Computing Medium Term Planning

Year 5

Key Concepts Overview

Key Concepts	EYFS	Year 1	Year2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	To know that a computer has a mouse and a keyboard and be able to recognise them **(N)** To use a mouse to manipulate a program **(R)** To use a keyboard and understand keys represent letters and numbers **(R)** To understand that a tablet is different to a computer in some ways **(R)**	**Technology Around Us** ◊ 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	**IT Around Us** ◊ 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	**Connecting Computers** ◊ 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	**The Internet** ◊ 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	**Sharing information** ◊ 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	**Communication** ◊ 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	◊ 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)**	**Digital Painting** ◊ 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 **Digital Writing** ◊ 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	**Digital Photography** ◊ Compose and frame an image ◊ Select images ◊ Edit images using software ◊ Produce a final image too meet a brief **Making Music** ◊ Discuss how music makes us feel ◊ Understand that music has patterns ◊ Create rhythms and patterns in music ◊ Use software to compose music	**Stop-Frame Animation** ◊ 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 **Desktop Publishing** ◊ 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	**Audio Editing** ◊ 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 **Photo Editing** ◊ 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	**Vector Drawing** ◊ 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 **Video Editing** ◊ Understand what makes a video effective ◊ Record video using a digital device ◊ Create a storyboard ◊ Improve video by reshooting and editing	**3D Modelling** ◊ Compare 2d and 3D shapes ◊ Use modelling software to combine shapes ◊ Colour, rotate and resize shapes ◊ Design a physical object ◊ Improve designs **Web Page Creation** ◊ 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
Programming	◊ Group objects by type (N) ◊ Discuss data and information and understand that things can be categorised using labels (R) ◊ Create tally charts (R)	**Floor Robots** ◊ 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 **Programming Animations** ◊ 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	**Robot Algorithms** ◊ 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 **Programming Quizzes** ◊ 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	**Sequence in Music** ◊ 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 **Events and actions** ◊ 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	**Repetition in Shapes** ◊ 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 **Repetition in Games** ◊ Develop the understanding of a count-controlled loop in a different environment ◊ Compare infinite loops and count-controlled loops ◊ Use loops in programs	**Selection in Physical Computing** ◊ 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 **Selection in Quizzes** ◊ Understand that conditions control the flow of programs ◊ Link a condition statement to a condition outcome ◊ Design and create a program that uses selection	**Variables in Games** ◊ 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 **Sensing** ◊ 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	◊ 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)**	**Grouping Data** ◊ 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	**Pictograms** ◊ 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	**Databases** ◊ 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	**Data Logging** ◊ 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	**Flat File Databases** ◊ Create paper file databases ◊ Understand how computers file records ◊ Group data ◊ Search records ◊ Compare data using charts ◊ Select flights based on search criteria	**Spreadsheets** ◊ Understand how spreadsheets organise data ◊ Manipulate data sets using spreadsheets ◊ Write and use formulas ◊ Calculate using spreadsheets ◊ Plan a budget

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Sharing Information	**Selection in Quizzes**	Vector Drawing	Video Editing	Selection in Physical Computing **Flat-file Databases**

Autumn Term 2—Sharing Information

Prior Learning	Children should know about: Some of the devices that make up a network The difference between the WWW and the internet How websites are stored (on servers) IP addresses (internet protocol—number of a specific computer or network) and web addresses How not all information on the internet is accurate or true
End Points	To be able to: Create and improve a Powerpoint presentation that has been created collaboratively online.
Vocabulary	System, connection, digital, input, process, output , system, connection, digital, input, process, output , protocol, address, packet, chat, explore, slide deck, reuse, remix, collaboration

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources

Computing systems and networks	**Responsibility:** (being safe online, using social media responsibly and respectfully, privacy, cyber-bullying)
	Similarity and difference: (making comparisons, finding patterns, noting differences and drawing conclusions)
	Cause and consequence: (inputs and outputs, pro-gramming)
	Significance: (significant inventions, significant figures from the world of computing)
	Chronology: (changes in technology over time, inventions, future technolo-gy)
		Lesson 1	I can explain that computers can be connected together to form systems
			 This lesson introduces learners to the concept of a system. Learners will develop their understanding of components working together to make a whole. They will outline how digital systems might work and the physical and electronic connections that exist.
				Slides (ncce.io/csn5-1-s)
				Activities:
				    Bicycle system: activity sheet (ncce.io/csn5-1-a1-w)
				    Digital Ted: activity sheet (ncce.io/csn5-1-a2-w)
				    Smart locker: activity sheet (ncce.io/csn5-1-a3-w)

		Lesson 2	I can recognise the role of computer systems in our lives
			In this lesson, learners will consider how larger computer systems work. Learners will consider how devices and processes are connected. They will also reflect on how computer systems can help us.
				Slides (ncce.io/csn5-2-s)
				Activities:
				    Pedestrian crossings: activity sheet (ncce.io/csn5-2-a1-h) and teacher notes (ncce.io/csn5-2-a1-d)
				    Catalogue store: activity sheet (ncce.io/csn5-2-a2-w) and solutions (ncce.io/csn5-2-a2-s)

		Lesson 3	I can recognise how information is transferred over the internet
			This lesson introduces the idea that parts of a computer system are not always in the same place or country. Instead, those parts of a system must transfer information using the internet. This lesson builds on the introduction to the internet in the Year 4 'What is the internet?' unit, adding awareness of IP addresses and the rules (protocols) that com-puters have for communicating with one another.
				Slides (ncce.io/csn5-3-s)
				Activities:
				    Sending messages: packet strips handout (ncce.io/csn5-3-a3-rp) (at least six for each learner) and position numbers handout (ncce.io/csn5-3-a3-rn)
				    Sending information: activity sheet (ncce.io/csn5-3-a4-w) and answers (ncce.io/csn5-3-a4-s)

		Lesson 4	I can explain how sharing information online lets people in different places work together In this lesson, learners will consider how people can work together when they are not in the same location. They will discuss ways of working and start a collaborative online pro-ject. The online activity assumes that learners can make simple slides including text and images. If your learners are unsure how to do this, you may wish to spend some time on the Year 3 'Desktop publishing' unit before this lesson	Slides (ncce.io/csn5-4-s) One shared project slide deck per group (ncce.io/csn5-4-a2-r) Computers that are connected to the internet Individual learner logins for G Suite Working together homework (ncce.io/csn5-4-w)
		Lesson 5	I can contribute to a shared project online In this lesson, learners will reflect on how they worked together in the previous lesson and how their working together might be improved. Learners will work together on an un-plugged activity and use that experience to develop their own ideas of good collective working practices.	Slides (ncce.io/csn5-5-s) Shared files from Lesson 4 Computers that are connected to the internet Individual learner logins for G Suite
		Lesson 6	I can evaluate different ways of working together online In the previous two lessons, learners worked together online on a shared project. This lesson introduces another approach to online working: reusing and modifying work done by someone else. (Using someone else's work needs to be done within the bounds of copyright and with the relevant permissions.) This lesson uses the Scratch programming tool, which allows learners to use other people's work.	Slides (ncce.io/csn5-6-s) Paper and pencil Laptops or tablets to access Scratch 3 Scratch 3 pupil accounts A Scratch project to remix (scratch.mit.edu/projects/343870811)

Spring Term 1 - Selection in Quizzes

Prior Learning	Children should know about: How software uses algorithms How to code using a block coding environment (Scratch) How some algorithms use repetition and that these are defined as loops Debugging and how to ensure that a program works
End Points	To be able to: Cretae a quiz in Scratch that uses an algorithm that incorporates selection to produce responses to correct or incorrect answers
Vocabulary	Selection, condition, true, false, count-controlled loop, conditional statement (the linking together of a condition and outcomes), algorithm, program, debug, outcomes, question, answer, algorithm, program, debug,

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Programming	**Responsibility:** (being safe online, using social media responsibly and respectfully, privacy, cyber-bullying) **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)	Lesson1	I can explain how selection is used in computer programs In this lesson, learners revisit previous learning on 'selection' and identify how 'conditions' are used to control the flow of actions in a program. They are introduced to the blocks for using conditions in programs using the Scratch programming environment. They modify the conditions in an existing program and identify the impact this has	Slides (ncce.io/pg5b-1-s) A1 Code: 'Using selection' (ncce.io/pg5b-1-a1-c) A2 Code: 'Conditions in programs' (ncce.io/pg5b-1-a2-ca) A2 Code: 'Annotated conditions in programs' (ncce.io/pg5b-1-a2-cb) - optional, this is additional support that some users may need A2 'Conditions in programs' worksheet (ncce.io/pg5b-1-a2-wc) A3 Code: 'Modifying selection' (ncce.io/pg5b-1-a3-c) Homework (ncce.io/pg5b-1-w)
		Lesson 2	I can relate that a conditional statement connects a condition to an outcome In this lesson, learners will develop their understanding of selection by using the 'if… then… else...' structure in algorithms and programs. They will revisit the need to use repetition in selection to ensure that conditions are repeatedly checked. They identify the two outcomes in given programs and how the condition informs which outcome will be selected. Learners use this knowledge to write their own programs that use selection with two outcomes.	Slides (ncce.io/pg5b-2-s) A1 Code: 'Using repeats' (ncce.io/pg5b-2-a1-c) A3 'Programming two outcomes' worksheet (ncce.io/pg5b-2-a3-wp)
		Lesson 3	I can explain how selection directs the flow of a program In this lesson, learners consider how the 'if… then... else…' structure can be used to identify two responses to a binary question (one with a 'yes or no' answer). They identify that the answer to the question is the 'condition', and use algorithms with a branching structure to represent the actions that will be carried out if the condition is true or false. They learn how questions can be asked in Scratch, and how the answer, supplied by the user, is used in the condition to control the outcomes. They use an algorithm to design a program that uses selection to direct the flow of the program based on the answer provided. They implement their algorithm as a program and test whether both outcomes can	Slides (ncce.io/pg5b-3-s) A1 Code: Program Flow () A2 'Designing outcomes' worksheet (ncce.io/pg5b-3-a2-hd) A3 Code: Programming different outcomes (support) () - optional, providing additional support that some users may need A3 'More answers' worksheet (ncce.io/pg5b-3-a3-wm) - optional, explorer task
		Lesson 4	I can design a program which uses selection In this lesson, learners will be provided with a task: to use selection to control the outcomes in an interactive quiz. They will outline the requirements of the task and use an algorithm to show how they will use selection in the quiz to control the outcomes based on the answer given. Learners will complete their designs by using storyboards to identify the questions that will be asked, and the outcomes for both correct and incorrect answers. To demonstrate their understanding of how they are using selection to control the flow of the program, learners will identify which outcomes will be selected based on given responses.	Slides (ncce.io/pg5b-4-s) A1 'Design outline' (ncce.io/pg5b-4-a1-wd) A2 'Quiz design' worksheet (ncce.io/pg5b-4-a2-wq) A3 'Identifying outcomes' (ncce.io/pg5b-4-a3-w)

Summer Term 1 - Selection in Quizzes

Prior Learning	Children should know about:
End Points	
Vocabulary	Selection, condition, true, false, count-controlled loop, conditional statement (the linking together of a condition and outcomes), algorithm, program, debug, outcomes, question, answer, algorithm, program, debug,

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
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 create a program which uses selection In this lesson, learners will use the Scratch programming environment to implement the first section of their algorithm as a program. They will run the first section of their program to test whether they have correctly used selection to control the outcomes, and debug their program if required. They will then continue implementing their algorithm as a program. Once completed, they will consider the value of sharing their program with others so that they can receive feedback. Learners conclude the lesson by using another learner's quiz and providing feedback on it.	Slides (ncce.io/pg5b-5-s) A0 'Both, one, none?' handout (ncce.io/pg5b-5-a0-hb) A1 Code: Quiz (annotated) (ncce.io/pg5b-5-a1-c) (optional support) A2 'Testing my program' worksheet (ncce.io/pg5b-5-a2-wt) (including one copy enlarged for class display) A2 Code: Testing (ncce.io/pg5b-5-a2-ca) A2 Code: Class example (ncce.io/pg5b-5-a2-cb) A3 Code: Setup (ncce.io/pg5b-5-a3-c) Learners' designs from the previous lesson.
		Lesson 6	I can evaluate my program In this lesson, learners will return to their completed programs and identify ways in which the program can be improved. They will focus on issues where answers similar to those in the condition are given as inputs, and identify ways to avoid such problems. Learners will also consider how the outcomes may change the program for subsequent users, and identify how they can make use of setup to provide all users with the same experience. They will implement their identified improvements by returning to the Scratch programming environment and adding to their programs. They conclude the unit by identifying how they met the requirements of the given task, and identifying the aspects of the program that worked well, those they improved, and areas that could improve further.	Slides (ncce.io/pg5b-6-s) A1 Improving my program worksheet (ncce.io/pg5b-6-a1-wi) A2 Code: Class example (ncce.io/pg5b-6-a2-c) A3 Code: Improved project (ncce.io/pg5b-6-a3-c)

Spring Term 2 - Vector Drawing

Prior Learning	Children should know about: Digital images How to produce digital images in a digital paint package How digital paintings are made up of pixels How apps and software contain tools that can be used to create and edit digital images
End Points	To be able to: **Plan, draw and edit vector drawings for a specific aim**
Vocabulary	Vector, drawing tools, object, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, rotate, object, align, resize, modify, layers, object, order, copy, paste, group, ungroup, duplicate, object, vector drawing, reuse, reflection, vector drawing

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Creating media	**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)	Lesson1	I can identify that drawing tools can be used to produce different outcomes In this lesson learners will be introduced to vector drawings and begin to have an understanding that they are made up of simple shapes and lines. Learners will use the main drawing tools within a software package. This unit is written assuming the use of Google Drawings (docs.google.com/drawings/) but other packages such as Microsoft Publisher, or Microsoft PowerPoint can be used if preferred. Learners will discuss how vector drawings differ from paper-based drawings.	Google Drawings (You and your learners need to have access to Google Workspace for Education) L1 Handout – Overview of the drawing tools L1 Slides A1 Activity sheet – Shape picture A1 – Optional – Glue and A4 paper
		Lesson 2	I can create a vector drawing by combining shapes During this lesson learners will begin to identify the shapes that are used to make vector drawings. They will be able to explain that each element of a vector drawing is called an **object**. Learners will create their own vector drawing by moving, resizing, rotating, and changing the colours of a selection of objects. They will also learn how to duplicate the objects to save time.	L2 Slides A0 Teacher handout – Owl shapes (printed on A3 paper) Sticky tack or other non-permanent adhesive for the introductory activity A1 Activity sheet – Copy and paste (ncce.io/copyandpaste) A1 Activity sheet – Copy and paste (if using an alternative vector drawing program) Google Drawings (ncce.io/gdrawing)
		Lesson 3	I can use tools to achieve a desired effect During this lesson learners will continue to increase the complexity of their vector drawings by using the zoom tool to help them add detail. They will begin to understand how grids and resize handles can be used to improve consistency in their drawings and use tools to modify objects, creating different effects.	L3 Slides A1 Activity sheet – Make your own penguin (ncce.io/penguin) A1 Activity sheet – Make your own penguin (if using an alternative vector drawing program)
		Lesson 4	I can recognise that vector drawings consist of layers During this lesson learners will gain an understanding of layers and how they are used in vector drawings. They will learn that each object is built on a new layer and that these layers can be moved forward and backward to create effective vector drawings.	L4 Slides A2 Activity sheet – Emoji layering (ncce.io/emojis) A2 Activity sheet – Emoji layering (if using an alternative vector drawing program)
		Lesson 5	I can group objects to make them easier to work with During this lesson learners will be taught how to duplicate multiple objects. They will learn how to group objects to make them easier to work with, how to copy and paste these images, and then make simple alterations.	L5 Slides A1 Activity sheet – Flower (ncce.io/flower) A1 Activity sheet – Flower (if using an alternative vector drawing program) A2 Activity sheet – Making changes (ncce.io/grouping) A2 Activity sheet – Making changes (if using an alternative vector drawing program) A2 Solutions – Making changes (ncce.io/groupingsolution) A3 Activity sheet – Grass (ncce.io/grass) A3 Activity sheet – Jungle (ncce.io/jungle) A3 Activity sheet – Moss (ncce.io/moss) A3 Activity sheet – Mountains (ncce.io/mountains) A3 Activity sheet – Background images (if using an alternative vector drawing program)
		Lesson 6	I can evaluate my vector drawing During this lesson learners will understand how digital images can be made from shapes or pixels. They will suggest and implement improvements to vector drawings and complete the unit by creating their own labels for the classroom using the skills they have learned.	L6 Slides Access to Google Drawings (ncce.io/gdrawing) for Activity 1 A2 Activity sheet – Reflection Whiteboards, pens, and rubbers (optional) for Activity 3

Summer Term 1 — Video Editing

Prior Learning	Children should know about: Digital images How animations are a sequence of photos or images What digital recording is Input and output devices (microphones and speakers, cameras and video) How audio files can be edited to improve them or compose digital content
End Points	To be able to: **Plan, record and edit a video and evaluate it**
Vocabulary	Video, audio, camera, talking head, panning, close up, video camera, microphone, lens, close up, mid range, long shot, moving subject, side by side, high angle, low angle, normal angle, static camera, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Creating media	**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)	Lesson1	I can explain what makes a video effective Learners will be introduced to video as a media format. They will see examples of videos featuring production and editing techniques that they will work towards using their own videos. Learners will begin by explaining what the medium of video is before analysing	L1 Slides A1 Sticky notes A1 Worksheet – Reviewing a video
		Lesson 2	I can use a digital device to record video Learners will explore the capabilities of a digital device that can be used to record video. Once they are familiar with their device, learners will experiment with different camera angles, considering how different camera angles can be used for different purposes.	L2 Slides A1 Devices that can record video A1 Handout – Filming techniques A2 Worksheet – Which technique? A2 Worksheet answers – Which technique?
		Lesson 3	I can capture video using a range of techniques Learners will use a storyboard to explore a variety of filming techniques, some of which they will use in their own video project later in the unit. They will evaluate the effectiveness of these techniques before offering feedback on others' work.	L3 Slides A1 Handout – Storyboard A2 Filming devices
		Lesson 4	I can create a storyboard Learners will plan a video by creating a storyboard. Their storyboard will describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of	L4 Slides A2 Handout – Storyboard A3 Filming devices
		Lesson 5	I can identify that video can be improved through reshooting and editing Learners will film the remaining scenes of their video, and then import their content to video editing software. They will then explore key editing techniques and decide whether sections of their video can be edited or need to be shot again.	L5 Slides A1 Storyboard work from Lesson 4 A1 Devices for filming A2 Devices for editing with the editing software/app installed (Windows 10 Video Editor is used here as an example) A3 Teacher handout – Reshoot or edit?
		Lesson 6	I can identify that video can be improved through reshooting and editing Learners will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others.	L6 Slides A1 Access to the videos the learners recorded in Lesson 5 A1 Devices for editing with the editing software/app installed (Windows 10 Video Editor is used as an example) A2 Storyboard work from Lesson 4

Summer Term 2 - Flat-file Databases

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources
Data and information	**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)	Lesson1	I can use a form to record information In the first lesson, pupils create a paper version of a record card database. Using a card template, they create a data set, with each pupil creating eight to ten cards linked to a theme, eg animals. They complete records for each of the animals in their database and then physically sort the cards to answer questions about the data.	Slides (ncce.io/dat5-1-s) L1 Handout – Printable record cards (ncce.io/dat5-1-hp) (two sheets per pupil) L1 Handout – Scaffolded information (ncce.io/dat5-1-hs) (optional) A3 Worksheet – Question recording sheet (ncce.io/dat5-1-a3-w) (optional)
		Lesson 2	I can compare paper and computer-based databases In this lesson, pupils use a computer-based database to examine how data can be recorded and viewed. They learn that a database consists of 'records', and that each record contains 'fields'. In addition, they will order records in different ways and compare this database to the paper database they created in lesson 1.	Slides (ncce.io/dat5-2-s) A1 Resource: Mini beasts database from J2E (ncce.io/dat5-2-a1-r) A2 Resource: Countries database from J2E (ncce.io/dat5-2-a2-r) A2 Worksheet – Different views for sorting (ncce.io/dat5-2-a2-w) A3 Worksheet – Records and fields (ncce.io/dat5-2-a3-w) A3 Solutions – Records and fields (ncce.io/dat5-2-a3-s) Personal whiteboards and pens
		Lesson 3	I can outline how grouping and then sorting data allows us to answer questions In this lesson, pupils investigate how records can be grouped, using both the paper record cards created in lesson 1 and a computer based database from J2E. They use 'grouping' and 'sorting' to answer questions about the data.	Slides (ncce.io/dat5-3-s) Paper record cards created in Lesson 1 Scissors A2 Resource – Countries database from J2E (ncce.io/dat5-3-a2-r) A3 Worksheet – Using the database (ncce.io/dat5-3-a3-w) (optional) A3 Solutions – Using the database (ncce.io/dat5-3-a3-s) (optional) Mini whiteboards and pens
		Lesson 4	I can explain that tools can be used to select specific data In this lesson, pupils develop their search techniques to answer questions about the data. They use advanced techniques to search for more than one field, and practise doing this through both unplugged methods (without using computers), and using a	Slides (ncce.io/dat5-4-s) A2 and A3 Worksheet – AND / OR searches (ncce.io/dat5-4-a2-w) A2 and A3 Solutions – AND / OR searches (ncce.io/dat5-4-a2-s) A1 Resource – Titanic database from J2E (ncce.io/dat5-4-a1-r)
		Lesson 5	I can explain that computer programs can be used to compare data visually In this lesson, pupils consider what makes a useful chart, and how charts can be used to compare data. They create charts from their data in order to answer ques-	Slides (ncce.io/dat5-5-s) A1 Handout – Comparing charts (ncce.io/dat5-5-a1-h) A2 Worksheet – Using charts (ncce.io/dat5-5-a2-w) A2 Resource – Titanic database from J2E (ncce.io/dat5-5-a2-r)
		Lesson 6	I can apply my knowledge of a database to ask and answer real-world questions The final lesson requires pupils to use a real-life database to ask questions and find answers in the context of a flight search based on set parameters. They take on the role of a travel agent and present their findings, showing how they arrived at their chosen options. Presentations may be given between groups of pupils, or by each	Slides (ncce.io/dat5-6-s) A1 Worksheet – Searching the flight database (ncce.io/dat5-6-a1-w) A1 Resource – Flight finder database (ncce.io/dat5-6-a1-r) or any suitable online flight-finder database A3 Resource – Presenting your findings (ncce.io/dat5-6-a3-r) each pupil needs a digital, editable copy https://www.expedia.co.uk/Flights Mini whiteboards and pens

Summer Term 2—Selection in Physical Computing

Prior Learning	Children should know about: How software uses algorithms How to code using a block coding environment (Scratch) How some algorithms use repetition and that these are defined as loops Debugging and how to ensure that a program works
End Points	To be able to: **Make a working model of a fairground ride using a microcontroller(Crumber Controller) and a writing code that incorporates selection and loops**
Vocabulary	Microcontroller, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, motor, LED, Sparkle, crocodile clips, connect, battery box, program, condition, input, output, selection, condition, debug

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources

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)
		Lesson1	I can control a simple circuit connected to a computer
			In this lesson, learners will become familiar with the Crumble controller, some of its associated components, and the programming environment used to control it. They will explore how the items connect together to create a complete circuit, and how to construct programs that turn an LED on and off and set its colour. Learners will apply their understanding of repetition by identifying how their programs can be modified to make an LED
				L1 Slides
				L1 Code – Lesson prep white_flashing_sparkle
				Activities:
				    A2 Activity sheet – Sparkle patterns
				    A2 Activity sheet – Exploring colour values – Explorer task

		Lesson 2	I can write a program that includes count-controlled loops
			In this lesson, learners will develop their knowledge of a Crumble controller further by connecting additional devices (another Sparkle and a motor) to the controller, and they will construct programs to control more than one of these. They will design sequences of actions for these output devices. They will then apply their understanding of repetition by using count-controlled loops when implementing their design as a program
				L2 Slides
				Activities:
				    A1 Handout: Spinning disc template — one disc per Crumble
				    A2 Activity sheet – Algorithms for controlling outputs
				Homework — optional
				Crumble starter kits and devices capable of running the Crumble software
				Geared motor and wheel — one set per Crumble
				Sticky tack — for sticking the 'spinning disc' to the motors

		Lesson 3	I can explain that a loop can stop when a condition is met e.g. number of times
			In this lesson, learners will be introduced to conditions, and how they can be used in algorithms and programs to control their flow. They will identify conditions in statements, stating if they are true or false, and learn how they can be used to start and stop a set of actions. Learners will be introduced to a Crumble switch, and learn how it can provide the Crumble controller with an input that can be used as a condition. They will explore how to write programs that use an input as a condition, and use this knowledge to write a program that uses a condition to stop a repeating light pattern.
				L3 Slides
				Activities:
				    A1 Activity sheet – Conditions
				    A2 Activity sheet – Do until loops
				    A2 Solutions – Do until loops
				    A3 Code: Support file conditions — optional, scaffolding opportunity
				Crumble starter kits and devices running Crumble software

		Lesson 4	I can conclude that a loop can be used to repeatedly check whether a condition has been met In this lesson, learners will develop their understanding of how the flow of actions in algorithms and programs can be controlled by conditions. They will be introduced to selection, and learn to represent conditions and actions using the 'if… then…' structure. They will apply their understanding by using selection in an algorithm created to meet the requirements of a task. They will discover that infinite repetition is required when programming input devices to repeatedly check if a condition has been met	L4 Slides Activities: A2 Activity sheet – Design with selection Homework — optional Crumble starter kits and a device capable of running the Crumble software

		Lesson 5	I can design a physical project that includes selection
			
			In this lesson, learners will apply their understanding of microcontrollers, output devices, and selection when designing a project to meet the requirements of a given task. To ensure their understanding, they will identify how selection might be used in real-world situations, then they will consider how they can apply this knowledge when designing their project. They will produce detailed drawings to show how their model will be made and how they will connect the microcontroller to its components.
				L5 Slides
				Activities:
				    A2 Activity sheet – Designing a model (page 2 is used in Lesson 6)
				    A2 Designing a model template – Completed example
				A selection of materials and equipment suitable for making models
				Crumble starter kit — one per group
				1 geared motor and wheel — per group

		Lesson 6	I can create a controllable system that includes selection In this final lesson of the unit, learners will build on the designs that they developed in Lesson 5 by creating an algorithm to meet the requirements of the given task. They will identify how they are going to use selection before writing their algorithm. They will then move into the code level to test their algorithm by implementing it as a program, running it, identifying any bugs, and returning to the algorithm to debug it where necessary. Finally, to conclude the unit, they will evaluate their algorithms and other areas of their designs.	L6 Slides Activities: Page 2 of the A2 Worksheet – Designing a model from Lesson 5 Devices capable of running the Crumble software