

Computing Knowledge Progression Document

Features

At EYFS, the knowledge progression takes full account of the Early Learning Goals of:

- Listening, attention and understanding

At key stage 1, the knowledge progression takes full account of the national curriculum's strands of:

- Algorithms
- Creating Programs
- Reasoning
- Using Technology
- Uses of IT beyond school
- Being Safe

At key stage 2, the knowledge progression takes full account of the national curriculum's strands of:

- Creating Programs
- Developing Programs
- Reasoning
- Networks
- Search Engines
- Using Programs
- Being Safe

- Skills are dependent on specific knowledge. A skill is the capacity to perform and in order to perform a deep body of knowledge needs to be acquired and retained.

- These knowledge statements should be what pupils retain for ever. In other words, this knowledge is within their long-term memory and will be retained

- When considering pupils' improvement in subject specific vocabulary, pupils could be provided with a knowledge organiser which contains all words used for computing for their age group.

EYFS and National Curriculum Subject Content

EYFS

Explore the natural world around them.
Describe what they see, hear and feel whilst outside, including plants and animals
Begin to name a range of common animals
Draw pictures of animals and plants around them
Be able to sort animals, plants and humans.
To develop an understanding of how animals grow and change over time
To make observations of animals and plants and explains why some things occur
To observe and know how to talk about patterns and changes
To know how to show care and concern for living things and the environment
To know the changes that happen in each season and the effect on the world around them

	<p>Experience natural and human made materials.</p> <p>Use the vocabulary needed to name specific features of the natural world, both natural and manmade</p> <p>Begin to understand the need to respect and care for the natural environment</p> <p>To know some similarities and differences in the natural world around them and contrasting environments, drawing on their experiences and what has been read in class</p> <p>To know their senses and use them to explore objects</p> <p>To explore materials and name things that are the same and different.</p> <p>Name and describe everyday materials based on their simple properties</p> <p>Play with a range of materials and discover whether they can be changed</p> <p>Identify a range of materials and experiment with how they behave in different conditions.</p> <p>To know some forces and explore the impact they have on different objects</p> <p>To explore and name different forces they can feel</p>
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Year 1	Thunderbolts and lightening	Explorers discover the world!	Creating Media
Substantive Knowledge	<p>Children will experiment using Scratch Jr and create a project that involved creating their own background and sprite (weather themed) and complete a simple animation.</p> <ul style="list-style-type: none"> To know that a username and password are not to be shared Remember their username and some of their password (adult support) To know what to do if they see something on a digital monitor (on iPads and on Computers) that they do not like To know how to explore internet safety To know how we use computers and technology in school and at home and explore through use of iPads and computers with support To know that a sequence of actions can be broken down into smaller rules which are known as algorithms 	<p>Children will be using simple algorithms to guide Beebots around a chalk map drawn on the playground. Children will devise their algorithms (in the form of directions) and debug any problems. Children will use ABC searching to find different locations.</p> <ul style="list-style-type: none"> To know how to explore internet safety using Digiduck 	<p>As part of their art unit, children will using digital devices to create digital painting linked to their Thematic unit.</p> <ul style="list-style-type: none"> To know that different paint tools do different jobs
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to log on with minimal support. To be able to use a computer to write. To be able to use a series of commands and repeat commands to draw shapes with support. To be able to create a simple animation using Scratch Jr. 	<ul style="list-style-type: none"> To be able to type words with correct capitals and lowercase To be able to use ABC searching with support To be able to follow an algorithm and be able to create an algorithm with support using Beebots To be able to debug an algorithm 	<ul style="list-style-type: none"> To be able to use paint tools to draw a picture To be able to use shape and line tools effectively To be able to select appropriate colours, brush sizes, and brush tools
Oracy	Sequence, Privacy, Password, Algorithm	Debugging, Algorithm, Sequence, Trial and Error	
Year 2	Sow and Grow	Nurturing nurses	Creating Media
Substantive Knowledge	<p>Children will create flower art using given, adapted and created algorithms in Scratch Junior. Children will also learn how to complete ABC searching, about the importance of passwords and identifying parts of a computer in discrete lessons.</p> <ul style="list-style-type: none"> To know that a username and password are not to be shared and begin to understand why. 	<p>Children will be using Scratch Jr to create a simple animation where two sprites (nurses) engage in dialogue, which is linked to their Thematic unit of 'Nurturing Nurses'.</p> <ul style="list-style-type: none"> To be able to debug an algorithm and suggest some ideas about how to fix it with support. 	<p>As part of their art unit, children will using digital devices to create digital photographs linked to their Thematic unit.</p> <ul style="list-style-type: none"> To know what devices can be used to take photographs To know what makes a good photograph

	<ul style="list-style-type: none"> To know the main parts of a computer independently (mouse, keyboard, monitor and hard drive) 	<ul style="list-style-type: none"> To know what to do if they see something on a digital monitor that they do not like (on iPads and on Computers) and understand what is appropriate/inappropriate. To know how we use computers and technology in the wider world and explore through use of iPads and computers 	<ul style="list-style-type: none"> To know that images can be changed
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to follow an algorithm and be able to create an algorithm by decomposing a pre-existing one. To be able to recognise patterns within algorithms. To be able to use ABC searching independently 	<ul style="list-style-type: none"> To be able to log on independently. To be able to create a simple program using a series of algorithms and be able to reason logically why something is/ is not working, using Scratch Junior To be able to use a series of commands and repeat commands to draw shapes using Scratch Junior 	<ul style="list-style-type: none"> To be able to use a digital device to take a photograph To be able to decide how photographs can be improved To be able to use tools to change an image
Oracy	Algorithm, Hardware, Pattern Recognition, Decomposition	Debugging, Algorithm, Sequence, Trial and Error	
Year 3	Feel the Force, See the Light	How my body works	Creating Media
Substantive Knowledge	<p>Children will use Studio Code to play a simple Star Wars game using simple code. They will then create their own similar game in Scratch with backgrounds and moving sprites. Children will learn about password security and further parts of the computer in discrete lessons.</p> <ul style="list-style-type: none"> To know that a username and password are not to be shared and start being able to explain the reason why. Remember their username and password independently. To know how they might make their own password and remember it without using obvious information. To know the main parts of a computer independently (left and right side of mouse, keyboard and main buttons- shift, CL, enter, delete - monitor and hard drive) 	<p>Children will use scratch junior or understand how inputs lead to outputs. Children are to be able to code using Scratch Jr to understand how to move the sprites, understand what each separate part of a code enables a sprite to do including dialogue, movement and sound)</p> <ul style="list-style-type: none"> To know what to do if they see something on a digital monitor that they do not like (on iPads and on Computers) and why this is important. To know that some social media sites have age restrictions and that they might need support in checking their age appropriateness. To know that identities can be hidden on the internet and understand the repercussions of this with support. To know what the difference between hardware and software To know what inputs and outputs are with support. To know how a computer network can be used to share information To know the difference between coding and algorithms. 	<p>As part of their art unit, children will using digital devices to create stop-frame animations linked to their Thematic unit.</p>
Disciplinary Knowledge	<ul style="list-style-type: none"> Be able to write simple code, using Studio Code (1-18). Be able to code using Scratch (understand how to move the sprite, understand what each separate part of a code enables a sprite to do, use two sprites, include dialogue, movement and sound) 		<ul style="list-style-type: none"> To be able to choose appropriate page settings To be able to use different layouts for different purposes To be able to create an effective stop-frame animation To be able to use onion skinning to make small changes To be able to add other media to my animation
Oracy	Efficiency, Sequencing, Cyber Security, Hardware	Acceptable Use, Algorithms, Hardware, Software	
Year 4	Make some noise!	My Home is your Home	Creating Media
Substantive Knowledge	<p>Children will create a scene on Scratch of a band performing and will be adding music/sound to their backgrounds and sprites. They will also learn about password security in discrete lessons.</p>	<p>Children will create their own app (NOT SURE ON SOFTWARE NEED TO LOOK) which can identify different species of plants and trees.</p>	<p>As part of their art unit, children will using digital devices to edit photos linked to their Thematic unit.</p> <ul style="list-style-type: none"> To know that digital media can be changed

	<ul style="list-style-type: none"> Understand and be able to use variables on Scratch and make specific turns based on angles to draw shapes. Share a sequence of actions with the children and decompose into algorithms. To know that a username and password are not to be shared and give a clear reason why. To know how to make their own password, with increased security, and remember it without using obvious information. 	<ul style="list-style-type: none"> To know what to do if they see something on a digital monitor that they do not like (digital devices) and why this is important. To begin to know and implement acceptable use of digital devices in addition to their user agreements. Be aware of restrictions when using digital devices and social media. To know that identities can be hidden on the internet and understand the repercussions of this with support. 	<ul style="list-style-type: none"> To know how images can be changed for different uses To know that not all images are real
Disciplinary Knowledge	<ul style="list-style-type: none"> Be able to code using Scratch (use two sprites, include dialogue, movement and sound) Be able to create a suitable background related to topic theme for the Sprites on Scratch. 	<ul style="list-style-type: none"> Be able to make an app with support. Understand and be able use a range of different apps. 	<ul style="list-style-type: none"> To be able to change the composition of an image To be able to make good choices when selecting different tools To be able to evaluate how changes can improve an image
Oracy	Algorithm, Variables, Sequencing, Decomposition	Online Safety, Acceptable Use, Application, User Agreement,	
Year 5	<u>Gods and Mortals</u>	<u>Tides of Change</u>	<u>Creating Media</u>
Substantive Knowledge	<p>Children will use Scratch to create an animation retelling a Greek myth of their choice. They will include a background and a number of sprites with changing colours and movements. Children will also be learning about computer systems in discrete lessons.</p> <ul style="list-style-type: none"> To know that a username and password are not to be shared and understand what might happen if they were shared. Be able to give a detailed and concise explanation. To know how they might make their own password (using a range of upper/lower case letters) and remember it without using obvious information. To know that that a computer system features inputs, processes, and outputs. To know what script is and to know what a loop is and use it within a Scratch program. 	<p>Children will be using TinkerCAD to design part of their Thematic project focusing on the use of gears and pulleys.</p> <ul style="list-style-type: none"> To know what to do if they see something on a digital monitor (digital devices) that they do not like and be able to explain how to report this content, and why this is important. To know and implement acceptable use of digital devices in addition to their user agreements. To know that identities can be hidden on the internet and understand the repercussions of this. To know that search engines use different rules to rank results To know the limitations of search engines and how they can be influenced 	<p>As part of their art unit, children will be using digital devices to create vector drawings linked to their Thematic unit.</p> <ul style="list-style-type: none"> To know that vector drawings are made using shapes and layers
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to understand their digital footprint (caches) and how things that are published on the internet cannot be removed. Be able to alter the costume of a Sprite for a specific purpose on Scratch. Be able to use variables on Scratch to make objects/sprites change colour when pressed. Introduce movement to create a simple animation (eg the sprite will raise his hat, eyebrow or stick out tongue) 	<ul style="list-style-type: none"> To be able to be aware of restrictions when using digital devices and social media and understand why. To be able to use Tinker CAD for designing. 	<ul style="list-style-type: none"> To be able to create a vector drawing by combining shapes To be able to zoom to add detail to vector drawings To be able to change the order of layers in a vector diagram
Oracy	Movement, Digital Footprint, Variable, Loop,	Search Engines, Acceptable Use,	
Year 6	<u>WHICH UNIT</u>	<u>Light it Up</u>	<u>Creating Media</u>

Substantive Knowledge	<p>Children will be learning about the Internet and how data is transferred in discrete lessons.</p> <ul style="list-style-type: none"> To know how they might make their own password (using a range of upper/lower case letters and symbols) and remember it without using obvious information. To know that there are age restrictions when using digital devices and social media and be able to give a detailed explanation of why. Know what to do if they see something on a digital monitor (digital devices) that they do not like and be able to explain the most appropriate actions of how to report this content, and why this is important. To know that Internet devices have addresses To know how computers use addresses to access websites To know that data is transferred over the Internet in packets 	<p>Children will be designing a handle using TinkerCAD for a buzzer game that they will be making in their Thematic unit. They will then 3D print their design.</p> <ul style="list-style-type: none"> Use Tinker CAD for designing. To know about copyright and ownership To know that you can work in three dimensions on a computer To know that objects can be combined to make a 3D model <p>ADDING CODING STUFF IN (PYTHON????)</p> <p>TOO SIMILAR TO THE CREATING MEDIA????</p>	<p>As part of their art unit, children will be using digital devices to create 3D models linked to their Thematic unit.</p> <ul style="list-style-type: none"> To know that you can work in three dimensions on a computer To know that objects can be combined to make a 3D model
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to understand that a username and password are not to be shared and understand what might happen if they were shared. To be able to give a detailed and concise explanation and identify scenarios in the real world where this has happened with negative outcomes. To be able to spot errors (debug) in Excel spread sheets and correct. 	<ul style="list-style-type: none"> To be able to understand their digital footprint and how things that are published on the internet cannot be removed and their implications. To be able to identify that identities can be hidden or even falsified on the internet and understand the repercussions of this and how to identifies these. To be able to manipulate 3D objects digitally To be able to lift, resize, recolour, rotate, duplicate and group 3D objects To be able to construct a 3D model based on a design 	<ul style="list-style-type: none"> To be able to manipulate 3D objects digitally To be able to lift, resize, recolour, rotate, duplicate and group 3D objects To be able to construct a 3D model based on a design
Oracy	Debugging, World Wide Web, Networks,	Digital Footprint, ADD SOME 3D MODELLING VOCAB	

Year 1	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know that a username and password are not to be shared To know what to do if they see something on a digital monitor that they do not like (on iPads and on Computers) To know how to explore internet safety using the app, Digiduck 	<ul style="list-style-type: none"> To know the main parts of a computer with some support (mouse, keyboard, monitor and hard drive) To know how we use computers and technology in school and at home and explore through use of iPads and computers with support. To know that different paint tools do different jobs 	<ul style="list-style-type: none"> To know that a sequence of actions can be broken down into smaller rules which are known as algorithms.
Disciplinary Knowledge	<ul style="list-style-type: none"> Remember their username and some of their password (adult support) 	<ul style="list-style-type: none"> To be able to log on with minimal support To be able to type words with correct capitals and lowercase To be able to use ABC searching with support. 	<ul style="list-style-type: none"> To be able to use a series of commands and repeat commands to draw shapes with support. To be able to follow an algorithm and be able to create an algorithm with support using Beebots.

		<ul style="list-style-type: none"> To be able to use paint tools to draw a picture To be able to use shape and line tools effectively To be able to select appropriate colours, brush sizes, and brush tools 	<ul style="list-style-type: none"> To be able to debug an algorithm To be able to create a simple animation using Scratch Jr
Oracy	Password, Security, Privacy,	Technology, Digital Devices, Hardware,	Decomposition, Algorithms, Commands, Animation
Year 2	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know that a username and password are not to be shared and begin to understand why. To know what to do if they see something on a digital monitor that they do not like (on iPads and on Computers) and understand what is appropriate/inappropriate. 	<ul style="list-style-type: none"> To know the main parts of a computer independently (mouse, keyboard, monitor and hard drive) To know how we use computers and technology in the wider world and explore through use of iPads and computers To know what devices can be used to take photographs To know what makes a good photograph To know that images can be changed 	<ul style="list-style-type: none"> To know and explain what a code is.
Disciplinary Knowledge	<ul style="list-style-type: none"> To know how to remember their username and password independently. 	<ul style="list-style-type: none"> To be able to understand search history, in terms to them doing the same activity more than once with support. To be able to log on independently. To be able to use ABC searching independently. To be able to use a digital device to take a photograph To be able to decide how photographs can be improved To be able to use tools to change an image 	<ul style="list-style-type: none"> To be able to follow an algorithm and be able to create an algorithm by decomposing a pre-existing one. To be able to recognise patterns within algorithms. To be able to create a simple program using a series of algorithms and be able to reason logically why something is/ is not working, using Beebots. To be able to use a series of commands and repeat commands to draw shapes using Beebots. To be able to debug an algorithm and suggest some ideas about how to fix it
Oracy	Password, Privacy, Cybersecurity,	Online Searching,	Debugging, Algorithm, Digital Patterns, Commands,
Year 3	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know that a username and password are not to be shared and start being able to explain the reason why. Remember their username and password independently. To know how they might make their own password and remember it without using obvious information. To know what to do if they see something on a digital monitor that they do not like (on iPads and on Computers) and why this is important. To know that some social media sites have age restrictions and that they might need support in checking their age appropriateness. To know that identities can be hidden on the internet and understand the repercussions of this with support. 	<ul style="list-style-type: none"> To know the main parts of a computer independently (left and right side of mouse, keyboard and main buttons- shift, CL, enter, delete - monitor and hard drive) To know what the difference between hardware and software To know what inputs and outputs are with support. To know how a computer network can be used to share information To know how digital devices can be connected 	<ul style="list-style-type: none"> To know the difference between coding and algorithms.
Disciplinary Knowledge		<ul style="list-style-type: none"> To be able to use different layouts for different purposes To be able to create an effective stop-frame animation 	<ul style="list-style-type: none"> To be able to debug an algorithm and explain where it had mistakes/errors. To be able to write repeat codes using Scratch. To be able to write simple code, using Studio Code (1-18).

		<ul style="list-style-type: none"> To be able to use onion skinning to make small changes To be able to add other media to my animation 	<ul style="list-style-type: none"> To be able to code using Scratch (understand how to move the sprite, understand what each separate part of a code enables a sprite to do, use two sprites, include dialogue, movement and sound)
Oracy	Online Restrictions, Age Restrictions,	Hardware, Software, Stop-Frame,	Algorithms, Coding, Programming, Debugging
Year 4	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know that a username and password are not to be shared and give a clear reason why. To know how to make their own password, with increased security, and remember it without using obvious information. To know what to do if they see something on a digital monitor that they do not like (digital devices) and why this is important. To know and implement acceptable use of digital devices in addition to their user agreements To know that restrictions exist when using digital devices and social media To know that identities can be hidden on the internet and understand the repercussions of this with support. 	<ul style="list-style-type: none"> To know how network devices make up the internet To know how websites can be shared via the WWW To know how content can be added and accessed on the WWW To know that digital media can be changed To know how images can be changed for different uses To know that not all images are real 	<ul style="list-style-type: none"> Share a sequence of actions with the children and decompose into algorithms.
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to understand search history and understand how to access this. 	<ul style="list-style-type: none"> To be able to change the composition of an image To be able to make good choices when selecting different tools To be able to evaluate how changes can improve an image To be able to make a stop motion animation with support. 	<ul style="list-style-type: none"> To be able to code using Scratch (use two sprites, include dialogue, movement and sound) To be able to create a suitable background related to topic theme for the Sprites on Scratch. To be able to decompose a game on Scratch To be able use a range of different apps. To be able to make an app with support. To be able to use variables on Scratch and make specific turns based on angles to draw shapes.
Oracy	User Agreement, Acceptable Use,	World Wide Web, Internet,	Algorithms, Coding, Decomposition, Variables, APP VOCAB
Year 5	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know that a username and password are not to be shared and understand what might happen if they were shared. Be able to give a detailed and concise explanation. To know how they might make their own password (using a range of upper/lower case letters) and remember it without using obvious information. To know what to do if they see something on a digital monitor (digital devices) that they do not like and be able to explain how to report this content, and why this is important. To know and implement acceptable use of digital devices in addition to their user agreements. To know that identities can be hidden on the internet and understand the repercussions of this. 	<ul style="list-style-type: none"> To know that that a computer system features inputs, processes, and outputs. To know that search engines use different rules to rank results To know the limitations of search engines and how they can be influenced To know that vector drawings are made using shapes and layers 	<ul style="list-style-type: none"> To know what script is. To know what a loop is and use it within a Scratch program.
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to understand their digital footprint (caches) and how things that are published on the internet cannot be removed. 	<ul style="list-style-type: none"> To be able to spot errors (debug) in Excel spreadsheet and correct with support. To be able to use a web search to find specific information 	<ul style="list-style-type: none"> To be able to alter the costume of a Sprite for a specific purpose on Scratch. To be able to introduce movement to create a simple animation (eg the sprite will raise his hat, eyebrow or stick out tongue)

	<ul style="list-style-type: none"> To be able to be aware of restrictions when using digital devices and social media and understand why. 	<ul style="list-style-type: none"> To be able to refine a web search To be able to compare search results from different search engines To be able to create a vector drawing by combining shapes To be able to zoom to add detail to vector drawings To be able to change the order of layers in a vector diagram 	<ul style="list-style-type: none"> To be able to use variables on Scratch to make objects/sprites change colour when pressed. To be able to design a project on TinkerCAD
Oracy	Digital Footprint, Acceptable Use,	Systems, Search Engines,	Scrip, Loop, Variable,
Year 6	Online Safety	Digital Literacy & Information Technology	Computational Thinking
Substantive Knowledge	<ul style="list-style-type: none"> To know how they might make their own password (using a range of upper/lower case letters and symbols) and remember it without using obvious information. To know that there are age restrictions when using digital devices and social media and be able to give a detailed explanation of why. Know what to do if they see something on a digital monitor (digital devices) that they do not like and be able to explain the most appropriate actions of how to report this content, and why this is important. 	<ul style="list-style-type: none"> To know that Internet devices have addresses To know how computers use addresses to access websites To know that data is transferred over the Internet in packets To know that you can work in three dimensions on a computer To know that objects can be combined to make a 3D model 	
Disciplinary Knowledge	<ul style="list-style-type: none"> To be able to understand that a username and password are not to be shared and understand what might happen if they were shared. Be able to give a detailed and concise explanation and identify scenarios in the real world where this has happened with negative outcomes. To be able to understand their digital footprint (caches) and how things that are published on the internet cannot be removed and their implications. To be able to identify that identities can be hidden or even falsified on the internet and understand the repercussions of this and how to identify these. 	<ul style="list-style-type: none"> To be able to manipulate 3D objects digitally To be able to lift, resize, recolour, rotate, duplicate and group 3D objects To be able to construct a 3D model based on a design 	<ul style="list-style-type: none"> Use Minecraft to build code for specific purposes. PYTHON Use Barefoot to create, tinker and debug algorithms. Use Scratch to create detailed codes (incorporating multiple sprites, costumes, movements, speech and sounds). To be able to use Tinker CAD for designing.
Oracy			