Computing KS 2

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.

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

Lessons follow the NCCE Teach Computing Curriculum and ensure each unit builds on previous skills and learning. At Dane Ghyll Community Primary School pupils will be taught how 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 worldwide 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.

In addition to the NCCE Teach curriculum, children will participate annually in the Kidsafe program covering Internet Safety and cyber bullying, providing suitable and appropriate levels of safety for the children.

Computing – KS2

Year 3

Connecting Computers
Children will be:
- Exploring how digital devices can be connected
- Recognising the physical components of a network

Stop-frame Animation
Children will be:
- Planning, creating, reviewing and evaluating an animation

Sequencing Sounds
Children will be:
- Creating programs following a design
- Building a sequence of commands

Branching Databases
Children will be:
- Creating branching databases

Desktop Publishing
Children will be:
- Editing texts and layouts
- Adding and editing content in a desktop publishing program

Events and Actions in Programs
Children will be:
- Creating, adapting and developing a program
- Identifying and fixing bugs.

Year 4

The Internet
Children will be:
- Describing how content can be created, added and accessed
- Explaining the consequences of unreliable content

Audio Production
Children will be:
- Using technology to record audio
- Plan and record a podcast

Repetition in Shapes
Children will be:
- Creating code for a purpose
- Debugging a program

Data Logging
Children will be:
- Exploring how data can be recorded
- Use a data logger to collect data and draw conclusions from it

Photo editing
Children will be:
- Editing photos by adding filters, cropping and cloning
- Combining photos

Repetition in games
Children will be:
- Modifying loops
- Designing a project that includes repetition.

Year 5

Systems and Searching
Children will be:
- Comparing, using and refining searches on search engines

Video Production
Children will be:
- Creating, experimenting, capturing and saving videos
- Editing and improving videos

Selection in Physical Computing
Children will be:
- Controlling simple circuits connected to a computer
- Designing, creating and debugging a conditional loop

Flat-File Databases
Children will be:
- Creating and comparing paper and computer databases

Vector Graphics
Children will be:
- Creating vectors
- Using layering to create images

Selection in Quizzes
Children will be:
- Identifying and modifying conditions in a program
- Designing, creating and evaluating a program that uses selection

Year 6

Communication and Collaboration
Children will be:
- Exploring how information can be transferred across the internet
- Evaluating different ways of working together online

Webpage Creation
Children will be:
- Planning, adding and evaluating content on a web page
- Considering ownership of images

Variables in Games
Children will be:
- Defining and using variables in a program
- Designing, creating and evaluating projects

Introduction to Spreadsheets
Children will be:
- Creating and building data in a spreadsheets
- Applying formulas to data

3D Modelling
Children will be:
- Planning and creating 3D models

Sensing Movement
Children will be:
- Designing and developing a program using inputs and outputs on a device

Key Skills Progression

Over the year, children will develop the following skills: • Identifying input and output devices • Explain how a computer network can be used to share information and the roles of a switch, server and wireless access point in a network. • Explain how networks can be connected to other networks. • Build, combine and order commands in a program to produce a given outcome • Identify an object using a branching database • Retrieve information from different levels of the branching database • Organise, add and edit text and images to a placeholder • Plan animations • Capture images • Review a sequence of frames as an animation • Add and remove media to enhance an animation • Review a completed project	Over the year, children will develop the following skills: • Outline how information can be shared via the World Wide Web and understand that the global connection of networks is the internet • Describe how networks connect to other networks • Recognise the need for security on the internet • Describe the types of content/media that can be added, created, and shared on the World Wide Web • To describe the types of content and media available on the World Wide Web and explain how content is created, owned, and shared by people • Evaluating the reliability of content • Use count-controlled and indefinite loops to produce a given outcome • Create two or more sequences that run at the same time • Using a digital device to collect data • Using a program to sort data • Export information in different formats • Recognise that digital images can be altered for different purposes • Use photo editing tools to manipulate images • Record, import and play sounds using a computer	Over the year, children will develop the following skills: • Describe the input and output of a search engine • Demonstrate that different search terms produce different results • Explain why search engines create indices, and that they are different for each search engine • Evaluate the results of search terms • Create a condition-controlled loop, using a condition in an 'if...then…' statement to start an action and produce given outcomes. • Using selection to switch the program flow in one of two ways • Choosing different ways to view data • To choose which attribute and value to search by to answer a given question (operands) • Ask questions that need more than one attribute to answer • Choose which attribute to sort data by to answer a given question • To choose multiple criteria to search data to answer a give question • Select an appropriate graph to visually compare data • Choosing suitable ways to present information to other people • Add an object to a vector drawing • Move and delete objects between the layers of a drawing • Group, ungroup, duplicate and reposition objects	Over the year, children will develop the following skills: • Outline, choose and evaluate methods of internet communication and collaboration for given purposes • Decide what should and should not be shared online • Identify a variable in an existing program • Experiment with the value of an existing variable • Choose names that identifies the role of a variable to make it easier for humans to understand it • Decide where in a program to set a variable • Use both an event in a program to update a variable and with user input • Use a variable in a conditional statement to control the flow of a program • Use the same variable in more than one location in a program • Choose suitable ways to present spreadsheet data • Use existing cells within a formula and use functions to create new data • Calculate data using a formula for each operation • Position 3D shapes relative to one another • Use digital tools to modify 3D objects • Combine objects to create a 3D digital artefact

		• Combine options to achieve a desired effect • Use different camera angles, pan, tilt and zoom, combining filming techniques for a given reason • Identify features of a video recording device or application • To choose to reshoot a scene or improve later through editing • Use split, trim and crop to edit a video	• Use digital tools to accurately size 3 objects • Construct a 3D model which reflects a real world object • Review an existing website (navigation bars, header) • Create a new blank web page • Add text to a web page, setting the style on a web page • Embedding media in a web page • Add web pages to a website • Insert hyperlink between pages and to another site • To preview a web page (different screen sizes)