Computing an introduction

Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

	End of Key Stage Expectations	Working towards ARE	Working at ARE
Technology in our lives	Pupils should be taught to: Recognise common uses of information technology beyond school.	I can recognise the way 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.	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.
Programming	Pupils should be taught to: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	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 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 programming software to make objects move.

		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.	I can watch a program execute and spot where it goes wrong so that I can debug it.
Data Retrieving and Multimedia	Pupils should be taught to: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	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. 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.	I can talk about the different ways I use technology to collect information, including a camera. 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 can tell you what kind of information I could use to help me investigate a question. 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.

ESafety	Pupils should be taught to: Use technology safely and respectfully, keeping personal information private; know where to go for help and support when they have concerns about material on the internet.	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.	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.