

# Digital Schoolhouse

## Computing National Curriculum: Numbered Subject content

### Key stage 1

1. Pupils should be taught to:

- 1.1. understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- 1.2. create and debug simple programs
- 1.3. use logical reasoning to predict the behaviour of simple programs
- 1.4. use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 1.5. recognise common uses of information technology beyond school
- 1.6. 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

2. Pupils should be taught to:

- 2.1. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- 2.2. use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- 2.3. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- 2.4. 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
- 2.5. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 2.6. 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
- 2.7. use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

## Key stage 3

### 3. Pupils should be taught to:

- 3.1. design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- 3.2. understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- 3.3. use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- 3.4. understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- 3.5. understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- 3.6. understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits

- 3.7. undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- 3.8. create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- 3.9. understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

## Key stage 4

All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career.

4. All pupils should be taught to:
  - 4.1. develop their capability, creativity and knowledge in computer science, digital media and information technology
  - 4.2. develop and apply their analytic, problem-solving, design, and computational thinking skills
  - 4.3. understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.