 **Progression of Skills**

 **In Computing**

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Technology in Our Lives** | * Recognise the way they use technology in our classroom.
* Recognise ways that technology is used in their home and community.
* Use links to websites to find information.
* Begin to identify some of the benefits of using technology
 | * Tell adults why they use technology in the classroom.
* Tell adults why they use technology in their home and community.
* Starting to understand that other people have created the information they use.
* Identify benefits of using technology including finding information, creating and communicating.
* Talk about the differences between the internet and things in the physical world.
 | * Save and retrieve work on the internet, the school network or their own device.
* Talk about the parts of a computer.
* Tell adults ways to communicate with others online.
* Describe the World Wide Web as the part of the internet that contains websites.
* Use search tools to find and use an appropriate website.
* Think about whether they can use images that they find online in their own work.
* <https://www.barefootcomputing.org/resources/modelling-the-internet>
 | * Tell adults whether a resource they are using is on the internet, the school network or their own device.
* Identify key words to use when searching safely on the World Wide Web.
* Think about the reliability of information they read on the World Wide Web.
* Tell adults how to check who owns photos, text and clipart.
* Create a hyperlink to sources on the World Wide Web.
* <https://www.barefootcomputing.org/resources/network-hunt-activity>
 | * Describe different parts of the internet.
* Use different online communication tools for different purposes.
* Use a search engine to find appropriate information and check its reliability.
* Recognise and evaluate different types of information they find on the World Wide Web.
* Describe the different parts of a webpage.
* Find out who the information on a webpage belongs to.

<https://www.barefootcomputing.org/resources/ranking-search-activity> | * Tell adults the internet services they need to use for different purposes.
* Describe how information is transported on the internet.
* Select an appropriate tool to communicate and collaborate online.
* Talk about the way search results are selected and ranked.
* Check the reliability of a website.
* Tell adults about copyright and acknowledge the sources of information that they find online
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| **PROGRAMMING****Computer Science** | * Give instructions to others and follow their instructions to move around.
* Describe what happens when they press buttons on a robot.
* Press the buttons in the correct order to make their robot do what they want.

BeeBot activities<https://studio.code.org/s/coursea-2019> introduction to the basics | * Give instructions to others (using forward, backward and turn) and physically follow their instructions.
* Program a robot or software to do a particular task.
* Use programming software to make objects move.

<https://art.kano.me/challenges> - written instructions<https://art.kano.me/challenges/basic/> sunny day art work | * Put programming commands into a sequence to achieve a specific outcome.
* Use repeat commands.

<https://www.barefootcomputing.org/resources/dance-move-algorithms> with repeat commands<https://www.barefootcomputing.org/resources/house-patterns-activity> | * Use a variety of tools to create a program.
* Use a sensor to detect a change which can select an action within their program.

<https://makecode.microbit.org/#editor> making a dice with Microbit | * Refine a procedure using repeat commands to improve a program.
* Change an input to a program to achieve a different output.
* Talk about how a computer model can provide information about a physical system.
* Use a variable to increase programming possibilities.

<https://makecode.microbit.org/#editor> - programming words<https://www.barefootcomputing.org/resources/dance-move-algorithms> repeat, if, then, loop | * Recognise when they need to use a variable to achieve a required output.
* Use a variable and operators to stop a program.
* Use different inputs (including sensors) to control a device or onscreen action and predict what will happen.

<https://makecode.microbit.org/#editor> smiley face - variables<https://www.barefootcomputing.org/resources/code-cracking> links to History, WW11, 6 week project |
| **PROGRAMMING****Computational Thinking** | * Describe what actions they will need to do to make something happen and begin to use the word ‘algorithm’.
* Begin to predict what will happen for a short sequence of instructions.

<https://www.barefootcomputing.org/resources/crazy-character-algorithms><https://www.barefootcomputing.org/resources/getting-ready-for-school-decomposition-activity> | * Tell adults the order they need to do things to make something happen and talk about this as an algorithm.
* Look at other’s programs and tell them what will happen.

<https://www.barefootcomputing.org/resources/crazy-character-algorithms> plus addition of making the algorithm clear and concise.  | * Break an open‐ended problem up into smaller parts.
* Describe the algorithm they will need for a simple task.

<https://www.barefootcomputing.org/resources/decomposition-unplugged-activity-ks1><https://art.kano.me/challenges/basic/> - flags | * Use logical thinking to solve an open‐ended problem by breaking it up into smaller parts.
* Recognise that an algorithm will help them sequence more complex programs.
* Use an efficient procedure to simplify a program.
* Recognise that using algorithms will also help solve problems in other learning such as maths, science and design technology

<https://www.barefootcomputing.org/resources/fossil-formation-animation> | * Decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program.
* Use ‘if’ and ‘then’ commands to select an action.
* Use logical thinking, imagination and creativity to extend a program.

<https://arcade.makecode.com/#editor> - creating an arcade game. <https://projects.raspberrypi.org/en/projects/fortune-teller><https://art.kano.me/challenge/mischiefweek2015/skull> - directional coding | * Deconstruct a problem into smaller steps, recognising similarities to solutions used before.
* Explain and program each of the steps in their algorithm.

<https://www.barefootcomputing.org/resources/code-cracking> links to History, WW11, 6 week project |
| **PROGRAMMING****Evaluation** | * Use the word ‘debug’ when they correct mistakes when they program.

<https://www.barefootcomputing.org/resources/crazy-character-algorithms> | * Watch a program execute and spot where it goes wrong so that they can debug it.

<https://www.barefootcomputing.org/resources/bee-bot-route-decomposition-activity>  | * Detect a problem in an algorithm which could result in a mistake to occur.
* Keep testing their programs and can recognise when they need to debug it.

Food tech activity, give wrong instructions for a recipe, children create – where did it go wrong? Debug and make algorithm clearer  | * Recognise an error in a program and debug it.
* Know that they need to keep testing their programs while they are putting it together

<https://minecraft.makecode.com/#editor> chicken Minecraft  | * Use logical reasoning to detect and debug mistakes in a program.

<https://www.barefootcomputing.org/resources/2d-shape-drawing-debugging> | * Evaluate the effectiveness and efficiency of their algorithm while they continually test the programming of that algorithm.
* Use logical reasoning to detect and correct errors in algorithms

<https://www.barefootcomputing.org/resources/classroom-sound-monitor> (links to science) |
| **Online Safety and Online Sense** | * Keep a password private
* Explain what personal information is
* Know when to tell an adult when they see something unexpected or worrying online
* Able to talk about why it is important to be kind and polite
* Recognise an age appropriate website
* Agree and follow sensible safety rules
 | * Explain why we need to keep my password and personal information private.
* Describe the things that happen online that they must tell an adult about.
* Talk about why they should go online for a short amount of time.
* Talk about why it is important to be kind and polite online and in real life.
* Know that not everyone is who they say they are on the internet.
 | * Talk about what makes a secure password and why they are important.
* Protect personal information when they do different things online.
* Use the safety features of websites as well as reporting concerns to an adult.
* Recognise websites and games appropriate for my age.
* Make good choices about how long they spend online.
* Ask an adult before downloading files and games from the internet.
* Post positive comments online.

<https://www.barefootcomputing.org/resources/stop-think-do-i-consent> | * Choose a secure password when they are using a website.
* Talk about the ways they can protect themselves and others from harm online.
* Use the safety features of websites as well as reporting concerns to an adult.
* Know that anything they post online can be seen by others.
* Choose websites and games that are appropriate for their age.
* Help their friends make good choices about the time they spend online.
* Talk about why they need to ask a trusted adult before downloading files and games from the internet.
* Comment positively and respectfully online.
 | * Protect their password and other personal information.
* Explain why they need to protect themselves and their friends and the best ways to do this, including reporting concerns to an adult.
* Know that anything they post online can be seen, used and may affect others.
* Talk about the dangers of spending too long online or playing a game.
* Explain the importance of communicating kindly and respectfully.
* Discuss the importance of choosing an age‐ appropriate website or game.
* Explain why they need to protect their computer or device from harm.
* Know which resources on the internet they can download and use
 | * Protect their password and other personal information.
* Explain the consequences of sharing too much information about themselves online.
* Support their friends to protect themselves and make good choices online, including reporting concerns to an adult.
* Explain the consequences of spending too much time online or on a game.
* Explain the consequences to themselves and others of not communicating kindly and respectfully.
* Protect their computer or device from harm on the internet.
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| **Multimedia** | * Be creative with different technology tools.
* Use technology to create and present their ideas.
* Use the keyboard or a word bank on their device to enter text.
* Save information in a special place and retrieve it again
 | * Use technology to organise and present their ideas in different ways.
* Use the keyboard on their device to add, delete and space text for others to read.
* Tell adults about an online tool that will help them to share their ideas with other people.
* Save and open files on the device they use.
 | * Create different effects with different technology tools.
* Combine a mixture of text, graphics and sound to share their ideas and learning.
* Use appropriate keyboard commands to amend text on their device, including making use of a spellchecker.
* Evaluate their work and improve its effectiveness.
* Use an appropriate tool to share their work online.
 | * Use photos, video and sound to create an atmosphere when presenting to different audiences.
* Be confident to explore new media to extend what they can achieve.
* Change the appearance of text to increase its effectiveness.
* Create, modify and present documents for a particular purpose.
* Use a keyboard confidently and make use of a spellchecker to write and review their work.
* Use an appropriate tool to share their work and collaborate online.
* Give constructive feedback to others to help them improve their work and refine their own work.
 | * Use text, photo, sound and video editing tools to refine their work.
* Use the skills they have already developed to create content using unfamiliar technology.
* Select, use and combine the appropriate technology tools to create effects that will have an impact on others.
* Select an appropriate online or offline tool to create and share ideas.
* Review and improve their work and support others to improve their work.
 | * Talk about audience, atmosphere and structure when planning a particular outcome.
* Confidently identify the potential of unfamiliar technology to increase their creativity.
* Combine a range of media, recognising the contribution of each to achieve a particular outcome.
* Tell adults why they select a particular online tool for a specific purpose.
* Be digitally discerning when evaluating the effectiveness of their work and the work of others

<https://www.barefootcomputing.org/resources/code-cracking> links to History, WW11, 6 week project - (Flipgrid, OneNote, Sway)<https://projects.raspberrypi.org/en/projects/blender-rocket> |
| **Handling Data****These aspects will taught in other curriculum areas (Science, geography and maths)** | * Talk about the different ways in which information can be shown.
* Use technology to collect information, including photos, video and sound.
* Sort different kinds of information and present it to others.
* Add information to a pictograph and talk to adults about what they have found out.
 | * Talk about the different ways they use technology to collect information, including a camera, microscope or sound recorder.
* Make and save a chart or graph using the data they collect.
* Talk about the data that is shown in their chart or graph.
* Starting to understand a branching database.
* Tell adults what kind of information they could use to help investigate a question.
 | * Talk about the different ways data can be organised.
* Search a ready‐made database to answer questions.
* Collect data to help them answer a question.
* Add to a database.
* Make a branching database. Use a data logger to monitor changes and can talk about the information collected.
 | * Organise data in different ways.
* Collect data and identify where it could be inaccurate.
* Plan, create and search a database to answer questions.
* Choose the best way to present data to others.
* Use a data logger to record and share readings with others.
 | * Use a spreadsheet and database to collect and record data.
* Choose an appropriate tool to help them collect data.
* Present data in an appropriate way.
* Search a database using different operators to refine their search.
* Talk about mistakes in data and suggest how it could be checked.
 | * Plan the process needed to investigate the world around them.
* Select the most effective tool to collect data for their investigation.
* Check the data they collect for accuracy and plausibility.
* Interpret the data they collect.
* Present the data they collect in an appropriate way.
* Use the skills they have developed to interrogate a database.
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