Knowledge Progression - Computing

Inspire Academy

Year Group	Nursery
Term	Autumn 1 & 2
Unit(s)	Inspire Unit – Basic iPad Skills
Objectives	**Key Knowledge and Vocabulary**
Children will become familiar with how to use the iPad and how to use a small selection of simple apps e.g. the camera app and simple games such as Cbeebies and Geoboard. • *Communication and language* • *Personal, social and emotional development* • *Understanding the world*	**Context for study:** This unit will be the children's first ever Computing unit in school. They may have used an **iPad** at home. **Knowledge content:** Know the name '**iPad**' Know that an **iPad** has to be **charged** in order to work Know that an **iPad** is a piece of **technology** Know that we must handle the **iPad** carefully, using two hands, walking slowly and placing it down gently once finished Know that only one child at a time should use the **iPad** Know that we need to press the **home button** to start up the **iPad** Know that iPads are **touchscreen** and that we need to use our finger to navigate between screens and use **apps** Know that we use the **camera app** if we would like to take a **photograph** and how to open this **app** Know which button to press to capture a **photograph**

Year Group	Nursery
Term	Spring 1
Unit(s)	Inspire Unit - Digital Music
Objectives	**Key Knowledge and Vocabulary**
Children will choose songs for a party playlist then be involved in playing, pausing, rewinding, fast forwarding and changing the volume, using the interactive whiteboard with adult support. • *Communication and language* • *Personal, social and emotional development* • *Understanding the world* • *Expressive arts and design* *Cross-curricular opportunities – music from around the world could be included to link in with Geography.*	**Context for study:** Children will have gained experience using touchscreen technology in the prior Nursery unit. This unit will be the first unit where children gain experience in controlling the **interactive whiteboard**. **Knowledge content:** Know that an **interactive whiteboard** is another piece of **technology**, like an **iPad** Know that an **interactive whiteboard** includes **touchscreen** controls, like an **iPad** Know that only one child at a time should be controlling the **interactive whiteboard** Know what the '**play**' symbol looks like and understand that this will start the music video Know what the '**pause**' symbol looks like and understand that this will stop the music wherever it is at Know that **volume** means how **loud / quiet** something is and that we can control it on the screen Know that the **forwards** and **backwards** symbols allow for **fast forwarding / rewinding** within **videos**

Year Group	Nursery
Term	Spring 2
Unit(s)	Inspire Unit - Voice Recording
Objectives	**Key Knowledge and Vocabulary**
Children will use a recordable microphone to record one spoken sentence each, learning how to operate the record and play buttons. They will then listen back to a recording at a time and try to work out which of their friends is speaking. • *Communication and language* • *Personal, social and emotional development* • *Understanding the world* *Cross-curricular opportunities - the sentence children say could be linked to current learning e.g. one fact they have remembered about something in the current topic.*	**Context for study:** This unit will be the first unit where children are involved in recording their own content, using a simple recordable **microphone**. It will integrate one of the most important prime objectives of the Nursery curriculum; Listening and Attention. The children will have been exposed to the '**play**' symbol in the Digital Music unit, and will now be able to use this knowledge to **play** their own recorded content on the **microphone**. **Knowledge content:** Know that a **microphone** is another piece of **technology**, like an **iPad** and **interactive whiteboard** Know that when we press the '**record**' button on the **microphone** it is ready to **record** sound, and that we must press it again when we are finished Know that when recording content, we need to speak **loud** and clear and the background noise should be **quiet** Know that only one child at a time should speak into the **microphone** Know that the '**play**' button will allow us to listen back to the recording

Knowledge Progression - Computing

Year Group	Nursery
Term	Summer 1
Unit(s)	Inspire Unit - Digital Reading
Objectives	**Key Knowledge and Vocabulary**
Children will use the Cbeebies app to access an e-book, learning how to navigate through the book and adjust the volume. They can listen to it with or without headphones and discuss which option works best and why. • *Communication and language* • *Understanding the world* • *Literacy*	**Context for study:** This unit will build on the Basic iPad Skills unit where children became familiar with the **iPad**. The children will have gained experience of the **forwards** and **backwards** symbols being used for **fast forwarding** and **rewinding** within **videos** in the Digital Music unit, but will now become familiar with these symbols in a new context; being able to move **forwards** and **backwards** through the pages of an **e-book**. The children will have learnt what **volume** means and how it can be changed on the **interactive whiteboard** in the Digital Music unit, and will now learn how to adjust the **volume** on the **iPad.** **Knowledge content:** Know that an **e-book** is a book we can look at on the **iPad** or other technological device e.g. a **computer** / **interactive whiteboard** Know how to move **forwards** and **backwards** through the pages Know that **volume** means how **loud / quiet** something is and how to adjust **volume** using the side buttons on the **iPad** Know that we can use **headphones** when we would like to listen to something in a noisy environment

Inspire Academy

Year Group	Nursery
Term	Summer 2
Unit(s)	Inspire Unit – Digital Pictures
Objectives	Key Knowledge and Vocabulary
Children will learn how to select and drag pre-drawn images onto a background scene on J2E Paint. They will also have the opportunity to explore online mark making using a mouse. • *Communication and language* • *Personal, social and emotional development* • *Physical development*	**Context for study:** This unit will be the first unit where children learn how to use the desktop **computers**, navigating independently with the **mouse**. Most children will have had experience of using the **computers** with support during continuous provision time or at home, but ability levels / exposure will be varied. **Knowledge content:** Know that a **computer** is another piece of **technology**, like an **iPad, interactive whiteboard** and **microphone** **Know** that a **computer** does not run on **touchscreen technology** Know that a computer has a **keyboard** for typing and a **mouse** for controlling things on screen Know that the direction the mouse is moved, determines the movement of the pointer on screen Know that clicking and holding down the left-hand button of the **mouse**, allows items on screen to be **dragged** and moved

Year Group	Reception
Term	Autumn 1 & 2
Unit(s)	Inspire Unit - Recording content
Objectives	**Key Knowledge and Vocabulary**
Children will learn how to take a photograph on the camera app of the iPad, ensuring they have the full picture in frame, and holding it steady to ensure the photograph is not blurred. They will also learn how to record a video. Once secure with this, children will learn how to take photographs and videos of their independent learning in the provision through the Seesaw app, recording captions to explain what they have done / learnt. • *Communication and language* • *Understanding the world*	**Context for study:** Children who have been at our school Nursery will have had experience of using **iPads** and the **camera app,** as well as recording audio using a recordable **microphone**. This unit will build on that knowledge with the children learning how to record content (**photographs, videos** and **audio captions**) using the **Seesaw** app. Children who have not attended our Nursery may need additional support. **Knowledge content:** Know the name '**iPad**' Know that the **iPad** has to be **charged** in order to work Know that an **iPad** is a piece of **technology** Know that we must handle the **iPad** carefully, using two hands, walking slowly and placing it down gently Know that we need to press the **home button** to start up the **iPad** Know that we need to use our finger to navigate between screens and open **apps** Know that we use the **camera app** if we would like to take a photograph / record a video and how to open this **app** Know which button to press to capture a **photograph** or **record** a **video** Know that we need to hold the **iPad** steady to ensure our **photograph** is not **blurred** Know that we need to move the **iPad** around until the item / person we would like to **photograph** is in **frame** Know that the **camera app** can be used to **scan QR codes** and know how to do this Know how to open the **Seesaw** app Know how to take a **photograph** or **video** through **Seesaw** Know how to **record** a **caption** to go alongside a **photograph** or **video** recorded through **Seesaw** Know that only one person at a time should speak on the **caption** and that their voice needs to be **loud** and clear Know how to tag a name onto a **Seesaw** recording Know how to **save** content recorded on **Seesaw**

Year Group	Reception
Term	Spring 1
Unit(s)	Inspire Unit - Programming Remote-Controlled Technology
Objectives	Key Knowledge and Vocabulary
Children will learn that a direction is the way in which something moves. They will learn how to use the forwards, backwards, left and right controls on a remote-controlled car to direct it from a set starting point to a set end point. • *Communication and language* • *Maths* • *Understanding the world* *Cross-curricular opportunities – the route of the car could be linked to current learning e.g. navigating it to a certain country on a floor map.*	**Context for study:** Children who have been at our school Nursery will have experienced the terms **forwards** and **backwards** in relation to navigating their way through **e-books** in Digital Reading, and for **fast forwarding** and **rewinding** in Digital Music. This will be built upon during this unit to include **left** and **right** so children can control the journey of a **remote-controlled car**. The children will have talked about the concept of **charging** when working on the Basic **iPad** Skills unit in Nursery so should understand the concept that the cars and remotes need charging after each use if we want to use them again. Children who have not attended our Nursery may need additional support with this unit. **Knowledge content:** Know that a **remote-controlled car** is another piece of **technology** like an **iPad, computer, interactive whiteboard** and **microphone** Know that the cars and **remotes** must be **charged** in order to work Know that the buttons pressed on the **remote** give an **instruction** to the car, telling it which **direction** to move Know how to use the **forwards, backwards, left** and **right controls** to move the car Know that **reverse** is another term for the car moving **backwards** Know that if they make a wrong turn, they can **fix / correct** their **mistake** by **reversing** and trying again

Year Group	Reception
Term	Spring 2
Unit(s)	Inspire Unit - Digital Art
Objectives	Key Knowledge and Vocabulary
Children will learn how to create a simple picture using J2E Paint, learning how to change the thickness and colour of the paintbrush tool. • *Physical Development* • *Understanding the World* • *Expressive Arts and Design* *Cross-curricular opportunities – the piece of art can be linked to the current focus book / learning in class*	**Context for study:** Children who have been at our school Nursery will have used **J2E Paint** before, creating a scaffolded online picture, where they **dragged** pre-drawn images with their **mouse** onto a background scene. This unit will build on that knowledge, extending children to be able to create their own picture using the **paintbrush tool**. **Knowledge content:** Know that we can create art **online** using **technology**, as well as creating art in real life Know how to use the **mouse** to **drag** the **paintbrush tool** across the **screen** to make marks Know how to use the **mouse** to change the colour of the paint Know how to use the **mouse** to change the thickness of the **paintbrush tool** Know that the **eraser tool** allows us to rub out work we no longer need Know that we can **print** or **save** our work to refer back to at a later time

Year Group	Reception
Term	Summer 1
Unit(s)	Inspire Unit - Programming Robots
Objectives	Key Knowledge and Vocabulary
Children will learn how to programme the robot to reach a set end point. They will gain experience in debugging when having to clear the Bee-bot before reprogramming. They will also be given the opportunity to freely explore the Bee-bots as part of their continuous provision. • *Communication and language* • *Personal, social and emotional development* • *Maths* • *Understanding the world* *Cross-curricular opportunities – the route of the Bee-bot could be linked to current learning e.g. navigating it to a certain country on a floor map.*	**Context for study:** The children will have gained experience with programming in Spring 1 when using the **remote-controlled cars**. They will have come across the vocabulary for **instruction, direction, forwards, backwards, left and right**. **Knowledge content:** Know that a **Bee-bot** is another piece of technology, like a **phone, iPad, computer, interactive whiteboard, microphone** and **remote-controlled car** Know that the **Bee-bots** must be **charged** in order to work Know that the pressing the buttons gives an **instruction** to the **Bee-bot**, telling it which **direction** to move Know how to make the **Bee-bot** move **forwards** and **backwards** Know how to make the **Bee-bot** do a **quarter turn** Know that if a mistake is made, the **clear** button can be pressed and we can try again Know that we must press the **clear** button before inputting a new **instruction**, or the **Bee-bot** will **repeat** the previous **instruction** as well

Year Group	Reception
Term	Summer 2
Unit(s)	Inspire Unit – Basic Laptop Skills
Objectives	**Key Knowledge and Vocabulary**

Children will learn what a laptop is and how to look after it. They will gain experience in logging on, opening Microsoft Word and typing a simple sentence.   Children will not be expected to open Microsoft Word independently or save their own work at this point but we can model and talk about what we are doing and why.
 	
    • Communication and language
    • Physical development
    • Literacy
    • Understanding the world
 	
Cross-curricular opportunities – the sentence being typed could be linked to current learning e.g. writing one fact about something recently learned in the current topic.
	<u>Context for study:</u>
	The children will have used desktop computers in the Nursery unit 'Digital Pictures' and the Reception unit 'Digital Art', as well as in their continuous provision time. This is the first time they will be using laptops.
	
	<u>Knowledge content:</u>
	Know that a **laptop** is a type of **computer**
	Know that a **laptop** is different to a desktop **computer** because it is **portable** and can be moved around
	Know that a **laptop** must be **charged** in order for it to work
	Know that we must handle the **laptops** extremely carefully, placing them down gently and opening the **screen** correctly
	Know how to type in our class **username** and **password** in order to **log in**
	Know that we can use **computers / laptops** to write online, as well as writing in real life with pen and paper
	Know that if we are writing online, we call it **typing**
	Know that we use the **keyboard** to **type**
	Know that the buttons on the **keyboard** are called **keys**
	Know that **laptops** have a **mouse pad** instead of a separate **mouse** and this **mouse pad** controls the pointer in the same way
	Know that the **screen** is the area of the computer / laptop that displays what we are seeing
	Know how to **type** a sentence, using the **space bar** for finger spaces and the **full stop key**

Year Group	Year 1
Term	Autumn 1 and 2
Unit(s)	NCCE Teach Computing Unit – Programming: Moving a Robot
	Inspire Unit – Extension on Programming and Online Safety (Permissions)

Objectives	Key Knowledge and Vocabulary
Children will learn how to create a clear and precise algorithm to programme a Bee-bot to take a specific route. They will also learn how to debug when needed. • *Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions* • *Create and debug simple programs* • *Use logical reasoning to predict the behaviour of simple programs* • *Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies* *Cross-curricular opportunities – the routes planned for the Bee-bots could be linked to a Year 1 Geography unit.*	**Context for study:** Children will have had experience in creating simple programs for **Bee-bots** in Reception and should know the purpose of the different buttons. This unit will extend their knowledge in understanding what an **algorithm** is and the importance of creating **clear** and **precise algorithms**. **Knowledge content:** Know that a **command** is an **instruction** that we give to a **device** Know that an **outcome** is what the **device** does when it receives a certain **command** Know the **directions forwards, backwards, left, right, and quarter turn** and how to programme these **directions** into a **Bee-bot** Know that an **algorithm** is a list of **clear, precise and ordered instructions** Know that if the **algorithm** is not **clear, precise and ordered**, it will cause a **bug** Know that a **bug** in the context of Computing is a problem / mistake Know that **debugging** means we are solving the problem / fixing the mistake Know that there are different ways to solve a problem / fix a mistake Know that a **route** is a way of getting from one place to another Know when I need **permission** to do something **online** and why this is important **NOTE:** **To allow flexibility for transitioning the children from EYFS into KS1, and for any time needed for Christmas events, the below weeks can be covered at any time across Autumn 1 and Autumn 2** **Week 1 – unplugged lesson on algorithms – teacher planned** **Week 2-7 – NCCE Teach Computing Unit** **Week 8 – a lesson programming on the Bee-bot app on iPads** **Week 9 – Online Safety – Project Evolve – Online Relationships: Permission**

Year Group	Year 1
Term	Spring 1
Unit(s)	NCCE Teach Computing Unit – Computing Systems & Networks: Technology Around Us (inc Online Safety themes of Copyright & Ownership / Privacy & Security / Health, Wellbeing & Lifestyle)
Objectives	Key Knowledge and Vocabulary
Children will develop their mouse pad and typing skills by independently logging in, drawing and typing within a simple painting app and saving and opening documents. They will learn about how we can stay safe and healthy when using technology. • *Use technology purposefully to create, organise, store, manipulate and retrieve digital content* • *Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies* *Cross-curricular opportunities - the work created in this unit could link to any Year 1 topic.*	<u>**Context for study:**</u> Children will have had access to a desktop **computer** with a **mouse** during their Nursery and Reception years, and will have completed one unit on basic **laptop** skills in Reception. This will give children their first opportunity to **open** and **save documents** independently and will allow them to develop their ability to use a **mouse pad** as opposed to a physical **mouse**. <u>**Knowledge content:**</u> Know that **technology** helps us to do things and be able to name different **technologies** we use in school Know that a **laptop** is a type of **computer** Know that a **laptop** must be **charged** in order for it to work Know that we must handle the **laptops** extremely carefully, placing them down gently and opening the **screen** correctly Know how to type in our **username** and **password** in order to **log in** Know how to **switch on** a **laptop** and **shut down** safely Know how to place a **laptop** back onto the **trolley** safely and plug in the **charger** Know that the **mouse pad** controls the **pointer** and be able to use the **mouse pad** to complete various actions Know that to **drag** an item you hold down the **left mouse button** with one hand and use the other hand to control the **mouse pad** Know how to **open** a browser using a **double click** Know that in Computing, **tools** refer to things that help us do a specific job Know how to use the **mouse** to **drag** the **paintbrush tool** across the **screen** to make marks Know how to use the **mouse** to change the **line colour** and **line thickness** within a painting app Know how to use the **fill tool** and **text box tool** within a painting app Know that we use the **keyboard** to **type** Know that the buttons on the **keyboard** are called **keys** Know how to **type**, using the **space bar** for finger spaces, **left and right arrow keys** to navigate and **backspace key** to **delete** mistakes Know how to **save** a document Know that we must use our name when **saving** our work so others know it belongs to us Know how to **open** previously **saved** work **Know** ways in which to keep **safe** and **healthy** when using **technology**

Year Group	Year 1
Term	Spring 2
Unit(s)	NCCE Teach Computing Unit – Creating Media: Digital Painting
Objectives	Key Knowledge and Vocabulary
Children will learn how to use some new tools within a painting app to create pieces of online art in the style of various well-known artists. • *use technology purposefully to create, organise, store, manipulate and retrieve digital content* • *recognise common uses of information technology beyond school* *Cross-curricular opportunities – the Artists being looked at could be changed to match a Year 1 Art unit.*	**Context for study:** The children will have gained experience in creating online art in the Reception unit 'Digital Art' and the previous Year 1 unit 'Technology All Around Us' and will now develop their skills further, learning how to use a wider variety of tools to create different effects. **Knowledge content:** Know how to switch on, log in to, and shut down a laptop Know how to control the **mouse pad** using two hands Know how to **open** a browser using a **double click** Know how to **save** a document Know that we must use our name when **saving** our work so others know it belongs to us Know how to **open** previously **saved** work Know how to use a variety of **tools** including the **paintbrush, pencil, spray can, fill, line** and **shape tools** Know how to change the **colour** and **brush size** Know how to **delete** mistakes by using the **undo** and **eraser tools** Know that different **tools** give different **effects** and be able to choose the one that is most appropriate for the task

Year Group	Year 1
Term	Summer 1
Unit(s)	Inspire Unit – Basic Word Skills and Online Safety (kindness)
Objectives	Key Knowledge and Vocabulary
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	**Context for study:** Children will have gained experience in simple typing in the Reception unit 'Basic Laptop Skills' and the previous Year 1 unit 'Technology All Around Us' and will now develop their skills further, learning how to open and save a Word document and how to make changes to their text. This is an unplanned unit that Y1 teachers can use as a *cross-curricular unit* with one of the wider curriculum subjects e.g. History / Geography. Children need to be taught the knowledge / skills below during this term with a view to creating a **Word document** containing an **image** and some typed sentences. Online safety when using **search engines** should be covered when finding and copying an **image** from the **internet,** as well as being covered in the discrete lesson '**Online Safety – Project Evolve – Online Relationships: Kindness'**. **Knowledge content:** Know that **Microsoft Word** is a type of **word processor** but that other computers might have a different word processing programme Know how to **open Microsoft Word** Know how to **type** a sentence, using the **caps lock key** for capital letters, **space bar** for finger spaces and the **full stop key** as well as the **letter and number keys** Know that on most **keyboards**, the **letter keys** are in capital letters Know that the **letter keys** are not in alphabetical order Know how to use the **backspace key** to **delete** any mistakes Know that the **enter / return key** takes us onto the next line Know where the **toolbar** is Know how to **save** a **Word document** Know how to **retrieve** a **Word document** that has been previously saved Know that an **image** is a picture Know that to **copy** an **image** from a **search engine**, we need to right click and select **copy** Know that to **paste** that **image** into a **document**, we need to right click and select **paste** Know that children should use a child-safe **search engine** such as Swiggle Know that if children see something on the **internet** that scares or upsets them, they should tell an adult they trust

Year Group	Year 1
Term	Summer 2
Unit(s)	NCCE Teach Computing Unit – Programming: Animations
Objectives	**Key Knowledge and Vocabulary**
Children will be introduced to on-screen programming through ScratchJr. They will explore the way a project looks by investigating sprites and backgrounds and will use programming blocks to use, modify, and create programs. Children will also be introduced to the early stages of program design through the introduction of algorithms. ● Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions ● Create and debug simple programs ● Use logical reasoning to predict the behaviour of simple programs	**Context for study:** This unit progresses children's knowledge and understanding of **programming** and follows on from the **Bee-bot** units in Reception and earlier in Year 1. Children will have had some brief experience with on-screen **programming** on the **Bee-bot app** but this will be their first opportunity to use the **ScratchJr app**. **Knowledge content:** Know how to find and open the **ScratchJr app** on an **iPad** Know that the **house icon** takes you to the **home page** where new project can be created Know that to start a new project we click on the blue + circle **icon** Know that characters in **ScratchJr** are called **sprites** Know that the settings in **ScratchJr** are called **backgrounds** Know how to add a **sprite** Know how to turn / move a **sprite left, right, up** and **down** Know how to **delete** a sprite Know that more than one **sprite** can be added and **programmed** Know how to add / change a **background** Know that we use the **blocks of code** to give our **commands** Know that the **blocks of code** must be **dragged** into the **programming area** and can be deleted from here Know that **blocks of code** can be joined together to make a complete **program** Know that some **blocks of code** have numbers that can be changed Know the effect of changing a number on a **block of code** Know that **run** in the context of Computing means to **start** a **program** Know how to use a **start block** to **run** a **program** Know that **end blocks** tell you what will happen at the end of a **program** Know that an **algorithm** is a list of **clear, precise and ordered instructions** Know that if the **algorithm** is not **clear, precise and ordered**, it will cause a **bug** Know that a **bug** in the context of Computing is a problem / mistake Know that **debugging** means we are solving the problem / fixing the mistake Know that there are different ways to solve a problem / fix a mistake Know how to **predict** the **outcome** of a program

Year Group	Year 2
Term	Autumn 1
Unit(s)	NCCE Teach Computing Unit – Programming: Robot Algorithms
Objectives	Key Knowledge and Vocabulary

Children will use given commands in different orders to investigate how the order affects the outcome. They will design algorithms and then test those algorithms as programs on the Bee-bots, debugging them along the way. • *Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions* • *Create and debug simple programs* • *Use logical reasoning to predict the behaviour of simple programs* *Cross-curricular opportunities – the route the Bee-bots take could be linked to a Year 2 Geography unit.*	**Context for study:** Children will have gained experience in simple **programming** and **debugging** using a **Bee-bot** in the Reception unit 'Programming Robots' and the Year 1 unit 'Moving a Robot' and will now develop these skills to a higher level. **Knowledge content:** Know that a **command** is an **instruction** that we give to a **device** Know that an **outcome** is what the **device** does when it receives a certain **command** Know that **unambiguous** means **clear** and **precise** Know that we must give **unambiguous instructions** to a **device** for it to give the desired **outcome** Know that an **algorithm** is a list of **unambiguous instructions** Know that **sequence** means the order in which things happen Know that if the **algorithm** or the **sequence** is incorrect or **imprecise**, it will cause a **bug** Know that a **bug** in the context of Computing is a problem / mistake Know that **debugging** means we are solving the problem / fixing the mistake Know that there are different ways to solve a problem / fix a mistake Know that **Bee-bots** have **computers** inside them Know that when we give **commands** to a **Bee-bot**, its **computer** turns it into **code** Know that this set of **code** is called a **program** Know how to **predict** the **outcome** by looking at an **algorithm** Know that we must **clear** the **memory** of the **Bee-bot** before we **input** a new **algorithm** Know that a **route** is a way of getting from one place to another Know how to create a variety of programs to complete a **route** for the **Bee-bot** Know the **directions forwards, backwards, left, right, quarter turn, half turn and three-quarter turn**

Knowledge Progression - Computing

Year Group	Year 2
Term	Autumn 2
Unit(s)	NCCE Teach Computing Unit – Computing Systems & Networks: IT Around Us (inc Online Safety themes of Copyright & Ownership / Privacy & Security / Health, Wellbeing & Lifestyle / Online Relationships)
Objectives	**Key Knowledge and Vocabulary**
Children will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, how IT improves our world, and the importance of using IT responsibly. • *Recognise common uses of information technology beyond school* • *Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies*	**Context for study:** Children will have gained experience in using a variety of devices in school and at home but will now learn how information technology is integrated into the wider world. **Knowledge content:** Know the names of a number of **devices** e.g. **tablets / iPads, phones, laptops, desktop computers, Bee-bots, interactive whiteboards, TVs, printers, USB flash drives, games consoles, digital cameras / speed cameras / CCTV cameras, tills, scanners, cash machines, card machines, traffic light / crossing systems, smart watches, smart speakers** (e.g. Amazon Alexa) Know some similarities and differences between **devices** Know that **Information Technology** refers to **computers,** or **devices** that have **computers** inside them Know a variety of purposes that **IT devices** are used for Know a variety of places where **IT devices** can be found, beyond school and home Know that a **barcode** is a set of **code** that the **computer** in a **scanner** can read to find the item / price quickly Know that we must keep **passwords** safe Know that we must not share **personal information online** Know that we should always ask **permission** before taking a **photograph** of someone Know that we must be kind to people **online** Know that if someone is unkind to us **online,** we should tell someone we trust Know that it is important for our health and wellbeing that we have a **balanced digital diet**, with a variety of non-screen based activities included in our day Know that **Information Technology** has many positives but it can also have some negative effects **NOTE: As this unit falls in the Christmas term, please feel free to condense some of the lessons a little to allow time for any Christmas events**

Inspire Academy

Year Group	Year 2
Term	Spring 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: Digital Photography (inc Online Safety theme of Managing Online Information)
Objectives	Key Knowledge and Vocabulary
Children will learn to recognise that different devices can be used to capture photographs and will gain experience in capturing, editing, and improving photographs. Finally, they will use this knowledge to recognise that the images they see may not always be real. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	**Context for study:** Children will have gained experience in taking **photographs** in the Nursery unit 'Basic iPad Skills' and the Reception unit 'Recording Content' and will now develop their skills further, making creative decisions and adding **effects** to improve their **photographs**. **Knowledge content:** Know that there are different types of **images** Know that a **photograph** is an **image** that has been **captured** by a **camera** (standalone **camera** or **camera** within a **device**) Know which **devices** we can use to **capture** a **photograph** Know that we should always ask **permission** before taking a **photograph** of someone Know the difference between a **landscape** and **portrait photograph** and be able to say which is more appropriate for a given task Know that an **action shot** is a **photograph** of something that is moving Know that a **selfie** is a **photograph** that someone takes of themselves Know the **sequence** of taking a **photograph** should be **hold, look, press** Know that **field of view** refers to everything the **photographer** can see in the **frame** Know that **angle** is the position we take the **photograph** from and that changing the **angle** can improve the **photograph** Know how to **delete** a previously taken **photograph** Know the factors that determine whether a **photograph** is good or not; **positioning, framing, detail, background, focus** and **lighting** Know how to turn the **flash** on and off within the **camera app** Know that if we move the **camera** as we take a **photograph**, it will look **blurry / out of focus** Know that **photographers** use different **online tools** to **edit photographs** to improve them or change their **effect** Know how to **edit** a **photograph** to give it a **warmer or cooler tint** Know how to **save** an **edited photograph** Know that if we see an **image online** that upsets or worries us, we must tell a trusted adult Know that the **images** we see **online** will not always be real

Inspire Academy

Year Group	Year 2
Term	Spring 2
Unit(s)	NCCE Teach Computing Unit – Data & Information: Pictograms (inc Online Safety themes of Privacy & Security / Health, Wellbeing & Lifestyle / Self Image and Self Identity)
Objectives	**Key Knowledge and Vocabulary**
Children will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams, and use the data presented to answer questions. • *Use technology purposefully to create, organise, store, manipulate and retrieve digital content* • *Recognise common uses of information technology beyond school* • *Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies*	<u>Context for study:</u> Children should have some background knowledge on data and comparisons from their Maths lessons, but this will be the first time they have used software to present data online. <u>Knowledge content:</u> Know that **data** means collected information Know that **data** can be presented in different formats e.g. **tally charts, pictograms**, **block diagrams etc** Know that we can present **data** on paper or on a **computer** Know that a **pictogram** is a **chart** that uses pictures to present the **data** Know that **data** can be collected to help people make decisions e.g. favourite fruit tells us how much of which fruit to buy Know that it is often quicker and easier to present **data** using a **computer** Know how to create an **online pictogram** using **J2Data** Know that **attributes** are features of the subjects we have collected **data** on Know that organising **data** into **charts** helps us to make sense of the **data** and answer questions on it Know that we must ask someone's **permission** before sharing **data** about them Know that we shouldn't share **personal data** that should remain **private** Know that it is ok to say no if you're not sure about sharing **data**

Year Group	Year 2
Term	Summer 1
Unit(s)	Inspire Unit - PowerPoint Skills and Online Safety (online reputation)
Objectives	**Key Knowledge and Vocabulary**
Children will learn how to create and deliver a PowerPoint presentation on a subject linked to one of their wider curriculum topics. • *Use technology purposefully to create, organise, store, manipulate and retrieve digital content* • *Recognise common uses of information technology beyond school* • *Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies*	**Context for study:** Children will have gained experience in typing and editing text in Year 1 within Microsoft Word. This will be their first opportunity to use the Microsoft PowerPoint software. This is an unplanned unit that Y2 teachers can use as a *cross-curricular unit* with one of the wider curriculum subjects e.g. History / Geography. Children need to be taught the knowledge / skills below during this term with a view to creating a **PowerPoint document** containing text and images. Online safety when using **search engines** should be discussed when finding and copying an **image** from the **internet,** as well as being covered in the discrete lesson **'Online Safety – Project Evolve – Online Reputation (2 PPTs)'** **Knowledge content:** Know how to open **Microsoft PowerPoint** and create a new **document** Know that you can add new **slides** to a **document** and how to do this Know how to create **text boxes** and type into these using the **caps lock key** for capital letters, **space bar** for finger spaces and various **punctuation keys,** as well as the **letter and number keys** Know that we can **edit** text using **tools** on the **toolbar** such as **bold, italic**, **underline** and **font** Know that **double clicking** on a word will **highlight** it, ready to be **edited** Know what the **undo** symbol looks like and that clicking this will reverse the most recent change Know what the **redo** symbol looks like and that clicking this will return whatever has been undone Know how to **edit** the type, size and colour of **font** Know that a **search engine** allows us to **search** for information / content (e.g. **photos / videos**) on the **internet** Know that children should use a child-safe **search engine** such as **Swiggle** Know that to **copy** an **image** from a **search engine**, we need to right click and select **copy** Know that to **paste** that **image** into a **document**, we need to right click and select **paste** Know how to present the **PowerPoint** in **slideshow** mode Know how to **print** a copy of their **document** Know that children should use a child-safe **search engine** such as Swiggle Know that if children see something on the **internet** that scares or upsets them, they should tell an adult they trust Know who to talk to if something has been put online without consent or is incorrect Know that anyone's online information can be seen by others

Year Group	Year 2
Term	Summer 2
Unit(s)	NCCE Teach Computing – Programming: Quizzes
Objectives	Key Knowledge and Vocabulary
Children will begin to understand that sequences of commands have an outcome, and make predictions based on their learning. They will use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. Finally, they will evaluate their work and make improvements to their programming projects. • *Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions* • *Create and debug simple programs* • *Use logical reasoning to predict the behaviour of simple programs*	**Context for study:** Children will have gained experience in creating simple **programs** and **debugging** in the Reception unit 'Programming Robots', the Year 1 units 'Moving a Robot' and 'Animations' and the previous Year 2 unit 'Robot Algorithms'. **Knowledge content:** Know how to find and open the **ScratchJr app** on an **iPad** Know that the **house icon** takes you to the **home page** where new project can be created Know that to start a new project we click on the blue + circle **icon** Know that characters in **ScratchJr** are called **sprites** Know that the settings in **ScratchJr** are called **backgrounds** Know how to add, move, change and **delete sprites** and **backgrounds** Know that we use the **blocks of code** to give our **commands** Know that the **blocks of code** must be **dragged** into the **programming area** and can be deleted from here Know that **blocks of code** can be joined together to make a complete **program** Know that **sound** can be added to **programmes** in **Scratch Jr** Know that **run** in the context of Computing means to **start** a **program** Know various ways to **run** a **program** e.g. clicking on the green flag, clicking on the **sprite** etc Know that **end blocks** tell you what will happen at the end of a **program** Know that **sequence** means the order in which things happen Know that a **computer animation** is a **sequence** of moving **images** Know that an **algorithm** is a list of **clear, precise and ordered instructions** Know that if the **algorithm** is not **clear, precise and ordered**, it will cause a **bug** Know that a **bug** in the context of Computing is a problem / mistake Know that **debugging** means we are solving the problem / fixing the mistake Know that there are different ways to solve a problem / fix a mistake Know how to **predict** the **outcome** of a program Know that an **outcome** is what happens when the **programme** is **run** Know that there are different ways to reach the same **outcome** Know how to **save** a **programme** created in **Scratch Jr**

Year Group	Year 3
Term	Autumn 1
Unit(s)	NCCE Unit – Computing Systems & Networks: Connecting Computers
Objectives	**Key Knowledge and Vocabulary**
Children will develop their understanding of digital devices, with an initial focus on inputs, processes and outputs. They will then be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, children will discover the benefits of connecting devices in a network. • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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	**Context for study:** This unit progresses children's knowledge and understanding of **technology** by focusing on **digital** and **non-digital devices**, and for the first time, introduces the concept of computers connected together as a network. **Knowledge content:** Know that **digital devices** accept **inputs**, **process** those **inputs**, then produce **outputs** Know the **input, process** and **outputs** of several **digital devices** Know that **digital devices** can be used for different activities Know that **digital devices** and **non-digital devices** have different benefits for different activities Know that a **network** is a number of **connections** linking things with each other Know that a **computer network** is made up of multiple **devices** Know that a **network switch** enables multiple **devices** on a **network** to be **connected** Know the benefits of **computer networks** Know that a **server** is an important computer that **stores files** and manages the **network** Know that some **devices** in a **network** are not **connected** by **wires** and that their **connection** takes place via **wireless networking (Wi-Fi)** Know that **wireless devices connect** to the **network switch** through a **wireless access point (WAP)** Know that a **router** provides the **internet connection** Know that **wired devices** are **connected** to the **network** by a **network cable** which is plugged into a **network socket**

Year Group	Year 3
Term	Autumn 2
Unit(s)	Inspire Unit – Basic Publisher Skills and Online Safety (trust)
Objectives	Key Knowledge and Vocabulary

Children will learn new skills within Microsoft Publisher to create a newspaper article based on one of their topics, combining text and images to communicate with their audience effectively. • 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.	**Context for study:** This unit progresses learners' knowledge and understanding of using **digital devices** to **combine text** and **images**, building on work from the following units: Digital Writing Year 1, Digital Painting Year 1 and Digital Photography Year 2. This will be their first experience of working with **publishing software.** This is an unplanned unit that Y3 teachers can use as a *cross-curricular unit* with one of the wider curriculum subjects e.g. History / Geography. Children need to be taught the knowledge / skills below during this term with a view to creating a **Publisher document** containing text and images. Online safety is to be covered in the discrete lesson **'Online Safety – Project Evolve – Online Relationships: Trust'.** **Knowledge content:** Know that **text** and **images** can be combined to communicate messages effectively Know how to change the **templates** and **orientation (landscape / portrait)** within **publishing software** Know that different **layouts** have different purposes e.g. the effect of **headlines**, the benefit of writing in **columns** etc Know how to change **font style, size**, and **colours** for a given purpose using the **toolbar** Know the function of the **backspace** and **return keys** Know how to add alternative punctuation marks including question marks and exclamation marks Know how to **align text (left, right, centre, justify)** Know how to use **bullet points** and **numbering** and the benefits of using these functions Know how to **cut, copy** and **paste** using the **ctrl shortcuts (ctrl x/ ctrl c / ctrl v)** Know how to use **word art** and where it is appropriate to use this function Know how to draw a **text box** and change the **line colour** / **thickness** and the **fill colour** / **gradient** Know that **images** can be obtained from a variety of sources e.g. their own **images**, **images** found on the **internet**, **clip art** etc Know what **trust** means and why it is so important, **online** and offline Know that we must be careful when **sharing information** about myself and other people **online** **NOTE:** **As this unit falls in the Christmas term, please feel free to condense the teaching into fewer lessons to allow time for any Christmas events planned**

Year Group	Year 3
Term	Spring 1
Unit(s)	NCCE Teach Computing – Programming: Sequencing Sounds
Objectives	Key Knowledge and Vocabulary
This unit explores the concept of sequencing in programming through Scratch. Children will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. • 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 • 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	**Context for study:** This unit builds on the children's prior experience of **programming** using floor robots and **ScratchJr**. This will be their first opportunity to use the main desktop version of Scratch. **Knowledge content:** Know that the objects in **Scratch** are called **sprites** (characters) and **backdrops** (settings) Know that **commands** in **Scratch** are represented as **blocks** Know that these **commands** create a **block of code** and lead to an **outcome** e.g. the **sprite** will move Know how to create a **program** following a given design Know that **event blocks** can be used to start a project in a variety of different ways Know that **blocks of code** can be joined together to create a **sequence** Know that **sequence** means the order in which things happen Know how to combine **sound commands** Know how to combine **motion** and **sounds** in one **sequence** Know how to use **costumes** to change the appearance of a **sprite** and **backdrops** to change the appearance of the **stage** Know how to **copy code** from one **sprite** to another Know that a **program** should be tested to see if it performs as expected Know how to design and create a **program** Know how to **predict** the **outcome** from a given **sequence** Know that music can be created **online**, as well as using real-world instruments Know that **debugging** means fixing any **errors** that occur during **programming**

Year Group	Year 3
Term	Spring 2
Unit(s)	NCCE Teach Computing Unit – Creating Media: Stop-Frame Animation (inc Online Safety Themes of Managing Online Information / Copyright & Ownership)
Objectives	**Key Knowledge and Vocabulary**
Children will use a range of techniques to create a stop-frame animation using iPads. Next, they will apply those skills to create a story-based animation. This unit will conclude with children adding other types of media to their animation, such as music and 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, 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. *Cross-curricular opportunities – the characters / theme of the animations can be linked to a current topic.*	**Context for study:** This unit progresses children's knowledge and understanding of using **digital devices** to create **media**, exploring how they can create **stop-frame animations**. Following this unit, children will further develop their **video editing** skills in Year 5. **Knowledge content:** Know that an **animation** is a **sequence** of drawings or **photographs** Know that each drawing or **photograph** in an **animation** is called a **frame** Know that little changes are needed for each **frame** in an **animation** Know that when taking **photographs** for an **animation**, the **iPad** and subject must be completely still Know that **animations** can be created on paper or on-screen Know that **online animations** can be sped up / slow down Know that **animators** start by drawing a **storyboard** to set out characters, settings, events and to set the **sequence** Know that **onion skinning** allows you to see the previous **frame** faintly so you can see where to draw / change next Know how to use **onion skinning** to make small changes between **frames** Know that some things need to stay **consistent** between **frames** e.g. the background Know that **animations** can be moved from **iMotion** to **iMovie** to allow other **media** to be added Know how to add other **media** to an **animation** e.g. music, text etc Know different ways to **edit** an **animation** e.g. **deleting** unwanted **frames** Know how to **save** an **animation** to the **camera roll**

Year Group	Year 3
Term	Summer 1
Unit(s)	NCCE Teach Computing – Data & Information: Branching Databases
Objectives	**Key Knowledge and Vocabulary**

Children will develop their understanding of what a branching database is and how to create one using J2e software. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Children will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it and will consider real-world applications for branching databases.
 	
    • 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
	<u>Context for study:</u>
	This unit progresses children's knowledge and understanding of the categories of **data** handling, with a particular focus on implementation. It builds on their knowledge of **data** and information from KS1. They will continue to develop their understanding of attributes and begin to construct and interrogate **branching databases** as a means of displaying and retrieving information.
	
	<u>Knowledge content:</u>
	Know that **attributes** are features of the subjects we have collected **data** on
	Know that **branching databases** require a selection of yes/no questions based on the subjects' **attributes**
	Know that a **table** represents information in **rows** and **columns**
	Know that a **branching database** is a way of **classifying** a group of objects and allows someone else to use it to identify one of the objects
	Know how to create suitable questions for a **branching database**
	Know the real-world uses of **branching databases**

Year Group	Year 3
Term	Summer 2
Unit(s)	NCCE Teach Computing – Programming: Events and Actions in Programs
Objectives	Key Knowledge and Vocabulary

This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Children begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of Pen blocks. Children are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with them designing and coding their own maze-tracing program. ● 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 ● 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	**Context for study** Children will have prior experience of programming in EYFS and KS1 using physical devices such as floor robots and online applications such as Scratch Jr. This unit builds on children's knowledge gained in the earlier Year 3 programming unit, 'Sequencing Sounds'. **Knowledge content** Know the relationship between an **event** and an **action** Know that **motion** means moving or being moved Know that **sprites** can be moved using **event blocks** Know that **event blocks** can be triggered by using the **mouse** or **keyboard** Know that the R **key** moves right, the U **key** moves up, the D **key** moves down, the L **key** moves left and the C **key** changes the **sprite's** costume Know that **arrow keys** can also be used to move a **sprite** Know that a **sprite** can be **resized** and how to do this Know that a **sprite** can be **re-centred** and how to do this Know how to add more than one **sprite** Know that if a **key** has been used to move one **sprite**, the **mouse** should be used for the second **sprite** Know that the **pen code block** is an **extension block** Know that **pen down** means the nib of the pen is placed down on the **screen**, ready to draw Know that **pen up** means the nib will be removed from the **screen** to stop drawing Know that the **pen colour** and **pen size** can be changed and how to do this Know that **duplicate** means to make another copy of something Know that **code blocks** can be **duplicated** for additional **sprites** and this is done by right clicking on the **blocks** and selecting '**duplicate**' Know that '**erase all**' removes all lines from the **screen** Know that the **sequence** of the **blocks** is important to get the required **outcome** Know how to **debug** in a variety of ways Know how to set the starting position of a **sprite** using **coordinates**

Knowledge Progression - Computing

Year Group	Year 4
Term	Autumn 1
Unit(s)	NCCE Teach Computing Unit – Computing Systems & Networks: The Internet (inc Online Safety theme of Managing Online Information)
Objectives	Key Knowledge and Vocabulary

Objectives	Key Knowledge and Vocabulary
Children will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. - 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	**Context for study:** This unit progresses children's knowledge and understanding of **networks** gained in Year 3. In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working. **Knowledge content:** Know that the **internet** is a **network** of **networks** Know that **computers** are **connected** to a **switch** which passes messages around one **network** Know that for messages to be passed from one **network** to another, a **router** is needed Know that **networks** are **secured** to ensure that only information that you want to be shared is available to others Know that a **router** allows many **networks** to be **connected** by **routing** messages to their destinations Know how information is shared across the **internet** Know why a **network** needs protecting Know the parts of a **network** and how they **connect** to each other Know the difference between the **World Wide Web** and the **internet**; that the **World Wide Web** is a part of the **internet** and contains **websites** and **web pages** whereas the **internet** is the **network** of **connected computers** that the **web** works on Know that the **internet** is used to provide many services Know how to access **websites** on the **World Wide Web** Know where **websites** are stored when **uploaded** to the **World Wide Web** Know who owns **content** on the **World Wide Web** Know that there are rules to protect **online content** Know that not everything on the **World Wide Web** is true Know that we need to think carefully before we share or reshare **online content** Know that a **web address** can be broken into three parts; the first part being an abbreviation for **World Wide Web**, the middle part relating to the theme or organisation behind the website, and the end part indicating where the **website** originates from (this could be a country e.g. .fr for France, or an organisation e.g. gov.uk for the UK Government) Know a variety of **devices** that give us access to the **internet** Know that a **web browser** allows us to access **websites** Know how to locate the **address bar, forward** and **back buttons, refresh button** and different **tabs** within a **web browser** Know some commonly used **browsers** e.g. Google Chrome, Safari, Internet Explore, Microsoft Edge and Firefox Know some common features of a **website** e.g. logo or title, links to other **websites** / pages, videos, images and text Know that people can share some **online content** but that does not change the **ownership** of the **content**

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.	Know that some online content can be downloaded but no-one but the original owner should change it or claim it as their own Know that some **online content** can be adapted but the original owner must always be credited Know that some information on the **internet** is subjective e.g. reviews, where people have different opinions of may be paid to leave a certain type of review Know that some people share **false** information on the **internet** for various reasons e.g. to make money, gain popularity or power, or by mistake

Year Group	Year 4
Term	Autumn 2
Unit(s)	Inspire Unit – Word Skills and Online Safety (online reputation)
Objectives	**Key Knowledge and Vocabulary**
- Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. - Select, use and combine a variety of software (including internet services) on a range of 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.	**Context for study:** Children will have used Microsoft Word in the Reception unit 'Basic Laptop Skills' and the Year 1 unit 'Basic Word Skills'. They may also have some experience of using it in cross-curricular contexts e.g. typing English work, or at home. Some transferable skills will have been learnt e.g. some ctrl shortcuts, copying and pasting etc in the Year 2 unit on PowerPoints and the Year 3 unit on Publisher. This is an unplanned unit that Y4 teachers can use as a *cross-curricular unit* with another subject e.g. History / Science. Children need to be taught the knowledge / skills below during this term with a view to creating a finished piece on Microsoft Word. Online safety is to be covered in the discrete lesson **'Online Safety – Project Evolve – Online Reputation**. **Knowledge content:** Create and **edit** a **table** in **Microsoft Word.** **Insert** and **delete cells** in a **table**. Use **find** and **replace tools** to **edit text**. Learn the following shortcuts: **ctrl B** for **bold**, **ctrl U** for **underline**, **ctrl I** for **italic**, **ctrl A** for **select all**, **ctrl E** to **align text** into the centre (or a page or **table cell**), **ctrl P** for **print** and **ctrl S** for **save**. Know the function of the **shift key**, including for creating capital letters instead of **Caps Lock** Know some ways to change **page setup** e.g. whether **portrait** or **landscape** would work best Know how to **spellcheck** their work Know which fingers we should use typing (**index fingers** on **keyboard home keys** (f/j), **left fingers** for a/s/d/f/g and **right fingers** for h/j/k/l) and begin to start practising **touch typing** when working on a laptop Know that we can find information about others by **searching online** Know that information online could have been **created, copied** or **shared** Know that **content** posted **online** can affect others, their feelings and how others feel about them (their **reputation**) The typing skills mentioned can be practised as a warm-up to each lesson, using any of the following resources: Computing KS2 - Dance Mat Typing - BBC Bitesize Race Now - 100% Free | Nitro Type Free Typing Game | Keyboard Ninja Game - Typing.com Free Typing Game | Tommy Q Game - Typing.com Free Typing Game | Type A Balloon Game - Typing.com Typing Rocket - Keyboarding Game • ABCya!

	Type Type Revolution **NOTE:** **As this unit falls in the Christmas term, please feel free to condense the teaching into fewer lessons to allow time for any Christmas events planned**

Year Group	Year 4
Term	Spring 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: Photo Editing (inc Online Safety themes of Self-Image and Identity / Copyright & Ownership)
Objectives	Key Knowledge and Vocabulary
Children will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have, and evaluate the effectiveness of their choices • Use search technologies effectively • 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.	**Context for study:** This unit builds on the Year 2 Unit 'Digital Photography' and progresses children's skills through **editing digital images** and considering the impact that **editing** can have on an **image**. Children will also consider how **editing** can be used appropriately for different scenarios, and create and evaluate '**fake**' images, combining all of their new skills. **Knowledge content:** Know that an **image** is a **digital** copy of a picture Know how to use the **crop tool** on an **image** Know how to **rotate** an **image** Know how to **flip** an **image** Know how to change colours on an **image** Know how to apply **filters** to an **image** Know that **retouching** means focusing on a small part of the **image** and removing it to enhance how the photo looks Know that to **retouch** an **image** we can use the **cloning tool** Know that the **undo** button can reverse any unwanted changes Know that **images** can be **combined** to make an **image** made up of different parts Know how to **zoom** in and out of an **image** Know that **selecting** means choosing Know that the **selection tools** within paint.net are **rectangle**, **lasso**, **ellipse** and **magic wand** Know what has changed in an **edited image** Know that **images** can be **edited** in a variety of ways e.g. removing an unwanted part of it, making the colours brighter or making certain colours more visible, focusing in on an important part of it, or making it look more attractive in some way Know that different changes suit different purposes Know how to **save as** so the original version can remain as well as the **edited** one Know that **editing images** can have positive and negative effects Know that not all **images** are real (and can also be described as **fake**) Know that some **images** are protected by **copyright** rules Know that some countries e.g. Norway, have a law to say that people who make money from **images** must tell people if those **images** have been **edited**

Year Group	Year 4
Term	Spring 2
Unit(s)	Inspire Unit – Introduction to 3D Design
Objectives	**Key Knowledge and Vocabulary**
In this unit, children will be designing some classroom furniture to meet a particular brief. They will become familiar with the Tinkercad software and some of its tools as they progress through the design process. • 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	<u>Context for study:</u> Children will have previously created 2D drawings a variety of devices and software and will now progress to working with 3D designs. They will learn the steps of the online design process, looking at constraints, blueprints, prototypes etc. They will build further skills within Tinkercard in the Year 6 unit, 3D modelling. <u>Knowledge content:</u> Know that **technology** is used by lots of occupations for a purpose / to solve a problem e.g. engineers, designers etc Know that a **blueprint** is a design plan or other technical drawing Know that a **prototype** is an early version of something from which others are developed Know how to **place**, **view**, **move**, **rotate**, **resize**, **duplicate**, **group** and **align** different shapes within **Tinkercad** Know that shapes can be combined to make more complex, solid shapes or to cut holes into shapes Know that the **mirror tool** allows you to flip objects so they face different directions Know how to **save** and **share** a **file** on **Tinkercad** Know how to take a **screenshot snip** of work in **Tinkercad** to present to others

Year Group	Year 4
Term	Summer 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: Audio Production (inc Online Safety theme of Copyright & Ownership)
Objectives	Key Knowledge and Vocabulary
In this unit, children will initially examine devices capable of recording digital audio, which will include identifying the input device (microphone) and output devices (speaker or headphones). Children will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. • 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	**Context for study:** This unit progresses children's knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5. **Knowledge content:** Know that **audio** is another word for sound Know that an **input** records sound and an **output** allows us to listen to sound Know some **inputs** e.g. **microphones**, and **outputs** e.g. **headphones / speakers** Know the features of a **podcast** e.g. an introduction, sound effects / jingles etc Know how to **save** a **digital recording** as a **file** Know how to **retrieve** a previously saved **digital recording file** Know how to **edit** a **digital recording file** Know that additional sounds can be added to a voice **recording** e.g. sound effects / background music Know that the person who **records** sound can say who is allowed to use it Know that we cannot copy someone else's work e.g. **downloading audio** from the **internet** without **permission** Know some of the consequences of **downloading** without **permission** e.g. a fine, a criminal record etc Know how to **record**, **play**, **delete**, **trim** and adjust the **volume** of sound in **Audacity** Know some things that make a good **recording** e.g. having a clear voice, one person speaking at a time, no background noise etc Know that the taller **peaks** on a **soundwave** indicate louder noises and smaller / flat lines indicate quieter noises / silence Know that the **time shift tool** allows **audio tracks** to be moved left and right Know that multiple **audio tracks** can be played at the same time Know how to **export** their finished **recording** from **Audacity** to be saved as an **MP3 file**

Cross curricular opportunities – the subject of the podcast could be linked to a current topic.	

Year Group	Year 4
Term	Summer 2
Unit(s)	NCCE Teach Computing Unit – Programming: Repetition in Games
Objectives	**Key Knowledge and Vocabulary**

Children will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where children can discover similarities between two environments. Children look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.
 	
    ● 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
    ● 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
	Context for study:
	Children will have had experience using Scratch Jr in KS1 and **Scratch** in Year 3. This unit gives children the opportunity to work with **count-controlled loops**.
	
	Knowledge content:
	Know how to predict the **outcome** of a snippet of **code**
	Know how to **modify** a snippet of **code** to create a given **outcome**
	Know that **infinite** means it will continue forever
	Know that in **programming** there are **infinite loops** and **count-controlled loops**
	Know when to use an **infinite loop** or **count-controlled loop**

accomplish given goals, including collecting, analysing, evaluating and presenting data and information	

Year Group	Year 5
Term	Autumn 1
Unit(s)	NCCE Teach Computing Unit – Computing Systems & Networks: Systems and Searching (inc Online Safety theme of Copyright & Ownership)
Objectives	**Key Knowledge and Vocabulary**
In this unit, children will develop their understanding of computer systems and how information is transferred between systems and devices. They will consider small-scale and large-scale systems and will explain the input, output, and process aspects of a variety of different real-world systems. Children will also take part in a collaborative online project with other class members and develop their skills in working together online. ● 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 ● 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 ● Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range	**Context for study:** This unit progresses children's knowledge and understanding of computing systems, covered in Year 3 and 4, and online collaborative working. **Knowledge content:** Know that **computers** can be connected together to form **systems** Know that **systems** are built using a number of parts Know that **computer systems** feature **inputs, processes** and **outputs** Know that **computer systems communicate** with other **devices** Know that certain tasks can be managed by **computer systems** Know the benefits of **computer systems** Know that the parts of a **computer system** are not always in the same place or country Know that **computer systems** use the **internet** to **transfer** information Know the rules that **computers** have for **communicating** with one another Know that **networked digital devices** have **unique addresses** Know that **data** is **transferred** over **networks** in **packets** Know that people can **collaborate** to create **online content** Know that working together on the **internet** can be **public** or **private** Know a number of popular **search engines** e.g. Google, Bing etc Know that a **search engine** is a **system** that looks for information Know that the **input** of a **search engine** is the entering of the search terms and the **output** is the results displayed Know ways in which to **refine** a **search** Know what to do if we see **inappropriate content online** Know that **crawlers** (also called spiders or **spiderbots**) crawl through **websites** for **searchable content** and **store** it in an **index** Know that **crawlers** are **computer programs** and not physical objects

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	Know that the **indexes** for **search engines** are stored in huge **data centres** around the world Know that when we **search** for **content**, **search engines** display results from their own **index** Know that **search engines** score **webpages** against the search term and display results in order Know that the top results are usually **sponsored posts** or **adverts** meaning those companies have paid the **search engine** for their positions in the ranking Know that not all information is available on the **web** e.g. private information such as medical records

Year Group	Year 5
Term	Autumn 2
Unit(s)	Inspire Unit – PowerPoint Skills and Online Safety (privacy and security)
Objectives	Key Knowledge and Vocabulary

Objectives	Key Knowledge and Vocabulary
• 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.	**Context for study:** Children will have gained experience in using Microsoft PowerPoint in the Year 2 unit 'Basic PowerPoint Skills' and will now build on that, learning some new knowledge and combining a wider variety of media. This is an unplanned unit that Y5 teachers can use as a *cross-curricular unit* with another subject e.g. History / Geography. Children need to be taught the knowledge / skills below during this term with a view to creating a finished piece on Microsoft PowerPoint. Online safety is to be covered in the discrete lesson **'Online Safety – Project Evolve – Privacy and Security'** **Knowledge content:** Know that we can **combine text, images** and **videos** from different **sources** to create a **presentation** Know how to **insert** a **hyperlink** Know how to improve text using the online **thesaurus tool** Know how to change the **layout**, **background** and **theme** of a **presentation** Know how to **edit** and **enhance photographs / images** for the **presentation** Know how to **add** and **re-order slides** Know how to present a **presentation** in **slideshow mode** Know that apps may read and **share** our information with others Know that people need to give their **consent** for their information to be shared **NOTE:** **As this unit falls in the Christmas term, please feel free to condense the teaching into fewer lessons to allow time for any Christmas events planned**

Year Group	Year 5
Term	Spring 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: Video Production
Objectives	**Key Knowledge and Vocabulary**
Children will learn how to create short videos by working in pairs or groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Children are guided with step-by-step support to take their idea from conception to completion. • 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 **Internet safety** • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour	**Context for study:** This unit progresses children's knowledge and understanding of creating **media** by guiding them systematically through the process involved in creating a **video**. The unit builds on the Year 4 unit 'Photo editing' where **composition** is introduced and the Year 3 unit 'Stop-frame animation' where children explored some of the features of **video production**. By the end of this unit, children will have developed the skills required to plan, **record, edit**, and share a **video**. **Knowledge content:** Know that a **video** is a **visual media** format Know that different **camera angles** and **filming techniques** can be used for different purposes (**close-up, mid-range, long shot, moving subject, side by side, high angle, low angle, normal angle**) Know that **static camera** means the camera is fixed Know that **zoom** means making the subject larger by **zooming** in or smaller by **zooming** out (without physically moving the camera) Know that **pan and tilt** means the camera is in a fixed location but **pivots vertically** or ……………………………… Know that **videos** usually start with some planning e.g. **storyboard / script** Know how to **create, save** and **retrieve video content** Know how to **import** a **video** for **editing** Know that a **video** can be improved by **reshooting** or **editing** it Know how to use a variety of **tools** within **Video Editor** to make **edits** to a **video** e.g. trimming, rearranging the order of scenes etc

Knowledge Progression - Computing

Cross curricular opportunities – the content of the videos could be linked to a current topic.	

Year Group	Year 5
Term	Spring 2
Unit(s)	NCCE Teach Computing Unit – Programming: Selection in Physical Computing
Objectives	**Key Knowledge and Vocabulary**
In this unit, children will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. They will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Children will be introduced to conditions as a means of controlling the flow of actions in a program. They will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design ● 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 ● Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and	**Context for study:** From their work in prior programming units, children will have prior experience of programming using a block-based language (e.g. Scratch) and understand the concepts of **sequence** and **repetition**. This unit will allow them to create **code** that will then be transferred to a **physical computer**, the **Crumble**. **Knowledge content:** Know that the **Crumble** is a **microcontroller** Know that a **microcontroller** can respond to **inputs** and **control outputs** Know that a **Sparkle** is a multi-coloured **LED** Know that **crocodile clips** are used to **connect** the **Crumble** to the **battery box** and the **Sparkle** Know how to **program** a **microcontroller** to make an **LED** switch on Know that the '**do forever**' **command** will **repeat** the **command** until the **program** is stopped Know that a **count-controlled loop** will **repeat** the **command** until the **loop** count matches the number set Know how to **connect** more than one **output component** to a **microcontroller** Know how to use a **count-controlled loop** to **control outputs** Know that a **loop** can stop when a **condition** is met Know that a **condition** is either true or false Know that a **switch** can be used as a **condition** e.g. when the switch is pressed, the flashing light will stop Know how to **program** a **microcontroller** to respond to an **input** Know that a **loop** can be used to repeatedly check whether a **condition** has been met Know how to use **selection** to direct the flow of a **program** (if … then … statements)

create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information	

Year Group	Year 5
Term	Summer 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: Introduction to Vector Graphics
Objectives	**Key Knowledge and Vocabulary**
In this unit, children start to create **vector drawings**. They learn how to use different **drawing tools** to help them create **images**. Children will recognise that **images** in **vector drawings** are created using shapes and lines, and each individual element in the **drawing** is called an object. They will then **layer** their objects and begin **grouping and duplicating** them to support the creation of more complex pieces of work. • 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.	**Context for study:** Children will have created **online drawings** in the simpler **program** of J2ePaint in EYFS and the Paint app KS1. This unit will give them their first experience in creating **vector drawings**. **Knowledge content:** Know that **drawing tools** can be used to produce different outcomes Know that **vector drawings** are made using lines and shapes Know that **vector drawings** are **computer graphics** used for things like logos Know what each element of a **vector drawing** is called an **object** Know some ways in which **vector drawings** are different from paper-based **drawings** Know how to identify the shapes used to make a **vector drawing** Know how to **move, re-size, rotate, delete** and **duplicate objects** and change colours Know how to select the shape and line tools and how to **undo / redo** selections Know how to use the **zoom tool** to add detail to **drawings** Know how to use **layering** to create an **image**, starting with the shape that will be at the back Know the **shortcuts Ctrl c** for **copying**, **Ctrl v** for **pasting** and **Ctrl z** for **undoing** Know that the **outline** of shapes can be **edited** e.g. **border colour**, **border weight** and **border dash** Know that **objects** can be **grouped** so they will all move if **dragged** / they will all **delete** if **deleted** etc Know that **objects** need to be **ungrouped** once the action is complete Know that **objects** can be **flipped** to face a different **direction** **NOTE – as this uses Google Drawings, please have the children's Google logins to hand that Helen Thomas created during lockdown**

Year Group	Year 5
Term	Summer 2
Unit(s)	NCCE Teach Computing Unit – Programming: Selection in Quizzes
Objectives	**Key Knowledge and Vocabulary**
In this unit, children develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, and then learning how the 'if… then… else…' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They represent this understanding in algorithms, and then by constructing programs using Scratch. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. ● 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	**Context for study:** This unit assumes that learners will have prior experience of programming using block-based construction (eg Scratch), understand the concepts of 'sequence' and 'repetition', and have some experience of using 'selection'. Ideally, learners will have completed 'Programming A – Selection in physical computing' before undertaking this unit, as this will provide them with the required knowledge of 'selection'. **Knowledge content:** Know that **conditions** are used to **control** the **flow** of **actions** in a **program** Know how to identify and **modify conditions** in a **program** Know that a **conditional statement connects** to a **conditional outcome** Know how to use an 'if … then … else …' statement

detect and correct errors in algorithms and programs	

Year Group	Year 6
Term	Autumn 1
Unit(s)	NCCE Teach Computing Unit – Creating Media: 3D Modelling
Objectives	**Key Knowledge and Vocabulary**
During this unit, children will develop their knowledge and understanding of using a computer to produce 3D models. They will initially familiarise themselves with working in a 3D space, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics. Children will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Finally, they will examine the need to group 3D objects, then go on to plan, develop, and evaluate their own 3D model of a photo frame. • 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	**Context for study:** This unit progresses children's knowledge and understanding of creating **3D graphics** using a computer. They will have had the opportunity to work within Tinkercad at a more basic level in Year 4. **Knowledge content:** Know that **3D** means **three-dimensional** Know some similarities and differences between **2D** and **3D** shapes Know why we might want to represent **3D** objects on a computer Know that the **view tools** enable us to view the objects from different **perspectives** and **zoom in and out** Know that the **workplane** is where we place shapes and see the **models** we create Know how to **select, move, re-size, rotate** and **delete** a **digital 3D shape** Know how to change the colour of a **3D shape** Know how to **position 3D shapes** in relation to each other Know how to **duplicate** multiple **3D objects** Know how to add **text** to a **digital model** Know that physical objects can be broken down into a collection of **3D shapes** Know how to use a **digital 3D shape** and a **placeholder** to create a hole in an object **Login Details for Tinkercad – children put in the class code then use their login (saved in the Computing folder on Staff Shared)** **6A** **Children to type in the following class code on the Tinkercad website:** **https://www.tinkercad.com/joinclass/GNSYZ3JY7QUX** **6B**

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	**Children to type in the following class code on the Tinkercad website:** **https://www.tinkercad.com/joinclass/UICHJTE3VN7A**

Year Group	Year 6
Term	Autumn 2
Unit(s)	Inspire Teacher Planned Unit – Spreadsheet Skills and Online Safety (online reputation)
Objectives	**Key Knowledge and Vocabulary**
• 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	**Context for study:** Children will have worked with data in previous units in KS1 and LKS2 but this will be the first time they have used a spreadsheet. This is an unplanned unit that Y6 teachers can use as a *cross-curricular unit* with another subject; creating a spreadsheet for something relevant to the children e.g. planning and costing a Christmas party / trip. Whatever, the subject of the spreadsheet, children need to be taught the knowledge / skills below during this term. Online safety is to be covered in the discrete lesson **'Online Safety – Project Evolve – Online Reputation'.** **Knowledge content:** Know that a **spreadsheet** has **columns** and **rows**, labelled with letters and numbers Know how to change the size of **cells** Know that these letters and numbers provide us with **cell references** which tell us where a particular piece of **data** is stored e.g. A1 Know that we can **format cells** e.g. **plain text, date, number, currency etc** Know that **formatting** makes **spreadsheets** easier to use and read Know that **calculations** can be performed in **spreadsheets** using **mathematical operations** Know that * can represent **multiplication** and / can represent **division** Know that a **formula** can be **duplicated** to save time Know how to use the **SUM** formula Know some benefits of using **spreadsheets** for calculations e.g. it saves time, you can update data easily, you can work with large amounts of **data** easily Know that using **data headings** helps to keep the **data** organised Know that **spreadsheets** can be used to create **graphs** Know how to interpret **data** from looking at a **pie chart** Know some benefits from **data** being shown in a **chart** e.g. it is visual, it allows comparison of **data** etc

Know some benefits from **data** being shown in a **table** e.g. you can sort the **data**, easily update it, see individual **data** etc
Know ways in which anyone can create a positive **online reputation**
Know strategies that can protect a person's **online reputation** e.g. **anonymity**

Year Group	Year 6
Term	Spring 1
Unit(s)	NCCE Teach Computing Unit – Programming: Variables in Games
Objectives	Key Knowledge and Vocabulary

This unit explores the concept of variables in programming through games in Scratch. First, children will learn what variables are, and relate them to real-world examples of values that can be set and changed. Children will then use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, pupils will experiment with variables in an existing project, then modify them, then they will create their own project. In Lesson 4, pupils will focus on design. Finally, in Lesson 6, pupils will apply their knowledge of variables and design to improve their game in Scratch. • 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	**Context for study:** Children will have gained experience with **programming** in all prior year groups, and in later years, with **sequence, repetition**, and **selection** in particular. **Knowledge content:** Know that a **variable** is something that is changeable Know how to use an **event** in a **program** to set a **variable** Know that a **variable** can only hold one **value** at a time Know that **variables** should be **labelled** with a brief name with no spaces and identify what **value** the **variable** holds Know that an **underscore** can be used to replace a space if using multiple words in a **variable** name Know that in a game, the **score** should be **reset** before each new game Know that a game should include **code** to determine how the game will end e.g. reaching a certain number of points, when a certain amount of time has passed etc

• 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	

Year Group	Year 6
Term	Spring 2
Unit(s)	No unit due to SATS
Objectives	**Key Knowledge and Vocabulary**

Year Group	Year 6
Term	Summer 1
Unit(s)	No unit due to SATS
Objectives	**Key Knowledge and Vocabulary**

Year Group	Year 6
Term	Summer 2
Unit(s)	NCCE Teach Computing Unit – Programming: Sensing Movement and Online Safety (online bullying)
Objectives	Key Knowledge and Vocabulary
This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – 'Programming A'. It offers learners the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for learners to build in and test in the programming environment, before transferring it to their micro:bit. Learners then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth. • 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	**Context for study:** This unit presumes that learners are already confident in their understanding of **sequence, repetition and selection** independently within **programming**. Please also teach the discrete online safety lesson at the end; **'Online Safety – Project Evolve – Online Bullying'** **Knowledge content:** Know that a **micro:bit** is a very small computer Know that the **micro:bit** runs **programs** that are created on **MakeCode** Know that the **emulator** on **MakeCode** is a **simulator** that can be used to **run** and **test code** before **downloading** it to the **device** Know how to **download code** onto a **micro:bit** Know that the **accelerometer** on the **micro:bit detects** movement Know that the **micro:bit** is an **input, process, output device** that can be **programmed** Know that a **program** can be created on a computer then transferred to a **controllable device** Know that **selection** can control the **flow** of a **program** Know how to use an '**if … then … else' statement** to select the **flow** of a **program** Know how to use a **condition** to change a **variable** Know that the order of **conditions** in statements is important Know how to report **online bullying** in a variety of contexts

- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- 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