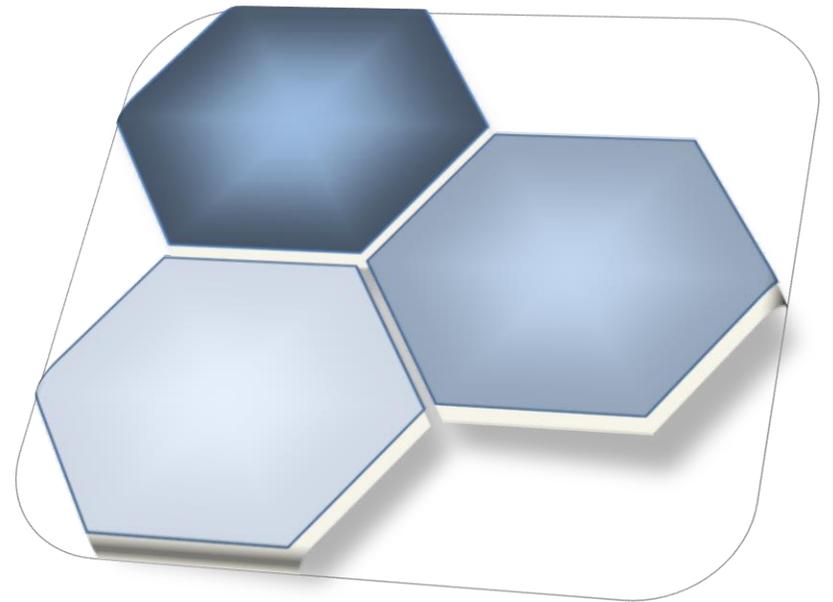


Primary Computing: End of Year Expectations and Skills Grids

St John's CE Academy Darlington 



This resource prepared using guidance from



The New Computing Curriculum contains three Strands:

- ★ Computer Science – essentially, Programming and Coding
- ★ Information Technology – Using computers to organise and present information in different ways
- ★ Digital Literacy – Understanding where computers fit into our daily lives.

This document breaks these skills down further to aid planning. In each Skills Grid, the strands are:

Computer Science
Information Technology
Digital Literacy

In each Skills Grid, many of the skills will be taught cross-circularly; for example, when presenting a poem using the word processor in Year Two or when producing multimedia PowerPoints in Year Four. **However, staff must show in planning where the Computing Learning Intention is included, and should also make reference to this in their marking.**

E-safety must be taught whenever appropriate; it is not just a task to plan in for e-safety week. E-safety skills should be constantly reinforced and should also be taught specifically in response to any incidents arising in class.

Coding is the most important part of the new curriculum. It involves programming the computer or Bee-bot with a series of instructions, called an algorithm, to make it do something. In all likelihood it will need to be taught discretely within the timetabled Computer Suite slots, apart from some of the simpler tasks at KS1 which can be done as small group tasks if this is easier. If you have any specific issues or training needs to help you to teach the features of your Coding section, please asks the ICT co-ordinator.

Foundation Stage

Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
<ul style="list-style-type: none">★ I can make a floor robot move.★ I can use simple software to make something happen.★ I can make choices about the buttons and icons I press, touch or click on.	<ul style="list-style-type: none">★ I can tell you about different kinds of information such as pictures, video, text and sound.	<ul style="list-style-type: none">★ I can move objects on a screen.★ I can create shapes and text on a screen.★ I can use technology to show my learning.	<ul style="list-style-type: none">★ I can ask an adult when I want to use the Internet.★ I can tell an adult when something worrying or unexpected happens while I am using the Internet.★ I can be kind to my friends.★ I can talk about the amount of time I spend using a computer / tablet / game device.★ I am careful with technology devices.	<ul style="list-style-type: none">★ I can tell you about technology that is used at home and in school.★ I can operate simple equipment.★ I can use a safe part of the Internet to play and learn.

Year 1

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none">★ I can give instructions to my friend and follow their instructions to move around.★ I can describe what happens when I press buttons on a robot.★ I can press the buttons in the correct order to make my robot do what I want.★ I can describe what actions I will need to do to make something happen and begin to use the word algorithm.★ I can begin to predict what will happen for a short sequence of instructions.★ I can begin to use software/apps to create movement and patterns on a screen.★ I can use the word debug when I correct mistakes when I program.	<ul style="list-style-type: none">★ I can talk about the different ways in which information can be shown.★ I can use technology to collect information, including photos, video and sound.★ I can sort different kinds of information and present it to others.★ I can add information to a pictograph and talk to you about what I have found out.	<ul style="list-style-type: none">★ I can be creative with different technology tools.★ I can use technology to create and present my ideas.★ I can use the keyboard or a word bank on my device to enter text.★ I can save information in a special place and retrieve it again.	<ul style="list-style-type: none">★ I can keep my password private.★ I can tell you what personal information is.★ I can tell an adult when I see something unexpected or worrying online.★ I can talk about why it's important to be kind and polite.★ I can recognise an age appropriate website.★ I can agree and follow sensible e-Safety rules.	<ul style="list-style-type: none">★ I can recognise the ways we use technology in our classroom.★ I can recognise ways that technology is used in my home and community.★ I can use links to websites to find information.★ I can begin to identify some of the benefits of using technology.

Year 2

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none">★ I can give instructions to my friend (using forward, backward and turn) and physically follow their instructions.★ I can tell you the order I need to do things to make something happen and talk about this as an algorithm.★ I can program a robot or software to do a particular task.★ I can look at my friend's program and tell you what will happen.★ I can use Coding software to make objects move.★ I can watch a program execute and spot where it goes wrong so that I can debug it.	<ul style="list-style-type: none">★ I talk about the different ways I use technology to collect information, including a camera, microscope or sound recorder.★ I can make and save a chart or graph using the data I collect.★ I can talk about the data that is shown in my chart or graph.★ I am starting to understand a branching database.★ I can tell you what kind of information I could use to help me investigate a question.	<ul style="list-style-type: none">★ I can use technology to organise and present my ideas in different ways.★ I can use the keyboard on my device to add, delete and space text for others to read.★ I can tell you about an online tool that will help me to share my ideas with other people.★ I can save and open files on the device I use.	<ul style="list-style-type: none">★ I can explain why I need to keep my password and personal information private.★ I can describe the things that happen online that I must tell an adult about.★ I can talk about why I should go online for a short amount of time.★ I can talk about why it is important to be kind and polite online and in real life.★ I know that not everyone is who they say they are on the Internet.	<ul style="list-style-type: none">★ I can tell you why I use technology in the classroom.★ I can tell you why I use technology in my home and community.★ I am starting to understand that other people have created the information I use.★ I can identify benefits of using technology including finding information, creating and communicating.★ I can talk about the differences between the Internet and things in the physical world.

Year 3

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none">★ I can break an open-ended problem up into smaller parts.★ I can put Coding commands into a sequence to achieve a specific outcome.★ I keep testing my program and can recognise when I need to debug it.★ I can use repeat commands.★ I can describe the algorithm I will need for a simple task.★ I can detect a problem in an algorithm which could result in unsuccessful Coding.	<ul style="list-style-type: none">★ I can talk about the different ways data can be organised.★ I can search a ready-made database to answer questions.★ I can collect data help me answer a question.★ I can add to a database.★ I can make a branching database.★ I can use a data logger to monitor changes and can talk about the information collected.	<ul style="list-style-type: none">★ I can create different effects with different technology tools.★ I can combine a mixture of text, graphics and sound to share my ideas and learning.★ I can use appropriate keyboard commands to amend text on my device, including making use of a spellchecker.★ I can evaluate my work and improve its effectiveness.★ I can use an appropriate tool to share my work online.	<ul style="list-style-type: none">★ I can talk about what makes a secure password and why they are important.★ I can protect my personal information when I do different things online.★ I can use the safety features of websites as well as reporting concerns to an adult.★ I can recognise websites and games appropriate for my age.★ I can make good choices about how long I spend online.★ I ask an adult before downloading files and games from the Internet.★ I can post positive comments online.	<ul style="list-style-type: none">★ I can save and retrieve work on the Internet, the school network or my own device.★ I can talk about the parts of a computer.★ I can tell you ways to communicate with others online.★ I can describe the World Wide Web as the part of the Internet that contains websites.★ I can use search tools to find and use an appropriate website.★ I think about whether I can use images that I find online in my own work.

Year 4

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none"> ★ I can use logical thinking to solve an open-ended problem by breaking it up into smaller parts. ★ I can use an efficient procedure to simplify a program. ★ I can use a sensor to detect a change which can select an action within my program. ★ I know that I need to keep testing my program while I am putting it together. ★ I can use a variety of tools to create a program. ★ I can recognise an error in a program and debug it. ★ I recognise that an algorithm will help me to sequence more complex programs. ★ I recognise that using algorithms will also help solve problems in other learning such as Maths, Science and Design and Technology. 	<ul style="list-style-type: none"> ★ I can organise data in different ways. ★ I can collect data and identify where it could be inaccurate. ★ I can plan, create and search a database to answer questions. ★ I can choose the best way to present data to my friends. ★ I can use a data logger to record and share my readings with my friends. 	<ul style="list-style-type: none"> ★ I can use photos, video and sound to create an atmosphere when presenting to different audiences. ★ I am confident to explore new media to extend what I can achieve. ★ I can change the appearance of text to increase its effectiveness. ★ I can create, modify and present documents for a particular purpose. ★ I can use a keyboard confidently and make use of a spellchecker to write and review my work. ★ I can use an appropriate tool to share my work and collaborate online. ★ I can give constructive feedback to my friends to help them improve their work and refine my own work. 	<ul style="list-style-type: none"> ★ I choose a secure password and an appropriate screen name when I am using a website. ★ I can talk about the ways I can protect myself and my friends from harm online. ★ I use the safety features of websites as well as reporting concerns to an adult. ★ I know that anything I share online can be seen by others. ★ I choose websites, apps and games that are appropriate for my age. ★ I can help my friends make good choices about the time they spend online. ★ I can talk about why I need to ask a trusted adult before downloading files and games from the Internet. ★ I comment positively and respectfully online and through text messages. 	<ul style="list-style-type: none"> ★ I can tell you whether a resource I am using is on the Internet, the school network or my own device. ★ I can identify key words to use when searching safely on the World Wide Web. ★ I think about the reliability of information I read on the World Wide Web. ★ I can tell you how to check who owns photos, text and clipart. ★ I can create a hyperlink to a resource on the World Wide Web. ★ I can recognise that websites use different methods to advertise products.

Year 5

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none"> ★ I can decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program. ★ I can refine a procedure using repeat commands to improve a program. ★ I can use a variable to increase Coding possibilities. ★ I can change an input to a program to achieve a different output. ★ I can use 'if' and 'then' commands to select an action. ★ I can talk about how a computer model can provide information about a physical system. ★ I can use logical reasoning to detect and debug mistakes in a program. ★ I use logical thinking, imagination and creativity to extend a program. 	<ul style="list-style-type: none"> ★ I can use a spreadsheet and database to collect and record data. ★ I can choose an appropriate tool to help me collect data.. ★ I can present data in an appropriate way. ★ I can search a database using different operators to refine my search. ★ I can talk about mistakes in data and suggest how it could be checked. 	<ul style="list-style-type: none"> ★ I can use text, photo, sound and video editing tools to refine my work. ★ I can use the skills I have already developed to create content using unfamiliar technology. ★ I can select, use and combine the appropriate technology tools to create effects that will have an impact on others. ★ I can select an appropriate online or offline tool to create and share ideas. ★ I can review and improve my own work and support others to improve their work. 	<ul style="list-style-type: none"> ★ I can choose a secure password and screen name. ★ I protect my password and other personal information. ★ I can explain why I need to protect myself and my friends and the best ways to do this, including reporting concerns to an adult. ★ I know that anything I post online can be seen, used and may affect others. ★ I can talk about the dangers of spending too long online or playing a game. ★ I can explain the importance of communicating kindly and respectfully. ★ I can discuss the importance of choosing an age-appropriate website, app or game. ★ I can explain why I need to protect my computer or device from harm. 	<ul style="list-style-type: none"> ★ I can describe different parts of the Internet. ★ I can use different online communication tools for different purposes. ★ I can use a search engine to find appropriate information and check its reliability. ★ I can recognise and evaluate different types of information I find on the World Wide Web. ★ I can describe the different parts of a webpage. ★ I can find out who the information on a webpage belongs to. ★ I know which resources on the Internet I can download and use. ★ I can describe the ways in which websites advertise their products to me.

Year 6

	Coding	Handling Data	Multimedia	e-Safety	Technology in our Lives
	<ul style="list-style-type: none"> ★ I can deconstruct a problem into smaller steps, recognising similarities to solutions used before. ★ I can explain and program each of the steps in my algorithm. ★ I can evaluate the effectiveness and efficiency of my algorithm while I continually test the Coding of that algorithm. ★ I can recognise when I need to use a variable to achieve a required output. ★ I can use a variable and operators to stop a program. ★ I can use different inputs (including sensors) to control a device or onscreen action and predict what will happen. ★ I can use logical reasoning to detect and correct errors in a algorithms and programs. 	<ul style="list-style-type: none"> ★ I can plan the process needed to investigate the world around me. ★ I can select the most effective tool to collect data for my investigation. ★ I can check the data I collect for accuracy and plausibility. ★ I can interpret the data I collect. ★ I can present the data I collect in an appropriate way. ★ I use the skills I have developed to interrogate a database. 	<ul style="list-style-type: none"> ★ I can talk about audience, atmosphere and structure when planning a particular outcome. ★ I can confidently identify the potential of unfamiliar technology to increase my creativity. ★ I can combine a range of media, recognising the contribution of each to achieve a particular outcome. ★ I can tell you why I select a particular online tool for a specific purpose. ★ I can be digitally discerning when evaluating the effectiveness of my own work and the work of others. 	<ul style="list-style-type: none"> ★ I protect my password and other personal information. ★ I can explain the consequences of sharing too much about myself online. ★ I support my friends to protect themselves and make good choices online, including reporting concerns to an adult. ★ I can explain the consequences of spending too much time online or on a game. ★ I can explain the consequences to myself and others of not communicating kindly and respectfully. ★ I protect my computer or device from harm on the Internet. 	<ul style="list-style-type: none"> ★ I can tell you the Internet services I need to use for different purposes. ★ I can describe how information is transported on the Internet. ★ I can select an appropriate tool to communicate and collaborate online. ★ I can talk about the way search results are selected and ranked. ★ I can check the reliability of a website. ★ I can tell you about copyright and acknowledge the sources of information that I find online. ★ I know that websites can use my data to make money and target their advertising .

Glossary

Abstraction Reducing complexity by focusing on the essential features of an algorithm or data representation and omitting unnecessary detail.

Algorithm A precise step by step method for solving a problem. Named after Iranian mathematician Muhammad ibn Musa al-Khwarizmi.

Application A self-contained program that performs a specific function for end users.

Boolean logic / digital logic A system of reasoning with truth values, true and false, using logical operations such as and, or, and not. Named after British mathematician George Boole.

Browser A piece of software that enables a user to locate, retrieve and display information on the world wide web.

Complexity The way that a solution to a problem scales as the size of the input increases, considering both the number of computational steps and the memory space required.

Computation Performing a calculation by executing the instructions of a program on a computational device.

Computational device / digital device A computer or other programmable device that performs computation.

Computational thinking The ability to analyse ways to solve problems using appropriate algorithms and data representations, taking account of the complexity of possible solutions.

Computer science The scientific study of computation, applied to both hardware and software, covering both theoretical and practical concerns.

Data Information which can be stored, retrieved and manipulated in digital form using digital devices.

Debug To find, remove and / or change errors in computer code.

Digital artifacts / digital content Images, videos, text or data, or a combination of these, which are made on a digital device.

Digital literacy The ability to access and manipulate digital content and understand the implications of its creation and distribution.

Data representation The various ways data can be represented as words, numbers and pictures in the memory of a computational device.

E-safety Understanding and applying rules to mitigate against the risks to personal safety and privacy of personal information in using digital devices of all kinds.

Function A small section of computational code that performs a specific operation. In particular, a function takes inputs, or arguments, and returns outputs, or results.

Hardware Physical items of computing kit such as desktop hard drives, printers and scanners

Input The data that feeds into a computation. A stimulus to which a real-time application will respond.

Internet A global network of computers which are linked, allowing the exchange of data. It uses various data transfer protocols which can be seen in the top bar of a browser, such as Hyper Text Transfer Protocol (http).

Logic A systematic approach to reasoning. The rules that underlie an algorithm used for an application. Can also refer to digital components in computer hardware.

Network A number of computational devices connected together, allowing sharing of resources and cooperation between devices in the solution of a problem. Also the hardware used to establish connections between devices on a network.

Operating system The program that enables the computer to start and access different sorts of software on the computer, examples include Microsoft Windows and iOS for Mac.

Output The data that results from a computation. A response generated by a real-time application to stimulus.

Procedure A small section of computational code that performs a specific operation. Unlike a function, a procedure does not return a result but may be to change the data stored in objects in computer memory.

Program / code (verb) To create or modify a program.

Program / code (noun) A sequence of instructions for a computational device, written in an appropriate programming language, for implementing an algorithm that manipulates appropriate data representations for solving a problem.

Programming language A formal language for representing statements, or commands, and data values used in a program. A programming language has a precise syntax that defines the valid ways for combining the symbols used to denote variables and data values. Examples used on schools include Scratch, Python and SmallBASIC.

Search technologies Algorithms used by applications known as search engines to trawl the internet for digital content matching search terms

given by a user. Results are normally presented in the form of links to relevant content.

Sequence A number of program statements, to be executed one after another.

Software The programs that enable computers to undertake specific functions.

Variable A symbol in the code for a program that represents a data value or data object that can be changed during the course of computation.