St Laurence in Thanet CE Junior Academy

Curriculum overview

Computing

Believe, Achieve, Aspire!

'Through God all things are possible' (Matthew 19:26)

Contents

Statement of Intent

Our computing curriculum aims to equip young people with the knowledge, skills and understanding they need to thrive in the digital world of today and the future. Ten years from now our school leavers may well be entering career pathways that currently do not exist. Many of these new opportunities will be within computing and technology.

Our Computing provision aims to provide an exciting, rich, relevant and challenging curriculum which equips children with the capability to use technology throughout their lives. We aim to instil critical thinking, reflective learning and a 'can do' attitude for all our pupils, particularly when engaging with technology and its associated resources. We teach pupils to become responsible, respectful and competent users of data, information and communication technology; equipping pupils with skills, strategies and knowledge that will enable them to reap the benefits of the online world, whilst being able to minimise risk to themselves or others.

As a school, we have the Teach Computing Scheme of Work. The scheme of work supports our teachers in delivering fun and engaging lessons which help to raise standards and allow all pupils to achieve to their full potential. This scheme of work allows children to experience different forms of computing and ICT including physical and digital.

Intent, Implementation and Impact in Computing

Intent	Implementation	Impact
Technology is changing the lives of everyone. Through teaching computing at St Laurence we aim to equip our children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. It is our intention to enable children to find, explore, analyse, exchange and present information. We also focus on developing the skills necessary for children to be able to use information in an effective way. Computing skills are a major factor in enabling children to be confident, creative and independent learners and it is our intention that children have every	Computing lessons are planned alongside the NC & the Teach Computing scheme and ensure children progress throughout the school and develop their computing skills in a spiral curriculum Computing is taught explicitly on a weekly basis (x1), however access to laptops/ipads is available throughout the week to support other areas of the curriculum. Teachers take advantage of cross-curricular opportunities and incorporate the use of ICT equipment wherever appropriate including in English, History, Geography and Maths. We work alongside other schools in the Aquila Multi-Academy Trust to share best practice and enhance the teaching and learning of computing. We engaged with outside agencies to improve children's' experiences of computing and help children access more equipment which we do not have in school currently due to funding.	After the implementation of this robust computing curriculum, children at St Laurence will be digitally literate and able to join the rest of the world on its digital platform. They will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely. The biggest impact we want on our children is that they understand the consequences of using the internet and that they are also aware of how to keep themselves safe online. As children become more confident in their abilities in Computing, they will become more independent and key life skills such as problem-

opportunity available to allow them to achieve this.	Staff plan computing lessons where children are clear on the skills and vocabulary they need to understand in order to progress. Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs, use logical reasoning to explain how some simple algorithms work and correct errors in algorithms and programs. Children are taught to understand computer networks, including the internet, and the opportunities they offer for communication and collaboration. They will use search technologies effectively, learn to appreciate how results are selected and ranked, and be discerning in evaluating digital content. Children will be taught to select, use and combine a variety of software (including internet services) on a range of digital devices to create a range of programs, systems and content that accomplish given goals. They will use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	solving, logical thinking and self-evaluation become second nature. Pupil consultations on the computing curriculum take place annually. Areas for development are identified and shared with staff and any adjustments are actioned. Work folders are used to log the children's work on paper.

Spiritual, Moral, Social and Cultural Aspects of the Computing Curriculum

Through computing, children will be able to develop the following –

Spiritual:

- Encouragement to consider the feelings of others in their use of technology.
- Allowing them to express themselves creatively using technology.
- Wondering at the power of the digital age.
- Allowing opportunities to learn about technology around them and the advantages and limits of these.

Moral:

- Exploring issues around data sharing.
- Treating others online with respect and ensuring the effects of not doing this are known.
- Raising awareness of the legal aspects of using technology including copyright legislation and age-restrictions.
- Knowing when and how to report instances of cyberbullying.

Social:

- Promoting collaborative learning with technology and exploring the benefits of this.
- Teaching rules for being a respectful member of an online community and the importance of mutual respect when using technology.
- Raising awareness of the common issues and benefits of social media.
- Teaching and discussing different ways the internet has impacted on communication.
- Preparing for the challenges of living and learning in a technologically enriched and increasingly interconnected world.

Cultural:

- Providing opportunities to learn about different cultures through the use of the internet and online platforms such as Newsround and Picture News.

- Providing opportunities to explore human achievements and creativity in relation to a worldwide communication platform.
- Encouraging them to reflect on how developments in technology have led to changes in every-day life.

Pedagogical Approach

Metacognition

Adapted from: EEF METACOGNITION AND SELF-REGULATED LEARNING—Guidance Report EEF_Metacognition_and_self-regulated_learning.pdf (d2tic4wvo1iusb.cloudfront.net)

Teaching Process

In terms of developing self-regulated learning and metacognition, this means we need to make sure that we don't give too much information at the same time (when delivering explicit instruction), and do not expect the learner to take on too much challenge when doing guided practice and independent work. The use of structured planning templates, teacher modelling, worked examples, and breaking down activities into steps can help achieve this.

Self-regulation and metacognition strategies work through learners monitoring and evaluating their own learning strategies.

- Explicit teaching
- Teachers modelling
- Opportunities for pupils to reflect on and monitor their strengths and areas of improvement, and plan how to overcome current difficulties.
- Providing enough challenge for learners to develop effective strategies, but not so difficult that they struggle to apply a strategy.

Self-regulated learning can be broken into three essential components that teachers need to know about to help their pupils to develop into successful learners:

Cognition is the mental process involved in knowing, understanding, and learning. By cognitive strategies, we mean skills like memorisation techniques or subject-specific strategies. This is the bread and butter of good teaching; cognitive strategies are fundamental to acquiring knowledge and completing learning tasks.

Metacognition is about the way's learners monitor and purposefully direct their learning. For example, having decided that a particular cognitive strategy for creating is likely to be successful, a pupil then monitors whether it has indeed been successful and then deliberately changes (or not) their method based on that evidence. By metacognitive strategies, we mean the strategies we use to monitor or control our cognition, such as checking that our technique was accurate or selecting the most appropriate cognitive strategy for the task we are undertaking.

Motivation is about our willingness to engage our metacognitive and cognitive skills and apply them to learning. Motivational strategies will include convincing oneself to undertake a tricky task now—affecting our current well-being—as a way of improving our future well-being in the task tomorrow. Cognition, metacognition, and motivation all interact in complex ways during the learning process. It is impossible to be metacognitive

without having different cognitive strategies to hand and possessing the motivation and perseverance to tackle problems and apply these strategies.

Pedagogical Approach

Cognitive Load Theory

Adapted from: Cognitive Load Theory: Research that teachers really need to understand

Cognitive Load Theory — aim = to develop instructional techniques that fit within the characteristics of working memory in order to maximise learning.

Based on two principles:

1. There is a limit to how much **new** information the brain can hold. (**Working memory**—processing new information results in 'cognitive load' which can affect outcomes.)
2. There is no know limit to how much **stored** information that can be processed at one time. (**Long term memory**—stores information as schemas.

Explicit instruction involves teachers clearly showing children what to do, rather than have them construct or discover it for themselves. To lessen cognitive load on working memory. This can be used for new information and learning. Independent learning also needs to be incorporated but with cognitive load managed through guidance, prior information, scaffolds and assistance if needed.

Long term memory relies on the formation of schemas where information can be processed automatically with minimal conscious effort. Automaticity happens after extensive practice. Thus reducing working memory load. If working memory is overloaded, there is greater risk that the content will not be understood, be confused and not stored into the long-term memory. Ultimately, learning will be slowed down. Automation of schemas reduces the burden on working memory because when information can be accessed automatically, the working memory is freed up to process new information.

There are 3 types of Cognitive load—Intrinsic, Extraneous and Germane

I**ntrinsic** —difficulty of subject matter being learnt, it depends on the complexity of the material and the prior learning—i.e. different people will have different levels of cognitive load depending on their experiences and knowledge

Extraneous — how the subject matter is taught—we need to minimise extraneous cognitive load to free up working memory.

Germane—the load imposed on the working memory by the process of learning i.e. by transferring information into long-term memory through schema construction.

Computing - Subject Leader Action Plan (23-24) – Key areas for development

Improvement Required	How will this be achieved?	By Whom?	When?	Success Criteria	Financial Implication	Monitoring -Who? When?
Ensure teachers have a clear understanding of prior learning and next steps in children's learning, to promote consistently high expectations.	Using the Teach Computing scheme, teachers are able to look back and forward on the scheme of work to see future and prior learning. As this is a new scheme, there will be some gaps which may need to be addressed before teaching.	JS and teachers	Look ahead to next unit termly.	Teachers will recap or teach relevant knowledge that is required to build upon. Children will be able to make at least expected progress. Teachers are better aware	None	Discussions with teachers. Refer to the curriculum scheme.
Quality teaching and learning in all year groups to ensure full coverage.	Supporting teachers in the planning of computing where required. Following Teach Computing scheme of work.	JS and all teachers delivering computing lessons.	Termly. Approximately 6 lessons per term.	All children will have access to quality teaching of the relevant curriculum. Learning will be built upon in subsequent year groups.	None	Observations and monitoring. Liase with teachers Looking at computing folders termly
To support improvement of Maths and English attainment through the use of technology.	Continue to promote Maths Prodigy, TTRS and various Emille competitions. Explore the possible use of English Prodigy. Use laptops for typing up work or other written tasks.	All staff	Term 1-6	Ensure laptops and iPads are being used to their full potential. A mixture of tasks are being completed using the laptops.	None	Discussions with pupils termly. Monitoring termly on engagement.

To raise awareness of online safety across the school community.	All teachers to teach the SMART rules for online safety and must refer to them regulary. Utilise the Teach Computing scheme of work and any associated resources. Explore possibility of workshops or visits for the children. Safer Internet Day (February 6th 2024)	All staff	All terms but a particular focus in term 3	All children are aware of how to keep safe online. SMART rules to be displayed in each classroom. Parents are kept informed by the school of how to keep their children safe online.	Unknown	Learning walks, pupil consultations, questionnaires.
Ensure that SEN children access work at the correct level of development with high expectations for their learning.	Lesson may need to be adapted to suit all needs. Lessons may need to come away slightly from the scheme of work to suit all needs for particular lessons.	All staff	Ongoing termly 1-6	Children make good progress even when disadvantaged by other factors.	None	Pupil voice. Discussions. Monitoring To review each term.
Review computing policy and Intent, Implication and Impact.	Computing policy to be read and checked alongside new scheme of work. III to check for consistency.	JS	Term 1	A reviewed policy fit for purpose. A reviewed III statement fit for purpose.	None	Monitor for any future changes.
Develop Computing folders to show a learning journey and are valued by children.	Ensure there is at least two pieces of work for each term in the computing folders. Talk to teachers about the type of evidence that can be used in the folders.	JS and teaching staff	Ongoing termly – beginning in term 1. To be reviewed regularly.	Folders will have at least two examples of the children's work per term. Front covers will be in place.	None	Book monitoring. Pupil voice. Discussions with teaching staff.
Review and replace the assessment tool in computing to fall	JS to source a new assessment tool to be used by all teachers.	JS	Source and in place by the end of term 2.	Assessment tool will be effect in assessing the	None/unknown.	Data drops every 2 terms.

in line with the new scheme of work.	Teachers to update their data term 2,4 and 6.			children's computing ability.		

Whole School Cultural Capital /Enrichment Opportunities

Whole School Enrichment Opportunities		
Term	**Event**	**Computing link**
2	Virtual Reality workshop	Cross-curricular link to Geography/Science or History. Exploring and reinforcing knowledge.
3	Safer Internet Day	Whole school Event The safe use of the internet underpins everything we do with computers. Children need to be made aware of how to stay safe and the potential risks whilst accessing the internet. Reinforce throughout Computing and PSHE lessons.
1-6	Opportunities for extra-curricular computing	Maths Prodigy Times Table Rockstars Reading Plus Accelerated Reader Finding enjoyment in computing and use of ICT in others ways.

Based on the TEACH Computing Scheme of Work Curriculum Map

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 3	Computing systems and networks – connecting computers 3.1 **Program: Paint**	Creating media – stop-frame animation 3.2 **Program: iMotion**	Programming A – sequencing 3.3 **Program: Scratch**	Data and information – Branching databases 3.4 **Program: j2data Branch and Pictogram**	Creating media – Desktop publishing 3.5 **Program: Canva.com**	Programming B – Events and actions in programs 3.6 **Program: Scratch**
Year 4	Computing systems and networks – The Internet 4.1 **Program: The web**	Creating Media – Audio Production 4.2 **Program: Audacity**	Programming A – Repetition in shapes 4.3 **Program: FMSLogo**	Data and information – Data Logging 4.4 **Program: Data loggers**	Creating media – Photo editing 4.5 **Program: Paint.net**	Programming B – Repetition in games 4.6 **Program: Scratch**
Year 5	Computing systems and networks – Systems and searching 5.1 **Program: Google slides/the web**	Creating Media – Video Production 5.2 **Program: iPads**	Data and information – Flat-file databases 5.4 **Program: j2data Database**	Programming A – Selection in physical computing 5.3 **Program: Crumble controller**	Creating media – Introduction to vector graphics 5.5 **Program: Google drawings**	Programming B – Selection in quizzes 5.6 **Program: Scratch**
Year 6	Computing systems and networks – Communication and collaboration 6.1 **Program: Google slides/the web**	Creating Media – Web page creation 6.2 **Program: Google sites**	Programming A – Variables in games 6.3 **Program: Scratch**	Data and information – Introduction to spreadsheets 6.4 **Program: Google sheets/Microsoft Excel**	Creating media – 3D modelling 6.5 **Program: Tinkercad**	Programming B – Sensing movement 6.6 **Program: Micro:bit and Microsoft MakeCode**

YEAR 3 MEDIUM-TERM OVERVIEW

Term 1 - Computer Systems and Networks – Connecting Computers

Lesson	Brief overview	Learning objectives
1 How does a digital device work?	This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process
2 What parts make up a digital device?	Learners will develop their knowledge of the relationship between inputs, processes, and outputs and apply it to devices and parts of devices that they will be familiar with from their everyday surroundings.	To identify input and output devices • I can classify input and output devices • I can describe a simple process • I can design a digital device
3 How do digital devices help us?	Learners will apply their learning from Lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	To recognise how digital devices can change the way that we work • I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and using non-digital tools

		• I can suggest differences between using digital devices and using non-digital tools
4 How am I connected?	Many digital devices are now connected to other digital devices, eg computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch
5 How are computers connected?	This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices • I can explain the role of a switch, server, and wireless access point in a network
6 What does our school network look like?	Learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in Lesson 5.	To recognise the physical components of a network

		• I can identify how devices in a network are connected together • I can identify networked devices around me • I can identify the benefits of computer networks

YEAR 3 MEDIUM-TERM OVERVIEW

Term 2 – Creating Media – Stop-frame animation

Lesson	Brief overview	Learning objectives
1 Can a picture move?	Learners will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes.	To explain that animation is a sequence of drawings or photographs • **I can draw a sequence of pictures** • **I can create an effective flip book—style animation** • **I can explain how an animation/flip book works**
2 Frame by frame	In the previous lesson, learners created their own flip book–style animations. In this lesson, they will develop this knowledge and apply it to make a stop-frame animation using a tablet.	To relate animated movement with a sequence of images • **I can predict what an animation will look like** • **I can explain why little changes are needed for each frame** • **I can create an effective stop-frame animation**

3 What's the story?	Remind the learners of the animations that we created last week and tell them that next week we will use tablets to animate some of our own stories. Tell the learners that during this lesson they will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week.	**To plan an animation** • **I can break down a story into settings, characters and events** • **I can describe an animation that is achievable on screen** • **I can create a storyboard**
4 Picture perfect	In the previous lesson, learners planned out their own stop-frame animations in a storyboard. This lesson, they will use tablets to carefully create stop-frame animations, paying attention to consistency.	To identify the need to work consistently and carefully • **I can use onion skinning to help me make small changes between frames** • **I can review a sequence of frames to check my work** • **I can evaluate the quality of my animation**
5 Evaluate and make it great!	Last lesson, learners created their own stop-frame animations. This lesson, they will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback.	To review and improve an animation • **I can explain ways to make my animation better** • **I can evaluate another learner's animation** • **I can improve my animation based on feedback**
6 Lights, camera, action!	Last lesson, learners perfected their stop-frame animations. This lesson, they will add other media and effects into their animations, such as music and text.	**To evaluate the impact of adding other media to an animation**

		• **I can add other media to my animation** • **I can explain why I added other media to my animation** • **I can evaluate my final film**

YEAR 3 MEDIUM-TERM OVERVIEW

Term 3 – Programming A – Sequencing Sounds

Lesson	Brief overview	Learning objectives
1. Introduction to Scratch	This lesson introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen.	To explore a new programming environment • I can identify the objects in a Scratch project (sprites, backdrops) • I can explain that objects in Scratch have attributes (linked to) • I can recognise that commands in Scratch are represented as blocks
2. Programming sprites	In this lesson, learners will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks.	To identify that commands have an outcome • I can identify that each sprite is controlled by the commands I choose

		• I can choose a word which describes an on-screen action for my plan • I can create a program following a design
3. Sequences	In this lesson, learners will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different ways. In doing this, they will apply principles of design to plan and create a project.	To explain that a program has a start • I can start a program in different ways • I can create a sequence of connected commands • I can explain that the objects in my project will respond exactly to the code
4. Ordering commands	This lesson explores sequences, and how they are implemented in a simple program. Learners have the opportunity to experiment with sequences where order is and is not important. They will create their own sequences from given designs.	To recognise that a sequence of commands can have an order • I can explain what a sequence is • I can combine sound commands • I can order notes into a sequence
5. Looking good	This lesson develops learners' understanding of sequences by giving them the opportunity to combine motion and sounds in one sequence. They will also learn how to use costumes to change the appearance of a sprite, and backdrops to change the appearance of the stage. They will apply the skills in Activity 1 and 2 to design and create their own project, including sequences, sprites with costumes, and multiple backdrops.	To change the appearance of my project • I can build a sequence of commands • I can decide the actions for each sprite in a program • I can make design choices for my artwork
6. Making an instrument	In this lesson, learners will create a musical instrument in Scratch. They will apply the concept of design to help develop programs and use programming blocks — which they have been introduced to throughout the unit. They will learn that	To create a project from a task description • I can identify and name the objects I will need for a project

	code can be copied from one sprite to another, and that projects should be tested to see if they perform as expected.	• I can relate a task description to a design • I can implement my algorithm as code

YEAR 3 MEDIUM-TERM OVERVIEW

Term 4 – Data and Information – Branching Databases

Lesson	Brief overview	Learning objectives
1 Yes or no questions	Learners will start to explore questions with yes/no answers, and how these can be used to identify and compare objects. They will create their own yes/no questions, before using these to split a collection of objects into groups.	To create questions with yes/no answers • I can investigate questions with yes/no answers • I can make up a yes/no question about a collection of objects • I can create two groups of objects separated by one attribute
2 Making groups	Learners will develop their understanding of using questions with yes/no answers to group objects more than once. They will learn how to arrange objects into a tree structure and will continue to think about which attributes the questions are related to.	To identify the attributes needed to collect data about an object • I can select an attribute to separate objects into groups • I can create a group of objects within an existing group • I can arrange objects into a tree structure
3 Creating a branching database	Learners will continue to develop their understanding of ordering objects/images in a branching database structure. They will learn how to use an online database tool to arrange objects into a branching database, and will create their own	To create a branching database • I can select objects to arrange in a branching database

	questions with yes/no answers. Learners will show that their branching database works through testing.	• I can group objects using my own yes/no questions • I can test my branching database to see if it works
4 Structuring a branching database	Learners will continue to develop their understanding of how to create a well-structured database. They will use attributes to create questions with yes/no answers, and will apply these to given objects. Learners will compare the efficiency of different branching databases, and will be able to explain why questions need to be in a specific order.	To explain why it is helpful for a database to be well structured • I can create yes/no questions using given attributes • I can compare two branching database structures • I can explain that questions need to be ordered carefully to split objects into similarly sized groups
5 Planning a branching database	Learners will independently plan a branching database by creating a physical representation of one that will identify different types of dinosaur. They will continue to think about the attributes of objects to write questions with yes/no answers, which will enable them to separate a group of objects effectively. Learners will then arrange the questions and objects into a tree structure, before testing the structure.	To plan the structure of a branching database • I can independently create questions to use in a branching database • I can create questions that will enable objects to be uniquely identified • I can create a physical version of a branching database
6 Making a dinosaur identifier	Learners will independently create a branching database to identify different types of dinosaur, based on the paper-based version that they created in Lesson 5. They will then work with a partner to test that their database works, before considering real-world applications for branching databases.	To independently create an identification tool • I can create a branching database that reflects my plan • I can work with a partner to test my identification tool

		• I can suggest real-world uses for branching databases

YEAR 3 MEDIUM-TERM OVERVIEW

Term 5– Creating Media - Desktop Publishing

Lesson	Brief overview	Learning objectives
1. Words and pictures	In this lesson, learners will become familiar with the terms 'text' and 'images' and understand that text and images need to be used carefully to communicate messages clearly. Learners will be able to give advantages and disadvantages of using text, images, or both text and images to communicate messages effectively.	To recognise how text and images convey information • I can explain the difference between text and images • I can recognise that text and images can communicate messages clearly • I can identify the advantages and disadvantages of using text and images
2. Can you edit it?	This lesson will build on last week's lesson, in which we looked at using images and text to communicate a message effectively. In this lesson we will look at desktop publishing. Learners will think about how to make careful choices regarding font size, colour, and type in an invitation. The use of the Return, Backspace, and Shift keys will be explored and learners will be taught how to type age-appropriate punctuation marks. This will build on the typing skills learned in the Year 1 'Digital writing' unit. Learners will understand that once content has been added, it can be rearranged on the page.	To recognise that text and layout can be edited • I can change font style, size, and colours for a given purpose • I can edit text • I can explain that text can be changed to communicate more clearly
3. Great template!	Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software. The learners will	To choose appropriate page settings

	create their own magazine template, which they will add content to during the next lesson. This lesson has been designed on a laptop using Canva and this is reflected in the slides. Teachers may decide to use Canva, or other software such as Microsoft Publisher.	• I can explain what 'page orientation' means • I can recognise placeholders and say why they are important • I can create a template for a particular purpose
4. Can you add content?	In this lesson, learners will add their own content (text and images) to the magazine templates they created in lesson 3. They will copy the information for the front of their magazine from a prewritten document and paste it into the chosen place on their magazine cover. Images will be added from within the search facility in Canva.	To add content to a desktop publishing publication • I can choose the best locations for my content • I can paste text and images to create a magazine cover • I can make changes to content after I've added it
5. Lay it out	In this lesson, learners will think about the different ways information can be laid out on a page. They will look at a range of page layouts such as letters and newspapers, and begin to think about the purpose of each of these.	To consider how different layouts can suit different purposes • I can identify different layouts • I can match a layout to a purpose • I can choose a suitable layout for a given purpose
6. Why desktop publishing?	In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.	To consider the benefits of desktop publishing • I can identify the uses of desktop publishing in the real world • I can say why desktop publishing might be helpful • I can compare work made on desktop publishing to work created by hand

YEAR 3 MEDIUM-TERM OVERVIEW

Term 6 – Programming B – Events and actions in programs

Lesson	Brief overview	Learning objectives
1 Moving a sprite	In this lesson, learners will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project.	To explain how a sprite moves in an existing project • I can explain the relationship between an event and an action • I can choose which keys to use for actions and explain my choices • I can identify a way to improve a program
2 Maze movement	In this lesson, learners will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Learners will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze.	To create a program to move a sprite in four directions • I can choose a character for my project • I can choose a suitable size for a character in a maze • I can program movement
3 Drawing lines	This lesson will introduce learners to extension blocks in Scratch using the **Pen** extension. Learners will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Learners will then decide how to set up their project every time it is run.	To adapt a program to a new context • I can use a programming extension • I can consider the real world when making design choices • I can choose blocks to set up my program

4 Adding features	In this lesson, learners will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness.	To develop my program by adding features • I can identify additional features (from a given set of blocks) • I can choose suitable keys to turn on additional features • I can build more sequences of commands to make my design work
5 Debugging movement	This lesson explores the process of debugging, specifically looking at how to identify and fix errors in a program. Learners will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Learners will also develop their projects by considering which new setup blocks to use.	To identify and fix bugs in a program • I can test a program against a given design • I can match a piece of code to an outcome • I can modify a program using a design
6 Making a project	In this lesson, learners will design and create their own projects. Using a template (which can be blank or partially completed), learners will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.	To design and create a maze-based challenge • I can make design choices and justify them • I can implement my design • I can evaluate my project

YEAR 4 MEDIUM-TERM OVERVIEW

Term 1 – Computing Systems and networks – The Internet

Lesson	Brief overview	Learning objectives
1 Connecting networks	Learners will explore how a network can share messages with another network to form the internet. They will consider some of the network devices involved in this, such as routers, and will also discuss what should be kept in and out of a network to keep safe.	To describe how networks physically connect to other networks • I can describe the internet as a network of networks • I can demonstrate how information is shared across the internet • I can discuss why a network needs protecting
2 What is the internet made of?	Learners will describe the parts of a network and how they connect to each other to form the internet. They will use this understanding to help explain how the internet lets us view the World Wide Web and recognise that the World Wide Web is part of the internet which contains websites and web pages.	To recognise how networked devices make up the internet • I can describe networked devices and how they connect • I can explain that the internet is used to provide many services • I can recognise that the World Wide Web contains websites and web pages
3 Sharing information	Learners will explore what can be shared on the World Wide Web and where websites are stored. They will also explore how the World Wide Web can be accessed on a variety of devices.	To outline how websites can be shared via the World Wide Web (WWW)

		• I can explain the types of media that can be shared on the WWW • I can describe where websites are stored when uploaded to the WWW • I can describe how to access websites on the WWW
4 What is a website?	Learners will analyse a website and identify the key parts. They will then consider what content can be added to websites and what factors they should consider before adding content to a website. Finally, they will use a website which enables them to create their own content online.	To describe how content can be added and accessed on the World Wide Web (WWW) • I can explain what media can be found on websites • I can recognise that I can add content to the WWW • I can explain that internet services can be used to create content online
5 Who owns the web?	Learners will explore who owns the content on the World Wide Web (or 'web' for short). They will explore a variety of websites and will investigate what they can and cannot do with the content on them. They will also relate this to principles of ownership and sharing in the real world.	To recognise how the content of the WWW is created by people • I can explain that websites and their content are created by people • I can suggest who owns the content on websites • I can explain that there are rules to protect content

6 Can I believe what I read?	Learners will gain an appreciation of the fact that not everything they see on the internet is true, honest, or accurate. They will review images and decide whether or not they are real, before looking at why web searches can return ambiguous (and sometimes misleading) results. Finally, learners will complete a practical activity, demonstrating how quickly information can spread beyond their control.	To evaluate the consequences of unreliable content • I can explain that not everything on the World Wide Web is true • I can explain why some information I find online may not be honest, accurate, or legal • I can explain why I need to think carefully before I share or reshare content

YEAR 4 MEDIUM-TERM OVERVIEW

Term 2 – Creating Media – Audio Production

Lesson	Brief overview	Learning objectives
1. Recording sound	In this lesson, learners will identify the input devices used to record sound and output devices needed to listen to it. They will then record their voices using a computer, and reflect on what makes a good audio recording. Lastly, learners will consider ownership and copyright issues related to recordings.	To identify that sound can be recorded • I can identify the input and output devices used to record and play sound • I can use a computer to record audio • I can explain that the person who records the sound can say who is allowed to use it

2. Editing audio	In this lesson, learners will record and re-record their voices to improve their recordings. They will edit the recordings, removing long pauses and mistakes. Learners will also listen to a range of podcasts and identify the features of a podcast.	To explain that audio recordings can be edited • I can re-record my voice to improve my recording • I can inspect the soundwave view to know where to trim my recording • I can discuss what sounds can be added to a podcast
3. Planning a podcast	In this lesson, learners will record their voices and then import and align sound effects to create layers in their recordings. Learners will learn how to save their work so it remains editable. They will then plan their own podcast which they will work on in future lessons.	To recognise the different parts of creating a podcast project • I can explain how sounds can be combined to make a podcast more engaging • I can save my project so the different parts remain editable • I can plan appropriate content for a podcast
4. Creating a podcast	In this lesson, learners will record the voice tracks for their podcast. They will review their recordings and re-record if necessary. Learners will edit, trim, and align their voice recordings, and then save their project so they can continue working on it in the next lesson.	To apply audio editing skills independently • I can record content following my plan • I can review the quality of my recordings • I can improve my voice recordings
5. Combining audio	In this lesson, learners will develop their podcast further by adding content such as sound effects and background music. The audio will be layered with their existing voice recordings and exported as an audio file.	To combine audio to enhance my podcast project • I can open my project to continue working on it

		• I can arrange multiple sounds to create the effect I want • I can explain the difference between saving a project and exporting an audio file
6. Evaluating podcasts	In this lesson, learners will evaluate their own podcasts and that of others. After looking at the evaluation, learners will decide if they can improve their podcast and then make any changes they have chosen.	To evaluate the effective use of audio • I can listen to an audio recording to identify its strengths • I can suggest improvements to an audio recording • I can choose appropriate edits to improve my podcast

YEAR 4 MEDIUM-TERM OVERVIEW

Term 3 – Programming A – Repetition in shapes

Lesson	Brief overview	Learning objectives
1 Programming a screen turtle	This lesson will introduce pupils to programming in Logo. Logo is a text-based programming language where pupils type commands that are then drawn on screen. Pupils will learn the basic Logo commands, and will use their knowledge of them to read and write code.	To identify that accuracy in programming is important • I can program a computer by typing commands • I can explain the effect of changing a value of a command • I can create a code snippet for a given purpose

2 Programming letters	In this lesson, pupils will create algorithms (a precise set of ordered instructions, which can be turned into code) for their initials. They will then implement these algorithms by writing them in Logo commands to draw the letter. They will debug their code by finding and fixing any errors that they spot.	To create a program in a text-based language • I can use a template to draw what I want my program to do • I can write an algorithm to produce a given outcome • I can test my algorithm in a text-based language
3 Patterns and repeats	In this lesson, pupils will first look at examples of patterns in everyday life. They will recognise where numbers, shapes, and symbols are repeated, and how many times repeats occur. They will create algorithms for drawing a square, using the same annotated diagram as in Lesson 2. They will use this algorithm to program a square the 'long' way, and recognise the repeated pattern within a square. Once they know the repeated pattern, they will use the `repeat` command within Logo to program squares the 'short' way.	To explain what 'repeat' means • I can identify repetition in everyday tasks • I can identify patterns in a sequence • I can use a count-controlled loop to produce a given outcome
4 Using loops to create shapes	In this lesson, pupils will work with count-controlled loops in a range of contexts. First, they will think about a real-life example, then they will move on to using count-controlled loops in regular 2D shapes. They will trace code to predict which shapes will be drawn, and they will modify existing code by changing values within the code snippet.	To modify a count-controlled loop to produce a given outcome • I can identify the effect of changing the number of times a task is repeated • I can predict the outcome of a program containing a count-controlled loop • I can choose which values to change in a loop

5 Breaking things down	In this lesson, pupils will focus on decomposition. They will break down everyday tasks into smaller parts and think about how code snippets can be broken down to make them easier to plan and work with. They will learn to create, name, and call procedures in Logo, which are code snippets that can be reused in their programming.	To decompose a task into small steps • I can identify 'chunks' of actions in the real world • I can use a procedure in a program • I can explain that a computer can repeatedly call a procedure
6 Creating a program	In the final lesson, pupils will apply the skills that they have learnt in this unit to create a program containing a count-controlled loop. Over the course of the lesson, they will design wrapping paper using more than one shape, which they will create with a program that uses count-controlled loops. They will begin by creating the algorithm, either as an annotated sketch, or as a sketch and algorithm, and then implement it as code. They will debug their work throughout, and evaluate their programs against the original brief.	To create a program that uses count-controlled loops to produce a given outcome • I can design a program that includes count-controlled loops • I can make use of my design to write a program • I can develop my program by debugging it

YEAR 4 MEDIUM-TERM OVERVIEW

Term 4 – Data and Information – Data Logging

Lesson	Brief overview	Learning objectives
1 Answering questions	Learners will consider what data can be collected and how it is collected. They will think about data being collected over time. Learners will also think about questions that can and can't be answered using available data, and reflect on the importance of collecting the right data to answer questions.	To explain that data gathered over time can be used to answer questions • I can choose a data set to answer a given question

		• I can suggest questions that can be answered using a given data set • I can identify data that can be gathered over time
2 Data collection	Learners will build on the idea of collecting data over time, and be introduced to the idea of collecting data automatically using computers such as data loggers. They will also be introduced to the concept that computers can capture data from the physical world using input devices called 'sensors'. Learners will establish that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer.	To use a digital device to collect data automatically • I can explain what data can be collected using sensors • I can use data from a sensor to answer a given question • I can identify that data from sensors can be recorded
3 Logging	Learners will explore how data loggers work. They will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Learners will use data loggers away from a computer, then they will connect the loggers to a computer and download the data.	To explain that a data logger collects 'data points' from sensors over time • I can recognise that a data logger collects data at given points • I can identify the intervals used to collect data • I can talk about the data that I have captured
4 Analysing data	Learners will open an existing data file and use software to find out key information. They will analyse a data file which shows hot water cooling over time.	To recognise how a computer can help us analyse data • I can view data at different levels of detail • I can sort data to find information

		• I can explain that there are different ways to view data
5 Data for answers	Learners will think about questions that can be answered using collected data. They will choose a question to focus on and then plan the data logging process that they need to complete. After learners have completed their plan, they will set up the data loggers to check that their plan will work. This setting up is designed to ensure that the data collection will work, and that learners will have data to use in the next lesson.	To identify the data needed to answer questions • I can propose a question that can be answered using logged data • I can plan how to collect data using a data logger • I can use a data logger to collect data
6 Answering my question	Learners will access and review the data that they have collected using a data logger. They will then use the data collected to answer the question that they selected in the previous lesson. Learners will also reflect on the benefits of using a data logger.	To use data from sensors to answer questions • I can interpret data that has been collected using a data logger • I can draw conclusions from the data that I have collected • I can explain the benefits of using a data logger

YEAR 4 MEDIUM-TERM OVERVIEW

Term 5 – Creating Media – Photo Editing

Lesson	Brief overview	Learning objectives

1 Changing digital images	In this lesson, you will introduce learners to the concept of editing images. They will go on to explore when we need to rotate and crop an image as well as how to use an image editor to make these changes. Learners will then discuss image composition.	To explain that the composition of digital images can be changed • I can improve an image by rotating it • I can explain why I might crop an image • I can use photo editing software to crop an image
2 Recolouring	In this lesson, learners will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the images using different effects to suit two different scenarios.	To explain that colours can be changed in digital images • I can explain that different colour effects make you think and feel different things • I can experiment with different colour effects • I can explain why I chose certain colour effects
3 Cloning	In this lesson, learners will be introduced to the cloning tool and its use in both changing the composition of a photo and photo retouching. They will see how parts of a photo can be removed or duplicated using cloning. Learners will consider what parts of an image can be retouched and learn techniques to make this as unnoticeable as possible. Finally, they will consider when it is necessary to edit photographs in this way.	To explain how cloning can be used in photo editing • I can add to the composition of an image by cloning • I can identify how a photo edit can be improved • I can remove parts of an image using cloning

4 Combining	In this lesson, students learn how to use different tools to select areas of an image. Learners then use copy and paste within one image and between two images to produce a combined image. Finally, learners will consider when it's appropriate to edit an image and discuss some of the ethics around retouching photos.	To explain that images can be combined • I can experiment with tools to select and copy part of an image • I can use a range of tools to copy between images • I can explain why photos might be edited
5 Creating	In this lesson, learners will apply all the skills they have learnt in the unit so far. They will start by reviewing some images and considering what makes an image look real or made up. Learners will then plan their own image. They will choose from a selection of images, open them and edit them to create their own project.	To combine images for a purpose • I can describe the image I want to create • I can choose suitable images for my project • I can create a project that is a combination of other images
6 Evaluating	This lesson is the final lesson in the unit on photo editing. Learners will review the image that they created in Lesson 5. After they have reviewed their image, they will have the opportunity to make changes to their image based on their review. Learners will then add text to their image to complete it as a publication.	To evaluate how changes can improve an image • I can review images against a given criteria • I can use feedback to guide making changes • I can combine text and my image to complete the project

YEAR 4 MEDIUM-TERM OVERVIEW

Term 6 – Programming B – Repetition in Games

Lesson	Brief overview	Learning objectives
1 Using loops to create shapes	In the first lesson, learners look at real-life examples of repetition, and identify which parts of instructions are repeated. Learners then use Scratch, a block-based programming environment, to create shapes using count-controlled loops. They consider what the different values in each loop signify, then use existing code to modify and create new code, and work on reading code and predicting what the output will be once the code is run.	To develop the use of count-controlled loops in a different programming environment • I can list an everyday task as a set of instructions including repetition • I can predict the outcome of a snippet of code • I can modify a snippet of code to create a given outcome
2 Different loops	In this lesson, learners look at different types of loops: infinite loops and count-controlled loops. They practise using these within Scratch and think about which might be more suitable for different purposes.	To explain that in programming there are infinite loops and count-controlled loops • I can modify loops to produce a given outcome • I can choose when to use a count-controlled and an infinite loop • I can recognise that some programming languages enable more than one process to be run at once
3 Animate your name	In this lesson, learners create designs for an animation of the letters in their names. The animation uses repetition to change the costume (appearance) of the sprite. The letter sprites will all animate together when the **event** block (**green flag**) is clicked. When they have designed their animations, the learners will program them in Scratch. After programming, learners then evaluate their work, considering how effectively they used repetition in their code.	To develop a design that includes two or more loops which run at the same time • I can choose which action will be repeated for each object • I can explain what the outcome of the repeated action should be • I can evaluate the effectiveness of the repeated sequences used in my program

4 Modifying a game	In this lesson, learners look at an existing game and match parts of the game with the design. They make changes to a sprite in the existing game to match the design. They then look at a completed design, and implement the remaining changes in the Scratch game. They add a sprite, re-use and modify code blocks within loops, and explain the changes made.	To modify an infinite loop in a given program • I can identify which parts of a loop can be changed • I can explain the effect of my changes • I can re-use existing code snippets on new sprites
5 Designing a game	In this lesson, learners look at a model project that uses repetition. They then design their own games based on the model project, producing designs and algorithms for sprites in the game. They share these designs with a partner and have time to make any changes to their design as required.	To design a project that includes repetition • I can evaluate the use of repetition in a project • I can select key parts of a given project to use in my own design • I can develop my own design explaining what my project will do
6 Creating your games	In this lesson, learners build their games, using the designs they created in Lesson 5. They follow their algorithms, fix mistakes, and refine designs in their work as they build. They evaluate their work once it is completed, and showcase their games at the end.	To create a project that includes repetition • I can refine the algorithm in my design • I can build a program that follows my design • I can evaluate the steps I followed when building my project

YEAR 5 MEDIUM-TERM OVERVIEW

Term 1 – Computing Systems and Networks – Systems and Searching

Lesson	Brief overview	Learning objectives
1 Systems	Learners are introduced to the concept of a system. They begin to understand that components can work together to perform a task. Finally, learners explore how digital systems can work and learn about physical and electronic connections.	To explain that computers can be connected together to form systems • I can explain that systems are built using a number of parts • I can describe the input, process, and output of a digital system • I can explain that computer systems communicate with other devices
2 Computer systems and us	Learners consider how larger computer systems work. They see how devices and processes are connected, and reflect on how computer systems can help them.	To recognise the role of computer systems in our lives • I can identify tasks that are managed by computer systems • I can identify the human elements of a computer system • I can explain the benefits of a given computer system
3 Searching the web	Learners are introduced to a range of search engines. They are given the opportunity to explain how to search, before they write and test instructions. Next, they learn that searches do not always return the results that someone is looking for, and refine their searches accordingly. Finally, learners are introduced to the two most common methods of searching: using a search engine and using the address bar.	To identify how to use a search engine • I can make use of a web search to find specific information • I can refine my web search • I can compare results from different search engines

4 Selecting search results	Learners gain an understanding of why search engines are necessary to help them find things on the World Wide Web. They conduct their own searches and break down, in detail, the steps needed to find things on the web. Learners then emulate web crawlers to create an index of their own classroom. Finally, they consider why some searches return more results than others.	To describe how search engines select results • I can explain why we need tools to find things online • I can recognise the role of web crawlers in creating an index • I can relate a search term to the search engine's index
5 How search results are ranked	Learners take part in an unplugged activity to find out about how a webpage's content can influence where it is ranked in search results. In groups, learners create paper-based webpages on a topic that they are familiar with. They then discover how their webpages would rank when searching for keywords relating to their content.	To explain how search results are ranked • I can order a list by rank • I can explain that a search engine follows rules to rank results • I can give examples of criteria used by search engines to rank results
6 How are searches influenced?	Learners explore how someone performing a web search can influence the results that are returned, and how content creators can optimise their sites for searching. They also explore some of the limitations of searching and discuss what cannot be searched.	To recognise why the order of results is important, and to whom • I can describe some of the ways that search results can be influenced • I can recognise some of the limitations of search engines • I can explain how search engines make money

YEAR 5 MEDIUM-TERM OVERVIEW

Term 2 – Creating Media – Video Production

Lesson	Brief overview	Learning objectives

1 What is video?	Learners will be introduced to video as a media format. They will see examples of videos featuring production and editing techniques that they will work towards using their own videos. Learners will begin by explaining what the medium of video is before analysing and comparing examples of videos.	To explain what makes a video effective • I can explain that video is a visual media format • I can identify features of videos • I can compare features in different videos
2 Filming techniques	Learners will explore the capabilities of a digital device that can be used to record video. Once they are familiar with their device, learners will experiment with different camera angles, considering how different camera angles can be used for different purposes.	To use a digital device to record video • I can identify and find features on a digital video recording device • I can experiment with different camera angles • I can make use of a microphone
3 Using a storyboard	Learners will use a storyboard to explore a variety of filming techniques, some of which they will use in their own video project later in the unit. They will evaluate the effectiveness of these techniques before offering feedback on others' work.	To capture video using a range of techniques • I can suggest filming techniques for a given purpose • I can capture video using a range of filming techniques • I can review how effective my video is
4 Planning a video	Learners will plan a video by creating a storyboard. Their storyboard will describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of their videos.	To create a storyboard • I can outline the scenes of my video • I can decide which filming techniques I will use • I can create and save video content
5 Importing and editing	Learners will film the remaining scenes of their video, and then import their	To identify that video can be improved

video	content to video editing software. They will then explore key editing techniques and decide whether sections of their video can be edited or need to be shot again.	through reshooting and editing • I can store, retrieve, and export my recording to a computer • I can explain how to improve a video by reshooting and editing • I can select the correct tools to make edits to my video
6 Video evaluation	Learners will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others.	To consider the impact of the choices made when making and sharing a video • I can make edits to my video and improve the final outcome • I can recognise that my choices when making a video will impact the quality of the final outcome • I can evaluate my video and share my opinions

YEAR 5 MEDIUM-TERM OVERVIEW

Term 3 – Programming A – Selection in Physical Computing

Lesson	Brief overview	Learning objectives
1 Connecting Crumbles	In this lesson, your learners will become familiar with the Crumble controller and the programming environment used to control it. Learners will connect a Sparkle to a Crumble and then program the Crumble to make the Sparkle flash	To control a simple circuit connected to a computer • I can create a simple circuit and connect it to a microcontroller

	different colour patterns. Learners will also use infinite loops, which were introduced to the learners in the previous school year.	• I can program a microcontroller to make an LED switch on • I can explain what an infinite loop does
2 Combining output components	In this lesson, learners will connect a Sparkle and a motor to the Crumble controller. Learners will design sequences of actions for these components. They will then apply their understanding of repetition by using count-controlled loops when implementing their design as a program.	To write a program that includes count-controlled loops • I can connect more than one output component to a microcontroller • I can use a count-controlled loop to control outputs • I can design sequences that use count-controlled loops
3 Controlling with conditions	In this lesson, learners will be introduced to conditions, and how they can be used in programs to control their flow. They will identify conditions in statements, stating if they are true or false. Learners will be introduced to a Crumble switch, and learn how it can provide the Crumble controller with an input that can be used as a condition. They will explore how to write programs that use an input as a condition.	To explain that a loop can stop when a condition is met • I can explain that a condition is either true or false • I can design a conditional loop • I can program a microcontroller to respond to an input
4 Starting with selection	In this lesson, learners will develop their understanding of how the flow of actions in algorithms and programs can be controlled by conditions. They will be introduced to selection and then represent conditions and actions using the 'if…then…' structure. Learners will create algorithms that include selection. They will use their algorithms to guide their program writing. Learners will see that infinite repetition is required to repeatedly check if a condition has been met.	To explain that a loop can be used to repeatedly check whether a condition has been met • I can explain that a condition being met can start an action • I can identify a condition and an action in my project

		• I can use selection (an 'if…then…' statement) to direct the flow of a program
5 Drawing designs	In this lesson, learners will apply their understanding of microcontrollers and selection when designing a project to meet the requirements of a given task. To support their understanding, learners will identify how selection might be used in real-world situations, then they will consider how they can apply this knowledge to design their project. Learners will produce design sketches to show how their model will be made and how they will connect the microcontroller to its components.	To design a physical project that includes selection • I can identify a real-world example of a condition starting an action • I can describe what my project will do • I can create a detailed drawing of my project
6 Writing and testing algorithms	In this final lesson of the unit, learners will develop Crumble programs to control the model of a fairground ride they built in Lesson 5. First, learners will identify how they are going to use selection before writing an algorithm to meet the requirements of the given task. They will then implement their algorithms as code. Learners will run their programs to identify any bugs, and then return to the code or algorithm to debug it where necessary. Finally, to conclude the unit, learners will evaluate their designs.	To create a program that controls a physical computing project • I can write an algorithm that describes what my model will do • I can use selection to produce an intended outcome • I can test and debug my project

YEAR 5 MEDIUM-TERM OVERVIEW

Term 4 – Data Information – Flat-file Databases

Lesson	Brief overview	Learning objectives

1. Creating a paper-based database	In this lesson, learners will create a paper version of a record card database. Using a card template, they will create a data set, with each learner creating eight to ten cards linked to a theme, e.g. animals. They will complete records for each of the animals in their database and then they will physically sort the cards to answer questions about the data.	To use a form to record information • I can create a database using cards • I can explain how information can be recorded • I can order, sort, and group my data cards
2. Computer databases	In this lesson, learners will use a computer-based database to examine how data can be recorded and viewed. They will learn that a database consists of 'records', and that each record contains 'fields'. In addition, they will order records in different ways and compare this database to the paper database they created in Lesson 1.	To compare paper and computer-based databases • I can explain what a field and a record is in a database • I can navigate a flat-file database to compare different views of information • I can choose which field to sort data by to answer a given question
3. Using a database	In this lesson, learners will investigate how records can be grouped, using both the paper record cards created in Lesson 1 and a computer-based database from J2E. They will use 'grouping' and 'sorting' to answer questions about the data.	To outline how you can answer questions by grouping and then sorting data • I can explain that data can be grouped using chosen values • I can group information using a database • I can combine grouping and sorting to answer specific questions
4. Using search tools	In this lesson, learners will develop their search techniques to answer questions about the data. They will use advanced techniques to search for more than one	To explain that tools can be used to select

	field, and will practise doing this through both unplugged methods (without using computers), and using a computer database.	specific data • I can choose which field and value are required to answer a given question • I can outline how 'AND' and 'OR' can be used to refine data selection • I can choose multiple criteria to answer a given question
5. Comparing data visually	In this lesson, learners will consider what makes a useful chart, and how charts can be used to compare data. They will create charts from their data in order to answer questions about it.	To explain that computer programs can be used to compare data visually • I can select an appropriate chart to visually compare data • I can refine a chart by selecting a particular filter • I can explain the benefits of using a computer to create charts
6. Databases in real life	The final lesson requires learners to use a real-life database to ask questions and find answers in the context of a flight search based on set parameters. They will take on the role of a travel agent and present their findings, showing how they arrived at their chosen options. Presentations may be given between groups of learners, or by each group to the whole class, depending on the time available.	To use a real-world database to answer questions • I can ask questions that will need more than one field to answer • I can refine a search in a real-world context • I can present my findings to a group

YEAR 5 MEDIUM-TERM OVERVIEW

Term 5 – Creating Media – Introduction to Vector Graphics

Lesson	Brief overview	Learning objectives
1 The drawing tools	Learners are introduced to vector drawings and begin to understand that they are made up of simple shapes and lines. They use the main drawing tools within the Google Drawings application to create their own vector drawings. Learners discuss how vector drawings differ from paper-based drawings.	To identify that drawing tools can be used to produce different outcomes • I can recognise that vector drawings are made using shapes • I can experiment with the shape and line tools • I can discuss how vector drawings are different from paper-based drawings
2 Creating images	Learners begin to identify the shapes that are used to make vector drawings. They are able to explain that each element of a vector drawing is called an object. Learners create their own vector drawing by moving, resizing, rotating, and changing the colours of a selection of objects. They also learn how to duplicate the objects to save time.	To create a vector drawing by combining shapes • I can identify the shapes used to make a vector drawing • I can explain that each element added to a vector drawing is an object • I can move, resize, and rotate objects I have duplicated
3 Making effective drawings	Learners increase the complexity of their vector drawings and use the zoom tool to add detail to their work. They are shown how grids and resize handles can improve the consistency of their drawings. Learners also use tools to modify objects to create a new image.	To use tools to achieve a desired effect • I can use the zoom tool to help me add detail to my drawings • I can explain how alignment grids and resize handles can be used to improve consistency • I can modify objects to create a new

		image
4 Layers and objects	Learners gain an understanding of layers and how they are used in vector drawings. They discover that each object is built on a new layer and that these layers can be moved forwards and backwards to create effective vector drawings.	To recognise that vector drawings consist of layers • I can identify that each added object creates a new layer in the drawing • I can change the order of layers in a vector drawing • I can use layering to create an image
5 Manipulating objects	Learners find out how to select and duplicate multiple objects at a single time. They develop this skill further by learning how to group multiple objects to make them easier to work with. Learners then use this knowledge to group and ungroup objects, in order to make changes to and develop their vector drawings.	To group objects to make them easier to work with • I can copy part of a drawing by duplicating several objects • I can recognise when I need to group and ungroup objects • I can reuse a group of objects to further develop my vector drawing
6 Create a vector drawing	Learners use the skills they have gained in this unit to create a vector drawing for a specific purpose. They reflect on the skills they have used to create the vector drawing and think about why they used the skills they did. Learners then begin to compare vector drawings to freehand paint program drawings.	To apply what I have learned about vector drawings • I can create a vector drawing for a specific purpose • I can reflect on the skills I have used and why I have used them • I can compare vector drawings to freehand paint drawings

YEAR 5 MEDIUM-TERM OVERVIEW

Term 6 – Programming B – Selection in quizzes

Lesson	Brief overview	Learning objectives
Exploring conditions	In this lesson, learners revisit previous learning on 'selection' and identify how 'conditions' are used to control the flow of actions in a program. They are introduced to the blocks for using conditions in programs using the Scratch programming environment. They modify the conditions in an existing program and identify the impact this has.	To explain how selection is used in computer programs • I can recall how conditions are used in selection • I can identify conditions in a program • I can modify a condition in a program
Selecting outcomes	In this lesson, learners will develop their understanding of selection by using the 'if… then… else...' structure in algorithms and programs. They will revisit the need to use repetition in selection to ensure that conditions are repeatedly checked. They identify the two outcomes in given programs and how the condition informs which outcome will be selected. Learners use this knowledge to write their own programs that use selection with two outcomes.	To relate that a conditional statement connects a condition to an outcome • I can use selection in an infinite loop to check a condition • I can identify the condition and outcomes in an 'if… then… else…' statement • I can create a program that uses selection to produce different outcomes
Asking questions	In this lesson, learners consider how the 'if… then... else…' structure can be used to identify two responses to a binary question (one with a 'yes or no' answer). They identify that the answer to the question is the 'condition', and use algorithms with a branching structure to represent the actions that will be carried	To explain how selection directs the flow of a program

	out if the condition is true or false. They learn how questions can be asked in Scratch, and how the answer, supplied by the user, is used in the condition to control the outcomes. They use an algorithm to design a program that uses selection to direct the flow of the program based on the answer provided. They implement their algorithm as a program and test whether both outcomes can be achieved.	• I can explain that program flow can branch according to a condition • I can design the flow of a program that contains 'if… then… else…' • I can show that a condition can direct program flow in one of two ways
Designing a quiz	In this lesson, learners will be provided with a task: to use selection to control the outcomes in an interactive quiz. They will outline the requirements of the task and use an algorithm to show how they will use selection in the quiz to control the outcomes based on the answer given. Learners will complete their designs by using design templates to identify the questions that will be asked, and the outcomes for both correct and incorrect answers. To demonstrate their understanding of how they are using selection to control the flow of the program, learners will identify which outcomes will be selected based on given responses.	To design a program that uses selection • I can outline a given task • I can use a design format to outline my project • I can identify the outcome of user input in an algorithm
Testing a quiz	In this lesson, learners will use the Scratch programming environment to implement the first section of their algorithm as a program. They will run the first section of their program to test whether they have correctly used selection to control the outcomes, and debug their program if required. They will then continue implementing their algorithm as a program. Once completed, they will consider the value of sharing their program with others so that they can receive feedback. Learners conclude the lesson by using another learner's quiz and providing feedback on it.	To create a program that uses selection • I can implement my algorithm to create the first section of my program • I can test my program • I can share my program with others
Evaluating a quiz	In this lesson, learners will return to their completed programs and identify ways in which the program can be improved. They will focus on issues where answers similar to those in the condition are given as inputs, and identify ways to avoid	To evaluate my program • I can identify ways the program could be improved

	such problems. Learners will also consider how the outcomes may change the program for subsequent users, and identify how they can make use of 'setup' to provide all users with the same experience. They will implement their identified improvements by returning to the Scratch programming environment and adding to their programs. They conclude the unit by identifying how they met the requirements of the given task, and identifying the aspects of the program that worked well, those they improved, and areas that could improve further.	• I can identify the setup code I need in my program • I can extend my program further

YEAR 6 MEDIUM-TERM OVERVIEW

Term 1 - Computing Systems and Networks – Communication and Collaboration

Lesson	Brief overview	Learning objectives
L1 Internet addresses	Learners explore what is necessary for effective communication and the importance of agreed protocols. They apply this understanding to IP addresses and the rules (protocols) that computers have for communicating with one another. Learners also use a Domain Name Server (DNS) to translate web addresses into IP addresses.	To explain the importance of internet addresses • I can recognise that data is transferred using agreed methods • I can explain that internet devices have addresses • I can describe how computers use addresses to access websites
L2 Data packets	Learners are introduced to the concept of packets. They complete an activity based on transferring an image across the internet, to see that as well as messages (text), other types of data (images, video, and audio) are also transferred over the internet. They gain an understanding of the key parts of a packet: the header and the data payload.	To recognise how data is transferred across the internet • I can identify and explain the main parts of a data packet • I can explain that data is transferred over networks in packets • I can explain that all data transferred over the internet is in packets
L3 Working together	Learners consider how people can work together when they are not in the same location. They discuss ways of working and complete a collaborative online project. The online activity assumes that learners can make simple slides, including text and images. If your	To explain how sharing information online can help people to work together • I can recognise how to access shared files stored online

	learners are unsure how to do this, you may wish to spend some time on the Year 3 – 'Desktop publishing' unit before this lesson.	• I can send information over the internet in different ways • I can explain that the internet allows different media to be shared
L4 Shared working	Learners are introduced to another approach to online working: reusing and modifying work done by someone else. (**Note:** Using someone else's work needs to be within the bounds of copyright and with the relevant permissions.) This lesson involves the Scratch programming tool, which allows learners to use other people's work.	To evaluate different ways of working together online • I can identify different ways of working together online • I can recognise that working together on the internet can be public or private • I can explain how the internet enables effective collaboration
L5 How we communicate	Learners deepen their understanding of the term 'communication'. They explore different methods of communication, before they consider internet-based communication in more detail. Finally, learners evaluate which methods of communication suit particular purposes.	To recognise how we communicate using technology • I can explain the different ways in which people communicate • I can identify that there are a variety of ways to communicate over the internet • I can choose methods of communication to suit particular purposes
L6 Communicating responsibly	Learners use information provided in the lesson and their own prior knowledge to categorise different forms of internet communication. They then choose which method(s) they would use for the scenarios discussed in the previous lesson. Through these activities, learners explore issues around privacy and information security.	To evaluate different methods of online communication • I can compare different methods of communicating on the internet • I can decide when I should and should not share information online • I can explain that communication on the internet may not be private

YEAR 6 MEDIUM-TERM OVERVIEW

Term 2 – Creating Media – Web Page Creation

Lesson	Brief overview	Learning objectives
1 What makes a good website?	In this lesson, learners will explore and review existing websites and evaluate their content. They will have some understanding that websites are created by using HTML code.	To review an existing website and consider its structure • I can explore a website • I can discuss the different types of media used on websites • I know that websites are written in HTML
2 How would you lay out your web page?	Learners will look at the different layout features available in Google Sites and plan their own web page on paper. **Homework:** Learners will look at two of their favourite websites and sketch them on the worksheet provided, detailing the similarities and differences. **Note:** For the homework activity, teachers could provide printed 'home page' images for anyone who doesn't have internet access at home.	To plan the features of a web page • I can recognise the common features of a web page • I can suggest media to include on my page • I can draw a web page layout that suits my purpose
3 Copyright or copyWRONG?	During this lesson learners will become familiar with the terms 'fair use' and 'copyright'. They will gain an understanding of why they should only use copyright-free images and will find appropriate images to use in their work from suggested sources.	To consider the ownership and use of images (copyright) • I can say why I should use copyright-free images • I can find copyright-free images

	Homework: Learners answer a series of questions based on copyright and fair use.	• I can describe what is meant by the term 'fair use'
4 How does it look?	Today learners will revise how to create their own web page in Google Sites. Using their plan from previous lessons, learners will create their own web page/home page. They will preview their web page as it will appear on different devices and suggest or make edits to improve the user experience on each device.	To recognise the need to preview pages • I can add content to my own web page • I can preview what my web page looks like • I can evaluate what my web page looks like on different devices and suggest/make edits.
5 Follow the breadcrumbs	During this lesson learners will begin to appreciate the need to plan the structure of a website carefully. They will plan their website, paying attention to the navigation paths (the way that pages are linked together). They will then create multiple web pages for their site and use hyperlinks to link them together as detailed in their planning.	To outline the need for a navigation path • I can explain what a navigation path is • I can describe why navigation paths are useful • I can make multiple web pages and link them using hyperlinks
6 Think before you link!	Learners will consider the implications of linking to content owned by other people and create hyperlinks on their own websites that link to other people's work. They will then evaluate the user experience when using their own website and that of another learner.	To recognise the implications of linking to content owned by other people • I can explain the implication of linking to content owned by others • I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website

YEAR 6 MEDIUM-TERM OVERVIEW

Term 3 – Programming A – Variables in games

Lesson	Brief overview	Learning objectives

1 Introducing variables	Learners are introduced to variables. They see examples of real-world variables (score and time in a football match) before they explore them in a Scratch project. Learners then design and make their own project that includes variables. Finally, learners identify that variables are named and that they can be letters (strings) as well as numbers.	To define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way a variable changes can be defined • I can identify that variables can hold numbers or letters
2 Variables in programming	Learners understand that variables are used in programs, and that they can only hold a single value at a time. They complete an unplugged task that demonstrates the process of changing variables. Then, learners explore why it is important to name variables and apply their learning in a Scratch project in which they make, name, and update variables.	To explain why a variable is used in a program • I can identify a program variable as a placeholder in memory for a single value • I can explain that a variable has a name and a value • I can recognise that the value of a variable can be changed
3 Improving a game	Learners apply the concept of variables to enhance an existing game in Scratch. They predict the outcome of changing the same `change score` block in different parts of a program, then they test their predictions in Scratch. Learners also experiment with using different values in variables, and with using a variable elsewhere in a program. Finally, they add comments to their project to explain how they have met the objectives of the lesson.	To choose how to improve a game by using variables • I can decide where in a program to change a variable • I can make use of an event in a program to set a variable • I can recognise that the value of a variable can be used by a program

4 Designing a game	Learners work at the 'design' level of abstraction, where they create their artwork and algorithms. Learners first design the sprites and backgrounds for their project, then they design their algorithms to create their program flow.	To design a project that builds on a given example • I can choose the artwork for my project • I can create algorithms for my project • I can explain my design choices
5 Design to code	Learners implement the algorithms that they created in Lesson 4. In doing this, they identify variables in an unfamiliar project and learn the importance of naming variables. They also have the opportunity to add another variable to enhance their project.	To use my design to create a project • I can create the artwork for my project • I can choose a name that identifies the role of a variable • I can test the code that I have written
6 Improving and sharing	Learners build on the project that they created in Lesson 5. They consider how they could improve their own projects and make small changes to achieve this. Learners then have the opportunity to add a variable independently. Finally, learners evaluate each other's projects; they identify features that they liked and features that could be improved.	To evaluate my project • I can identify ways that my game could be improved • I can use variables to extend my game • I can share my game with others

YEAR 6 MEDIUM-TERM OVERVIEW

Term 4 – Data and Information – Introduction to Spreadsheets

Lesson	Brief overview	Learning objectives

1 Collecting data	Learners will collect and organise data in a format of their choice. They will then explore how data can be structured in a table. Finally they will input data into a spreadsheet.	To create a data set in a spreadsheet • I can collect data • I can suggest how to structure my data • I can enter data into a spreadsheet
2 Formatting a spreadsheet	Learners will develop their understanding of the structure of a spreadsheet. They will be introduced to cell references, data items and the concept of formatting cells. Learners will see data items formatted in different ways, they will then choose formats for data items before applying formats in their own spreadsheet.	To build a data set in a spreadsheet • I can explain what an item of data is • I can choose an appropriate format for a cell • I can apply an appropriate format to a cell
3 What's the formula?	Learners will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). Learners will create formulas to use in a spreadsheet using cell references and identify that changing inputs will change the output of the calculation.	To explain that formulas can be used to produce calculated data • I can explain which data types can be used in calculations • I can construct a formula in a spreadsheet • I can identify that changing inputs changes outputs

4 Calculate and duplicate	Learners will calculate data using the operations of multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. Learners will then begin to understand the importance of creating formulas that include a range of cells and the advantage of duplicating in order to apply formulas to multiple cells.	To apply formulas to data • I can calculate data using different operations • I can create a formula which includes a range of cells • I can apply a formula to multiple cells by duplicating it
5 Event planning	Learners will plan and calculate the cost of an event using a spreadsheet. They will use a predefined list to choose what they would like to include in their event, and use their spreadsheet to answer questions on the data they have selected. Learners will be reminded of the importance of organising data and will then create a spreadsheet using formulas to work out costs for their event.	To create a spreadsheet to plan an event • I can use a spreadsheet to answer questions • I can explain why data should be organised • I can apply a formula to calculate the data I need to answer questions
6 Presenting data	Learners will gain skills to create charts in Google Sheets. They will evaluate the results from their charts to answer questions. Finally, learners will show they understand that there are different software tools available within spreadsheet applications to present data.	To choose suitable ways to present data • I can produce a chart • I can use a chart to show the answer to a question • I can suggest when to use a table or chart

YEAR 6 MEDIUM-TERM OVERVIEW

Term 5 – Creating Media – 3D Modelling

Lesson	Brief overview	Learning objectives
1 Introduction to 3D modelling	Learners will be introduced to the concept of 3D modelling by creating a range of 3D shapes that they select and move. Learners also examine shapes from a variety of views within the 3D space.	To recognise that you can work in three dimensions on a computer • I can add 3D shapes to a project • I can view 3D shapes from different perspectives • I can move 3D shapes relative to one another
2 Modifying 3D objects	Learners will manipulate 3D objects digitally. They will resize objects in one, two, and three dimensions. They will also lift and lower 3D objects relative to the workplane, and combine two 3D objects to make a new shape. Finally learners will recolour 3D objects.	To identify that digital 3D objects can be modified • I can resize an object in three dimensions • I can lift/lower 3D objects • I can recolour a 3D object
3 Make your own name badge	Learners will develop their understanding of manipulating digital 3D objects. They will rotate objects in three dimensions, duplicate objects, and then use grouping and ungrouping to manipulate many objects at once. They will combine these skills to create their own 3D name badge. Finally, learners will consider the practicality of 3D printing the objects they have made.	To recognise that objects can be combined in a 3D model • I can rotate objects in three dimensions • I can duplicate 3D objects • I can group 3D objects
4 Making a desk tidy	Learners will be introduced to the dimensions of shapes in Tinkercad which will enable them to accurately resize and move shapes. Learners will then be	To create a 3D model for a given purpose

	introduced to placeholders which can be used to create holes in objects. Finally learners will duplicate, then resize multiple objects to create a meaningful 3D object.	• I can accurately size 3D objects • I can show that placeholders can create holes in 3D objects • I can combine a number of 3D objects
5 Planning a 3D model	Learners will see how computer-based 3D design is used in architecture to plan buildings. They will explode 3D models of buildings to see what shapes they comprise of. Learners will then look at real world structures and identify the shapes that they include. They will then plan their own 3D building design.	To plan my own 3D model • I can analyse a 3D model • I can choose objects to use in a 3D model • I can combine objects in a design
6 Make your own 3D model	Learners will create a computer 3D model based on their design. They will then evaluate their model and that of another learner, before modifying their own model to improve it.	To create my own digital 3D model • I can construct a 3D model based on a design • I can explain how my 3D model could be improved • I can modify my 3D model to improve it

YEAR 6 MEDIUM-TERM OVERVIEW

Term 6 – Programming B – Sensing Movement

Lesson	Brief overview	Learning objectives

1 The micro:bit	Pupils will be introduced to the micro:bit as an input, process, output device that can be programmed. Pupils will familiarise themselves with the device itself and the programming environment, before creating their own programs. They will then run their programs on the device. **Note:** This unit is written assuming that you will be using a desktop or laptop computer (not a tablet) to connect micro:bits.	To create a program to run on a controllable device • I can apply my knowledge of programming to a new environment • I can test my program on an emulator • I can transfer my program to a controllable device
2 Go with the flow	Pupils will explore how if, then, else statements are used to direct the flow of a program. They will initially relate if, then, else statements to real-world situations, before creating programs in MakeCode. They will apply their knowledge of if, then, else statements to create a program that features selection influenced by a random number to create a micro:bit fortune teller project.	To explain that selection can control the flow of a program • I can identify examples of conditions in the real world • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection
3 Sensing inputs	Pupils will initially use the buttons to change the value of a variable using selection. They will then develop their programs to update the variable by moving their micro:bit using the accelerometer to sense motion. Finally, they will learn that a variable's value remains the same after it has been checked by the program.	To update a variable with a user input • I can use a condition to change a variable • I can experiment with different physical inputs • I can explain that checking a variable doesn't change its value

4 Finding your way	Pupils will apply their understanding of the importance of order in programs. They will then use operands in selection to determine the flow of a program. Pupils will then modify a program which will enable the micro:bit to be used as a navigational device. To code this, they will adapt the code they completed to make a basic compass.	To use an conditional statement to compare a variable to a value • I can use an operand (e.g. <>=) in an if, then statement • I can explain the importance of the order of conditions in else, if statements • I can modify a program to achieve a different outcome
5 Designing a step counter	Pupils will be working at the design level. They will pick out features of a step counter, a piece of technology with which they are likely to be familiar. They will then relate those features to the sensors on a micro:bit. In the main activity, pupils will design the algorithm and program flow for their step counter project.	To design a project that uses inputs and outputs on a controllable device • I can decide what variables to include in a project • I can design the algorithm for my project • I can design the program flow for my project
6 Making a step counter	Pupils will use the design that they have created in Lesson 5 to make a micro:bit-based step counter. First they will review their plans, followed by creating their code. Pupils will test and debug their code, using the emulator and then the physical device. To successfully complete this project, Pupils will need to demonstrate their understanding of all the programming lessons they've had so far.	To develop a program to use inputs and outputs on a controllable device • I can create a program based on my design • I can test my program against my design • I can use a range of approaches to find and fix bugs

Computing Progression Map

Computing Progression of Skills linked to TeachComputing Scheme and National Curriculum

National Curriculum Objectives

By the end of KS2 pupil 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.

National Curriculum		Year 3	Year 4	Year 5	Year 6
Programming	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems	• Create a sequence of commands using a block language to produce a given outcome • Debug errors to accomplish specific goal	• Plan a program using a block language which includes appropriate loops to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal	• Plan a program which includes selection to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal	• Plan a program which includes variables to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal

	Solve problems by decomposing them into smaller parts	• Work with others to decompose a problem into smaller steps in planning a project	• Independently decompose a problem into smaller steps in planning a project	• Plan a solution to a problem using decomposition	• Solve problems using decomposition, tackling each part separately
	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	• Explain the order (sequence) of commands can effect the outcome (same commands, different order -> same or different outcome) Identify different sequences can achieve • the same outcome	• Identify patterns (repetition) in a sequence • Understand repetition in programming is also called looping Identify a loop in a program • Understand, identify • and justify when to use 'infinite' or 'count-controlled' loops Explain the importance in instruction order in a • loop	• Define that conditional statements (selection) are used in computer programs Explain a loop can stop when a condition is met (number of times or • event) Explain a that program flow can branch according to a condition Use a condition in an • *if…then…* statement to produce a given outcome •	• Define 'variable' as something that is changeable Explain • that a variable has a name and a value Identify a variable • in an existing program Use a variable in a conditional statement • to control the flow of a program

	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	• Explain simple, sequence-based algorithm independently • Use logical reasoning to detect errors in programs	• Explain an algorithm using sequence and repetition independently • Use logical reasoning to detect and correct errors in programs	• Explain an algorithm using sequence, repetition and selection independently • Use logical reasoning to detect errors in increasingly complex programs	• Clearly and concisely explain algorithms using sequence, repetition, selection and variables independently • Use logical reasoning to detect errors in increasingly complex programs

National Curriculum			Year 3	Year 4	Year 5	Year 6
Information Technology	Digital Research	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	• Search for information in a single site • Understand that search engines select pages according to keywords found in the content	• Use a standard search engine to find information • Understand that search engines rank pages according to relevance.	• Use filters to make more effective use of a standard search engine • Understand that search engines use a cached copy of the crawled web to select and rank results	• Use of a range of search engines appropriate to finding information that is required • Understand that search engines rank pages based on the number

						and quality of inbound links

	Creating Digital Content	Text	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	• Combine text and images to share a message Consider • how different layouts can suit different purposes Type with • increased confidence and speed using age appropriate punctuation Use return to create • paragraphs Change orientation of • text Wrap text around an • image Recognise a document can be • formatted with placeholders	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	• Recognise components of a webpage layout • Create a webpage including text, images, hyperlinks and embedded content • Understand the need for a navigation path

		Images		• Change orientation of images	• Use a computer to (further) manipulate images Recognise images • can be changed for different purposes Use the most appropriate tool • for a particular purpose Consider the impact of changes • made on the quality of the image	• Recognise an image is comprised of separate objects • Add, remove, modify and combine objects to create graphical drawing on a computer Recognise • objects are layered Recognise that objects • can be modified in groups Consider the impact of choices • made	• Create 3D graphical objects on a computer • Alter the view of a 3D space • Modify 3D objects • Combine 3D objects to create desired effect • Apply blank 3D objects as placeholders to create holes
		Multimedia		• Understand animation is a sequence of drawings or photographs Relate animated movement with a • sequence of images Plan an animation Review and improve an animation Evaluate the • impact of adding other media to an animation •	• Press/tap buttons to start and stop recordings • Recognise recorded audio is stored as a file Edit and alter • recorded audio Layer sounds • Save/export an audio file Consider • the results of editing choices made	• Identify the features of a good video • Plan a video production using a story board • Use a computer to make a video • Recognise a video can be improved through editing • Consider the impact of changes made on the quality of the video	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 5

	Data Handling	Collecting, analysing, evaluating and presenting data and information	• Identify object attributes needed to collect relevant data • Create a branching database • Identify objects using a branching database • Compare information shown in a pictogram with a branching database • Explain that data can be used to answer questions	• Collect data using a digital device • Recognise that a sensor can be used as an input device for data collection • Use a larger data set to find information • Use a computer program to sort data by one attribute • Export information and present data in a table and a graph	• Use a form to collect information • Navigate a flat-file database • Apply knowledge of a database to ask and answer real-world questions • Design a structure for a flat-file database • Choose tools to select and analyse data to answer questions • Select an appropriate graph to visually compare data • Choose suitable ways to present information	• Identify questions that can be answered using data • Create a spreadsheet for a purpose • Apply a formula that can be used to produce calculated data • Recognise data can be calculated using different operations • Evaluate results in comparison to the question asked • Choose suitable ways to presents data

National Curriculum		Year 3	Year 4	Year 5	Year 6
	Online Safety	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a	Online safety week focus Online safety referenced throughout. PSHE links		

Digital Literacy		range of ways to report concerns about content and contact.				
	Computing Systems and Networks	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	• Explain how a computer network can be used to share information • Explore how digital devices can be connected • Recognise the physical components of a network • Explain how digital devices function • Identify input and output devices	• Describe how networks physically connect to other networks • Recognise how networked devices make up the internet • Describe how content can be added and accessed on the World Wide Web • Recognise how the content of the WWW is created and shared by people • Describe the current limitations of World Wide Web media	• Explain that computers can be connected together to form systems • Recognise the role of computer systems in our lives • Recognise how information is transferred over the internet • Explain how sharing information online lets people in different places work together • Contribute to a shared project online • Evaluate different ways of working together online	Continue to develop online searching skills to enhance online communication and collaboration

Vocabulary for each year group:

Year 3

Computing systems and networks - Connecting computers

digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets

Creating Media - Desktop publishing

text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.

Creating Media – Stop-frame animation

animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.

Data and Information - Branching databases

attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.

Programming A - Sequencing sounds

Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.

Programming B - Events and actions in programs

motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.

Year 4

Computing systems and networks - Connecting computers - The internet

internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts

Creating Media - Audio production

audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.

Creating Media - Photo editing

image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom,

Data and Information - Data logging

data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.

Programming A - Repetition in shapes

Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.

Programming B - Repetition in games

Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.

Year 5

Computing systems and networks - systems and searching

system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.

Creating Media - Introduction to vector graphics

vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection

Creating Media – Video production

video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.

Data and Information - Flat-file databases

database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.

Programming A - Selection in physical computing

microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer

Programming B - Making Quizzes

Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator

Year 6

Computing systems and networks - Communication and collaboration

communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.

Creating media - Webpage creation

website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.

Creating Media 3D Modelling

TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.

Data and Information - Introduction to spreadsheets

data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Programming - Variables in games

variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare

Programming - Sensing movement

Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.

End of Unit Summative Assessment:

Units which have a practical element are assessed using the Teach Computing Rubrics such as the one below:

Assessment rubric: Year 6 – Sensing

Learner:		**Teacher:**		**Date:**	

	Emerging [1]	**Expected [2]**	**Exceeding [3]**	**Score**
Task	• Describe the purpose of the project, for example, to create a project that shows how many steps someone has walked	• Describe what will be shown if someone has walked more than a set number of steps	• Describe a variety of responses based on the number of steps walked	
Design	• Identify how a user will be shown how many steps they've walked • Create an algorithm to describe how the program will record a step	• Identify what will be displayed and how the user will see it • Choose an appropriate name for a variable • Choose when and where to set a variable • Create an algorithm to describe how the program will process each input	• Relate the use of selection within the algorithm to other real-world systems	
Code	• Choose from a scaffolded set of blocks to implement their algorithm	• Combine appropriate blocks to implement their algorithm	• Explain why they have chosen to implement their algorithm in that way	
Running the code	• Run their code on the device • Identify if the program doesn't work as they expected it to	• Run their code on the emulator to test their program • Propose a strategy to fix the code if it is not working	• Discuss the limitations of the emulator when testing code • Explain to others about any bugs that were found and how they were fixed	
Evaluation	• Identify elements of the task that have been achieved	• Evaluate how successful they were in meeting the task requirements	• Identify how and why their project could be enhanced	
Teacher feedback				

Most units are assessed using an end of unit quiz as a form of summative assessment such as the one below:

Knowledge Organisers:

Key Vocabulary:

Crumble Controller
A small circuit board.

USB
A mechanism used to connect devices to computers

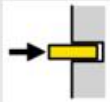
Component
A part of a machine or a device

Loop
A sequence of instructions that is continually repeated

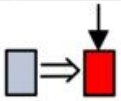
LED
Light Emitting Diode which lights up when electricity passes through

Crocodile Clips
A metal clip use for creating a temporary electrical connection

Input
A place where, or a device through which, energy or information enters a system.



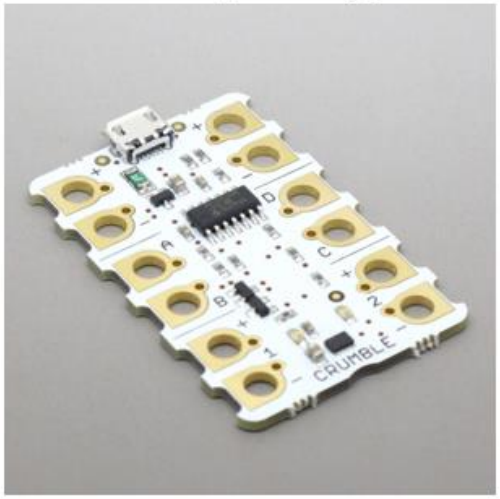
Output
A place where, or a device through which, energy or information exits a system.



Circuit board
A thin rigid board containing an electric circuit.

Term 4

Programming A – Selection in Physical Computing



Learning Journey:

Scratch programming – Year 3

Data loggers – Year 4

Micro-bits – Year 6

Sticky Knowledge:

What is an infinite loop?
An infinite loop is a sequence of instructions in a computer program which loops endlessly, either due to the loop having no terminating condition, having one that can never be met, or one that causes the loop to start over.

What are count-controlled loops?
A count-controlled loop is so called because it uses a counter. to keep track of how many times the algorithm has iterated.

What are 'conditions' and are they true or false?
Conditions are basic "if, then" logic statements that modify how code is executed. Conditions are a key part of the decision-making process for computers and are always true or false.

How can I use an 'if....then....' statement?
This tells the computer what to do and when to do it. In programming, a great example of a condition is a password. Passwords are "if, then" logic statements: If a user enters the correct password, then they can access the program.