



**Newall Green  
Primary School**

*Aiming High To Reach Our Goals*

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# Computing Curriculum

| Document Control                                  |   |
|---|---|
| Title   | Computing Curriculum  |
| Date  | June 2020   |
| Supersedes  | Rising Stars  |
| Amendments  | Junior Jam  |
| Related Policies/Guidance                         | Code of conduct<br>ICT policy<br>Safeguarding Policy<br>Student Planner |
| All policies can be found on the school web page. |   |

## Intent

The curriculum that we teach has been planned to developed the **five key skills for life** of: Problem solving, Teamwork, Self-management (initiative, organisation, accountability) Self-belief (confidence, resilience, positive attitude) and Communication.

The computing curriculum is designed to develop problem solving, self-management, Self-belief and communication. There will be opportunities for team work but we focus predominantly on ensuring each pupil has the skills needed in their future careers within computing.

Each child will be taught the rules to stay safe, knowing how to make the right decision to keep themselves and others safe on line and to take ownership of their actions. We intend to give our children the skills and the knowledge to communicate effectively using a multimedia approach.

## Aim

**We aim** to teach our pupils the skills and knowledge to use computers effectively for a range of purposes within their lives.

We believe that 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.

We are guided by the objectives within the National Curriculum for computing. This document outlines the aims as ensuring 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.

The National Curriculum outlines the subject content that should be taught as:

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.

### ICT in Early Years

Children start in Nursery with some understanding of the uses of ICT in the context of everyday experiences. This could be watching items of shopping being scanned at the supermarket or helping to programme a washing machine. Practitioners support children's learning about ICT using the same approach as for all the areas of learning. They build on knowledge, skills and understanding that children have so far and provide a balance of child-initiated and adult-led learning opportunities.

Children can explore and learn about the everyday uses of ICT through role play using real and pretend equipment. As they learn, within the context of adult-led activities, how to use digital cameras, CD players and different kinds of computer software they can begin to use these things more independently and for their own purposes.

By the end of Reception, children need to have met the Early Learning Goal in Technology:

- Children need to recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

### Modifications

We have made some modifications to the National Curriculum because we believe that our pupils need:

- To be taught the skills of locating the keys on the keyboard. To increase children's speed, we revisit this process and practice.
- We also place emphasis on work place readiness within our curriculum and have made links to this.
- Manchester's music scene is inspiring so we have added opportunities for digital music making to capture and celebrate this.
- The children within school spend a lot of time playing computer games and we feel we need to not only ensure that they are safe online but also develop an understanding of all the uses of technology.

## Organisation and progression of skills

|                  | Autumn 1  | Autumn 2   | Spring 1  | Spring 2   | Summer 1   | Summer 2 |
|------------------|---|--|---|--|--|----------|
| Nursery          | <p>Nursery Technology is not always taught as a discrete subject in Early Years and is linked in throughout the curriculum. Children cover the following objectives whilst they are in Nursery (taken from Development Matters):</p> <p>30-50 months</p> <ul style="list-style-type: none"> <li>-Knows how to operate simple equipment, e.g. turns on CD player and uses remote control.</li> <li>-Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</li> <li>-Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.</li> <li>-Knows that information can be retrieved from computers</li> </ul> <p>40-60 months (These objectives are introduced in Nursery then continue in Reception)</p> <ul style="list-style-type: none"> <li>-Completes a simple program on a computer.</li> <li>-Uses ICT hardware to interact with age-appropriate computer software</li> </ul> |  |   |  |  |          |
| Reception        |   | <p>The parts of a computer. What a computer is and what it does.</p> <p>Art programme</p> <p><b>Skill development – be able to control the mouse effectively</b></p> | <p>Art programme</p> <p>Know how to use the mouse and a paint program</p>   | <p>Know that computers need instructions to make them work.</p> <p>Programmable toys</p> | <p>Know that computers need instructions to make them work.</p> <p>Programmable toys</p> <p><b>Skill development – generate a series of simple instructions</b></p>  |          |
| Year 1<br>Theme: | <p>Taking photos and editing the picture, using filters and adding content.</p> <p><b>Skill development- create and sort digital pictures and edit a photo.</b></p> <p>SIMS Objectives: 04, 05, 06.</p>   |  | <p>Rising stars unit 1.1</p> <p>Understanding what an algorithm is.</p> <p><b>Skills for life – problem solving, resilience, organisation</b></p> <p>SIMS Objectives: 01, 02, 03.</p>   |  | <p>Creating a card /book/ picture &amp; caption</p> <p>Learning where the keys are so that children can type.</p> <p><b>Skill development – key board recognition skills</b></p> <p>SIMS Objectives: 04, 05, 06.</p> |          |
| Year 2           | <p>Scratch (2.1/ 2.2)</p> <p>Debugging algorithms</p> <p><b>Skill development – improve logical reasoning and prediction skills.</b></p> <p><b>Skills for life – problem solving</b></p> <p>SIMS Objectives: 01, 02, 03.</p>  |  | <p>ICT skills + e-safety</p> <p>Editing pictures, researching subjects, captions, explanation texts, PowerPoint presentations.</p> <p><b>Skill development – manipulate digital content</b></p> <p><b>Skills for life – self management and communication</b></p> <p>SIMS Objectives: 04, 05, 06.</p> |  |  |          |

3 year programme to ensure all pupils start at the appropriate level

Year 2019-2020 Level 1: For years 3,4,5,6

Level 1: iSong (SIMS Objectives: 01, 02, 03)

This is an introduction to basic song writing skills using the GarageBand app. Students will work in pairs or small groups to create a short composition using a variety of instruments and sounds available in the app. Tempo will be addressed, both in relation to musical genre and how it affects the feel and impact of a song. Musical and rhythmical patterns will be developed and students will appraise each other's work with a view to implementing changes and improving their compositions.

Level 1: iLogic (SIMS Objectives: 01, 02, 03)

Students will use games to learn key coding skills. They will learn how to use coding language Blockly to introduce key programming elements such as steps, loops, basic logic and functions such as 'if statements'. This will progress into using code to create Spyrograph style artwork.

Level 1: iSafety (SIMS Objectives: 04, 05, 06, 07)

This course is designed to inform KS2 children about how to stay safe on the internet. The topic will cover Cyber Bullying, Online Gaming, Trust, Digital Reputation, Location Permissions, Online Contact and Social Media. The class will compile videos, posters and badges to give warnings, helpful tips and advice to other schools in the local area.

Level 1: Stop Motion (SIMS Objectives: 02, 06, 07)

This is an introduction to basic song writing skills using the GarageBand app. Students will create their own series of short Stop Motion animations using the app iStop Motion. Working in groups, all participants will plan, film and edit their animations together to form a mini- film including titles and scene transitions using iMovie.

Year 2020-2021

Level 2: iDance for years 4,5,6, (year 3 iSong) (SIMS Objectives: 01, 02, 03)

Participants will begin listening to a variety of popular dance music styles and analysing key elements that distinguish one genre from another. These findings will then be applied when students create a short composition in their chosen genre. Elements such as dynamics and pitch will be explored and applied to the compositions. The concept of the 'Audio Spectrum' will be introduced and participants will begin to use stereo-panning and level controls to improve their music's balance and texture.

Level 2: Advanced iFunction (SIMS Objectives: 01, 02, 03)

iFunction looks at creating programs to solve real world problems. Building upon their knowledge of Blockly from level 1, they will apply it to create games, control solutions and other problems mimicking real application of programming. We will also introduce written programming languages and learn basic syntax.

Level 2: iPhotography (SIMS Objectives: 06, 07)

The iPhotography course aims to introduce participants to digital photography in the modern era. They learn about the basic principles of taking good pictures such as; framing, the rule of thirds, focus and perspective and photo-editing techniques.

Level 2: iFX (SIMS Objectives: 06, 07)

Participants will be taught how to create an animation using chroma key (green screen) and how to record and edit their own sound effects ready to be included in their finished animations. This will involve a mix of sounds selected from a sample library and Foley effects that will be created, recorded and edited by the students.

Year 2021-2022

Level 3: iHipHop for years 5& 6 (Years 3 & 4 as above) (SIMS Objectives: 01, 02, 03)

This workshop focuses on the origin and progression of Hip Hop as a musical movement. Students will study the basic elements of the genre and develop their sampling and audio editing skills to create their own original Hip Hop track. As well as using GarageBand, other apps will be introduced so participants can add their own drum rhythms, loops and sampled sounds to their compositions. Students will progress to creating lyrics to rap, speak or sing accompanying their tracks.

Level 3: iDebug (SIMS Objectives: 02, 03)

This workshop will require students to use their knowledge of Blockly to search through a broken program and repair the mistakes to make the program function correctly. They will then progress to create programs of their own design.

Level 3: iPublish (SIMS Objectives: 04, 05, 06, 07)

Participants will create a magazine including graphics, photographs and text about a theme of their choice. They will have to research, explore and develop ideas for both the aesthetics and content of the magazine, thus crossing curriculum with English. All skills learnt during level 1's 'iPhotography' will be developed and students will have to select specific shots to suit the genre of their magazine. Graphics and typography will be introduced and applied to their work.

Level 3: Advanced i2D (SIMS Objectives: 06, 07)

This module initially looks into early 2D animation and its development. Students will learn about vector animation and need to think about creating an animation that not only looks at the design and story but how characters move and interact.

Year 2022-2023

Level 4: iRemix for year 6 (Years 3, 4 & 5 as above) (SIMS Objectives: 01, 02, 03)

Throughout iRemix, pupils will be learning all about remixing and sampling. They look into a number of different ways to remix a song each lesson. They will try adding vocal effects to stems, creating live loops and layering them, as well as changing the genre of a song to something unexpected. During the final few sessions, the pupils will create their own remix of a song of their choosing.

Level 4: iDevelop (SIMS Objectives: 01, 02, 03)

After learning the main programming skills in Levels 1-3 using the Blockly language, the pupils will progress to learn Swift. Through Swift they will learn how to manipulate written code. The course will then give the students the freedom to create a final project to demonstrate their abilities.

Level 4: iGraphics (SIMS Objectives: 01, 02, 03, 04, 06, 07)

Students will begin by progressing into design for web before looking at game design. This module is all about creating stand out designs, with attention not only on format, dimensions, layout and colour choice but on target audience and web platform. Students will be presented with various design briefs over the course and also need to think about what the client would want. This is a very practical project-based module and will require students to analyse, review and evaluate their work more than ever.

Level 4: iFinance (SIMS Objectives: 02, 03, 05, 06)

iFinance is an advanced course in Excel and data processing. Following a brief recap of Excel, students are tasked with producing a movie. Their task is to act as movie producers and decide on a style of animated movie to put into production. Working in groups of two, students will start by inputting and analysing data, allowing them to make important production decisions. The class will develop their Excel skills and learn how to successfully use a variety of advanced functions within a spreadsheet.

In addition:

|        |  |
|--------|--|
| Year 3 | Create animations linking to 'Stone age.' E-safety. Rising stars unit 3.4: We are network engineers (SIMS Objectives: 01, 02, 03, 04)<br><b>Skills for life - communication</b>                      |
| Year 4 | Toodle bit - coding (SIMS Objectives: 01, 02, 03)<br><b>Skills for life - Self management, problem-solving, self-belief.</b>   |
| Year 5 | Kodu - Game Design. BW3: designing a house - part of construction week (SIMS Objectives: 01, 02, 03, 07)<br><b>(Linking with construction week) Skills for life accountability and communication</b> |
| Year 6 | Create spreadsheets to calculate profit and loss (SIMS Objectives: 04, 05, 06)<br><b>Skill development - spreadsheet</b><br><b>Skills for life - self-management</b>                                 |