

## Progression in Computing

### Essential:

Age appropriate skills for the use of core devices and applications within their setting.

| Reception   | Year 1  | Year 2  | Year 3   | Year 4   | Year 5  | Year 6   |
|---|---|---|--|--|---|--|
| <p>The children learn:</p> <p>about types of technology both in and outside of school.</p> <p>how to use classroom technology safely and responsibly, including the basic use of a camera and going online.</p> | <p>The children learn:</p> <p>to explore and experiment with technology in order to build familiarity with classroom apps and devices.</p> <p>basic photographic and video techniques to document their own learning.</p> | <p>The children learn:</p> <p>to create a range of simple digital documents that represents their learning during a topic and then save/share their digital work.</p> | <p>The children learn:</p> <p>to be more independent and are encouraged to attempt to fix a problem they may have before asking for help on their device.</p> <p>about different media and file types.</p> | <p>The children learn:</p> <p>about physical input and output slots on a device. E.g. USB, HDMI, etc.</p> <p>about how to save their work in a range of locations.</p> <p>the best way to save their files. E.g. as an image (jpeg) to share online.</p> | <p>The children learn:</p> <p>how to create a QR Code.</p> <p>about uploading work to a cloud or blog.</p> <p>advanced techniques to tell a story using technology/ multiple apps.</p> <p>about advanced film making elements such as sound and lighting.</p> | <p>The children learn:</p> <p>about collaboration and sharing documents with other children in order to create digital content.</p> <p>advanced features of common office/ classroom apps.</p> |

### (CS) Computational Thinking:

**Key Stage 1:** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.

**Key Stage 2:** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

| Reception  | Year 1  | Year 2  | Year 3   | Year 4  | Year 5  | Year 6  |
|--|---|---|--|---|---|---|
| <p>The children learn:</p> <p>that an algorithm is a list of instructions that solves a problem.</p> <p>to sequence a series of events and explain the importance of sequencing.</p> | <p>The children learn:</p> <p>to explore algorithms and sequencing of instructions.</p> <p>to read, follow and create a simple sequence algorithm.</p> <p>to give these instructions so that they can be executed by a robot with the aim of successfully reaching a destination.</p> | <p>The children learn:</p> <p>about writing algorithms that can be turned into programs.</p> <p>to implement their algorithm as a program on a digital device or programmable toy/ robot.</p> | <p>The children learn:</p> <p>to create a detailed flow diagram using the correct symbols.</p> <p>to turn an algorithm into a simple program on a digital device.</p> <p>about testing the program and recognising when it needs to be debugged.</p> | <p>The children learn:</p> <p>to design a simple algorithm to show a real- life situation.</p> <p>about the valuable skills of abstraction and decomposition when tackling more complex problems.</p> | <p>The children learn:</p> <p>to explore problem solving and decomposition.</p> <p>to independently plan, write and test their algorithms and create more complex programs, debugging as needed.</p> <p>about controlling / simulating physical systems and using sensors with multiple outcomes.</p> | <p>The children learn:</p> <p>to create complex algorithms and turn their designs into a program (incorporating variables, procedures and different forms of input and output).</p> |

## (CS) Coding:

**Key Stage 1:** Create and debug simple programs.

**Key Stage 2:** Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

| Reception   | Year 1   | Year 2   | Year 3  | Year 4  | Year 5   | Year 6  |
|---|--|--|---|---|--|---|
| <p>The children learn:</p> <p>to experiment controlling a range of 'toys' using remote controls and do this with purpose and direction.</p> | <p>The children learn:</p> <p>to create a simple program and correct mistakes (debug).</p> | <p>The children learn:</p> <p>to independently identify and fix a 'bug' in multiple programs.</p> <p>to create a simple program that includes a repeat x times loop.</p> <p>the difference between inputs and outputs.</p> | <p>The children learn:</p> <p>to create their own sprite in Scratch/ Scratch Jr.</p> <p>about sequencing commands and adding a repeat command in a program.</p> <p>how to refine/ improve a program by using the repeat command.</p> <p>how to create a variable.</p> <p>to create a program that contains selection, inputs and outputs.</p> | <p>The children learn:</p> <p>about the structure of a program and learn to plan in logical, achievable steps.</p> <p>to write a complex program, incorporating features such as selection, inputs, repetition, variables and procedures.</p> <p>attempt to debug their own programs and corrects/ debugs errors in code.</p> | <p>The children learn:</p> <p>to create their own complex game within Scratch or other block based coding app that uses variables, event handling, selection ("If" and "Then"), procedures and repetition (loops) to increase programming possibilities.</p> | <p>The children learn:</p> <p>about complex programs and are encouraged to persevere when solving difficult problems even if the solution is not obvious.</p> <p>about executing and adapting common commands using a text-based language e.g. Python/ Javascript/ SwiftPlayground.</p> |

## (CS) Logical Reasoning:

**Key Stage 1:** Use logical reasoning to predict the behaviour of simple programs.

**Key Stage 2:** Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

| Reception   | Year 1   | Year 2  | Year 3   | Year 4  | Year 5   | Year 6   |
|---|--|---|--|---|--|--|
| <p>The children learn:</p> <p>through play about action/reaction and will be asked "what do you think will happen?" when using technology or attempting to solve a problem.</p> | <p>The children learn:</p> <p>about making predictions when using technology. E.g. They will be asked to predict what will happen for a short sequence of instructions in a program.</p> | <p>The children learn:</p> <p>to offer accurate predictions of programs and then create their own simple program to check if they were correct.</p> | <p>The children learn:</p> <p>about using logical reasoning to detect potential problems in an algorithm or program which could result in something going wrong and then offer ideas of what is needed to fix/ debug it.</p> | <p>The children learn:</p> <p>to recognise an error in an existing program and attempt to debug/ fix the program.</p> <p>to investigate existing programs, evaluating them and consider how they could be improved.</p> | <p>The children learn:</p> <p>to explore logical reasoning in greater depth and learn to give well-thought-through explanations of any errors they identify in program code (using the correct terminology).</p> | <p>The children learn:</p> <p>to independently use logical reasoning to detect and correct errors in an algorithm and program.</p> <p>that there is often more than one way to solve a problem in an algorithm or program.</p> |

## (CS) Networking:

Key Stage 1: N/A

Key Stage 2: Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web.

| Reception   | Year 1   | Year 2   | Year 3   | Year 4  | Year 5   | Year 6   |
|---|--|--|--|---|--|--|
| The children learn:<br><br>how to access the web on a classroom device. | The children learn:<br><br>about signing into a device or online platform. | The children learn:<br><br>multiple services use the internet e.g. email, web and streaming. | The children learn:<br><br>the World Wide Web is only one part of the Internet, the part that contains websites.<br><br>to send an email and understands how this works.<br><br>how information travels through computer networks. | The children learn:<br><br>about the key services that can be used to communicate on the internet.<br><br>to recognise the main components (hardware) which allow computers to join and form a network. | The children learn:<br><br>about software, hardware and types of connected computers.<br><br>about how data travels via the internet including binary.<br><br>more about the different parts of the Internet and services.<br><br>to create a basic web page using HTML. | The children learn:<br><br>in more detail about how information/data is transported on the Internet and between computers using packets and IP addresses.<br><br>about the opportunities computer networks and the internet offer for communication and collaboration. |

## (CS) Online:

Key Stage 1: N/A

Key Stage 2: Appreciate how [search] results are selected and ranked.

| Reception  | Year 1  | Year 2  | Year 3   | Year 4  | Year 5   | Year 6  |
|--|---|---|--|---|--|---|
| The children learn:<br><br>to type keywords in a search engine (Google). | The children learn:<br><br>how they can use a search engine to find answers and different types of media e.g. videos. | The children learn:<br><br>the basic skills of searching and navigating the results in a search engine. | The children learn:<br><br>about key words.<br><br>that search engines try to put the most useful websites at the top. | The children learn:<br><br>that search engines use algorithms to sort websites. | The children learn:<br><br>key skills for using a search engine.<br><br>about the settings that can alter your search results. | The children learn:<br><br>to explore advanced features within search engines and learn to use them effectively.<br><br>how search results are selected and ranked by algorithms. |

## (IT) Harnessing Technology:

**Key Stage 1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content. \*

**Key Stage 2:** 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. \*

\* In addition see the "I know how to" big digital skills statements which provide a simple progression of digital skills from reception to year 6. The document links to the Knowsley CLCs computing scheme of work.

| Reception   | Year 1   | Year 2  | Year 3   | Year 4   | Year 5  | Year 6  |
|---|--|---|--|--|---|---|
| <p>The children learn:</p> <p>how various devices and apps can be used in the classroom.</p> <p>to independently choose an application for a particular purpose. E.g drawing a picture.</p> | <p>The children learn:</p> <p>to create different types of digital content (short video, ebook or presentation).</p> <p>to combine text and images in a document that showcases learning or tells a story.</p> <p>to use technology to collect, sort and display information that could include data, photos, video or sound.</p> <p>about saving work in a special place and retrieve it again.</p> | <p>The children learn:</p> <p>to create a presentation or basic digital book that is well designed, contains formatted text, images and presents information.</p> <p>to read a simple database to find information.</p> <p>about organising the data they collect.</p> <p>they can create digital content using more than one app or piece of software.</p> <p>to independently save and open files on the device they use.</p> | <p>The children learn:</p> <p>to create digital content using a range of mixed tools/media and how to improve its design.</p> <p>to be creative and independent while using unfamiliar apps or technology to create content.</p> <p>to create a plan/ storyboard when producing digital content.</p> <p>to design a simple questionnaire to collect information, and display the information in a graph or table.</p> <p>to add information to a database.</p> | <p>The children learn:</p> <p>to produce documents, media and presentations with increasing independence and competency that present data/ information.</p> <p>to use a keyboard confidently and make use of tools such as a spellchecker.</p> <p>about new forms of technology E.g. AR, Virtual Reality, Wearable Technology etc.</p> | <p>The children learn:</p> <p>to produce digital content in a given format e.g. podcasts, videos, AR, virtual reality, 3D, digital music or illustrations.</p> <p>about planning including elements that they may need to source from other services.</p> <p>to build on the skills they have already developed to create content using unfamiliar technology.</p> <p>to use a spreadsheet / database to collect, record data and to use simple formulae.</p> | <p>The children learn:</p> <p>to create digital storyboards with a complete narrative of the project or investigation.</p> <p>to confidently identify the potential of unfamiliar technology to increase their creativity.</p> <p>to source, store and combine copyright free images from the internet.</p> <p>to independently select, use and combine the appropriate technology/app tools to create effects that will have an impact on others and tell a story.</p> |

## (IT) Online:

**Key Stage 1:** N/A

**Key Stage 2:** Use search technologies effectively.

| Reception   | Year 1  | Year 2   | Year 3   | Year 4   | Year 5   | Year 6  |
|---|---|--|--|--|--|---|
| <p>The children learn:</p> <p>to type keywords in a search engine (Google).</p> | <p>The children learn:</p> <p>how they can use a search engine to find answers and different types of media category e.g. images, book, videos.</p> | <p>The children learn:</p> <p>the basic skills of searching and navigating the results in a search engine to answer questions.</p> | <p>The children learn:</p> <p>that the top search results can be manipulated and are based on things like most popular, recently updated.</p> <p>about filtering results by adding more detail or using advanced tools.</p> <p>to use search engines to collect information.</p> | <p>The children learn:</p> <p>to search for and use information from a range of sources.</p> <p>about making notes from information found on websites to present their findings.</p> <p>that not all sources of information including websites are accurate and can check information using a different sites.</p> | <p>The children learn:</p> <p>to use complex searches and advanced tools to find, select and use information.</p> <p>check the reliability of information on the internet.</p> | <p>The children learn:</p> <p>to use complex searches, filters and advanced tools to find, select and use information</p> |

## (DL) Technology in the Real World:

**Key Stage 1:** Recognise common uses of information technology beyond school.

**Key Stage 2:** Understand the opportunities [networks] offer for communication and collaboration.

| Reception   | Year 1  | Year 2   | Year 3  | Year 4   | Year 5   | Year 6  |
|---|---|--|---|--|--|---|
| <p>The children learn:</p> <p>to recognise and discuss common uses of information technology in school and outside of school.</p> | <p>The children learn:</p> <p>about the uses and purpose of technology in the classroom, at home, work and the world around them.</p> <p>about some of the common ways in which technology at home can be used.</p> | <p>The children learn:</p> <p>about the numerous methods of online communication and how it is used in the world around them.</p> <p>to explore their own use of the internet and why it is important to stick to the rules.</p> | <p>The children learn:</p> <p>that the internet is a computer network.</p> <p>that the internet can provide multiple services, such as the world wide web, streaming music/ video and email.</p> <p>explore a web sites journey from first request to appearing on the screen.</p> <p>to learn advanced web terminology e.g. URL.</p> | <p>The children learn:</p> <p>to differentiate between apps that use the Internet, the school network or that are self contained on a device.</p> <p>to use computing to communicate and collaborate.</p> <p>about documents and methods of collaboration over the internet e.g. blog.</p> | <p>The children learn:</p> <p>about different online communication tools/apps and how they could be used for different purposes e.g. work and social.</p> <p>about working in a group using collaborative tools.</p> | <p>The children learn:</p> <p>about digital crimes and threats that might exist online. E.g. worms, trojans, viruses, spyware, ransomware and malware.</p> <p>about anti-virus software and how they can help protect devices from infection.</p> <p>advanced web terminology e.g. firewall, security updates, pop up blocker, scams, phishing, HTTPs, location based settings, in app purchasing, trolling, filtering etc.</p> |

## (DL) Media & Content:

**Key Stage 1:** N/A

**Key Stage 2:** Be discerning in evaluating digital content.

| Reception   | Year 1   | Year 2   | Year 3   | Year 4  | Year 5  | Year 6   |
|---|--|--|--|---|---|--|
| <p>The children learn:</p> <p>that there are many different types of media content including; sound, images, books, podcasts/ audiobooks and video via the web.</p> | <p>The children learn:</p> <p>to access different types of media content on their device. Including; sound, images, books, podcasts/ audiobooks and video via the web.</p> | <p>The children learn:</p> <p>where different types of media content can be found online. Including; sound, images, books, podcasts/ audiobooks and video via the web.</p> | <p>The children learn:</p> <p>how to make judgements about the usefulness and accuracy of information.</p> <p>about the term 'fake news'.</p> <p>about what copyright is and why we have copyright laws.</p> <p>to recognise copyright material.</p> | <p>The children learn:</p> <p>more about what Fake News is, it's purpose and that Fake News can be found on all media.</p> <p>how to identify Fake News.</p> <p>that data can be manipulated to make Fake News appear to be true.</p> | <p>The children learn:</p> <p>about how and why information found on some sites will be biased.</p> <p>how to source copyright free materials to use in their digital projects.</p> <p>how to credit the use of websites in their work and why this should be done.</p> | <p>The children learn:</p> <p>to explore in more depth the legal and moral reasons not to plagiarise or infringe copyright and the impact it can have on the creator of the content.</p> |

## (DL) Online Safety:

**Key Stage 1:** 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:** Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. \*

\* Each year group has a 'My Online Life' topic which aims to ensure your school meets the requirements of the UKCIS Education for Connected World Framework.

| Reception   | Year 1  | Year 2  | Year 3   | Year 4   | Year 5  | Year 6  |
|---|---|---|--|--|---|---|
| <p>The children learn:</p> <p>the Internet can be used to communicate with others.</p> <p>simple online safety rules.</p> <p>people create online content such as video and websites.</p> | <p>The children learn:</p> <p>how to access and search the web.</p> <p>to identify people they can trust and who they can ask for help when using the internet.</p> <p>to send a digital message.</p> <p>how they should behave and interact with others in the online world.</p> <p>why it is very important not to over share, share things that are personal or may hurt other people.</p> <p>the ways that some people can be unkind online.</p> <p>about following sensible online rules.</p> <p>safe behaviours in their day to day world such as not talking to or meeting strangers and how this applies in the online world.</p> <p>what a username and password is and that they must keep them private.</p> <p>that online content such as video, images, websites and games are created and shared by people.</p> <p>that to use other peoples work without asking or giving credit is wrong.</p> | <p>The children learn:</p> <p>about safe and unsuitable sites/apps. e.g. PEGI rating.</p> <p>to talk to a trusted adult before sharing personal information online and using strong passwords.</p> <p>that the characters and people they interact with may be computer generated / including games.</p> <p>the differences between the Internet and the physical world.</p> <p>sending a message and why it is important to communicate in a polite manner.</p> <p>that login details and passwords should only be shared with trusted adults.</p> <p>that copyright is something that prevents people stealing other people's work (content).</p> <p>what personal information is and that they need to talk to a trusted adult before sharing online.</p> <p>how some information may be inaccurate or untrue.</p> <p>to independently use a search engine, navigate a website, use favourites, bookmarks or typing the URL.</p> <p>that you can be connected to many people in your life (real life and online).</p> <p>to ensure a trusted adult is aware of who they are interacting with online.</p> <p>to explain some of the potential risks when posting something to the internet.</p> <p>that once something is posted others can read the post and share it.</p> | <p>The children learn:</p> <p>the SMART rules about using the internet safely and responsibly.</p> <p>what personal information is and what they shouldn't be sharing.</p> <p>they should pause before posting and consider the potential consequences.</p> <p>who they should seek help from about online concerns.</p> <p>the correct and sensible choice when presented with hypothetical scenarios.</p> <p>how to send and reply to online messages, such as email, respectfully and understand the difference between online and face-to-face.</p> <p>how to use the safety features of websites as well as reporting concerns to an adult they trust.</p> <p>what online bullying/ cyberbullying is and some of the forms it can take.</p> <p>how to report any concerns and who they consider a trusted adult.</p> <p>they need to have a balanced approach to their use of technology.</p> <p>to make good choices about how long they spend online.</p> <p>to recognise websites and games appropriate for their age. E.g. PEGI rating.</p> <p>online accounts need to be signed in to and why passwords should never be shared.</p> <p>what makes a secure password and why they are important.</p> <p>how to use a password security checking tool.</p> <p>what represents an online identity E.g. images, username, information shared and digital footprint.</p> <p>to post positive comments online.</p> | <p>The children learn:</p> <p>the potential risks and ways they can protect themselves and friends from harm online.</p> <p>the safety features of websites and apps. e.g. block or report.</p> <p>they should report concerns to a trusted adult.</p> <p>the Internet is a great place to develop rewarding relationships.</p> <p>not to reveal private information to a person they know only online.</p> <p>that friends/followers profiles may not reflect the truth about their real lives.</p> <p>the term 'digital footprint' and that the information they put online leaves a digital footprint or "trail" which can be positive and negative.</p> <p>to search for their own name and usernames in Google to test their digital footprint.</p> <p>how they should act appropriately &amp; respectfully online.</p> <p>how to deal with online bullying.</p> <p>how photos can be altered digitally and the creative upsides of photo alteration, as well as its power to distort perceptions of beauty and health.</p> <p>why copyright laws exist and presenting others work as one's own is called plagiarism.</p> <p>to use a copyright free image gallery, or they can change the search criteria.</p> <p>the positive and negative effects technology may have on their health.</p> <p>why they need to ask a trusted adult before downloading files and games from the Internet. E.g. virus.</p> <p>to choose a secure passwords.</p> <p>why using an avatar and online name is advisable.</p> | <p>The children learn:</p> <p>to demonstrate and explain the importance of communicating kindly and respectfully.</p> <p>about the negative online behaviours such as bullying, trolling, grieving and harassment.</p> <p>about empathy and the effects of online bullying.</p> <p>anything they post online can be seen, re-shared, re-used and may have a negative effect on others.</p> <p>about the 'Digital 5 a Day' plan and that they need to have a balanced approach to their use of technology.</p> <p>what makes a secure username and password.</p> <p>why people set up fake accounts or copy others identities.</p> <p>what an online identity or internet persona is, e.g. social identity in online communities and websites (Facebook, Instagram, YouTube etc) including photos and posts.</p> <p>how to avoid being tricked by scammers online. E.g. Phishing emails. The child can explain why an app may be free but have in-app-purchasing and what that is.</p> | <p>The children learn:</p> <p>the advice they should/would give friends about making good choices online.</p> <p>the consequences of making poor online choices. E.g. Online bullying, Inappropriate comments (racially or sexually orientated), uploading inappropriate material (adult / illegal / anti-social ), accessing inappropriate sites (anti-social or illegal behaviour / adult content) and breaching copyright laws.</p> <p>the way men and women can be stereotyped in movies and TV.</p> <p>when to seek help from a trusted adult and not to try and deal with online situations on their own.</p> <p>how to block and report inappropriate comments or behaviour online.</p> <p>how to maintain healthy positive relationships with others while online.</p> <p>behaviours and strategies to prevent and stop online bullying. The child knows and can list the websites and agencies they can contact in case they need help.</p> <p>what steps they can take to create a 'positive online image' including defining acceptable and unacceptable online behaviour and the benefits this will have to them now and in the future.</p> |