



# Whole School Progression of Skills and Key Vocabulary - Computing

	<b>EYFS</b>	<b>Key Stage One</b>		<b>Key Stage Two</b>			
	<b>Reception</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Cycle A LKS2</b>	<b>Cycle B LKS2</b>	<b>Cycle A UKS2</b>	<b>Cycle B UKS2</b>
<b>Computer Science</b>	<p>By the end of Reception Children will:</p> <ul style="list-style-type: none"> <li>• Explore the way programmable toys work</li> <li>• Use programmable toys to develop their early understanding of algorithms</li> <li>• Use digital cameras to take photographs</li> <li>• Use and explore sound recorders</li> </ul>	<p><u>We Are Treasure Hunters</u></p> <ul style="list-style-type: none"> <li>• understand that a programmable toy can be controlled by inputting a sequence of instructions</li> <li>• develop and record sequences of instructions as an algorithm</li> <li>• program the toy to follow their algorithm</li> <li>• debug their programs</li> <li>• predict how their programs will work.</li> </ul>	<p><u>We Are Astronauts</u></p> <ul style="list-style-type: none"> <li>• have a clear understanding of algorithms as sequences of instructions</li> <li>• convert simple algorithms to programs</li> <li>• predict what a simple program will do</li> <li>• spot and fix (debug) errors in their programs.</li> </ul>	<p><u>We are Software Developers</u></p> <ul style="list-style-type: none"> <li>• develop an educational computer game using selection and repetition</li> <li>• understand and use variables</li> <li>• start to debug computer programs</li> <li>• recognise the importance of user interface design, including consideration of input and output.</li> </ul>	<p><u>We are Programmers</u></p> <ul style="list-style-type: none"> <li>• create an algorithm for an animated scene in the form of a storyboard</li> <li>• write a program in Scratch to create the animation</li> <li>• correct mistakes in their animation programs.</li> </ul>	<p><u>We are Game Developers</u></p> <ul style="list-style-type: none"> <li>• create original artwork and sound for a game</li> <li>• design and create a computer program for a computer game, which uses sequence, selection, repetition and variables</li> <li>• detect and correct errors in their computer game</li> <li>• use iterative development techniques (making and testing a series of small changes) to improve their game.</li> </ul>	<p><u>We are Cryptographers</u></p> <ul style="list-style-type: none"> <li>• be familiar with semaphore and Morse code</li> <li>• understand the need for private information to be encrypted</li> <li>• encrypt and decrypt messages in simple ciphers</li> <li>• appreciate the need to use complex passwords and to keep them secure</li> <li>• have some understanding of how encryption works on the web.</li> </ul>

# Computer Science

## We are Game Testers

- describe carefully what happens in computer games
- use logical reasoning to make predictions of what a program will do - test these predictions
- think critically about computer games and their use
- be aware of how to use games safely and in balance with other activities.

## We are Bug Fixers

- develop a number of strategies for finding errors in programs
- build up resilience and strategies for problem solving
- increase their knowledge and understanding of Scratch
- recognise a number of common types of bug in software.

## We are Musicians

- use one or more programs to edit music
- create and develop a musical composition, refining their ideas through reflection and discussion
- develop collaboration skills
- develop an awareness of how their composition can enhance work in other media

## We are Artists

- develop an appreciation of the links between geometry and art
- become familiar with the tools and techniques of a vector graphics package
- develop an understanding of turtle graphics
- experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers
- develop some awareness of computer-generated art, in particular fractal-based landscapes.

## We are Web Developers

- develop their research skills to decide what information is appropriate
- understand some elements of how search engines select and rank results
- question the plausibility and quality of information
- develop and refine their ideas and text collaboratively
- develop their understanding of online safety and responsible use of technology.

## We are Toy Designers

- design and make an on-screen prototype of a computer-controlled toy
- understand different forms of input and output (such as sensors, switches, motors, lights and speakers)
- design, write and debug the control and monitoring program for their toy.

## We are Bloggers

- become familiar with blogs as a medium and a genre of writing
- create a sequence of blog posts on a theme incorporate additional media
- comment on the posts of others
- develop a critical, reflective view of a range of media, including text.

## Information Technology

By the end of Reception Children will:

- Be able to complete simple ICT programs on the computer
- Be able to use a mouse to draw a picture on a paint program
- Be able to use a keyboard to type their name
- Begin to understand how to save and print their work

### We Are Painters

- select and use appropriate painting tools to create and change images on the computer
- understand how this use of ICT differs from using paint and paper
- create an illustration for a particular purpose
- know how to save, retrieve and change their work
- reflect on their work and act on feedback received.

### We Are Painters

- use the web safely to find ideas for an illustration
- with skill, select and use appropriate painting tools to create and change images on the computer
- understand how this use of ICT differs from using paint and paper
- create an illustration for a particular purpose
- know how to save, retrieve and change their work
- reflect on their work and act on feedback received.
- Present their illustrated book to the class.

### We are Meteorologists

- understand different measurement techniques for weather, both analogue and digital
- use computer-based data logging to automate the recording of some weather data
- use spreadsheets to create charts
- analyse data, explore inconsistencies in data and make predictions
- practise using presentation software and, optionally, video.

### We are Opinion Pollsters

- understand some elements of survey design
- understand some ethical and legal aspects of online data collection
- use the web to facilitate data collection
- gain skills in using charts to analyse data
- gain skills in interpreting results.

### We are Data Analysts

- understand some ethical and legal aspects of online data collection
- use the web to facilitate data collection
- gain skills in using charts to analyse data
- gain skills in interpreting results.

### We are Card Designers

- develop keyboard skills, through typing and formatting text
- use the web to find and select images and information
- design and create an e-card for an event

Information Technology

- We Are Celebrating
- develop basic keyboard skills, through typing and formatting text
  - develop basic mouse skills
  - use the web to find and select images
  - develop skills in storing and retrieving files
  - develop skills in combining text and images
  - discuss their work and think about whether it could be improved.

- We Are Collectors
- Find and use pictures on the web
  - know what to do if they encounter pictures that cause concern
  - group images on the basis of a binary (yes/no) question
  - organise images into more than two groups
  - according to clear rules sort (order) images according to some criteria
  - ask and answer binary (yes/no) questions about their images.

- We Are Story Tellers
- use sound recording equipment to record sounds
  - develop skills in saving and storing sounds on the computer
  - develop collaboration skills as they work together in a group
  - understand how a talking book differs from a paper-based book
  - talk about and reflect on their use of ICT
  - share recordings with an audience.

- We are Zoologists
- sort and classify a group of items by answering
  - questions
  - collect data using tick charts or tally charts
  - use simple charting software to produce
  - pictograms and other basic charts
  - take, edit and enhance photographs
  - record information on a digital map.

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## Digital Literacy

By the end of Reception

Children will:

- Be able to log onto the computer independently
- Understand the importance of having a personal account
- Understand how to turn on a computer
- Understand how to shut down a computer correctly

### We Are TV Chefs

- break down a process into simple, clear steps, as in an algorithm
- use different features of a video camera
- use a video camera to capture moving images
- develop collaboration skills
- discuss their work and think about how it could be improved.

### We Are Photographers

- consider the technical and artistic merits of photographs
- use a digital camera or camera app
- take digital photographs
- review and reject or pick the images they take
- edit and enhance their photographs
- select their best images to include in a shared portfolio.

### E-Safety

- Children develop strategies for staying safe when searching for content whilst using the Internet.
- Children to use the Internet to undertake independent and appropriate research and attempt to distinguish between fact and fiction.
- Children begin to use a range of online communication tools, such as forums, email and polls in order to formulate, develop and exchange ideas.
- Children develop awareness of online protocols, in order to stay safe on the web.

### E-Safety

- Children safely use the Internet for research and follow lines of enquiry.
- Children understand the function of a search engine and the importance of using correct search criteria.
- Children use the internet as a resource to support their work, and begin to understand plagiarism.
- Children know that not everything they find on the Internet is true and know what to do if they find something they are uncomfortable with.
- Children use a range of communication tools to collaborate and exchange information with others, e.g. email, blog, forums.
- Children are aware of the need to develop a set of online protocols in order to stay safe online.
- Children develop awareness of relevant e- safety issues.

### E-Safety

- Children develop their online set of protocols in order to keep safe online.
- Children recognise inaccuracy and bias on the web and evaluate websites for their validity.
- Children use online tools to exchange information and collaborate with others within and beyond their school and begin to evaluate their effectiveness.
- Children understand the potential risks of providing personal information in an increasing range of online technologies both within and outside school.

### E-Safety

- Children confidently and competently use the Internet as a tool for research and critically evaluate websites for their use.
- Children know that information they find on the Internet is often inaccurate or biased and develop strategies for identifying the origin of a website.
- Children are aware of copyright issues and know that not all resources they find on the Internet are legal to use or copy (even if sources are acknowledged).
- Children select appropriate tools to collaborate and communicate confidently and safely with others within and beyond their school.
- Children evaluate their use of technology including the use of email, social networking, online gaming and mobile phones and consider how they present themselves online

**Digital Literacy**

We Are Researchers

- develop collaboration skills through working as part of a group
- develop research skills through searching for information on the internet
- improve note-taking skills through the use of mind mapping
- develop presentation skills through creating and delivering a short multimedia presentation.

We are Presenters

- gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing
- edit video, including adding narration and editing clips by setting in/out points
- understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length.

We are HTML Editors

- understand some technical aspects of how the internet makes the web possible
- use HTML tags for elementary mark up
- use hyperlinks to connect ideas and sources
- code up a simple web page with useful content
- understand some of the risks in using the web.

We are Bloggers

- become familiar with blogs as a medium and a genre of writing
- create a sequence of blog posts on a theme incorporate additional media
- comment on the posts of others
- develop a critical, reflective view of a range of media, including text.

We are Co-Authors

- understand the conventions for collaborative online work, particularly in wikis
- be aware of their responsibilities when editing other people's work
- become familiar with Wikipedia, including potential problems associated with its use
- practise research skills
- write for a target audience using a wiki tool
- develop collaboration skills
- develop proofreading skills

We are Architects

- understand the work of architects, designers and engineers working in 3D
- develop familiarity with a simple CAD (computer aided design) tool
- develop spatial awareness by exploring and experimenting with a 3D virtual environment
- develop greater aesthetic awareness.

We are Game Developers (Kodu)

- create original artwork and sound for a game
- design and create a computer program for a computer game, which uses sequence, selection, repetition and variables
- detect and correct errors in their computer game
- use iterative development techniques (making and testing a series of small changes) to improve their game.

# Key Vocabulary

Reception	Cycle A KS1	Cycle B KS1	Cycle A LKS2	Cycle B LKS2	Cycle A UKS2	Cycle B UKS2
<b>Computer Science</b> Code Algorithm Instructions Camera Photograph Buttons Flash Record Voice Sound	<b>Computer Science</b> algorithm debug instructions predict programming robot treasure	<b>Computer Science</b> algorithm instructions predict problem program robot Scratch sprite algorithm predict rules Scratch test	<b>Computer Science</b> debug input interface output program prototype repetition variable algorithm bugs debug instruction program script algorithm debug input interactive output pitch prototype simulation	<b>Computer Science</b> algorithm animation input output program script storyboard audio composition copyright digital instruments pitch sample sequencing software	<b>Computer Science</b> algorithm debugging code programming sprites storyboard geometric landscape op art sprite symmetry tessellations Audience Blog Blogroll Copyright Dashboard Hyperlinks Podcast	<b>Computer Science</b> binary code cipher decrypt encrypt Morse code password security semaphore Bias e-safety Page rank Revision History Search Engine Wiki
<b>Information Technology</b> Mouse Keyboard Paint Cursor Print Save Type	<b>Information Technology</b> character eBook, edit illustration traditional tale celebrate copyright, greeting keyboard save, type algorithm copyright, e-safety mammal, permission personal, private audio book copyright microphone recording sound effects talking book	<b>Information Technology</b> character eBook edit illustration traditional tale chart classification key data database photograph tally chart tick chart	<b>Information Technology</b> chart data-logging forecast graph measurement prediction spreadsheet temperature	<b>Information Technology</b> chart data graph opinion questions rating scale research survey	<b>Information Technology</b> chart data graph opinion questions rating scale research survey	<b>Information Technology</b> celebrate copyright edit greeting keyboard save type

Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy	Digital Literacy
Keyboard	algorithm	camera	Internet	Internet	Internet	Internet
Mouse	clip	image	Safety	Safety	Safety	Safety
Shutdown	edit	Picasa	Online	Online	Online	Online
Log on	film	pixel	Forums	Forums	Forums	Forums
Log off	instructions	portfolio	Email	Email	Email	Email
Account	recipe	theme	Website	Website	Website	Website
Username	robot	Google	Search	Search	Search	Search
	video camera	mind map	audio close-up editing	code HTML HTTP	3D	Audience
		presentation	footage panning	(hyper text transfer	Animation	Blog
		research	shooting video camera	protocol) hyperlink	Gallery	Blogroll
		search	zooming	tag URL web page	Navigation	Copyright
		search engine		edit information mind	Screencast	Dashboard
				map reliable style wiki	Sculpture	Hyperlinks
				Wikipedia's Five	Virtual	Podcast
				pillars		algorithm
						debugging code
						programming
						sprites storyboard