



# 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 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 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 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 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.

## 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

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