



Gretton Primary School

Computing Curriculum



Computing Progression

Gretton uses the iLearn2 scheme, which covers National Curriculum 2014 objectives.

Key:

Computer Science (programming)

Information Technology (Creating digital content and computer skills)

Digital Literacy (E-safety and understanding computer systems)

Early Years Foundation Stage

Despite computing not being explicitly mentioned within the Early Years Foundation Stage Statutory Framework, which focuses on the learning and development of children from birth to age five, there are many opportunities for young children to use technology to solve problems and produce creative outcomes. In particular, many areas of the framework provide opportunities for pupils to develop their ability to use computational thinking effectively, such as through undertaking projects involving the concepts and approaches suggested by iLearn2 resources.

As young children take part in a variety of tasks with digital devices, such as moving a Bee Bot around a classroom, they will already be familiar with the device before being asked to undertake tasks related to the Key Stage One computing curriculum, such as writing and testing a simple program. Not only will children be keen to again use a device they had previously enjoyed using, their cognitive load will also be reduced, meaning they are more likely to succeed when undertaking activities linked to the next stage in their learning.

The children in Reception will experience some of the activities below.

Project, NC content and objectives

Robins

Early Programming

Programming plays such a large role in the Primary computing curriculum that the earlier the children begin developing the skills the better. The activities introduce equipment that needs programming and the basic principle of sequencing code blocks.

Music Creation

The suggested activities use free, online software that works on all devices. It helps understand the different sounds instruments make, the important of patterns in music creation and important words such as rhythm/beats, tempo and melody. Most importantly, pupils should be encouraged to experiment with music creation.

Digital Art and Design

These activities develop mouse control and interaction with programs to develop creativity and begin making decisions on which digital tools are appropriate for creating different content.

Digital Technology to support Early Mathematics and Literacy

This unit is a series of activities to support the development of mathematics and literacy skills using different types of technology.

Mouse and Keyboard Skills

Mouse and physical keyboard skills have become more and more challenging to teach, mainly due to the increased use of tablet computers and touch screen in homes. However, they are still important skills to teach, helping pupils use a range of computers in the future. Typing with a physical keyboard using all fingers (touch typing) should be practised by pupils as often as possible.

Objectives

- Mouse and keyboard skills; move mouse, left/right click, drag and drop.

Typing: Find letters on keyboard and begin touch typing with home row keys.

Digital Photos and Videos

Possibly the biggest change in technology over the past 10 years has been the use of photos and videos. Virtually everyone has a portable camera in their pocket. For 4 and 5 year old children, they will only know photos that have been taken with mobile phones and tablets - even digital cameras are less common. These activities allow children to understand the different ways photos and videos can be taken then how they can be used and shared.

E-SAFETY

Early years' children will not naturally be aware of the dangers of the internet because their use of it will be minimal compared to older children. It is still very important to introduce positives and the negatives as it does form part of the EYFS framework. In ilearn2 are some activities and resources to use with the children, which also form nice discussion points. On-line safety can be connected to general safety discussions; not talking to strangers, if something is wrong tell an adult you trust etc.

COMPUTER DISCOVERY

Children from a young age should not just learn how to use computers and digital devices but also understand how computers help us, the differences between different types of digital technology and recognise basic components. The activities should ideally be taught in sequence to first develop an understanding of computers before using them to achieve and help with basic tasks.

RECOGNISE USES OF IT

Recognise common uses of information technology beyond school; Spot digital technology in school or at home (Pupil Activity 1)

Find a piece of computer equipment amongst day to day objects and choose the correct definition. (Pupil Activity 2)

Understand how different technology helps us. (Pupil Activity 3)

National Curriculum Content: Recognise common uses of information technology beyond school.

Progression of skills in this unit:

1. Understand what makes a computer a computer.
2. Spot digital technology in school.
3. Understand how different technology helps us.

DESIGN

1. Change the colour and pattern of elements. (Activity 1)

2. Position and rotate objects on a design. (Activity 2)

3. Position objects in relation to each other. (Activity 3)

National Curriculum Content: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Progression of skills in this unit:

1. Change the colour and pattern of elements.
2. Position and rotate objects on a design.
3. Position objects in relation to each other.

INTRODUCE PROGRAMMING

Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.

Write and debug simple programs and use logical reasoning to predict simple programs

National Curriculum Content

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.

Progression of skills in this unit:

1. Understand sequence and algorithms.
2. Sequence instructions (commands) to achieve an objective.
3. Predict, write, execute and debug a simple program.

INTRODUCE DATA HANDLING

Understand what data is and collect it as a tally.

Label a pictogram and add data to each column.

Edit a table with correct titles and numbers.

Create a bar chart/pie chart/line chart suitable for the data.

Explain what a pictogram/bar chart/line chart shows.

National Curriculum Content: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Progression of skills in this unit:

1. Understand what data is and collect it as a tally.
2. Label a pictogram and add data to each column.
3. Edit a table with correct titles and numbers.
4. Create a bar chart / pie chart / line chart suitable for the data
5. Explain what a pictogram/bar chart/line chart shows.

E-BOOK CREATION

Add a book cover with title, author, colour and image.

Add multiple pages based on a theme. Add text on different pages.

Add images on different pages to match the theme/text

Add voice recordings to match the text and theme.

National Curriculum Content: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Progression of skills in this unit:

1. Add a book cover with title, author, colour and image.
2. Add multiple pages based on a theme.
3. Add text on different pages.
4. Add images on different pages to match the theme/text.

Add voice recordings to match the text and theme.

E-SAFETY

National Curriculum Content: 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.

Progression of skills in this pack

1. Keep personal information private. (Resource 1)
 2. Why do websites want personal information. (Resource 2)
- Identify when and where to go for help when concerned. (Resource 3)

TEXT AND IMAGES

Add, move and resize images the add text and adjust size and placement (Activity 1)

Add, resize and place images on a page then add and position text to label and describe images (Activity 2)

Use word banks to write sentences about images (Activity 3)

National Curriculum Content Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Progression of skills in this unit

1. Add, move and resize images the add text and adjust size and placement.
2. Add, resize and place images on a page then add and position text to label and describe images.

Use word banks to write sentences about images.

DIGITAL ART

Use lines and fill tools to make interesting patterns.

Add a variety of shapes (outlines and fill) and label them with text.

Re-create a graphic using pixels of different colours.

National Curriculum Content Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Progression of skills in this unit:

1. Use lines and fill tools to make interesting patterns.
2. Add a variety of shapes (outlines and fill) and label them with text.
3. Re-create graphics using pixels and colours.

DEVELOP PROGRAMMING

Create and debug simple programs.

Use logical reasoning to predict the behaviour of simple programs.

Simplify a program by using a loop.

National Curriculum Content 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.

Progression of skills in this unit:

1. Create and debug simple programs.
2. Use logical reasoning to predict the behaviour of simple programs.

Simplify a program by using a loop.

MOUSE AND KEYBOARD SKILLS

Mouse and keyboard skills; move mouse, left/right click, drag and drop.

Typing; Find letters on keyboard and begin touch typing with home row keys.

National Curriculum content

1. Move cursor and left click to select.
2. Click and drag to move items.

Find letters on a keyboard and begin touch typing.

PROGRAMMING WITH SCRATCH JNR

Use code blocks to:

Program movements

Program Inputs (touch or clicking)

Program outputs for audio or text

Find errors in a program (debug)

Program conditions (if one sprite hits another)

(Requires free Scratch Jr for iPad, Windows or Chromebook)

National Curriculum Content 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.

Progression of skills in this unit:

1. Program movements.
2. Program outputs for audio or text.
3. Find errors in a program (debug).
4. Program inputs (touch or clicking)

Program conditions (if statements).

E-SAFETY

National Curriculum Content 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.

Progression of skills in this unit:

(Resources 4-7)

1. What are the dangers of sharing photos online?
2. People are not always who they say they are online.
3. Trusting information online.
4. Using the Internet responsibly.

Being respectful.

E-SAFETY

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
National Curriculum Content Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

DOCUMENT EDITING AND CREATION

Copy and paste text and images

Find and replace words

Format text for a purpose

Edit images inside documents

(Requires one of Microsoft Word, Apple Pages for iPad or Google Drawing)

National Curriculum 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.

Progression of skills in this unit:

1. Copy and Paste text and images.
2. Find and replace words.

Format text for a purpose.

PROGRAMMING IN SCRATCH

1. Design, write and debug programs that accomplish specific goals. (Including outputs)

2. Use repetition in programs.

3. Work with various form of inputs: keyboard, mouse and touch screen. (Activity 3 and 4 below)

4. Write programs that simulate physical systems (Activity 5)

National Curriculum Content Design, write and debug programs that accomplish specific goal, including simulating physical systems. Use sequence, selection, and repetition in programs; work with various forms of input.

Progression of skills in this pack

1. Design, write and debug programs that accomplish specific goals. (Including outputs)
2. Use repetition in programs.

Write programs to simulate physical systems.

COMIC CREATION

Comic creation covers a wide range of objectives including:

Add, resize and organise colour or picture backgrounds

Add, resize, organise characters/objects to different panels.

Add narration using text and direct speech using speech bubbles.

National Curriculum 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.

Progression of skills in this pack

1. Add, resize and organise colour or picture backgrounds.
2. Add, resize, organise characters/object to different panels.

Add narration using text and direct speech using speech bubbles.

DIGITAL ART

Use various lines and fill tools plus copy/paste and rotation to create pattern effects. (Project 1)

Use shapes, fill, copy/paste, zoom and flip to create reflective symmetry effects. (Project 2)

Use stamps, copy/paste, layers and multiple frames to create animated GIF computer graphics. (Project 3)

National Curriculum 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.

Progression of skills in this pack

1. Use various lines and fill tools plus copy/paste and rotation to create pattern effects.
2. Use shapes, fill, copy/paste, zoom and flip to create reflective symmetry effects.

Use stamps, copy/paste, layers and multiple frames to create animated GIF computer graphics.

PROGRAMMING IN KODU

Create a 3D place using various design tools Write a program to control a character using inputs. Write a program with conditions to create an if statement (if the character touches an object it will disappear). Write a program with variables (scoring system) (4-6 Lessons)

(Requires installation of free Kodu software on Windows)

National Curriculum Content Design, write and debug programs that accomplish specific goal, including simulating physical systems. Use sequence, selection, and repetition in programs; work with various forms of input.

Progression of skills in this pack

1. Create a 3D place using various design tools.

Write a program to control using keyboard inputs.

E-SAFETY

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

National Curriculum Content Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

EBOOK CREATION

Add page colour and style Add, position and format text on different pages

Add and position images from camera/web

Add audio, including hiding it behind an object.

Add hyperlinks to text and images

Add and format shapes Use hyperlinks for navigation

Add audio to pages

National Curriculum 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.

Progression of skills in this pack

1. Add page colour and style then position and format text. 2. Add and position images from camera/internet.

3. Add audio, including hiding it behind an object.

Add hyperlinks to text and images.

INTERNET RESEARCH

Appreciate how search results are selected and ranked and show awareness of different struggles for finding specific information (Teacher input)

Use search technologies (different websites) to find specific pieces of information (Activity 1 and 2) Reference the correct source of information (Activity 3)

Be discerning in evaluating digital content. (Activity 4) Check the internet for fake news by cross-referencing facts (Activity 5)

National Curriculum Content

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Progression of skills in this pack

1. Use search technologies to find specific pieces of information.

2. Reference the correct source of information.
 3. Be discerning in evaluating digital content.
- Check the internet for fake news by crossreferencing facts.

VIDEO EDITING

Create and edit a film project by:

- *Add clips then resizing and ordering them.
- *Split clips (iMovie only) *Adjust the speed of clips. (iMovie only)
- *Add titles to clips and change themes.
- *Add voiceovers. Add split screen, freeze frame picture in picture and green screen effects (iMovie only)
- *Add music, including from Garageband if on iPad.
- *Add filter effects
- *Export your project

National Curriculum 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.

Progression of skills in this unit:

1. Add clips then order and resize them.
2. Add titles to clips and change themes.
3. Add voiceovers and music.
4. Add filters to clips.
5. Export a project.

DATA HANDLING

Select cells and resize them, fill with colour and add borders. (Activity 1 and 2)

Find and present data as a table and chart. (Activity 3)

(Requires Microsoft Excel, Apple Numbers for iPad or Google Sheets)

National Curriculum Content: Collecting, analysing, evaluating and presenting data and information

Progression of skills in this unit:

1. Find and present data as a table and suitable chart.
2. Give chart a suitable title and label axis correctly.

Select and use nonadjacent cells and resize multiple cell widths.

PROGRAMMING IN SCRATCH

1. Use sequence, selection, and repetition in programs.
2. Work with variables and various forms of input and output.
3. Debug programs that accomplish goals.
4. Work with variables and conditions.

National Curriculum Content: Design, write and debug programs that accomplish specific goals. Use sequence, selection, and repetition in programs; work with 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.

Progression of skills in this unit:

1. Use sequence, selection, and repetition in programs.
2. Work with variables and various forms of input and output.
3. Debug programs that accomplish goals.

Work with variables and conditions.

E-SAFETY

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

National Curriculum Content: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Progression of skills in this unit:

1. Keep personal information private.
2. Respect and protect against online bullies.
3. Understand the consequences of sharing photos/videos online.
4. Understand the term digital footprint.
5. How can we check online content is trustworthy.
6. How and where and who can we report concerns we have to.

PROGRAMMING WITH SCRATCH

1. Program list variables that chooses randomly.
2. Program inputs, conditions and sensing for interaction, data variables for scoring and a game timer.
3. Program Inputs, outputs, loops, conditions, sensing and variables.

National Curriculum Content Design, write and debug programs that accomplish specific goals; 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.

MUSIC CREATION

Layer tracks using sounds and effects.

Create effective instrument tracks.

Edit tracks and effectively adjust volume and add effects.

Build a song using Live Loops.

National Curriculum 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.

Progression of skills in this unit:

1. Layer tracks using sounds and effects.

COMPUTER NETWORKS AND THE INTERNET

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.

National Curriculum Content: 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.

EBOOK CREATION

Add page colour and style

Add, position and format text on different pages

Add and position images from camera/web

Add audio, including hiding it behind an object.

Add hyperlinks to text and images

Add and format shapes

Use hyperlinks for navigation

Add audio to pages

Embed content such as maps/YouTube videos

National Curriculum 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.

Progression of skills in this unit:

1. Add page colour and style

APP DESIGN

Use the tools in different presentation software (PowerPoint, Keynote, Google Slides) to design an app about your school with:

Slide size and background colour

Text and Images on different pages

Icons

Interactions using hyperlinks

(Requires Microsoft PowerPoint, Apple Keynote for iPad or Google Slides)

National Curriculum 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 tasks

E-SAFETY

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

National Curriculum Content

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Progression of skills in this unit:

1. Keep personal information private.
2. Respect and protect against online bullies.
3. Understand the consequences of sharing photo/videos online.
4. Understand the term digital footprint.
5. How can we check online content is trustworthy.

How, where and who can we report concerns we have to.

WEB DESIGN

Use and combine a variety of software (including internet services) to design and create content that accomplishes given goals.

Add and format text within a website.

Organise sections and pages.

Add and edit images.

Include other features such as hyperlinks, buttons and files.

Evaluate other websites and provide constructive feedback.

Make necessary changes to the website based on feedback

National Curriculum Content Design and create digital content to accomplish goals.

Progression of skills in this unit:

1. Add and format text within a website.

Organise sections

BINARY CODE

Understand why computers/electronics use binary.

To convert binary code to denary numbers (decimal numbers) and vice versa.

National Curriculum Content: Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits. (Key Stage 3)

Progression of skills in this unit:

1. Understand why computers/electronics use binary.
2. To convert binary code to denary numbers (decimal numbers) and vice versa.

PROGRAMMING IN PYTHON

Use an online Python editor to program in Python, including:

Write basic python syntax

Program movements using Python Turtle

Print text

Use Python as a calculator

Program loops to repeat text

Program interactive inputs

National Curriculum Content: Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Use a textual programming language to solve a variety of computational problems.

Progression of skills in this unit:

1. Program movements using Python Turtle.
2. Use the PRINT command for text
3. Program a simple calculator in Python
4. Program loops to repeat text
5. Program interactive inputs

IMAGE EDITING

To edit a photo/image using an online editor including:

Take and crop a screenshot and learn about ratios.

Adjust the colours, brightness, contrast and filters.

Add drawing and text layers.

Import new images as layers and resize/add effects.

Save finished image to use in other projects.

National Curriculum Content: Design and create digital content to accomplish goals

HTML

National Curriculum Content Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts.

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, presenting data and information. Use a textual programming language to solve a variety of computational problems.

Progression of skills in this pack

1. Add and align text and change colour.
2. Program background colour.
3. Add and align images.
4. Add hyperlinks and use them effectively to build navigation between different pages and external sites.
5. Add an iframe (such as a Google Map) and adjust the height and width.