GRESHAM VILLAGE SCHOOL AND NURSERY

# Programme of Study for Computing

Our Computing Programme of Study is based on the National Curriculum and taught through the STEM Teach Computing Scheme of Learning for Key Stages 1 and 2.

**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

Please note that **online safety** is taught as part of our PSHE curriculum.

**Key stage 1**

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.

**Key stage 2**

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.

## Progression in skills and understanding

| Aspect of learning | Key Stage 1 | Lower Key Stage 2 | Upper Key Stage 2 |
|---|---|---|---|
| **Computer Science** | Understand that algorithms are implemented as programs on digital devices.<br><br>Understand that programs execute by following precise and unambiguous instructions.<br><br>Debug simple programs.<br><br>Use logical reasoning to predict the behavior of simple programs. | Design and create programs to accomplish specific goals.<br><br>Use sequences in programs.<br><br>Use repetition in programs.<br><br>Use logical reasoning to detect and correct errors in programs.<br><br>Understand the varied services (email, search engines, websites that are provided by the internet. | Design more complex programs to achieve specific goals.<br><br>Solve problems by decomposing them into smaller parts.<br><br>Use selection in programs.<br><br>Work with variables.<br><br>Use logical reasoning to explain how some simple algorithms work.<br><br>Use logical reasoning to detect and correct errors in algorithms.<br><br>Understand computer networks, including cloud-based networks and the internet. |
| **Information technology** | Use technology purposefully to create, store and retrieve digital content.<br><br>Use technology purposefully to manipulate digital content. | Select a variety of software to accomplish specific goals.<br><br>Select, use and combine elements from different internet sources.<br><br>Collect data in spreadsheets and use the sort and graphing functions to analyse and present data.<br><br>Combine text, pictures and sound in a variety of software. | Use a variety of software to accomplish given goals.<br><br>Select, use and combine software on a range of digital devices.<br><br>Use spreadsheets to analyse and evaluate data. |
| **Digital literacy** | Use technology respectfully.<br><br>Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. | Use technology responsibly.<br><br>Recognise acceptable and unacceptable online behaviour. | Recognise acceptable and unacceptable online behaviour and know a range of ways to report concerns.<br><br>Be discerning in evaluating digital content. |

From ‘Computing in the National Curriculum’ NAACE

**Computing Curriculum Map**

| | Year 1 | Year 2 | Year 3 | Year 4 | UKS2 2020-21 | UKS2 2021-22 |
|---|---|---|---|---|---|---|
| **Information technology** | Computing systems and networks – Technology around us | Computing systems and networks – IT around us | Computing systems and networks – Connecting computers | Computing systems and networks – The Internet | Computing systems and networks – Sharing information | Computing systems and networks – Communication |
| | Data and information – Grouping data | Data and information – Pictograms | Data and information – Branching databases | Data and information – Data logging | Data and information – Flat-file databases | Data and information – Spreadsheets |
| **Digital literacy** | Creating media – Digital painting | Creating media – Digital photography | Creating media – Animation | Creating media – Audio editing | Creating media – Vector drawing | Creating media – 3D Modelling |
| | Creating media – Digital writing | Creating media – Making music | Creating media – Desktop publishing | Creating media – Photo editing | Creating media – Video editing | Creating media – Web page creation |
| **Computer science** | Programming – Moving a robot | Programming – Robot algorithms | Programming– Sequence in music | Programming– Repetition in shapes | Programming – Selection in physical computing | Programming – Variables in games |
| | Programming – Introduction to animation | Programming – An introduction to quizzes | Programming– Events and actions | Programming– Repetition in games | Programming – Selection in quizzes | Programming– Sensing |

**What does this lead to in Year 7?**

| | Information Technology | Digital Literacy | Computer Science |
|---|---|---|---|
| **Cromer Academy** | How a computer works- hardware, software, CPU, binary conversions. | E-safety- cyberbullying, social networking sites and nude selfies. | Algorithms and basic programming. |
| **Aylsham High School** | | Using the internet and other large databases.<br>Modelling scenarios through the use of spreadsheets<br>Communicating through a variety of digital media.<br>E-safety is also an important aspect of the digital literacy programme. | Basics of algorithms, binary and programming using Flowol, LOGO, Scratch and an introduction to coding with Python. |