



Computing at Broomhill



Purpose

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.

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

Cycle 1						
	Autumn Term		Spring Term		Summer Term	
Year 1	Computing systems and networks Technology around us	Creating Media Digital Painting	<i>Creating Media Digital Writing</i>	Data and Information Gathering Data	<i>Programming A Moving a Robot</i>	Programming B Introduction to Animation
Year 2	Computing system and networks Information around us	Creating Media Digital Photography	Creating Media Making Music	Data and information Pictograms	<i>Programming A Robot Algorithms</i>	Programming B An Introduction to quizzes
Year 3 / 4	Computing systems and networks The Internet	Creating media Desktop Publishing	Data and information Data Logging	Creating media Animation	Programming A Repetition in shape	Programming B Repetition in games

Cycle 2						
	Autumn Term		Spring Term		Summer Term	
Year 1	Computing systems and networks Technology around us	Creating Media Digital Painting	<i>Creating Media Digital Writing</i>	Data and Information Gathering Data	<i>Programming A Moving a Robot</i>	Programming B Introduction to Animation
Year 2	Computing system and networks Information around us	Creating Media Digital Photography	Creating Media Making Music	Data and information Pictograms	<i>Programming A Robot Algorithms</i>	Programming B An Introduction to quizzes
Year 3 / 4	Computing systems and networks Connecting Computers	Creating media Audio editing	Data and information Branching database	Creating media Photo editing	Programming A Sequence in music	Programming B Events and actions

Year	Topic/Learning	Knowledge/Skills taught	Assessment Tasks
Year 1	Computing systems and networks Technology around us	I can explain technology as something that helps us I can locate examples of technology in the classroom I can name the main parts of a computer and can switch on and log into a computer I can use a mouse to click and drag I can click and drag to make objects on a screen I can use a mouse to create a picture and to open a program I can open and save a file I can say what a keyboard is for I can type my name on a computer and delete letters I can use the arrow keys to move the cursor I can discuss how we benefit from these rules I can give examples of some of these rules I can identify rules to keep us safe and healthy when we are using technology in and beyond the home	Assessment Tasks Summative Assessment from NCCE
	Creating Media Digital Painting	I can draw marks and lines on a screen and explain which tools I used I can use the paint tools to draw a picture I can make marks with the square and line tools I can use the shape and line tools effectively and to recreate the work of an artist I can choose appropriate shapes to create a picture in the style of an artist I can choose appropriate paint tools and colours to recreate the work of an artist I can say which tools were helpful and why I know that different paint tools do different jobs I can change the colour and brush sizes and make dots of colour on the page I can use dots of colour to create a picture in the style of an artist on my own I can explain that pictures can be made in lots of different ways I can say whether I prefer painting using a computer or using paper I can spot the differences between painting on a computer and on paper	Assessment Tasks Summative Assessment from NCCE
	Creating Media Digital Writing	I can identify and recognise keys on a keyboard I can open a word processor I can enter text into a computer I can use backspace to remove text and use letter, number, and space keys I can explain what the keys that I have learnt about already do I can identify the toolbar and use capital letters, bold, italic, and underline I can change the font I can select all of the text by clicking and dragging I can select a word by double-clicking" I can decide if my changes have improved my writing and say if I prefer typing or writing I can say what tool I used to change the text I can use 'undo' to remove changes	Assessment Tasks Summative Assessment from NCCE
	Data and Information Gathering Data	I can describe and identify the label for a group of objects I can match objects to groups I can count a group of objects I can describe a property of an object I can find objects with similar properties I can record how many objects are in a group I can compare groups of objects I can decide how to group objects to answer a question	Assessment Tasks Summative Assessment from NCCE Insight Assessment

		I can record and share what I have found	
	Programming A Moving a Robot	I can match a command to an outcome and predict an outcome I can run a command on a device I can follow an instruction I can give directions I can predict the outcome of a sequence involving forwards and backwards commands I can experiment with turn and move commands to move a robot I can predict the outcome of a sequence involving up to four commands I can choose the order of commands in a sequence I can debug my program I can explain what my program should do I can identify several possible solutions	Assessment Tasks Summative Assessment from NCCE
	Programming B Introduction to Animation	I can compare different programming tools I can use commands to move a sprite I can run my program I can use a Start block in a program I can find blocks that have numbers I can say what happens when I change a value I can add blocks to each of my sprites I can delete a sprite I can show that a project can include more than one sprite I can choose appropriate artwork for my project I can create an algorithm for each sprite I can add programming blocks based on my algorithm I can test the programs I have created I can use sprites that match my design	Assessment Tasks Summative Assessment from NCCE
Year 2	Computing system and networks Information around us	I can identify that a computer is a part of IT I can sort school IT by what it's used for I can sort IT by where it is found I can talk about uses of information technology I can demonstrate how IT devices work together I can recognise common types of technology and say why we use IT I can list different uses of information technology I can say how rules can help keep me safe I can talk about different rules for using IT I can identify the choices that I make when using IT I can use IT for different types of activities	Assessment Tasks Summative Assessment from NCCE

Creating Media Digital Photography	I can recognise what devices can be used to take photographs I can talk about how to take a photograph I can explain the process of taking a good photograph I can take photos in both landscape and portrait format I can identify what is wrong with a photograph I can improve a photograph by retaking it I can experiment with different light sources I can explain why a picture may be unclear I can explore the effect that light has on a photo I can recognise that images can be changed I can use a tool to achieve a desired effect I can identify which photos are real and which have been changed	Assessment Tasks Summative Assessment from NCCE
Creating Media Making Music	I can describe how music makes me feel, e.g. happy or sad I can listen with concentration to a range of music (links to the Music curriculum) I can create a rhythm pattern I can play an instrument following a rhythm pattern I can identify that music is a sequence of notes I can use a computer to create a musical pattern using three notes I can identify that music is a sequence of notes I can use a computer to create a musical pattern using three notes I can save my work and reopen it I can explain how I made my work better I can listen to music and describe how it makes me feel	Assessment Tasks Summative Assessment from NCCE
Data and information Pictograms	I can compare totals in a tally chart I can represent a tally count as a total I can enter data onto a computer I can use pictograms to answer simple questions about objects I can explain what the pictogram shows I can use a tally chart to create a pictogram I can answer 'more than'/'less than' and 'most/least' questions about an attribute I can choose a suitable attribute to compare people I can collect the data I need I can share what I have found out using a computer I can use a computer program to present information in different ways	Assessment Tasks Summative Assessment from NCCE
Programming A Robot Algorithms	I can choose a series of words that can be enacted as a sequence I can follow instructions given by someone else I can create different algorithms for a range of sequences (using the same commands) I can use an algorithm to program a sequence on a floor robot I can compare my prediction to the program outcome I can follow a sequence and predict the outcome I can explain the choices I made for my mat design I can identify different routes and test my mat I can create an algorithm to meet my goal I can explain what my algorithm should achieve I can plan algorithms for different parts of a task I can put together the different parts of my program I can test and debug each part of the program	Assessment Tasks Summative Assessment from NCCE

	Programming B An Introduction to quizzes	I can identify that a program needs to be started I can identify the start of a sequence I can show how to run my program I can predict the outcome of a sequence of commands I can decide which blocks to use to meet the design I can work out the actions of a sprite in an algorithm I can choose backgrounds and characters for the design I can create a program based on the new design I can build sequences of blocks to match my design I can choose the images for my own design I can debug my program I can improve my project by adding features	Assessment Tasks Summative Assessment from NCCE
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Cycle 1 Year 3 / 4

	Computing systems and networks The Internet	I can demonstrate how information is shared across the internet I can describe the internet as a network of networks I can discuss why a network needs protecting I can explain that the internet is used to provide many services I can recognise that the World Wide Web contains websites and web pages I can explain that internet services can be used to create content online I can recognise that I can add content to the WWW I can explain that there are rules to protect content I can explain that websites and their content are created by people I can explain that not everything on the World Wide Web is true I can explain why I need to think carefully before I share or re-share content I can explain why some information I find online may not be honest, accurate, or legal	Assessment Tasks Summative Assessment from NCCE
	Creating media Desktop Publishing	I can explain and identify the advantages and disadvantages of using text and images I can recognise that text and images can communicate messages clearly I can change font style, size, and colours for a given purpose I can explain that text can be changed to communicate more clearly I can create a template for a particular purpose I can choose the best locations for my content I can make changes to content after I've added it I can paste text and images to create a magazine cover I can compare work made on desktop publishing to work created by hand I can identify the uses of desktop publishing in the real world I can say why desktop publishing might be helpful	Assessment Tasks Summative Assessment from NCCE
	Data and information Data Logging	I can choose a data set to answer a given question I can suggest questions that can be answered using a given data set I can identify that data from sensors can be recorded I can use data from a sensor to answer a given question I can import a data set I can use a computer program to sort data I can use a computer to view data in different ways	Assessment Tasks Summative Assessment from NCCE

	I can plan how to collect data using a data logger I can propose a question that can be answered using logged data I can draw conclusions from the data that I have collected I can explain the benefits of using a data logger I can interpret data that has been collected using a data logger	
Creating media Animation	I can create and explain how an animation/flip book works I can create an effective stop-frame animation I can explain why little changes are needed for each frame I can predict what an animation will look like I can break down a story into settings, characters and events I can describe an animation that is achievable on screen I can evaluate the quality of my animation I can evaluate another learner's animation I can improve my animation based on feedback I can add other media to my animation I can evaluate my final film	Assessment Tasks Summative Assessment from NCCE
Programming A Repetition in shape	I can create a code snippet for a given purpose I can test my algorithm in a text-based language I can use a template to create a design for my program I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves I can use a count-controlled loop to produce a given outcome I can predict the outcome of a program containing a count-controlled loop I can explain that a computer can repeatedly call a procedure I can identify 'chunks' of actions in the real world I can design a program that includes count-controlled loops I can develop my program by debugging it I can make use of my design to write a program	Assessment Tasks Summative Assessment from NCCE
Programming B Repetition in games	I can list an everyday task as a set of instructions including repetition I can modify a snippet of code to create a given outcome I can recognise that some programming languages enable more than one process to be run at once I can choose which action will be repeated for each object I can evaluate the effectiveness of the repeated sequences used in my program I can identify which parts of a loop can be changed I can re-use existing code snippets on new sprites I can develop my own design explaining what my project will do I can select key parts of a given project to use in my own design I can build a program that follows my design I can refine the algorithm in my design	Assessment Tasks Summative Assessment from NCCE

Year 3 / 4	Computing systems and networks Connecting Computers	I can explain that digital devices accept inputs I can classify input and output devices I can explain how I use digital devices for different activities I can recognise similarities between using digital devices and non-digital tools I can explain how messages are passed through multiple connections I can demonstrate how information can be passed between devices I can explain the role of a switch, server, and wireless access point in a network I can recognise that a computer network is made up of a number of devices I can identify how devices in a network are connected together	Assessment Tasks Summative Assessment from NCCE Insight Assessment
	Creating media Audio editing	I can identify digital devices that can record sound and play it back I can identify the inputs and outputs required to play audio or record sound I can recognise the range of sounds that can be recorded I can use a device to record audio and play back sound I can plan and write the content for a podcast I can save a digital recording as a file I can open a digital recording from a file I can choose suitable sounds to include in a podcast I can discuss sounds that other people combine I can use editing tools to arrange sections of audio	Assessment Tasks Summative Assessment from NCCE
	Data and information Branching database	I can make up a yes/no question about a collection of objects I can arrange objects into a tree structure I can select an attribute to separate objects into groups I can group objects using my own yes/no questions I can prove my branching database works I can select objects to arrange in a branching database I can select a theme and choose a variety of objects I can use my branching database to answer questions	Assessment Tasks Summative Assessment from NCCE
	Creating media Photo editing	I can explain the effect that editing can have on an image and how images are changed I can change the composition of an image by selecting parts of it I can consider why someone might want to change the composition of an image and explain what has changed in an edited image I can choose effects to make my image fit a scenario I can choose appropriate tools to retouch an image I can give examples of positive and negative effects that retouching can have on an image I can identify how an image has been retouched I can combine parts of images to create new images I can sort images into 'fake' or 'real' and explain my choices I can evaluate the impact of my publication on others through feedback	Assessment Tasks Summative Assessment from NCCE

	Programming A Sequence in music	I can explain that objects in Scratch have attributes (linked to) I can identify the objects in a Scratch project (sprites, backdrops) I can recognise that commands in Scratch are represented as blocks I can choose a word which describes an on-screen action for my plan I can create a program following a design I can identify that each sprite is controlled by the commands I choose I can create a sequence of connected commands I can explain that the objects in my project will respond exactly to the code a project I can implement my algorithm as code I can relate a task description to a design	Assessment Tasks Summative Assessment from NCCE
	Programming B Events and actions	I can choose which keys to use for actions and explain my choices I can explain the relationship between an event and an action I can choose a character for my project I can choose a suitable size for a character in a maze I can choose blocks to set up my program I can consider the real world when making design choices I can use a programming extension I can choose suitable keys to turn on additional features I can identify additional features (from a given set of blocks) I can match a piece of code to an outcome I can modify a program using a design I can make design choices and justify them	Assessment Tasks Summative Assessment from NCCE