



Computing Medium Term Planning

Year 2

Key Concepts Overview

Key Concepts	EYFS	Year 1	Year2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	<p>To know that a computer has a mouse and a keyboard and be able to recognise them (N)</p> <p>To use a mouse to manipulate a program (R)</p> <p>To use a keyboard and understand keys represent letters and numbers (R)</p> <p>To understand that a tablet is different to a computer in some ways (R)</p>	<p>Technology Around Us</p> <ul style="list-style-type: none"> Understand what technology is Know what technology they have in their lives Be able to use a mouse and a keyboard Be able to open a file Be able to create a typed document and save it 	<p>IT Around Us</p> <ul style="list-style-type: none"> Develop the understanding of where technology can be found in the world Be able to name the types of technology found in shops, schools and at home Understand why we use IT Understand how to use IT safely 	<p>Connecting Computers</p> <ul style="list-style-type: none"> Understand how inputs and outputs work in digital technology Understand how to use technology and inputs/outputs to achieve an aim Understand why we choose to use technology Understand the difference between digital and analogue outcomes Understand that technology connects people Begin to understand how networks connect people and how they work 	<p>The Internet</p> <ul style="list-style-type: none"> Understand how computers are physically connected in networks Start to understand the role of some of the devices in a network Know what the internet is Know what the WWW is and it is different from the internet Understand that people create web page Understand that not all information on the WWW is accurate 	<p>Sharing information</p> <ul style="list-style-type: none"> Understand what a digital system is Understand how larger computer systems work(traffic lights) Understand that the internet forms part of some systems Know what an IP address is Be able to work collaboratively online Understand how systems and networks enable collaborative working 	<p>Communication</p> <ul style="list-style-type: none"> Develop from the understanding of the internet to understand what the WWW is Be able to carry out specific searches on the WWW Understand how search engines work Understand what SEO is Know that the internet can be used to communicate Understand how to stay safe when communicating online
Creating media	<ul style="list-style-type: none"> To independently listen to digital audio (N) Take photographs using a digital device (N/R) To record video using a digital device (R) To record audio (R) 	<p>Digital Painting</p> <ul style="list-style-type: none"> To be able to digitally paint Use a range of tools to digitally paint Create a digital painting Compare digital painting to a painting on paper <p>Digital Writing</p> <ul style="list-style-type: none"> Type a document on a computer Be able to use a range of tools to digitally write Select tools to create digital writing Compare digital writing with handwriting 	<p>Digital Photography</p> <ul style="list-style-type: none"> Compose and frame an image Select images Edit images using software Produce a final image too meet a brief <p>Making Music</p> <ul style="list-style-type: none"> Discuss how music makes us feel Understand that music has patterns Create rhythms and patterns in music Use software to compose music 	<p>Stop-Frame Animation</p> <ul style="list-style-type: none"> Understand that animations are a series of photos or drawings Understand movement is a created by a sequence of images Plan/storyboard an animation Create and improve an animation Evaluate an animation <p>Desktop Publishing</p> <ul style="list-style-type: none"> Understand that text and images convey information Consider layout Understand how to create and edit content Use editing tools such as copy and paste to create content Discuss the benefits of desktop publishing 	<p>Audio Editing</p> <ul style="list-style-type: none"> Understand that sound can be digitally recorded Understand what input(microphone) and output devices are speakers) Use a digital recording device Edit a digital sound file <p>Photo Editing</p> <ul style="list-style-type: none"> Understand that an image can be changed Change the composition of an image Use tools to edit images Understand that some images are fake/edited 	<p>Vector Drawing</p> <ul style="list-style-type: none"> Know how to use tools in a vector based drawing program Use tools to create drawings by combining shapes Understand that vector drawing software uses layers Understand how to group objects for easy use <p>Video Editing</p> <ul style="list-style-type: none"> Understand what makes a video effective Record video using a digital device Create a storyboard Improve video by reshooting and editing 	<p>3D Modelling</p> <ul style="list-style-type: none"> Compare 2d and 3D shapes Use modelling software to combine shapes Colour, rotate and resize shapes Design a physical object Improve designs <p>Web Page Creation</p> <ul style="list-style-type: none"> Understand that web pages are written in HTML Plan a web page design Create a web page using software Use navigation paths and consider effective links
Program-ming	<ul style="list-style-type: none"> Group objects by type (N) Discuss data and information and understand that things can be categorised using labels (R) Create tally charts (R) 	<p>Floor Robots</p> <ul style="list-style-type: none"> Understand what commands are Use commands to control a floor robot Choose commands to achieve a goal Understand that a program is a set of commands Debug and improve programs <p>Programming Animations</p> <ul style="list-style-type: none"> Compare floor robots to Scratch Jnr Know what block code is Know that an algorithm is a set of instructions Write code (instructions) to control a sprite 	<p>Robot Algorithms</p> <ul style="list-style-type: none"> Understand that an algorithm is a set of instructions Understand that computers read and follow algorithms without thought Make predictions about programs Understand that programs can contain code and artwork Write a program to achieve an aim <p>Programming Quizzes</p> <ul style="list-style-type: none"> Understand that programs have a start and an outcome Incorporate design in a program Edit designs in a program Refine designs in programs to meet the initial brief 	<p>Sequence in Music</p> <ul style="list-style-type: none"> Progress from Sratch Jr to Scratch Understand that commands have outcomes Change the sequence of commands Edit the program appearance Write a program from a task description <p>Events and actions</p> <ul style="list-style-type: none"> Explain how sprites move in a program Be able to move a sprite in four directions using code Adapt an existing program to fit a different context Develop and refine a program by adding features Develop a process for debugging Design and create a program that creates a maze-based challenge 	<p>Repetition in Shapes</p> <ul style="list-style-type: none"> Write code inn a text-based language Understand the role of repetition in programs Understand what a count-controlled loop is Write a program using a count-controlled loop <p>Repetition in Games</p> <ul style="list-style-type: none"> Develop the understanding of a count-controlled loop in a different environment Compare infinite loops and count-controlled loops Use loops in programs 	<p>Selection in Physical Computing</p> <ul style="list-style-type: none"> Control a simple circuit connected to a computer Write programs including controlled loops Understand that a loop can end based on a condition Write a program that includes selection <p>Selection in Quizzes</p> <ul style="list-style-type: none"> Understand that conditions control the flow of programs Link a condition statement to a condition outcome Design and create a program that uses selection 	<p>Variables in Games</p> <ul style="list-style-type: none"> Understand what variables are Know how to use variables in programs Enhance a game code using variables Write a game code using variables Evaluate projects <p>Sensing</p> <ul style="list-style-type: none"> Learn what a Micro bit is Create a program using software Install software onto Micro bit Use variables Write a code to create a compass on a Micro bit Code and debug a step counter
Data and information	<ul style="list-style-type: none"> Program a floor robot to follow a simple set of instructions (N) Completes a simple program on an electronic device to achieve a goal (beebots) (R) 	<p>Grouping Data</p> <ul style="list-style-type: none"> Understand that objects can be labelled and grouped Be able to label and group objects based on properties Choose searches and compare groups Debug and improve 	<p>Pictograms</p> <ul style="list-style-type: none"> Use tally charts to collect data Understand that data can be represented in pictograms Use software to create and analyse pictograms Group object and label groups using attributes Draw conclusions from represented data Be able to present and discuss data 	<p>Databases</p> <ul style="list-style-type: none"> Understand how 'yes/no' can sort data Understand that attributes can be used to refine data Select appropriate attributes required to find desired data Understand what a branching database is Use a branching database to sort information Compare branching databases to pictograms 	<p>Data Logging</p> <ul style="list-style-type: none"> Understand that data can be collected over time Be able to use a datalogger Know that dataloggers collect data points from sensors Select what data need to be collected Answer question using data 	<p>Flat File Databases</p> <ul style="list-style-type: none"> Create paper file databases Understand how computers file records Group data Search records Compare data using charts Select flights based on search criteria 	<p>Spreadsheets</p> <ul style="list-style-type: none"> Understand how spreadsheets organise data Manipulate data sets using spreadsheets Write and use formulas Calculate using spreadsheets Plan a budget

Year 2 Computing Yearly Overview

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
			Robot Algorithms	Technology Around Us	Pictograms Introduction to Quizzes

Autumn Term 2—Technology Around Us

<i>Prior Learning</i>	Children should know about: What technology they see in their lives(bar code readers, televisions, bank cards, traffic lights) That the school has rules about using technology in school Understand some of the rules about using technology in school			
<i>End Points</i>	<u>Be able to discuss five ways to stay safe online and incorporate these into every interaction with technology is school</u>			
<i>Vocabulary</i>	Information technology (IT), computer, barcode, scanner/scan ,			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Computing systems and networks	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson1	I can recognise the uses and features of information technology This lesson develops learners’ understanding of what information technology (IT) is. They will identify devices which are computers and consider how IT can help us both at school and at home.	L1 Slides A1 Activity sheet – I can use a computer to... A1 (Optional) – Popplet or other mind mapping tool A3 Activity sheet – IT or not IT?
		Lesson 2	I can identify information technology in the home This lesson encourages learners to consider common uses of information technology in a context that they are familiar with beyond school.	L2 Slides A1 (Optional) – Notepad / scrap paper / individual dry erase whiteboards A2 Resource – Resizing images A2 Activity sheet – IT in school A2 (Optional) – Images have been provided in a zip file if you wish to use a different application to complete this activity
		Lesson 3	I can identify information technology beyond school Having considered the use of information technology in the familiar context of the home, learners will explore IT in other environments that they may have experienced.	L3 Slides A2 Activity sheet – IT in public places A3 Activity sheet – Talk about IT
		Lesson 4	I can explain how information technology benefits us In the previous lesson, learners looked at where IT is likely to be found and considered where it is less likely to be found. This lesson focuses on the specific use of IT in a shop.	L4 Slides A1 Resource – Barcodes A1 (Optional) – Glue sticks (one per group of three) A2 Resource – Product list A2 Resource – Prices list A2 (Optional) – Paper or dry erase whiteboard
		Lesson 5	I can show how to use information technology safely In this lesson, learners will consider how they use different forms of information technology safely, in a range of different environments.	L5 Slides Introduction (Optional) – Flipchart or large piece of paper A1 (Optional) – Paper / dry erase whiteboards A3 Activity sheet – Breaking the rules
		Lesson 6	I can recognise that choices are made when using information technology In this lesson, learners will think about the choices that are made when using information technology, and the responsibility associated with those choices.	L6 Slides Introduction (Optional) – Flipchart / large piece of paper A2 – Digital 5 a Day equipment Equipment to take photos Go Noodle or other physical activity app or website Computer or tablet with painting app, such as Paintz.app Equipment for recording sound, such as voice recorder buttons or tablet Sticky notes or scrap paper

Spring Term 1—Digital Photography

<i>Prior Learning</i>	Children should know about: Know a range of digital technology is all around us Know that computers can be used to create and change images(based on Year 1 unit—digital painting) Understand how to be responsible when using technology			
<i>End Points</i>	To be able to: Frame and compose three images Select the best image Edit and improve the image Create an image that meets a specific brief			
<i>Vocabulary</i>	Device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, lighting			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Creating media	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson1	I can use a digital device to take a photograph This lesson introduces the concept that many devices can be used to take photographs. In the lesson, learners begin to capture their own photographs.	L1 slides A1 Can these take photos? (optional) A2 Photography bingo sheet If possible, get access to at least one each of the following digital devices: A tablet (iPad or Android) A phone or iPod A digital camera An instant camera (e.g. a Polaroid camera)
		Lesson 2	I can make choices when taking a photograph A photograph can be taken in either portrait or landscape format. In this lesson, learners explore taking photographs in both portrait and landscape formats and explore the reasons why a photographer may favour one over the other	L2 slides A1 Devices with a camera which the learners can take photographs with A3 Landscape or portrait? activity sheet
		Lesson 3	I can describe what make a good photograph A photograph is composed by a photographer. In this lesson, learners discover what constitutes good photography composition and put this into practice by composing and capturing photos of their own.	L3 slides A2 Paper frame handout (printed and cut before the lesson, ideally on card) A2 Devices with a camera which the learners can take photographs with A3 Reviewing my photos sheet
		Lesson 4	I can decide how photographs can be improved This lesson introduces the concepts of light and focus as further important aspects of good photography composition. In this lesson, learners investigate the effect that good lighting has on the quality of the photos they take, and explore what effect using the camera flash and adding an artificial light source have on their photos. They also learn how the camera autofocus tool can be used to make an object in an image stand out.	L4 slides A1 Exploring light worksheet A1: devices with a camera which the learners can take photographs with A2: artificial light source(s) such as torches and lamps
		Lesson 5	I can use tools to change an image This lesson introduces the concept of simple image editing. Learners are introduced to the Pixlr image editing software and use the 'Adjust' tool to change the colour effect of an image.	L5 slides A1 Access to pixlr.com/x/ or the Pixlr app
		Lesson 6	I can recognise that photos can be changed This lesson introduces the concept that images can be changed for a purpose. Learners are introduced to a range of images that have been changed in different ways and through this, develop an awareness that not all images they see are real. To start the lesson, learners are first challenged to take their best photograph by applying the photography composition skills that they have developed during the unit.	L6 slides A1 Paper frame template (from Lesson 3) A1: devices with a camera which the learners can take photographs with A1 Photography review sheet

Spring Term 2 — Making Music

<i>Prior Learning</i>	Children should know about: Understand that technology can be used to change digital files (paintings, images, text) Understand that apps and software have tools that can be used to change files			
<i>End Points</i>	Compose, edit and a review a piece of music using digital media			
<i>Vocabulary</i>	Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, neptune, pitch, tempo, rhythm, notes, notes, instrument, create, pulse/beat, edit, open			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Programming	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson 1	I can say how music makes me feel The learners will listen to and compare two pieces of music from The Planets by Gustav Holst. They will then use a musical description word bank to describe how this music generates emotions, i.e. how it makes them feel.	Slides (ncce.io/cm2m-1-s) Music: <i>Mars:</i> archive.org/details/Holst-ThePlanets/Marte.mp3 <i>Venus:</i> archive.org/details/Holst-ThePlanets/Venus.mp3 <i>Jupiter:</i> archive.org/details/Holst-ThePlanets/Jupiter.mp3
		Lesson 2	I can identify that there are patterns in music In this lesson, learners will explore rhythm. They will create patterns and use those patterns as rhythms. They will use untuned percussion instruments and computers to hear the different rhythm patterns that they create.	Slides (ncce.io/cm2m-2-s) Coloured counters (approx. 20 counters in 2 different colours for each pair) Range of untuned percussion instruments PCs or tablets to run Chrome Music Lab online Chrome Music Lab help card (ncce.io/cm2m-2-a3-h)
		Lesson 3	I can describe how music can be used in different ways In this lesson, learners will explore how music can be used in different ways to express emotions and to trigger their imaginations. They will experiment with the pitch and duration of notes to create their own piece of music, which they will then associate with a physical object — in this case, an animal.	Slides (ncce.io/cm2m-3-s) <i>Neptune</i> piece: archive.org/details/Holst-ThePlanets/Neptuno.mp3 Musical composition art: teacher exemplar (ncce.io/cm2m-3-a1-d) Plain A4 paper Colouring pens or pencils
		Lesson 4	I can show how music is made from a series of notes In this lesson, learners will develop their understanding of music. They will use a computer to create and refine musical patterns.	Slides (ncce.io/cm2m-4-s) PCs or tablets to run Chrome Music Lab online
		Lesson 5	I can create music for a purpose In this lesson, learners will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it.	Slides (ncce.io/cm2m-5-s) Creating a rhythm based on an animal: word prompts (ncce.io/cm2m-5-a1-h1) Chrome Music Lab: Song Maker help card (ncce.io/cm2m-5-a1-h) Devices that can access Chrome Music Lab
		Lesson 6	I can review and refine our computer work In this lesson, learners will retrieve and review their work. They will spend time making improvements and then share their work with the class.	Slides (ncce.io/cm2m-6-s) Access to work from the previous lesson

Spring Term 2—Pictograms

<i>Prior Learning</i>	Children should know about: This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties			
<i>End Points</i>	<ul style="list-style-type: none"> ◦ <u>Collect a group of data and present it in a pictogram</u> ◦ <u>Answer questions about data using pictograms</u> 			
<i>Vocabulary</i>	More than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, compare, more than, less than, objects, count, explain, more, less, most, least, more common, least common, attribute, group, same, different, object, more than/less than, most/least, conclusion, sharing			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Data and information	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson1	I can recognise that we can count and compare objects using tally charts During this lesson learners will begin to understand the importance of organising data effectively for counting and comparing. They will create their own tally charts to organise data, and represent the tally count as a total. Finally, they will answer questions comparing totals in tally charts using vocabulary such as 'more than' and 'less than'.	L1 Slides A1 Worksheet – Tally chart A1 Handout – How many animals? A2 Worksheet – Comparing totals
		Lesson 2	I can recognise that objects can be represented as pictures During this lesson learners will become familiar with the term 'pictogram'. They will create pictograms manually and then progress to creating them using a computer. Learners will begin to understand the advantages of using computers rather than manual methods to create pictograms, and use this to answer simple questions.	L2 Slides A1 Worksheet – Pictogram coloured circles A3 Worksheet – Pictogram questions A3 Solutions – Pictogram solutions Pictogram software (This unit assumes the use of 'Just 2 Easy: Pictogram' (https://www.j2e.com/jit5#pictogram) but other packages such as 'Purple Mash: 2Count' are also available. Large sheets of paper e.g. flipchart paper Glue Scissors
		Lesson 3	I can create a pictogram During this lesson learners will think about the importance of effective data collection and will consider the benefits of different data collection methods: why, for example, we would use a pictogram to display the data collected. They will collect data to create a tally chart and use this to make a pictogram on a computer. Learners will explain what their finished pictogram shows by writing a range of statements to describe this.	L3 Slides A0 Resource – Large fruit images. To be stuck around the classroom A1 Worksheet – Minibeast tally chart A1 Handout – Minibeast hunt. Cut up for learners A3 Worksheet – What can you tell me?
		Lesson 4	I can select objects by attribute and make comparisons During this lesson learners will think about ways in which objects can be grouped by attribute. They will then tally objects using a common attribute and present the data in the form of a pictogram. Learners will answer questions based on their pictograms using mathematical vocabulary such as 'more than'/'less than' and 'most'/'least'.	L4 Slides A1 worksheet – Creating a tally A3 worksheet – Pictogram questions

Spring Term 2—Pictograms

<i>Prior Learning</i>	Children should know about: This unit progresses students’ knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties			
<i>End Points</i>	<ul style="list-style-type: none"> ◦ <u>Collect a group of data and present it in a pictogram</u> ◦ <u>Answer questions about data using pictograms</u> 			
<i>Vocabulary</i>	More than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, compare, more than, less than, objects, count, explain, more, less, most, least, more common, least common, attribute, group, same, different, object, more than/less than, most/least, conclusion, sharing			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Data and information	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson 5	<p>I can explain that programming project can have code and artwork</p> <p>During this lesson learners will understand that people can be described by attributes. They will practise using attributes to describe images of people and the other learners in the class. The learners will collect data needed to organise people using attributes and create a pictogram to show this pictorially. Finally, learners will draw conclusions from their pictograms and share their findings.</p>	<p>L5 Slides</p> <p>Whiteboards, pens, and rubbers</p> <p>A1 Handout – Who have I picked?</p> <p>Counters, or laminated handouts and drywipe pens</p> <p>A2 Worksheet – Tally charts</p> <p>A2 Handout – Example questions</p>
		Lesson 6	<p>I can design an algorithm</p> <p>During this lesson learners will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone asks for their data, and how to report their concerns.</p>	<p>L6 Slides</p> <p>Access to: ‘J2Data: Chart’</p> <p>Whiteboards, pens, and rubbers</p> <p>A1 Worksheet – Tally chart</p> <p>Cubes or counters</p> <p>A2 Handout – Sharing your data</p> <p>A2 Solutions – Sharing your data</p>

Summer Term 1—Robot Algorithms

<i>Prior Learning</i>	Children should know about: Algorithms Commands and how algorithms are a sequence of commands How floor robots are programmed How to use prediction in programs			
<i>End Points</i>	◊ Pupils will demonstrate understanding of design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.			
<i>Vocabulary</i>	Instruction, sequence, clear, unambiguous, algorithm, program, sequence, order, commands, prediction, artwork, design, route, mat,			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources—Floor Robots required for each session (lessons may need to be staggered across the week)
Programming	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson 1	I can describe a series of instructions as a sequence In this lesson, pupils will follow instructions given to them and give instructions to others. Pupils will consider the language used to give instructions and how that language needs to be clear and precise. Pupils will combine several instructions into a sequence that can then be issued to another pupil to complete. Pupils will then consider this clear and precise set of instructions in relation to an algorithm, and they will think about how computers can only follow clear and unambiguous instructions	<p>Slides (ncce.io/pg2a-1-s)</p> <p>'Following instructions' activity:</p> <p>Examples sheet (ncce.io/pg2a-1-a1-rd) — you may wish to cut this up before the lesson</p> <p>Dry wipe boards, pens, and erasers, or pencils and paper</p>
		Lesson 2	I can explain what happens we change the order of instructions This lesson focuses on sequences, and guides pupils to consider the importance of the order of instructions within a sequence. Pupils will create several short sequences using the same commands in different orders. They will then test these sequences to see how the different orders affect the outcome.	<p>Slides (ncce.io/pg2a-2-s)</p> <p>Activities:</p> <p>Activity sheet (ncce.io/pg2a-2-a1-wp) — one per pair or small group</p> <p>Different algorithms (floor robots):</p> <p>'Possible routes' teacher resource (ncce.io/pg2a-2-rt)</p> <p>Mat printout (ncce.io/pg2a-2-r1) — print one per pair or group in A3</p> <p>Note: You will reuse the mats in Lesson 3, so you may wish to laminate them.</p>
		Lesson 3	I can use logical reasoning to predict the outcome of a program (series of commands) In this lesson, pupils will use logical reasoning to make predictions. They will follow a program step by step and identify what the outcome will be.	<p>Slides (ncce.io/pg2a-3-s)</p> <p>Activities:</p> <p>Follow the algorithm:</p> <p>'Paper-bot' handout (ncce.io/pg2a-3-a1-h) — cut this up in advance of the lesson</p> <p>Activity sheet (ncce.io/pg2a-3-a1-w) — print in A3</p> <p>Mats from Lesson 2 (ncce.io/pg2a-2-r1)</p> <p>Predict and check:</p> <p>'Command cards' handout (ncce.io/pg2a-3-a3-h) — cut this up in advance of the lesson</p> <p>'Predictions' activity sheet (ncce.io/pg2a-3-a3-w)</p>
		Lesson 4	I can explain that programming project can have code and artwork In this lesson, pupils will design, create, and test a mat for a floor robot. This will introduce the idea that design in programming not only includes code and algorithms, but also artefacts related to the project, such as artwork and audio.	<p>Slides (ncce.io/pg2a-4-s)</p> <p>Blank mat printout (ncce.io/pg2a-4-a1-rb) — print one copy per group in size A3</p> <p>Obstacles printout (ncce.io/pg2a-4-a3-r) — this can be cut up and folded to make 3D obstacles, or you could use physical obstacles, such as small wooden blocks or toys</p> <p>Colouring pencils — using felt-tip pens for the artwork is not recommended as this can make the paper ripple, or even tear</p>

Summer Term 1—Robot Algorithms

<i>Prior Learning</i>	Children should know about: Algorithms Commands and how algorithms are a sequence of commands How floor robots are programmed How to use prediction in programs			
<i>End Points</i>	◊ Pupils will demonstrate understanding of design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.			
<i>Vocabulary</i>	Instruction, sequence, clear, unambiguous, algorithm, program, sequence, order, commands, prediction, artwork, design, route, mat,			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources—Floor Robots required for each session (lessons may need to be staggered across the week)
Programming	Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying) Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions) Cause and consequence: (inputs and outputs, programming) Significance: (significant inventions, significant figures from the world of computing) Chronology: (changes in technology over time, inventions, future technology)	Lesson 5	I can design an algorithm In this lesson, pupils will design algorithms to move their robot around the mats that they designed in Lesson 4. As part of the design process, pupils will outline what their task is by identifying the starting and finishing points of a route. This outlining will ensure that pupils clearly understand what they want their program to achieve.	Slides (nccce.io/pg2a-5-s) Mats and obstacles from Lesson 4 Dry wipe boards or paper and pens
		Lesson 6	I can create and debug a program that I have written In this lesson, pupils will take on a larger programming task. They will break the task into chunks and create algorithms for each chunk. This process is known as ‘decomposition’ and is covered further in key stage 2. Pupils will also find and fix errors in their algorithms and programs. This is known as ‘debugging’.	Slides (nccce.io/pg2a-6-s) ‘Debugging’ activity: activity sheet (nccce.io/pg2a-6-a1-w) and solutions (nccce.io/pg2a-6-a1-s) Mats and obstacles from Lessons 4 and 5 Dry wipe boards or paper and pens

Summer Term 2—An Introduction to Quizzes

<i>Prior Learning</i>	Children should know about: Algorithms Commands and how algorithms are a sequence of commands How ScratchJnr uses block programming(after Year 1 unit Programming Animations)			
<i>End Points</i>	◊ Design and create a quiz in ScratchJnr that has been debugged			
<i>Vocabulary</i>	Sequence, command, program, run, start, outcome, predict, program, blocks, sprite, algorithm, blocks, design, sequence, actions, project, modify, change, match, compare, design, debug, program, features, evaluate			
Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources—access to a PC with internet connection is required for each session
Creating media	<p>Responsibility: (being safe online, using social media responsibly and respectfully, privacy, cyberbullying)</p> <p>Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)</p> <p>Cause and consequence: (inputs and outputs, programming)</p> <p>Significance: (significant inventions, significant figures from the world of computing)</p> <p>Chronology: (changes in technology over time, inventions, future technology)</p>	Lesson1	I can explain that a sequence of commands has a start During this lesson, learners will recap what they know already about the ScratchJr app. They will begin to identify the start of sequences in real-world scenarios, and learn that sequences need to be started in ScratchJr. Learners will create programs and run them in full-screen mode using the Green flag.	Download ScratchJr App for tablets (iPad or Android), or install ScratchJr for computers: https://jfo8000.github.io/ScratchJr-Desktop/ before the lesson L1 Slides
		Lesson 2	I can explain that a sequence of commands has an outcome During this lesson, learners will discover that a sequence of commands has an ‘outcome’. They will predict the outcomes of real-life scenarios and a range of small programs in ScratchJr. Learners will then match programs that produce the same outcome when run, and use a set of blocks to create programs that produce different	Slides A2 Activity sheet – Match the programs A2 Solutions – Match the programs
		Lesson 3	I can create a program using a given design During this lesson, learners will be taught how to use the Start on tap and Go to page (Change background) blocks. They will use a predefined design to create an animation based on the seasons. Learners will then be introduced to the task for the next lesson. They will predict what a given algorithm might mean.	L3 Slides A2 Activity sheet – Choosing blocks L3 Handout – Seasons design
		Lesson 4	I can change a given design During this lesson, learners will look at an existing quiz design and think about how this can be realised within the ScratchJr app. They will choose backgrounds and characters for their own quiz projects. Learners will modify a given design sheet and create their own quiz questions in ScratchJr.	L4 Slides L4 Handout – Quiz design A2 Handout - Quiz backgrounds and characters A2 Activity sheet – Quiz design
		Lesson 5	I can create a program using my own design During this lesson, learners will create their own quiz question designs including their own choices of question, artwork, and algorithms. They will increase the number of blocks used within their sequences to create more complex programs.	Slides A1 Activity sheet – Quiz design A1 Handout - Quiz backgrounds and characters Note: You will need to retain the design sheets for learners to use in Lesson 6.
		Lesson 6	I can decide how my project can be improved During this lesson, learners will compare their projects to their designs. They will think about how they could improve their designs by adding additional features. They will modify their designs and implement the changes on their devices. Learners will find and correct errors in programs (debug) and discuss whether they debugged errors in their own projects.	L6 Slides Design sheets from Lesson 5