https://www.computingatschool.org.uk/teaching-resources/primary-computing/eyfs-computing

Computing			
Three and Four-Year-Olds	Personal, Social and Emotional Development	• Remember rules without needing an adult to remind them.	Rules of technology usage.
	Physical Development	• Match their developing physical skills to tasks and activities in the setting.	Give them experience of a mouse and touch screens, buttons and keys on a keyboard that enable technology.
	Understanding the World	• Explore how things work.	Give them experience and time/ advice to experiment with cause and effect.
Reception	Personal, Social and Emotional Development	• 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'.	Through unplugged activities go through process to get from A to B – coding. Use PRIMM.
	Physical Development	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	Ensure they have opportunities to use both touch screen and a mouse.

	Expressive Arts and Design		• Explore, use and refine a variety of artistic effects to express their ideas and feelings.	Explore recording on a screen using paint applications.
ELG	Personal, Social and Emotional Development	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.	

Resources
https://www.barefootcomputing.org/earlyyears
https://www.computingatschool.org.uk/teaching-resources/2021/february/computing-in-the-eyfs
https://www.computingatschool.org.uk/account/login?redirectUrl=%2fteaching-resources%2f2021%2fmarch%2fselection-of-shared-eyfs-resources-from-my-recent-cas-events

KS1

Statement Number	National Curriculum Statement
1.1	understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
1.2	create and debug simple programs
1.3	use logical reasoning to predict the behaviour of simple programs
1.4	use technology purposefully to create, organise, store, manipulate and retrieve digital content
1.5	recognise common uses of information technology beyond school

1.6	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.

Year 1

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- use logical reasoning to predict the behaviour of simple programs
- recognise common uses of information technology beyond school

https://teachcomputing.org/curriculum/key-stage-1/computing-systems-and-networks-technology-around-us

Technology around us	1	To identify technology	- I can explain how these technology examples help us - I can explain technology as something that helps us - I can locate examples of technology in the classroom	Technology
Technology around us	2	To identify a computer and its main parts	- I can name the main parts of a computer - I can switch on and log into a computer - I can use a mouse to click and drag	Computer, mouse/trackpad, keyboard, screen, click, drag
Technology around us	3	To use a mouse in different ways	- I can click and drag to make objects on a screen - I can use a mouse to create a picture - I can use a mouse to open a program	Computer mouse/trackpad, draw, click, double-click, click and drag
Technology around us	4	To use a keyboard to type	- I can save my work to a file - I can tell you that writing on a computer is called typing - I can type my name on a computer	Input device, computer, keyboard, mouse

Technology around us	5	To use the keyboard to edit text	- I can delete letters - I can open my work from a file - I can use the arrow keys to move the cursor	Shift, space bar, capital letter, full stop
Technology around us	6	To create rules for using technology responsibly	- I can discuss how we benefit from these rules - I can give examples of some of these rules - I can identify rules to keep us safe and healthy when we are using technology in and beyond the home	Safely, responsibly, computer, technology

Education in a connected world- online safety

- Health, well-being and lifestyle

The impact that technology has on health, well-being and lifestyle including understanding negative behaviours and issues amplified and sustained by online technologies and the strategies for dealing with them.

https://projectevolve.co.uk/toolkit/resources/strand/health-well-being-and-lifestyle/early-years-7/

- I can identify rules that help keep us safe and healthy in and beyond the home when using technology
- I can give some simple examples of these rules

- use technology purposefully to create, organise, store, manipulate and retrieve digital content

https://teachcomputing.org/curriculum/key-stage-1/creating-media-digital-painting

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Digital Painting	1	To describe what different freehand tools do	- I can draw lines on a screen and explain which tools I used - I can make marks on a screen and explain which tools I used - I can use the paint tools to draw a picture	paint program, tool, paintbrush, erase, fill, undo
Digital Painting	2	To use the shape tool and the line tools	- I can make marks with the square and line tools - I can use the shape and line tools effectively - I can use the shape and line tools to recreate the work of an artist	Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool

Digital Painting	3	To make careful choices when painting a digital picture	- I can choose appropriate shapes - I can create a picture in the style of an artist - I can make appropriate colour choices	Henri Matisse, shape tool, fill tool
Digital Painting	4	To explain why I chose the tools I used	- I can choose appropriate paint tools and colours to recreate the work of an artist - I can say which tools were helpful and why - I know that different paint tools do different jobs	Wassily Kandinsky, tools, feelings, colour, brush style
Digital Painting	5	To use a computer on my own to paint a picture	- I can change the colour and brush sizes - I can make dots of colour on the page - I can use dots of colour to create a picture in the style of an artist on my own	Georges Seurat, Pointillism, brush size
Digital Painting	6	To compare painting a picture on a computer and on paper	- I can explain that pictures can be made in lots of different ways - I can say whether I prefer painting using a computer or using paper - I can spot the differences between painting on a computer and on paper	Pictures, painting, computers, like, prefer, dislike

Education in a connected world- online safety

.- Copyright and ownership

Protecting personal content and crediting the rights of others as well as addressing potential consequences of illegal access, download and distribution

https://projectevolve.co.uk/toolkit/resources/strand/copyright-and-ownership/early-years-7/

- 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
- recognise common uses of information technology beyond school

https://teachcomputing.org/curriculum/key-stage-1/programming-a-moving-a-robot

Moving a robot	1	To explain what a given command will do	- I can match a command to an outcome - I can predict the outcome of a command on a device - I can run a command on a device	Forwards, backwards, turn, clear,

				go, commands
Moving a robot	2	To act out a given word	- I can follow an instruction - I can give directions - I can recall words that can be acted out	Instructions, directions
Moving a robot	3	To combine forwards and backwards commands to make a sequence	- I can compare forwards and backwards movements - I can predict the outcome of a sequence involving forwards and backwards commands - I can start a sequence from the same place	Forwards, backwards, commands
Moving a robot	4	To combine four direction commands to make sequences	- I can compare left and right turns - I can experiment with turn and move commands to move a robot - I can predict the outcome of a sequence involving up to four commands	Left, right, turn, commands
Moving a robot	5	To plan a simple program	- I can choose the order of commands in a sequence - I can debug my program - I can explain what my program should do	Plan, algorithm, program
Moving a robot	6	To find more than one solution to a problem	- I can identify several possible solutions - I can plan two programs - I can use two different programs to get to the same place	Route, plan, program

Education in a connected world- online safety

.- Online Bullying

Strategies for effective reporting and intervention and how bullying and other aggressive behaviour relates to legislation

https://projectevolve.co.uk/toolkit/resources/strand/online-bullying/early-years-7/

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 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.

https://teachcomputing.org/curriculum/key-stage-1/data-and-information-grouping-data

Grouping Data	1	To label objects	- I can describe objects using labels - I can identify the label for a group of objects - I can match objects to groups	Object, label, group, search, image
Grouping Data	2	To identify that objects can be counted	- I can count a group of objects - I can count objects - I can group objects	Group, object, label, image
Grouping Data	3	To describe objects in different ways	- I can describe a property of an object - I can describe an object - I can find objects with similar properties	Group, object, property, label, colour, size, shape
Grouping Data	4	To count objects with the same properties	- I can count how many objects share a property - I can group objects in more than one way - I can group similar objects	Group, object, property, value, label, colour, data set
Grouping Data	5	To compare groups of objects	- I can choose how to group objects - I can describe groups of objects - I can record how many objects are in a group	Group, object, property, value, label, colour, size, shape, more, less, most, fewest

Grouping Data	6	To answer questions about groups of objects	- I can compare groups of objects - I can decide how to group objects to answer a question - I can record and share what I have found	Group, object, property, value, label, colour, data set, more, less, most, least, fewest, the same

Education in a connected world- online safety

- Online Relationships

Relationships and behaviours that may lead to harm and how positive online interaction can empower and amplify voice.
https://projectevolve.co.uk/toolkit/resources/strand/online-relationships/early-years-7/

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 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.

https://teachcomputing.org/curriculum/key-stage-1/creating-media-digital-writing

Digital Writing	1	To use a computer to write	- I can identify and find keys on a keyboard - I can open a word processor - I can recognise keys on a keyboard	Word processor, keyboard, keys, letters, Microsoft Word, Google Docs

Digital Writing	2	To add and remove text on a computer	- I can enter text into a computer - I can use backspace to remove text - I can use letter, number, and space keys	Word processor, keyboard, keys, letters, numbers, space, backspace, text cursor, Microsoft Word, Google Docs
Digital Writing	3	To identify that the look of text can be changed on a computer	- I can explain what the keys that I have learnt about already do - I can identify the toolbar and use bold, italic, and underline - I can type capital letters	Word processor, keyboard, keys, capital letters, toolbar, bold, italic, underline, Microsoft Word, Google Docs
Digital Writing	4	To make careful choices when changing text	- I can change the font - I can select a word by double-clicking - I can select all of the text by clicking and dragging	Word processor, keyboard, mouse, cursor, select, font, toolbar, bold, italic, underline, Microsoft

				Word, Google Docs
Digital Writing	5	To explain why I used the tools that I chose	- I can decide if my changes have improved my writing - I can say what tool I used to change the text - I can use 'undo' to remove changes	Word processor, keyboard, keys, cursor, undo, font, toolbar, bold, italic, underline, Microsoft Word, Google Docs
Digital Writing	6	To compare writing on a computer with writing on paper	- I can compare using a computer with using a pencil and paper - I can say which method I like best - I can write a message on a computer and on paper	Word processor, keyboard, keys, undo, backspace, toolbar, bold, italic, underline, Microsoft Word, Google Docs

Education in a connected world- online safety

- Privacy and security

Behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise.
https://projectevolve.co.uk/toolkit/resources/strand/privacy-and-security/early-years-7/

- 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

https://teachcomputing.org/curriculum/key-stage-1/programming-b-introduction-to-animation

Programming Animations	1	To choose a command for a given purpose	- I can compare different programming tools - I can find which commands move a sprite - I can use commands to move a sprite	ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area
Programming Animations	2	To show that a series of commands can be joined together	- I can run my program - I can use a start block in a program - I can use more than one block by joining them together	Block, joining, command, start block, run, program, programming area, background, delete, reset, algorithm, predict
Programming Animations	3	To identify the effect of changing a value	- I can change the value - I can find blocks which have numbers - I can say what happens when I change a value	Effect, change, value, block
Programming Animations	4	To explain that each sprite has its own instructions	- I can add blocks to each of my sprites - I can delete a sprite - I can show that a project can include more than one sprite	Instructions, sprite, delete, program, algorithm
Programming Animations	5	To design the parts of a project	- I can choose appropriate artwork for my project - I can create an algorithm for each sprite - I can decide how each sprite will move	Sprite, background, appropriate, algorithm

Programming Animations	6	To use my algorithm to create a program	- I can add programming blocks based on my algorithm - I can test the programs I have created - I can use sprites which match my design	Sprite, design, programming blocks, algorithm, programs

Education in a connected world- online safety

- Online reputation

Strategies to manage personal digital content effectively and capitalise on technology's capacity to create effective positive profiles
https://projectevolve.co.uk/toolkit/resources/strand/online-reputation/early-years-7/

Year 2

- 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.

https://teachcomputing.org/curriculum/key-stage-1/computing-systems-and-networks-it-around-us

Information Technology around us	1	To recognise the uses and features of information technology	- I can describe some uses of computers - I can identify examples of computers - I can identify that a computer is a part of information technology	Information technology (IT), computer
Information Technology around us	2	To identify information technology in the home	- I can explain the purpose of information technology in the home - I can move and resize images - I can open a file	Information technology
Information Technology around us	3	To identify information technology beyond school	- I can compare types of information technology - I can find examples of information technology - I can talk about uses of information technology	Information technology (IT), computer

Information Technology around us	4	To explain how information technology benefits us	- I can demonstrate how information technology is used in a shop - I can explain how information technology helps people - I can recognise that information technology can be connected	Information technology (IT), computer, barcode, scanner/scan
Information Technology around us	5	To show how to use information technology safely	- I can list different uses of information technology - I can recognise how to use information technology responsibly - I can say how those rules/guides can help me	Information technology
Information Technology around us	6	To recognise that choices are made when using information technology	- I can enjoy a variety of activities - I can explain simple guidance for using information technology in different environments and settings - I can identify the choices that I make when using information technology	Information technology

Education in a connected world- online safety

- Health, well-being and lifestyle

https://projectevolve.co.uk/toolkit/resources/strand/health-well-being-and-lifestyle/early-years-7/

- I can explain rules to keep myself safe when using technology both in and beyond the home.
- I can explain simple guidance for using technology in different environments and settings e.g. accessing online technologies in public places and the home environment.
- I can say how those rules / guides can help anyone accessing online technologies

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school

https://teachcomputing.org/curriculum/key-stage-1/creating-media-digital-photography

Digital Photography	1	To know what devices can be used to take photographs	- I can capture digital photos and talk about my experience - I can sort devices into old and new - I can talk about how to take a photograph	Device, camera, photograph, capture, image, digital

Digital Photography	2	To use a digital device to take a photograph	- I can explain the process of taking a good photograph - I can explain why a photo looks better in portrait or landscape format - I can take photos in both landscape and portrait format	Landscape, portrait, horizontal, vertical, field of view, narrow, wide, format
Digital Photography	3	To describe what makes a good photograph	- I can discuss how to take a good photograph - I can identify what is wrong with a photograph - I can improve a photograph by retaking it	Framing, focal point, subject matter, field of view, format, compose
Digital Photography	4	To decide how photographs can be improved	- I can experiment with different light sources - I can explore the effect that light has on a photo - I can focus on an object	Natural lighting, artificial lighting, flash, focus, background, foreground
Digital Photography	5	To use tools to change an image	- I can explain my choices - I can recognise that images can be changed - I can use a tool to achieve a desired effect	Editing, tools, colour, filter, images, Pixlr
Digital Photography	6	To recognise that images can be changed	- I can apply a range of photography skills to capture a photo - I can identify which images are real and which have been changed - I can recognise which images have been changed	Format, framing, lighting, focus, filter, changed, real

Education in a connected world- online safety

- Self-image and identity

Shaping online identities and how media impacts on gender and stereotypes

https://projectevolve.co.uk/toolkit/resources/strand/self-image-and-identity/early-years-7/

- 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

https://teachcomputing.org/curriculum/key-stage-1/programming-a-robot-algorithms

Robot Algorithms	1	To describe a series of instructions as a sequence	- I can choose a series of words that can be enacted as a sequence - I can follow instructions given by someone else - I can give clear and unambiguous instructions	Instruction, sequence, clear, unambiguous, algorithm, program
Robot Algorithms	2	To explain what happens when we change the order of instructions	- I can create different algorithms for a range of sequences (using the same commands) - I can show the difference in outcomes between two sequences that consist of the same commands - I can use an algorithm to program a sequence on a floor robot	Sequence, order, algorithm, commands
Robot Algorithms	3	To use logical reasoning to predict the outcome of a program (series of commands)	- I can compare my prediction to the program outcome - I can follow a sequence - I can predict the outcome of a sequence	Sequence, prediction, program
Robot Algorithms	4	To explain that programming projects can have code and artwork	- I can explain the choices I made for my mat design - I can identify different routes around my mat - I can test my mat to make sure that it is usable	Artwork, design, route, mat
Robot Algorithms	5	To design an algorithm	- I can create an algorithm to meet my goal - I can explain what my algorithm should achieve - I can use my algorithm to create a program	Algorithm
Robot Algorithms	6	To create and debug a program that I have written	- I can plan algorithms for different parts of a task - I can put together the different parts of my program - I can test and debug each part of the program	Debugging, algorithm, program

Education in a connected world- online safety

- Online bullying

Shaping online identities and how media impacts on gender and stereotypes

https://www.childnet.com/resources/teachers-and-professionals?age=3-7-years

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 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.

https://teachcomputing.org/curriculum/key-stage-1/data-and-information-pictograms

Pictograms	1	To recognise that we can count and compare objects using tally charts	- I can compare totals in a tally chart - I can record data in a tally chart - I can represent a tally count as a total	More than, less than, most, least, organise, data, object, tally chart, votes, total
Pictograms	2	To recognise that objects can be represented as pictures	- I can enter data onto a computer - I can use a computer to view data in a different format - I can use pictograms to answer simple questions about objects	Pictogram, enter, data, tally chart, compare, more than, less than, objects, count
Pictograms	3	To create a pictogram	- I can explain what the pictogram shows - I can organise data in a tally chart - I can use a tally chart to create a pictogram	Tally chart, data, pictogram, explain, more, less, most, least, more common, least common
Pictograms	4	To select objects by attribute and make comparisons	- I can answer 'more than'/'less than' and 'most/least' questions about an attribute - I can create a pictogram to arrange objects by an attribute - I can tally objects using a common attribute	Attribute, group, same, different, object, more than/less than, most/least

Pictograms	5	To recognise that people can be described by attributes	- I can choose a suitable attribute to compare people - I can collect the data I need - I can create a pictogram and draw conclusions from it	Attribute, compare, tally chart, pictogram, more than, less than, most popular, least popular, conclusion
Pictograms	6	To explain that we can present information using a computer	- I can give simple examples of why information should not be shared - I can share what I have found out using a computer - I can use a computer program to present information in different ways	Tally chart, pictogram, block diagram, most, least, common, sharing, data

Education in a connected world- online safety

- Privacy and security

Behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise

https://projectevolve.co.uk/toolkit/resources/strand/privacy-and-security/early-years-7/

- use technology purposefully to create, organise, store, manipulate and retrieve digital content

https://teachcomputing.org/curriculum/key-stage-1/creating-media-making-music

Making Music	1	To say how music can make us feel	- I can describe how music makes me feel, e.g. happy or sad - I can identify simple differences in pieces of music - I can listen with concentration to a range of music (links to the Music curriculum)	Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions
Making Music	2	To identify that there are patterns in music	- I can create a rhythm pattern - I can explain that music is created and played by humans - I can play an instrument following a rhythm pattern	Pattern, rhythm, pulse

Making Music	3	To describe how music can be used in different ways	- I can connect images with sounds - I can relate an idea to a piece of music - I can use a computer to experiment with pitch and duration	Neptune, pitch, tempo, rhythm, notes
Making Music	4	To show how music is made from a series of notes	- I can identify that music is a sequence of notes - I can refine my musical pattern on a computer - I can use a computer to create a musical pattern using three notes	Pattern, notes, instrument, tempo
Making Music	5	To create music for a purpose	- I can describe an animal using sounds - I can explain my choices - I can save my work	Create, emotion, pitch, pulse/beat, tempo, instrument, rhythm, notes
Making Music	6	To review and refine our computer work	- I can explain how I made my work better - I can listen to music and describe how it makes me feel - I can reopen my work	Open, edit

Education in a connected world- online safety

- Copyright and ownership

Protecting personal content and crediting the rights of others as well as addressing potential consequences of illegal access, download and distribution.

https://www.barefootcomputing.org/resources/who-does-this-belong-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

https://teachcomputing.org/curriculum/key-stage-1/programming-b-an-introduction-to-quizzes

An Introduction to Quizzes	1	To explain that a sequence of commands has a start	- I can identify that a program needs to be started - I can identify the start of a sequence - I can show how to run my program	Sequence, command, program, run, program, start
An Introduction to Quizzes	2	To explain that a sequence of commands has an outcome	- I can change the outcome of a sequence of commands - I can match two sequences with the same outcome - I can predict the outcome of a sequence of commands	Sequence, command, outcome, predict, program, blocks
An Introduction to Quizzes	3	To create a program using a given design	- I can build the sequences of blocks I need - I can decide which blocks to use to meet the design - I can tell the actions of a sprite in an algorithm	Sprite, algorithm, blocks, design, sequence, predict
An Introduction to Quizzes	4	To change a given design	- I can choose backgrounds for the design - I can choose characters for the design - I can create a program based on the new design	Actions, sprite, project, blocks, design, sequence, modify, change
An Introduction to Quizzes	5	To create a program using my own design	- I can build sequences of blocks to match my design - I can choose the images for my own design - I can create an algorithm	Design, algorithm, build, sequence, blocks, match
An Introduction to Quizzes	6	To decide how my project can be improved	- I can compare my project to my design - I can debug - I can improve my project by adding features	Compare, design, debug, program,

				features, evaluate

Education in a connected world- online safety

-Managing online information

Strategies for effective searching, critical evaluation and ethical publishing

https://projectevolve.co.uk/toolkit/resources/strand/managing-online-information/early-years-7/

Online learning tips

https://www.computingatschool.org.uk/teaching-resources/2021/february/ten-top-tips-for-google-classroom-and-microsoft-teams

https://www.computingatschool.org.uk/teaching-resources/2021/january/how-to-use-loom