The Wokingham Computing Curriculum
KS1: Year 1 and Year 2

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WOKINGHAM BOROUGH COUNCIL

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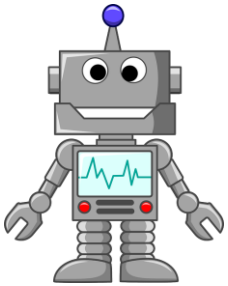
The Computing Curriculum

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.*
Computing in the National Curriculum – A Guide for Primary Teachers by CAS NAACE



For Guidance on how to plan and use the Wokingham Computing curriculum, please see **The Wokingham Computing Curriculum Planning Guidance 2014**.

National Curriculum Computing programmes of study: 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.

The Wokingham Schemes Overview for KS1 (Years 1 and 2)

NB Statements in red are specific to e-safety

Computer Science (CS)	**Programming, Coding and Controlling Devices** In this strand the pupils will explore computer programming and computational thinking in different contexts – they will relate this to the world around them. Pupils will learn what an algorithm is by writing instructions to solve problems. They will use a range of programmable devices such as a Bee-Bot or Pro-Bot. They will use simple block coding to write instructions and solve problems on screen. They will discuss their ideas and turn this into instructions the computer can understand. They will begin to understand that to write a program they will need to have clear ideas and clear instructions. • Talk about how to solve problems with instructions on and off screen • Write instructions to solve given problems. Using these instructions (algorithms) to control devices or objects on screen. • Debug their instructions to improve or correct errors.
Computer Science (CS) & Digital Literacy (DL)	**Digital Exploration** In this strand the pupils will explore finding information on the Internet safely. They will explore concepts such as where information and digital files are stored, who might create them and how they can find information in a safe and productive way. • Familiarisation with digital content, digital files and storage systems (school network, Wi-Fi at school/home, cloud networks, internet, media storage) • Explore concepts of staying safe online • How to deal with inappropriate content
Digital Literacy (DL)	**Communicating and Collaborating** In this strand the pupils will explore communication and collaboration tools. They will consider the e-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how to be a responsible in online communities. • Importance of keeping personal information private on the web • Tools used to communicate and collaborate – in school and beyond • Knowledge of the school e-safety policy
Information Technology (IT)	**Multimedia** In this strand the pupils will create multimedia content in different curriculum contexts. (This unit relates closely to Digital Imagery, Music and Sound as well as Communicating and Collaborating) • Communicate their ideas using text, graphics and sound • Publish work collaboratively on a VLE/ learning platform for different audiences (Also see the strand Communicating and Collaborating)
	Digital Imagery In this strand pupils will explore creating and making digital images in different contexts. • Use a range of graphics, paint packages, cameras and capture devices, simple photo manipulation software, animation and filming. • Consider issues about sharing images with a wider audience
	Music and Sound In this strand pupils will explore and create and make music and sound in different contexts. • Explore digital musical instruments and recording devices – they will know how their sounds are stored and played back through different media • Understand that their sound can be added to different software to create multimedia • Learn to use different software to create, edit and manipulate sounds
	Collecting, Analysing, Evaluating and Presenting Data In this strand pupils will explore data in different contexts. They collect and represent data using charting software. They will use data to answer questions . • Use software to sort objects and represent data on screen • Use ICT to create pictograms, bar charts and tables to illustrate data for different purposes • Use the tools to sort and search the data to answer specific questions

KS1: Programming Coding and Controlling Devices (Computer Science)

Year Group	Year 1	Year 2
Learning Objectives	• Begin to understand that you need instructions to solve control problems e.g. to move a device from one place to another. These instructions form an **algorithm**, used to solve specific problems e.g. entered as sequences in a **programmable device** such as a BeeBot • Understand that **programs** are executed by following precise and unambiguous instructions, known as **code** • Begin to understand that simple **programs** or **code** can be created and then the code can be **debugged** or edited if necessary	• Understand that **algorithms** are a set of instructions that solves specific problems. Know they can be used to program **digital** or **programmable devices** by following instructions or **code** • Create and write a **program** using precise and unambiguous instructions, understand that this is **coding** • Create and **debug** simple **code** • Use logical reasoning to predict the behaviour of simple **programs** or **code**
Teachers enable progress	• Talk about how **devices** respond to commands, demonstrate how remote devices use buttons to sequence commands • Set problem solving activities that require the children to sequence a list of commands using a programmable robot or toy to follow a route; this is an **algorithm** • Ask open questions to develop understanding, *"What would happen if we pressed this button twice?"* • Talk about how **programmable devices** and on-screen objects can be controlled by sequences of instructions or actions and that this is called **code** • Talk about how other software works by programming objects to do things e.g. when something is clicked on or a keyboard input is given; explore examples • Look at simple lines of instructions,(**code),** encourage them to make predictions about what the **code** does by testing and discussing • Show how planning, predicting and estimating helps to create a set of instructions that will control a **device** or object on screen and can be used to achieve a specific outcome • Talk about the application of **code** to other **devices** at school and in the world around them e.g. everyday **devices**, washing machines, traffic lights mobile phones, Apps etc.	

Children will …	• Explore a range of control toys and devices such as sound recording devices, music players, digital recording devices
	• Explore outcomes when individual buttons are pressed on a programmable device
	• Explore an on-screen character (or BeeBot) and navigate it around a course or grid. While navigating around a course on a computer, predict what will happen once the next command is entered
	• Solve simple problems by following instructions to move objects on screen or devices in the classroom
	• Create a series of instructions to move their peers/toys around a course using simple planning aids e.g. a series of cards used to remember and recall the order of instructions (code)
	• Talk about how devices need instructions to work and talk about common devices in school and in the home
		• Talk about and demonstrate how everyday devices can be controlled through the use of remote control e.g. TV, DVD, cameras, projectors, automated doors and screens etc.
		• Use a series of cards or written instructions to plan and/or record the sequence of instructions, understand the need for precise language e.g. forward, backward, right, left, turn, angle
		• Through different cross curricular opportunities create a series of instructions to program objects to move, to solve specific problems
		  ◦ Understand that this is coding
		  ◦ Talk about what each part of the code does
		  ◦ Ensure that by testing, any bugs in the code are resolved (debugging)
		• Discuss devices that have been programmed and need code such as domestic appliances, games, Apps in order to operate successfully

Lesson content (Exemplars)	• Children investigate a variety of programmable toys and how different buttons work • Children move an onscreen sprite around a course • Children make sequences of commands using themselves or a BeeBot; by using a map or chart, more complex sequences can be investigated • Discuss the variety of programmable devices in school and at home	• Children are shown and compare the programmable equipment around school; photocopier, scanner, camera, washing machine, microwave, dishwasher and fax machine • More challenging sequences of commands are devised to move a programmable robot or screen turtle around a path. The need for precision in the programming code is demonstrated • Evaluation of sequences enables an understanding of the debugging process • A variety of programming software/games are made available for comparison
Suggested Resources	TES i-board tools, Purple Mash 2DIY, 2Go, BeeBots, Probots , Roamer Too, Espresso Coding. iOS Apps: Daisy the Dinosaur, Flobot, Cargobot	

KS1: Digital Exploration (Digital Literacy and Computer Science)

Year Group	Year 1	Year 2
Learning Objectives	• Explore and share information from a variety of sources (including digital resources).	• Explore and share information from a variety of sources (including digital resources). • Use the Internet to find answers to questions, following straightforward lines of enquiry • Be aware of the school rules for accessing the internet • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies • Recognise Common uses of technology beyond school
Teachers enable progress	• Explore a variety of resources on a topic including physical and digital forms e.g. books, web sites, TV etc. • Model how information can be used to answer specific questions • Reflect upon how some resources are more useful than others • Demonstrate the layout and key features of a web browser (such as Internet Explorer) to access the internet, web addresses, menu buttons etc. • Introduce the concept of a search engine to find answers to specific questions • Explain responsible internet use and the e-safety rules of the school - Discuss where to go for help and support when they have concerns about content including at home and school • Physically demonstrate that different types of digital files may be saved in different places; server, data centres (online and cloud), network drives, USB devices – discuss uses at home	
Children will…	• Talk about their use of ICT and other methods to find information • Select the appropriate buttons to navigate given web sites or stored information • Begin to understand they have to abide by school rules on Internet safety e.g. only navigate to given pages • Begin to understand where their work is being stored	• Recognise that some information is more useful than others • Navigate using the key features of both a web page and a web browser (such as Internet Explorer) • Use given web based resources to find out answers to questions about a specific topic • Use a safe search engine (e.g. Kidrex) to find answers to specific questions • Understand the importance of abiding by school rules on Internet safety • Discuss where to go for help and support when they have concerns about content • Begin to manipulate information using copy and paste for a specific purpose and discuss the fact that both the picture and text actually belongs to someone else • Understand that information can be stored in many different places either locally or remotely
Lesson content (Exemplar)	• Children explore a given internet page to find out information about toys from the past • Children talk about their use of a talking book (fiction or non-fiction) • Find information in relation to a topic in both the library and on the Internet. • Visit the server room in school to see where their work is stored	• Find information in relation to a topic in both the library and on the internet • Compare the process of finding and the quality of information • Navigate around a website on toys from the past to find information about different toys • Copy and paste a picture that has been found by the teacher on the internet to create a booklet in 2Publish Plus • Create a list of good internet research rules
Suggested Resources	Child centred websites on a variety of internet enabled devices, child safe internet search engines, school e-safety rules, word processor or VLE/learning platform page to paste information *Key resources can also be found through the SWGfL Digital Literacy Curriculum to support key aspects of safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

KS1: Communicating and Collaborating (Digital Literacy)

Year Groups	Year 1	Year 2
Learning Objectives	• Use passwords to access online resources and keep them private • Know messages can be sent electronically • Show awareness that information online can be seen by others • Know there are rules to keep them safe when accessing content online	• Use passwords to access resources and know why they need to keep them private • Know the school e-safety rules and know how to respond to inappropriate content • Show an awareness that information including images online can be shared at home, school and worldwide • Know private information should never be given out on the internet • Communicate their ideas with an invited group • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
Teachers enable progress	• Discuss and demonstrate e-safety in terms of the school acceptable use policy, using age-appropriate tools, such as "Hector the Protector", "Digi Duck". • Discuss and illustrate the sort of information that is private • Demonstrate the use of private logins and passwords to access content • Demonstrate and discuss vocabulary associated with electronic communication • Discuss how a range of electronic communication tools are used at school and home whilst following an agreed etiquette • Model collaboration on a class or group project • Show that many different people can communicate and publish online but that some content is not suitable for our use • Discuss how to respond whenever inappropriate material has been accessed. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	
Children will …	• Talk about and learn the school's e-safety rules • Understand that the Internet can be a useful place but there is a need to be cautious. They learn that computers can be used to visit far-away places where they can learn new things • Understand that staying safe online is similar to staying safe in the real world (SWGfL E-safety)* • Be confident in their response to doubtful or inappropriate internet content • Talk about how to communicate safely and respectfully using different technologies and tools • Work collaboratively, as a group or independently to communicate electronic information safely	• Create a resource to share the school's e-safety rules • Use passwords which are kept secret • Use internet sites to support their learning which have been previously monitored and checked by an adult • Talk about how to communicate safely and respectfully • Talk about e-safety rules where to go for help and support when they have concerns about content or contact on the Internet or other online technologies • Work collaboratively or individually in order to share or request information • Make use of collaborative workspace such as a VLE/ learning platform to share content based on a topic or area of interest
Lesson content (Exemplar)	• Use different forms of communicating in role-play areas such as telephones, mobiles, walkie-talkies etc. • Communicate electronically with a story character • Compose a class blog e.g., a diary of a tadpole, chick, caterpillar or class toy	• Contact children in another class/school to request information • Writing in role using a forum or blog e.g. to another class as fairy story characters • Contribute to a discussion about holidays in the past asking parents and grandparents to share and contribute • Use a forum to discuss with Year 3 moving to the Junior school • Use a blog tool to celebrate achievements at home and at school
Suggested resources	Walkie-talkies, toy mobile phones, digital recorders, , blogging software, 2Publish, 2Create a Story, word processor, VLE/ learning platform wiki, *Key resources can also be found through the SWGfL Digital Literacy Curriculum to support key aspects of safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

KS1: Multimedia (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Add text to graphics and use sound to communicate ideas • Know there are rules concerning staying safe online	• Create presentations for a specific audience • Refine their presentations • Children publish and share work online such as Purple Mash or through a VLE/learning platform • Know why there are e-safety rules and that these apply to all connected devices
Teachers enable progress	• Provide cross curricular opportunities to enable familiarity with the keyboard and text editing • Model sound recording and add sound clips to stories, talk about the sounds and how appropriate they are within the context • Provide opportunities to combine text, sound and graphics using a variety of templates in order to support areas of the curriculum • Model the use of graphics animation in multimedia presentations and talk about how they may or may not enhance a presentation • Demonstrate the use of a template to produce a multimedia presentation or printed resource • Encourage creativity by setting a multimedia open ended task in order to enhance mood and atmosphere • Present the school e-safety rules and discuss their importance at school and at home	
Children will …	• Use keyboard spacebar, backspace, shift, enter, to provide text on screen that is clear and error free • Select or create appropriate images to illustrate cross-curricular work • Begin to select or record a sound to add to their work • Add text to photographs, graphics (images) and sound e.g. captions, labelling and simple sentences • Use pre-defined layouts or templates for presentations or published work (labels, books, stories etc.) • Begin to explain why their choices have been made	• Develop basic editing skills including different presentational features (font size, colour and style) • Select from different presentational features e.g. title, paragraph, label etc. • Use appropriate editing tools to improve and correct their work • Make use of graphics, graphic animations and sound to enhance their work • Talk about their use of graphics and sound and how it may enhance or change the mood and atmosphere of their presentation and make changes where appropriate • Choose different layouts and templates for different purposes
Lesson content (Exemplar)	• Children photograph play or PE and they add a caption or voice recording • Children use a paint package to create a picture and annotate (e.g. Aboriginal art, labelling parts of a plant, body part labels, routes to school, plan a playground or classroom etc.) • Children sequence images for narrative or non-narrative writing (e.g. school incident, a route to school , life cycles, simple timeline)	• Children create an on-screen book about their visit to the shops • Children use digital images and text to tell the life story of Grace Darling or Florence Nightingale using the teacher's previously downloaded images • Children use text, photographs and maps to compare the local area to an island home
Suggested Resources	**Multimedia-authoring software**: Purple Mash Creative Tools: 2Publish, 2Publish Extra, 2Publish Projects, 2 Create a story, Touch typing packages; e.g. 2Type, PowerPoint, Clicker, Textease, paint package, digital camera/ camcorder, microphone and digital sound recorder, digital microscope, VLE/ learning platform, iPad and tablet Apps, Web 2 applications	

KS1: Digital Imagery (Information Technology)

<table>
<tr><th>Year Group</th><th>Year 1</th><th>Year 2</th></tr>
<tr><td>Learning Objectives</td><td colspan="2">Using a variety of tools to create and manipulate an image (picture)
Know they can use devices to capture still and video images
Retrieve digital content, evaluate and make improvements
Use tools to share their ideas, experiences and imagination</td></tr>
<tr><td>Teachers enable progress</td><td colspan="2">Creating Images
Demonstrate a variety of tools in a graphics package to communicate a specific idea
Discuss and demonstrate the difference and advantage between a graphics package and paper based art activities
Capturing Images
Demonstrate that a variety of devices can capture images and contrast the differences between still and moving images
Use devices to capture images to share, store and retrieve; make use of these in other software e.g. camera, tablet or phone
Discuss the framing of an image or scene and how the impact of the image may be improved
Presenting Images
Show that images can be joined together to make a sequence
e- safety
Discuss online publication and e-safety rules of respect and safety (see Communicating and Collaborating and e-safety)</td></tr>
<tr><td>Children will …</td><td>Graphics Packages
Use a paint package to create a picture using a variety of tools to communicate their ideas
Explore shape, line and colour to communicate a specific idea
Animate an image or screen using predefined animations (e.g. using 2Simple 2Create a Story)
Film and photo
Use a device to take a picture or record their work
Talk about the images or film they have taken and the tools used
Talk about how images can be shared and who might see them</td><td>Graphics Packages
Develop a variety of skills using a range of tools and techniques to communicate a specific idea or effect
Describe to others their reason for choice of tools and effects
Digital Imagery
Discuss quality of their image and make decisions (e.g. delete a bad image)
Edit and enhance photographs and pictures
Animation
Create a sequence of still images which together form a short animated sequence
Share their work online
Talk about who might see the images and what is safe to share – and with whom</td></tr>
<tr><td>Lesson content (Exemplars)</td><td>Use digital images and art packages to investigate the work of other artists
Use an art package to explore techniques (e.g. patterning, tiling, stamping)
Children design wrapping paper for Christmas or DT project</td><td>Use a simple animation package to show the growth of a seed
Children use a paint package and select appropriate images to produce maps, diagrams, charts and posters
Children use a hand held video camera or digital camera to record the acting out of story boards they have created</td></tr>
<tr><td>Suggested Resources</td><td colspan="2">Paint software 2Paint, 2Simple – 2Paint a Picture, Purple Mash: 2Paint, 2Animate, 2design and Make
A range of digital capture tools e.g. digital camera, tablet, other image capture devices, visualisers, microscope</td></tr>
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KS1: Music and Sound (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Know they can record sound using ICT that can be stored and played back • Locate, listen to, play and begin to record sounds • Use software to change the musical phrases they create	• Begin to understand that adding music and or a sound can affect mood and atmosphere of their work • Save, retrieve and add their own recorded sound to their presentations • Be familiar with the school's e-safety rules
Teachers enable progress	• Allow for pupil exploration with a range of devices which create and record sounds and musical phrases • Explain that devices have stop, record and playback functions • Explain that music software can be used to organise and reorganise musical phrases using icons • Demonstrate that sound features of programs can add to a pupil's work e.g. 2create a story	
Children will …	• Explore a range of electronic music and sound devices including software and different peripherals • Talk about their music when they share their recordings with the rest of the class • Use software to explore sound and musical phrases, create and edit musical phrases for a specific purpose and talk about their choices	• Select and use devices for recording sound for a specific purpose e.g. Talking Tins, tape recorder, MP3 recorder, microphone and online • Know the risks involved when accessing resources from the Internet • Use software to explore sound and musical phrases, create edit and refine musical phrases for a specific purpose and talk about their choices • Exploring a range of sounds on an electronic instrument and choose appropriate sounds for a purpose • Use the sound features of programs to add to their work e.g. 2create a story
Lesson content (Exemplar)	• Use sound recording devices to record sounds around the school and identify them • Use sound buttons in a program to hear sounds and link them to pictures • Compose a simple musical phrase to link with another curriculum area • Use the sound features of programs to add to their work • Children record their talk while in role as a topic-based or story character	• Children add sound effects to a poem to enhance performance • Children compose music to represent the seaside • Children use microphones and pre-recorded sounds to add narration to multimedia work e.g. 2Simple software • Children add sound clips to the school's VLE/learning platform describing a picture or an event at school • Children record a line of a poem to be shared online e.g. in a forum
Suggested Resources	Microphone, digital sound recorder e.g., TTS sound recording postcards, tins, buttons etc., programs with sound buttons, 2 Simple Music Toolkit, Purple Mash 2sequence, Busy Things Musical Monsters, The Dums, electronic keyboard, electronic drums, 2create a story, Talking books, Talking pens, Karaoke machines, Dance mats, voice changers, **Sound resources** www.findsounds.com	

KS1 – Data Handling - Collecting, Analysing, Evaluating and Presenting Data (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Begin to understand that you can use software to represent data and information on screen • Understand that tools can be used to sort and illustrate the data in different ways • By selecting appropriate tools they can create a graph or chart to answer questions • Begin to understand they need to use a password to access different things on the computer, tablet or online	• Understand you can use graphing software to collect, illustrate, organise and classify data • Use graph plotting tools to answer appropriate questions concerning the plotted data • Understand the same data may be illustrated in a variety of ways • Understand they might use different passwords to access different systems (school network, home computer, online resources) and they should keep them private
Teachers enable progress	• Develop opportunities to use ICT to solve sorting problems to consolidate practical activities such as sorting, classifying objects in to sets, hoops, boxes etc. • Demonstrate how ICT helps sorting and classifying data. Begin to recognise that ICT allows quick variation in how the data may be illustrated • Set problem solving activities that require the children to collect information about themselves or data specific to a topic, generate graphs and charts and answer simple questions • Discuss and illustrate what happens if data has not been entered accurately	
Children will…	• Explore different ways of sorting objects on screen • Compare on screen activities with pencil and paper methods or sorting real objects • Create a pictogram to represent the data the class has collected on themselves or linked with a topic and use it to answer questions • Use a password to access information and know it needs to be kept safe	• Create pictograms, charts and graphs in a variety of curriculum contexts, adding labels and numbers as appropriate • Talk about how ICT helps them to organise their information, edit and make rapid changes • Use the sorting tool to help recognise patterns within data • Use charts and graphs to both create and answer questions • Use a password to access systems and talk about why they must not be shared • Know that some personal information must not be shared with others and that they need permission to make changes
Lesson content (Exemplars)	• Table top activities with real objects sorted into hoops using a variety of criteria (colour, hard/soft, metal/non-metal, size etc.) • In a topic on Ourselves, children interpret a pictogram showing the types of houses people live in • Children use ICT to sort objects according into living or not living • Children talk about images of old and new toys sorting them on the screen	• Children undertake a traffic survey and interpret the data as a pictogram • Children collect and analyse class based data about themselves (e.g. Our favourite fruits, eye or hair colour within science, DT, geography, or history) • Pictograms and charts are labelled by the children • Children collect information on school food preferences such as favourite snacks. This information is graphed and the children interpret and discuss the results • Collected data is illustrated differently but they understand although it looks different the data is the same
Suggested Resources	**Pictograph software** – Furbles, Purple Mash 2 Count, Smart Notebook **Simple Graphing software** such as 2Graph, Purple Mash.	