

# Computing



## The Inspire Multi Academy Trust (South West)



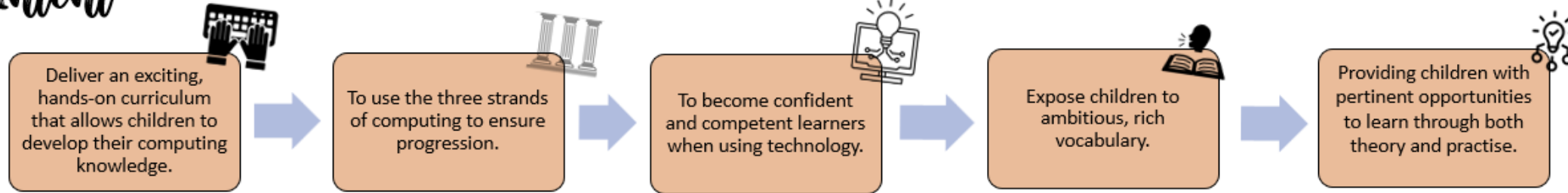
# SUBJECT ON A PAGE

# Computing

AT THE INSPIRE MULTI ACADEMY TRUST WE BELIEVE THAT BEING TAUGHT COMPUTING IS A RIGHT AND NOT A PRIVILEGE FOR CHILDREN WHO ARE GROWING UP IN AN EVER-CHANGING DIGITAL WORLD. WE AIM TO DEVELOP CONFIDENT, ENTHUSIASTIC AND SKILLED USERS OF A BROAD RANGE OF TECHNOLOGIES.



## Intent



## Implementation

### COMPUTER SCIENCE

Computer Science is essentially the **core** of the computing curriculum, covering data representation, algorithms and programming. It provides the essential foundation knowledge required in order to understand and interpret other areas of the computing curriculum. Computational thinking is used throughout this strand.

### INFORMATION TECHNOLOGY

Information technology focuses on **how** computers function and how they are used within society. Technology is used purposefully to create, organise, store, manipulate and retrieve digital content. Digital artefacts are created in a range of ways, such as videos, animations or 3D models.

### DIGITAL LITERACY

Digital Literacy is having the secure knowledge and ability to use a range of technology with confidence and competence. This covers the use of devices at a mechanical level, searching and selecting information and how to ensure devices are used safely and responsibly at all times.

### EARLY YEARS

The Early Years is crucial for laying the foundation knowledge in computing. Children are exposed to vocabulary early on and are given the opportunity to build their skills independently, developing computational thinking and reducing cognitive load.



### TEACH COMPUTING

The NCCE Teach Computing scheme aims to transform the way computing is taught in schools and enable more young people to benefit from studying this vital subject. As a result of this, it is believed that children's skills and career opportunities will be enhanced.



# The Inspire Multi Academy Trust

## Computing Progression

### Early Years

Throughout their time in the Early Years, children are consistently exposed to the world of technology. They are given the opportunity to use the desktops in their classroom, by independently entering a child friendly username and password, developing their computer skills by typing and using a mouse. Whilst on the desktops, children engage in a range of educational games. Alongside this, during their Independent Learning, children are permitted to use the Interactive Whiteboard, where they can practise their handwriting on the large screen with their peers. What a great way to support the development of their fine/gross motor skills. In the classrooms, children also have free access to a range of physical computing devices, such as Bee-Bots and are encouraged to use these during their Independent Learning time. Following on from this, teachers can use these devices as a teaching tool in Maths inputs and during 'Understanding the World' activities.

### Term 1

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Computing Systems and Networks</b></p> <p>In this unit, children will develop their understanding of technology and how it can help them. They will become more familiar with the different components of a computer by developing their keyboard and mouse skills, and also start to consider how to use technology responsibly.</p> <p>Lesson 1 – Technology in our classroom</p>	<p><b>Computing Systems</b></p> <p>How is information technology (IT) being used for good in our lives? With an initial focus on IT in the home, children explore how IT benefits society in places such as shops, libraries, and hospitals. Whilst discussing the responsible use of technology, and how to make smart choices when using it.</p> <p>Lesson 1: What is IT?</p> <p>Lesson 2: IT in school</p>	<p><b>Computing systems and networks – connecting computers</b></p> <p>This unit has an initial focus on inputs, processes, and outputs. Children will start by comparing digital and non-digital devices, before introducing them to computer networks that include network infrastructure devices like routers and switches.</p> <p>Lesson 1 - How does a digital device work?</p>	<p><b>Computing systems and networks - The internet</b></p> <p>Children will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate</p>	<p><b>Computing systems and networks – Systems and searching</b></p> <p>In this unit, children will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members and</p>	<p><b>Computing systems and networks – communication and collaboration</b></p> <p>In this unit learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared</p>



## Term 3

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Creating Media – Digital painting</b></p> <p>In this unit, children will explore the world of digital art and its exciting range of creative tools. Students will be empowered to create their own paintings, while getting inspiration from a range of other artists. This unit will be concluded by asking them to consider their preferences when painting with, and without, the use of digital devices.</p> <p>Lesson 1 – How can we paint using computers?</p> <p>Lesson 2 – Using shapes and lines</p> <p>Lesson 3 – Making careful choices</p> <p>Lesson 4 – Why did I choose that?</p> <p>Lesson 5 – Painting all by myself</p> <p>Lesson 6 – Comparing computer art and painting</p>	<p><b>Creating Media – Digital Photography</b></p> <p>In this unit, children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.</p> <p>Lesson 1: Taking photographs</p> <p>Lesson 2: Landscape or portrait</p> <p>Lesson 3: What makes a good photograph?</p> <p>Lesson 4: Lighting</p> <p>Lesson 5: Effects</p> <p>Lesson 6: Is it real?</p>	<p><b>Creating media – stop-frame animation</b></p> <p>In this unit, children will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.</p> <p>Lesson 1 – Can a picture move?</p> <p>Lesson 2 – Frame by frame</p> <p>Lesson 3 – What’s the story?</p> <p>Lesson 4 – Picture perfect</p> <p>Lesson 5 – Evaluate and make it great</p> <p>Lesson 6 – Lights, camera, action</p>	<p><b>Creating Media – Audio Production</b></p> <p>Children will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. They will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.</p> <p>Lesson 1 – Digital recording</p> <p>Lesson 2 – Recording sound</p> <p>Lesson 3 – Creating a podcast</p> <p>Lesson 4 – Editing digital recordings</p>	<p><b>Creating media – Video production</b></p> <p>This unit gives children the opportunity to learn how to create short videos in groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Learners are guided with step-by-step support to take their idea from conception to completion. At the teacher’s discretion, the use of green screen can be incorporated into this unit. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.</p> <p>Lesson 1 – What is video?</p> <p>Lesson 2 – Filming techniques</p> <p>Lesson 3 – Using a storyboard</p>	<p><b>Creating media – Web page creation</b></p> <p>This unit introduces learners to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.</p> <p>Lesson 1 – What makes a good website?</p> <p>Lesson 2 – How would you lay out your webpage?</p> <p>Lesson 3 – Copyright or copyWRONG?</p> <p>Lesson 4 – How does it look?</p> <p>Lesson 5 – Follow the breadcrumbs</p>

			Lesson 5 – Combining audio  Lesson 6 – Evaluating podcasts	Lesson 4 – Planning a video  Lesson 5 – Importing and editing video  Lesson 6 – Video evaluation	Lesson 6 – Think before you link
<b>Term 4</b>					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Term 5</b>					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Programming – Moving a robot</b></p> <p>This unit introduces children to early programming concepts. Learners will explore using individual commands, both with other learners and as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is spent on all aspects of programming and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design</p>	<p><b>Programming – Robot algorithms</b></p> <p>This unit develops learners’ understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Children will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.</p> <p style="text-align: center;">Lesson 1: Giving instructions</p> <p style="text-align: center;">Lesson 2: Same but different</p>	<p><b>Programming – Sequencing sounds</b></p> <p>This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure</p>	<p><b>Programming – repetition in shape</b></p> <p>This unit looks at repetition and loops within programming. Children will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.</p> <p style="text-align: center;">Lesson 1 – Programming a screen turtle</p> <p style="text-align: center;">Lesson 2 - Programming letters</p> <p style="text-align: center;">Lesson 3 – Patterns and repeats</p>	<p><b>Programming – selection in Physical Computing</b></p> <p>In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Learners are introduced to conditions as a means of controlling the flow of actions and make use of their knowledge of repetition and conditions when introduced to</p>	<p><b>Programming – Variables in games</b></p> <p>This unit explores the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project. In</p>

through the introduction of algorithms.  Lesson 1 –Buttons  Lesson 2- Directions  Lesson 3 – Forwards and backwards  Lesson 4 – Four directions  Lesson 5 – Getting there  Lesson 6 - Routes	Lesson 3: Making predictions  Lesson 4: Mats and routes  Lesson 5: Algorithm design  Lesson 6: Debugging	that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.  Lesson 1 – Introduction to Scratch  Lesson 2 – Programming sprites  Lesson 3 – Sequences  Lesson 4 – Ordering commands  Lesson 5 – Looking good  Lesson 6 – Making an instrument	Lesson 4 - Using loops to create shapes  Lesson 5 – Breaking things down  Lesson 6 – Creating a program	the concept of selection (through the if, then structure).  Lesson 1 – Connecting crumbles  Lesson 2 – Combining output components  Lesson 3 – Controlling with conditions  Lesson 4 – Starting with selection  Lesson 5 – Drawing designs  Lesson 6 – Writing and testing algorithms	Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.  Lesson 1 – Introducing variables  Lesson 2 - Variables in programming  Lesson 3 – Improving a game  Lesson 4 – Designing a game  Lesson 5 – Design to code  Lesson 6 – Improving and sharing
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### Term 6

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Data and information</b> This unit introduces children to data and information. They will begin by using labels to put objects into groups, and	<b>Data and information – Pictograms</b> This unit introduces the children to the term ‘data’. They will begin to understand what data	<b>Data and information – branching databases</b> In this unit, children will develop their understanding of what a branching database is and	<b>Data and information – Data logging</b> In this unit, children will consider how and why data is collected over time. They will consider the senses that	<b>Data and information – flat file databases</b> This unit looks at how a flat-file database can be used to organise data in records. Pupils use tools within a database to	<b>Data and information – Spreadsheets</b> This unit introduces the learners to spreadsheets. They will be supported in

<p>labelling these groups. Students will demonstrate that they can count a small number of objects, before and after the objects are grouped. They will then begin to demonstrate their ability to sort objects into different groups, based on the properties they choose. Finally, they will use their ability to sort objects into different groups to answer questions about data.</p> <p>Lesson 1 – Label and match</p> <p>Lesson 2 – Group and count</p> <p>Lesson 3 – Describe an object</p> <p>Lesson 4 – Making different groups</p> <p>Lesson 5 – Comparing groups</p> <p>Lesson 6 – Answering questions</p>	<p>means and how this can be collected in the form of a tally chart. They will learn the term ‘attribute’ and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Learners will use the data presented to answer questions.</p> <p>Lesson 1 – Counting and comparing</p> <p>Lesson 2 - Enter the data</p> <p>Lesson 3 – Creating pictograms</p> <p>Lesson 4 – What is an attribute?</p> <p>Lesson 5 – Comparing people</p> <p>Lesson 6 – Presenting information</p>	<p>how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Learners will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.</p> <p>Lesson 1 – Yes or no questions</p> <p>Lesson 2 – Making groups</p> <p>Lesson 3 – Creating a branching database</p> <p>Lesson 4 – Structuring a branching database</p> <p>Lesson 5 – Using a branching database</p> <p>Lesson 6 – Two ways of presenting information</p>	<p>humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Pupils will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Pupils will spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions.</p> <p>Lesson 1 – Answering questions</p> <p>Lesson 2 - Data collection</p> <p>Lesson 3 – Logging</p> <p>Lesson 4 – Analysing data</p> <p>Lesson 5 – Data for answers</p> <p>Lesson 6 – Answering my question</p>	<p>order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others.</p> <p>Lesson 1 – Creating a paper-based database</p> <p>Lesson 2 – Computer databases</p> <p>Lesson 3 – Using a database</p> <p>Lesson 4 – Using search tools</p> <p>Lesson 5 – Comparing data visually</p> <p>Lesson 6 – Databases in real life</p>	<p>organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.</p> <p>Lesson 1 – What is a spreadsheet?</p> <p>Lesson 2 – Modifying spreadsheets</p>
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**Online Safety**

Term	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Term 1</b>	Health, well-being and lifestyle	Health, well-being and lifestyle	Health, well-being and lifestyle	Health, well-being and lifestyle	Health, well-being and lifestyle	Health, well-being and lifestyle
<b>Term 3</b>	Privacy and security	Privacy and security	Privacy and security	Privacy and security	Privacy and security	Privacy and security
<b>Term 5</b>	Online relationships	Online relationships Online bullying	Online relationships Online bullying	Online relationships Online bullying Self-image and identity	Online relationships Online bullying Self-image and identity	Online relationships Online bullying Self-image and identity
<b>Term 6</b>	Copyright and ownership	Copyright and ownership Reliability of information	Copyright and ownership Reliability of information	Copyright and ownership Reliability of information Online reputation	Copyright and ownership Reliability of information Online reputation	Copyright and ownership Reliability of information Online reputation