Purpose of study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. 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.

Aims

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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.
Schools are not required by law to teach the example content in [square brackets].

Subject content

Key stage 1	Key stage 2
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 - use technology purposefully to create, organise, store, manipulate and retrieve digital content - recognise common uses of information technology beyond school - 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.	Pupils should be taught to: - design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - use sequence, selection, and repetition in programs; work with variables and various forms of input and output - use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs - understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration - use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - 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 - use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Year 1 & Year 2		Year 3 & Year 4		Year 5 & Year 6	
Computers					
• Recognise common uses of information technology in the home and school environment	• Recognise common uses of information technology beyond school	• Recognise familiar forms of input and output devices and how they are used • Make efficient use of familiar forms of input and output devices	• Use other input devices such as cameras or sensors	•	•
Networks					
•	•	• Understand that computer networks enable the sharing of data and information • Understand that the internet is a large network of computers and that information can be shared between computers	• Understand what servers are and how they provide services to a network	• Begin to use internet services to share and transfer data to a third party	• Understand how computer networks enable computers to communicate and collaborate • Begin to use internet services within his/her own creations to share and transfer data to a third party
Using a computer					
• Use technology purposefully to create digital content	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use technology purposefully to create digital content comparing the benefits of different programs	• With support select and use a variety of software to accomplish goals	• With support select and use a variety of software on a range of digital devices • With support select, use and combine a variety of software on a range of digital devices to accomplish given goals	• Independently select and use appropriate software for a task • Independently select, use and combine a variety of software to design and create content for a given audience	• Independently select, use and combine a variety of software to design and create content for a given audience, including collecting, analysing, evaluating and presenting data and information • Design and create a range of programs, systems and content for a given audience • Independently select, use and combine a variety of software to collect, analyse, evaluate and present data and information

E-Safety					
• Understand where to go for help and support when he/she has concerns about content or contact on the internet or other online technologies	• Use technology safely and keep personal information private	• Use technology safely and respectfully, keeping personal information private • Use technology safely and recognise acceptable and unacceptable behaviour	• Use technology responsibly and understand that communication online may be seen by others • Understand where to go for help and support when he/she has concerns about content or contact on the internet or other online technologies	• Understand the need to only select age appropriate content	• Use technology respectfully and responsibly • Identify a range of ways to report concerns about content and contact in and out of school

Net Searching					
•	•	• Use simple search technologies • Use simple search technologies and recognise that some sources are more reliable than others	• Understand how results are selected and ranked by search engines	• Use filters in search technologies effectively • Use filters in search technologies effectively and appreciates how results are selected and ranked	• Be discerning when evaluating digital content • Use filters in search technologies effectively and is discerning when evaluating digital content

Coding					
• Predict the behaviour of simple programs • Understand what algorithms are and how they are implemented on digital devices	• Use logical reasoning to predict the behaviour of simple programs • Create simple programs • Create and debug simple programs • Debug simple programs by using logical reasoning to predict the actions instructed by the code • Understand that programs execute by following precise and	• Design, write and debug programs that control or simulate virtual events • Use logical reasoning to explain how some simple algorithms work	• Decompose programs into smaller parts • Use logical reasoning to detect and correct errors in algorithms and programs • Select, use and combine a variety of software, systems and content that accomplish given goals	• Design, input and test an increasingly complex set of instructions to a program or device • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems • Design, write and test simple programs that	• Include use of sequences, selection and repetition with the hardware used to explore real world systems • Solves problems by decomposing them into smaller parts • Create programs which use variables • Use variables, sequence, selection, and repetition in programs • Use logical reasoning to explain how increasingly

	unambiguous instructions			follow a sequence of instructions or allow a set of instructions to be repeated • Design write and test simple programs with opportunities for selection, where a particular result will happen based on actions or situations controlled by the user • Use logical reasoning to explain how increasingly complex algorithms work to ensure a program's efficiency	complex algorithms work and to detect and correct errors in algorithms and programs efficiently •