Hardingstone Academy
Computing Curriculum Map

Key Concepts	Data Handling	E-Safety	Multimedia	Programming	Technology in our lives	ICT Skills

Programming and Computational Thinking

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit 1.1 - We are treasure hunters *In this unit, the children will program a toy to move around a map to find buried treasure. They will start by thinking of algorithms for their routes, then input these as stored programs for the robot. They predict how the robot will move and will debug their programs.* **In this unit children will learn to:** • understand that a programmable toy can be controlled by inputting a sequence of instructions • develop and record sequences of instructions as an algorithm • program the toy to follow their algorithm • debug their programs • predict how their programs will work.	**Unit 2.1 - We are astronauts** *In this unit, the children will build on work from Unit 1.1 – We are treasure hunters to program a sprite (such as a spaceship) to move around the screen. This unit acts as a springboard for programming in Year 3.* **In this unit children will learn to:** • have a clear understanding of algorithms as sequences of instructions • convert simple algorithms to programs • predict what a simple program will do • spot and fix (debug) errors in their programs.	**Unit 3.1 - We are programmers** *In this unit, the children create an animated cartoon using characters they design. They use a paint tool to create characters and backgrounds. They then create an animation by translating a storyboard into a series of scripted instructions (program) for graphic objects.* **In this unit children will learn to:** • create an algorithm for an animated scene in the form of a storyboard • write a program in Scratch to create the animation • correct mistakes in their animation programs.	**Unit 4.1 - We are software developers** *The pupils start by playing and analysing educational computer games, identifying those features that make a game successful. They then plan and design a game, with a clear target audience in mind. They create a working prototype, and then develop it further to add functionality and improve the user interface. They test their game and make any necessary changes.* **In this unit children will learn to:** • develop an educational computer game using selection and repetition • understand and use variables • start to debug computer programs • recognise the importance of user interface design, including consideration of input and output.	**Unit 5.1 - We are game developers** *The pupils plan their own simple computer game. They design characters and backgrounds, and create a working prototype, which they develop further based on feedback they receive.* **In this unit children will learn to:** • 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.	**6.1 We are app planners** *In this unit the pupils learn about the capabilities of websites, think of a subject that a website could inform about or engage somebody with, and then pitch the idea for their website.* **In this unit children will learn to:** • develop an awareness of the purposes of different types of websites • understand geolocation, including GPS • identify interesting, engaging content • evaluate competing products • pitch a proposal for a new website

1.1	1.2	2.1	2.2	1.1	2.1	2.2	3.1	3.2	2.1	2.2	3.1	3.2	4.1	3.1	3.2	4.1	4.2	5.1	3.2	4.1	4.2	5.1	6.4	6.5	5.2	6.1	6.2	6.5
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

| **Unit 1.2 We are TV chefs**
In this unit, pupils produce short videos of themselves making a healthy meal or snack. They also decompose a complex problem into smaller parts – an important idea from computer science.

In this unit children will learn to:
• 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. | **Unit 2.2 We are games' testers**
In this unit, the pupils will try to work out how some simple Scratch games work. They also look at free online or open source games and share their favourite games with the class.

In this unit children will learn to:
• 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. | **Unit 3.2 We are bug fixers**
In this unit, the children work with six example Scratch projects. They explain how the scripts work, finding and correcting errors in them, and explore creative ways of improving them. The children learn to recognise some common types of programming error, and practise solving problems through logical thinking.

In this unit children will learn to:
• 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. | **Unit 4.2 We are toy designers**
In this unit, the children work together to design a simple toy that incorporates sensors and outputs and then create an on-screen prototype of their toy in Scratch. Finally, they pitch their toy idea to a Dragons' Den-style panel.

In this unit children will learn to:
• 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. | **Unit 5.2 We are cryptographers**
In this unit the pupils learn more about communicating information securely through an introduction to cryptography (the science of keeping communication and information secret). They investigate early methods of communicating over distances, learn about two early ciphers, and consider what makes a secure password.

In this unit children will learn to:
• be familiar with semaphore and Morse code
• understand the need for private information to be encrypted
• encrypt and decrypt messages in simple ciphers
• appreciate the need to use complex passwords and to keep them secure
• have some understanding of how encryption works on the web. | **Unit 6.2 - We are project managers**
In this unit pupils work collaboratively to develop a website. Pupils apply computational thinking to the task of managing a complex project.

In this unit children will learn to:
• scope a project to identify different components that must be successfully combined
• identify their existing talents and plan how they can develop further knowledge and skills
• identify the component tasks of a project and develop a timeline to track progress
• identify the resources they'll need to accomplish a project
• use web-based research skills to source tools, content and other resources
• consider strategies to ensure the quality of a collaborative project. |

1.1	1.2	2.1	2.2	1.1	2.1	2.2	3.1	3.2	2.2	3.1	3.2	4.1	5.1	2.2	3.2	4.1	4.2	5.1	4.4	5.2	5.4	6.1	5.4	6.1	6.2	6.3	6.4
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

Every child deserves to be the best they can be

Stimpson Avenue Academy
Computing Curriculum Map

Key Concepts

Data Handling	E-Safety	Multimedia	Programming	Technology in our lives	ICT Skills

Creativity

Year 1 — Unit 1.3 We are painters
This unit allows children to create digital illustrations for familiar stories and understand the difference between a print and a digital picture.

In this unit children will learn to:
- use the web safely to find ideas for an illustration
- 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.

Year 2 — Unit 2.3 We are photographers
In this unit, the children review photos online, practise using a digital camera, take photos to fit a given theme, edit their photos, and then select their best images to include in a shared portfolio.

In this unit children will learn to:
- 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
- elect their best images to include in a shared portfolio.

Year 3 — Unit 3.3 We are presenters
This unit gives children a chance to make a short, narrated video of themselves practising a sport or other skill, and to use this to help improve their performance.

In this unit children will learn to:
- 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.

Year 4 — Unit 4.3 We are musicians
In this unit, the children produce music suitable for any purpose they choose, such as music inspired by the sounds of the Rainforest.

In this unit children will learn to:
- 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.

Year 5 — Unit 5.3 We are artists
The pupils use vector and turtle graphics to explore geometric art, taking inspiration from the work of Escher, Riley and traditional Islamic artists, as well as experimenting with complex 'fractal' landscapes.

In this unit children will learn to:
- 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.

Year 6 — Unit 6.4 We are interface designers
In this unit, the children will start to design the look/feel of their website's main interface. They begin by sketching ideas, planning the different screen layouts for the pages and developing these using a site mapping tool.

In this unit children will learn to:
- work collaboratively to design the website's interface
- use site mapping tools to create a design prototype of their website
- develop or source the individual interface components (media assets) they will use
- address accessibility and inclusion issues
- document their design decisions and the process they've followed.

Year 1			Year 2			Year 3				Year 4			Year 5				Year 6				
1.3	2.3	3.3	1.3	2.3	3.3	2.3	3.3	4.6	6.6	4.3	5.1	6.6	1.3	5.3	5.6	6.4	3.6	4.6	6.3	6.4	6.5
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

Computer Networks

Year 1 — Unit 1.4 We are collectors
In this unit, the pupils will use web search engines to collect pictures of different types of animals and then explore ways in which those pictures can be organised.

In this unit children will learn to:
- 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 1(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.

Year 2 — Unit 2.4 We are researchers
The children research a topic – safely, effectively and efficiently – using a structured approach (mind mapping). They share their findings with others through a short multimedia presentation.

In this unit children will learn to:
- 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.

Year 3 — Unit 3.4 We are network engineers
In this unit, the pupils investigate how computer networks work. They use a simulation and learn some simple command prompt (C:) tools for testing network connections.

In this unit children will learn to:
- understand the physical hardware connections necessary for computer networks to work
- understand some features of internet protocols
- understand some diagnostic tools for investigating network connections
- develop a basic understanding of how domain names are converted to IP addresses.

Year 4 — Unit 4.4 We are html editors
In this unit the children learn about the history of the web, before studying HTML (hypertext mark-up language), the language in which web pages are written. They learn to edit and write HTML, and then use this knowledge to create a web page.

In this unit children will learn to:
- 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.

Year 5 — Unit 5.4 We are web developers
In this unit, the pupils work together to create a website explaining e-safety and responsible online behaviour.

In this unit children will learn to:
- 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 e-safety and responsible use of technology.

Year 6 — Unit 6.3 We are market researchers
The pupils conduct research into the potential market for their website, using an online survey together with interviews or focus groups. They analyse the data and information they obtain and create a presentation summarising their findings.

In this unit children will learn to:
- create a set of good survey questions
- analyse the data obtained from a survey
- work collaboratively to plan questions
- conduct an interview or focus group
- analyse and interpret the information obtained from interviews or a focus group
- present their research findings.

1.4	2.4	2.6	3.5	1.4	2.4	2.6	3.5	3.4	3.5	4.5	5.2	5.4	3.4	4.4	4.5	5.4	3.5	4.4	5.4	5.5	6.2	5.3	5.6	6.4	6.5	6.6
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

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Communication / Collaboration	**Unit 1.5 We are storytellers** *In this unit, the children create a talking book that they can share with others.* **In this unit children will learn to:** • 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.	**Unit 2.5 We are detectives** *In this unit, the children are challenged to solve a mystery by reading, sending and replying to emails, and by listening to a witness statement. They use a fact file sheet to create a table and identify the culprit.* **In this unit children will learn to:** • understand that email can be used to communicate • develop skills in opening, composing and sending emails • gain skills in opening and listening to audio files on the computer • use appropriate language in emails • develop skills in editing and formatting text in emails • be aware of e-safety issues when using email.	**Unit 3.5 We are communicators** *This unit allows the children to learn about a number of e-safety matters in a positive way. They will work with a partner in another class, learning how to use email and video conferencing safely.* **In this unit children will learn to:** • develop a basic understanding of how email works • be able to use email to send a message • be aware of broader issues surrounding email, including 'netiquette' and e-safety • work collaboratively with a remote partner • experience video conferencing.	**Unit 4.5 We are co-authors** *In this unit, the pupils collaborate to create a 'mini Wikipedia'. They then go on to add or amend content on the real Wikipedia.* **In this unit children will learn to:** • 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.	**Unit 5.5 We are bloggers** *In this unit, pupils create a media-rich blog, comment on blogs and respond to comments.* **In this unit children will learn to:** • 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.	**Unit 6.5 We are mobile app developers** *In this unit, the pupils draw on their work from the previous Year 6 units to create a working app. They write down their algorithms, and use a programming toolkit to code them.* **In this unit children will learn to:** • become familiar with another programming toolkit or development platform • import existing media assets to their project • write down the algorithms for their app • program, debug and refine the code for their website • thoroughly test and evaluate their website.

1.5		2.4		3.5	1.5		2.5		3.5	2.5	3.4	3.5	4.5	5.5	6.6	3.4	3.5	4.5	5.5	6.6	3.5		4.5	5.5	6.6	5.6	6.4	6.5	6.6
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Productivity	**Unit 1.6 We are celebrating** *In this unit, pupils will have the opportunity to create a digital greetings card, which could be used for a religious festival such as Diwali or Christmas, pupils' birthdays, or simply to say thank you or good luck.* **In this unit children will learn to:** • 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.	**Unit 2.6 We are zoologists** *In this unit, the children go on a bug hunt, recording and identifying the small animals they find. They then organise the data they have collected, record it using a graphing package, and interpret the graph to answer questions about the animals.* **In this unit children will learn to:** • 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.	**Unit 3.6 We are opinion pollsters** *In this unit, the children create their own opinion poll, seek responses, and then analyse the results.* **In this unit children will learn to:** • understand some elements of survey design • understand some ethical and legal aspects of online data collection • use the web to facilitate data collection • use charts to analyse data • interpret results represented in a chart or table.	**Unit 4.6 We are meteorologists** *This unit brings together data measurement, analysis and presentation, as the children take on the role of meteorologists and weather presenters.* **In this unit children will learn to:** • 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.	**Unit 5.6 We are architects** *In this unit, the pupils research examples of art gallery architecture, before using Trimble SketchUp to create their own virtual gallery. Finally, they use the gallery to exhibit their own artwork.* **In this unit children will learn to:** • 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.	**Unit 6.6 We are marketers** *The pupils work collaboratively to produce marketing materials for the app they have been developing in the Year 6 units. They create a poster or flyer, and shoot a short video.* **In this unit children will learn to:** • consider key marketing messages, including identifying a unique selling point • develop a printed flyer or brochure incorporating text and images • further develop knowledge, skills and understanding in relation to creating a website • further develop skills relating to shooting and editing video.

1.3		1.6		2.3		5.3	1.4		2.6		3.6		4.6	1.4	2.6		3.6	4.6	6.3	6.6	2.6		3.6		4.6	6.3	5.3		5.6		6.4		6.6	5.3		5.6		6.4		6.6
DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK	DH	ES	MM	PR	TL	SK

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