Computing Medium Term Planning

Year 6

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 ordanise data ◊ Manipulate data sets using spreadsheets ◊ Write and use formulas ◊ Calculate using spreadsheets ◊ Plan a budget

Year 6 Computing Yearly Overview

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computing Systems and Networks	Variable in Games	Sensing	Web page Creation	Spreadsheets 3D Modelling

Autumn Term 2—Computing Systems and Networks

Prior Learning	That computers are connected in networks What small and large networks are That networks allow people to work collaboratively What the internet is How to use desktop publishing to create slides
End Points	To be able to: **To demonstrate a clear understanding of how search engines work, how web pages can optimise the number of visits and to understand how to communicate safely online.**
Vocabulary	Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine , index, crawler, bot, search engine, ranking, search engine, search engine optimisation, links, web crawlers, Searching, content creator, selection, ranking, communication, internet, communication, public, private, one-way, two-way, one-to-one, one-to-many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround

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, 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 how to use a search engine In this lesson, learners will be introduced to a range of search engines. They will be given the opportunity to explain how we search, then they will write and test instructions. Next, they will learn that searches do not always return the results that we are looking for, and will refine their searches accordingly. Finally, they will be introduced to the two most common methods of searching: using a search engine and the address bar.	Slides (ncce.io/csn6-1-s) Activity sheet (ncce.io/csn6-1-a1-h) Internet-connected devices with a web browser
		Lesson 2	I can describe how search engines select results In this lesson, learners will gain an understanding of why search engines are necessary to help us find things on the World Wide Web. They will conduct their own searches and break down, in detail, the steps needed to find things on the web. They will then emulate web crawlers to create an index of their own classroom. Finally, they will consider why some searches return more results than others.	Slides (ncce.io/csn6-2-s) Activity sheet (ncce.io/csn6-2-a2-w) and example solutions (ncce.io/csn6-2-a2-d)
		Lesson 3	I can explain how search results are ranked This lesson includes an unplugged activity in which the class will learn about some of the main factors that influence how a search engine ranks a web page. Learners will create paper-based 'web pages' in groups, on a topic that they are currently studying. They will then discover how their web pages would rank when searching for keywords relating to their content.	Slides (ncce.io/csn6-3-s) Activity sheet (ncce.io/csn6-3-a1-h) Internet-enabled devices A3 paper (for web page design)
		Lesson 4	I can recognise why the order of results is important, and to whom In this lesson, learners will explore how the person performing a web search can influence the results that are returned, and how content creators can optimise their sites for searching. Learners will also explore some of the limitations of searching, then discuss what cannot be searched.	Slides (ncce.io/csn6-5-s) Handout (ncce.io/csn6-5-a3-h) and activity sheet (ncce.io/csn6-5-a3-w) Individual whiteboards (for the 'Communicating using the internet' activity) Homework (ncce.io/csn6-5-w)
		Lesson 5	I can recognise how we communicate using technology In this lesson, learners will deepen their understanding of the term 'communication'. They will explore different methods of communication, then they will consider internet-based communication in more detail. Finally, they will evaluate which methods of communication suit particular purposes.	Slides (ncce.io/csn6-5-s) Handout (ncce.io/csn6-5-a3-h) and activity sheet (ncce.io/csn6-5-a3-w) Individual whiteboards (for the 'Communicating using the internet' activity) Homework (ncce.io/csn6-5-w)
		Lesson 6	I can evaluate different methods of online communication In this lesson, learners will use information provided and their own prior knowledge to categorise different forms of internet communication. They will then choose which method they would use for the scenarios discussed in the previous lesson. During these activities, they will explore issues around privacy and information security.	Slides (ncce.io/csn6-6-s) Activities: Comparing methods of internet communication: handout (ncce.io/csn6-6-a1-h) and solutions (ncce.io/csn6-6-a1-s) Exit ticket: handout (ncce.io/csn6-6-aP-h) Individual whiteboards and pens (for the introduction) Sticky notes (for the 'Choosing a method of communication' activity) Learners' mind maps from lesson 5 (ncce.io/csn6-5-a3-h)

Spring Term 1—Variables in Games

Prior Learning	Children should know about: Physical computing and that code is used by some hardware Some physical computing devices and what they can be used for (Crumble controllers) LED lights and their application Selection and how programs use it Loops and how programs use them
End Points	To be able to: Design and write code for a game which uses variables to keep a score.
Vocabulary	Variable, change, name, value, set, change, design, event, algorithm, code, artwork, program, project, code, test, debug, improve, evaluate, share

Key Concept	Second Order Concepts	Lesson Sequence	Learning Objectives	Resources—access to a PC with internet connection is required for each session
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 define a 'variable' as something that is changeable In this lesson, pupils will be introduced to variables. Pupils will see examples of real-world variables (score and time in a football match), then they will explore them in a Scratch project. Pupils will then design and make their own project including variables. Finally, pupils will identify that variables are named and can be letters (strings) as well as numbers.	Slides (ncce.io/pg6a-1-s) Scratch project (ncce.io/pg6a-1-a1-ca) Activities: Designing a project with a variable: activity sheet (ncce.io/pg6a-1-a2-w) and solutions (ncce.io/pg6a-1-a2-s) Variable values: activity sheet (ncce.io/pg6a-1-aP-wv) and solutions (ncce.io/pg6a-1-aP-sv) Homework (ncce.io/pg6a-1-w) Devices that are capable of running Scratch 3
		Lesson 2	I can explain why a variable is used in a program In this lesson, pupils will understand that variables are used in programs, and that they can hold a single value at a time. Pupils will complete an unplugged task that will demonstrate the process of changing variables. Next, they will explore why it is important to name variables, then they will apply their learning in a Scratch project in which they will make, name, and update variables.	Slides (ncce.io/pg6a-2-s) 'Updating a value' handout (ncce.io/pg6a-2-a1-hu) or sticky notes and page 2 of the handout Individual dry wipe boards and pens 'Making a scoreboard in Scratch' activity: Scoreboard Scratch project template (ncce.io/pg6a-2-a3-ca) Scoreboard Scratch project solution (ncce.io/pg6a-2-a3-cb) Devices capable of running Scratch 3
		Lesson 3	I can choose how to improve a game using variables In this lesson, pupils will apply the concept of variables to enhance an existing game in Scratch. They will predict the outcome of changing the same change score block in different parts of a program, then they will test their predictions in Scratch. They will also experiment with using different values in variables, and with using a variable elsewhere in a program. Finally, they will add comments to their project, explaining how they have met the objectives of the lesson.	Slides (ncce.io/pg6a-3-s) Activities: Introduction: Scratch project (ncce.io/pg6a-3-a0-ra) Making a 'score' variable: 'Changing the score' activity sheet (ncce.io/pg6a-3-a1-h) Scratch project (ncce.io/pg6a-3-a1-ca) Devices that are capable of running Scratch 3
		Lesson 4	I can design a project that builds on a given examples This lesson focuses on the design elements of programming. For the majority of the tasks, pupils will be working at the algorithmic level of abstraction. Pupils will first design the sprites and backgrounds for their project, then they will design their algorithms to create their program flow.	Slides (ncce.io/pg6a-4-s) Activities: Analysing a game: Scratch project (ncce.io/pg6a-4-a0-ra) Activity sheet (ncce.io/pg6a-4-a0-w) Scratch project template (ncce.io/pg6a-4-a1-ca) 'Project design' activity sheet (ncce.io/pg6a-4-a1-w)

Spring Term 1—Variable in Games

Prior Learning	Children should know about:			
End Points	To be able to: Design and write code for a game which uses variables to keep a score.			
Vocabulary	Variable, change, name, value, set, change, design, event, algorithm, code, artwork, program, project, code, test, debug, improve, evaluate, share			
Key Concept	**Second Order Concepts**	**Lesson Sequence**	**Learning Objectives**	**Resources—access to a PC with internet connection is required for each session**
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 use my design to create a project In this lesson, pupils will implement the algorithms that they created in Lesson 4 as code. In doing this, they will identify variables in an unfamiliar project and learn the importance of naming variables. They will also have the opportunity to add another variable to enhance their project.	Slides (ncce.io/pg6a-5-s) Activities: Identifying and naming variables: Scratch project at project level (ncce.io/pg6a-5-a1-ra) Scratch project at code level (ncce.io/pg6a-5-a1-ca) Create your project: Scratch project template (ncce.io/pg6a-5-a3-ra) 'Project evaluation' activity sheet (ncce.io/pg6a-5-a3-h) Designs from Lesson 4 Individual dry wipe boards Devices that are capable of running Scratch 3 Homework: activity sheet (ncce.io/pg6a-5-w) and solutions (ncce.io/pg6a-5-ws)
		Lesson 6	I can evaluate my project This lesson gives pupils the opportunity to build on the project that they created in Lesson 5. As the lesson develops, the scaffolding is gradually removed, so that the last main activity is without constraints. Finally, pupils will evaluate each other's projects, identifying features that they like, and features that could be improved further.	Slides (ncce.io/pg6a-6-s) Activities: Are all games the same?: activity sheet (ncce.io/pg6a-6-a0-w) Share your project: 'Sharing and evaluating' activity sheet (ncce.io/pg6a-6-aP-w) Scratch project example (ncce.io/pg6a-6-a1-ra) Devices that are capable of running Scratch 3

Spring Term 2 — Sensing

Prior Learning	Children should know about: Physical computing and that code is used by some hardware Some physical computing devices and what they can be used for (Crumble controllers) LED lights and their application Selection and how programs use it Loops and how programs use them
End Points	Write a number of different codes to enable a micro bit to be used for a number of purposes such as a compass or a step counter
Vocabulary	Micro:bit, MakeCode, input, process, output, flashing, USB, selection, condition, if then else, variable, random, input, variable, sensing, accelerometer, compass, direction, navigation, task, algorithm, variable, step counter, plan, create, code, test, de-bug,

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 create a program to run on a controllable device In this lesson, learners will be introduced to the micro:bit as an input, process, output device that can be programmed. Learners will familiarise themselves with the device itself and the programming environment, before creating their own programs. They will then flash their programs to the device.	Slides (ncce.io/pg6b-1-s) Computers with USB connectivity and access to makecode.microbit.org (ncce.io/pg6b-1-c) Micro:bits with a micro USB lead Label a micro:bit: handout (ncce.io/pg6b-1-a0-h) Input, process, output: handout (ncce.io/pg6b-1-aP-h) Homework handout (ncce.io/pg6b-1-w) and answers (ncce.io/pg6b-1-ws)
		Lesson 2	I can explain that selection can control the flow of a program In this lesson, learners will explore how if, then, else statements are used to direct the flow of a program. They will initially relate if, then, else statements to real-world situations, before creating programs in Make-Code. They will apply their knowledge of if, then, else statements to create a program that features selection influenced by a random number to create a micro:bit fortune teller project.	Slides (ncce.io/pg6b-2-s) Activities: Conditions in the real world: handout (ncce.io/pg6b-2-a1-hc) A1 2 code (ncce.io/pg6b-2-a2-c) Algorithm and program flow: resource (ncce.io/pg6b-2-a3-ra) A3 code (ncce.io/pg6b-2-a3-c) The flow of a program: handout (ncce.io/pg6b-2-aP-ht) and solutions (ncce.io/pg6b-2-aP-hs) Micro:bits with USB micro leads
		Lesson 3	I can update a variable with a user input In this lesson, learners will initially use the buttons to change the value of a variable using selection. They will then develop their programs to update the variable by moving their micro:bit using the accelerometer to sense motion. Finally, they will learn that a variable can be displayed after it is updated or in response to an input.	Slides (ncce.io/pg6b-3-s) Activities: A1 code: Counter full project (ncce.io/pg6b-3-a1-c) Project design template: A1 handout (ncce.io/pg6b-3-a1-hd) A2 code: Counter with second condition full project (ncce.io/pg6b-3-a2-c) Project design template: A2 handout (ncce.io/pg6b-3-a2-hd) Computers connected to the internet Micro:bits with micro USB leads
		Lesson 4	I can use a conditional statement to compare a variable to a value In this lesson, learners will initially work at code level by applying their knowledge from the previous lesson to make their micro:bit perform the function of a compass. They will then design a program which will enable the micro:bit to be used as a navigational device. To code this, they will adapt the code they completed to make the compass.	Slides (ncce.io/pg6b-4-s) Activities: Direction and degrees: A1 handout (ncce.io/pg6b-4-a1-h1) - help sheet Project design template: A1 handout (ncce.io/pg6b-4-a1-h2) - part-complete project design Project design template: A1 handout (ncce.io/pg6b-4-a1-h3) - complete project design A1 code (ncce.io/pg6b-4-a1-ca) - part complete A1 code (ncce.io/pg6b-4-a1-cb) - complete project Project design template: A2 handout (ncce.io/pg6b-4-a2-hd) - project design A2 code (ncce.io/pg6b-4-a2-c) - complete project Computers connected to the internet Micro:bits with micro USB cables Micro:bit project ideas: homework (ncce.io/pg6b-4-w)

Spring Term 2 — Sensing

Prior Learning	Children should know about:			
End Points	To be able to: Write a number of different codes to enable a micro bit to be used for a number of purposes such as a compass or a step counter			
Vocabulary	Micro:bit, MakeCode, input, process, output, flashing, USB, selection, condition, if then else, variable, random, input, variable, sensing, accelerometer, compass, direction, navigation, task, algorithm, variable, step counter, plan, create, code, test, 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 design a project that uses inputs and outputs on a controllable device In this lesson, learners will be working at the design level. They will pick out features of a step counter, a piece of technology with which they are likely to be familiar. They will then relate those features to the sensors on a micro:bit. Having seen a simulated example of a micro:bit step counter, learners will pick out features which they will be able to include in their design. In the main activity, learners will design the algorithm for their step counter project. Finally, they will connect the battery pack to their micro:bit to set it up as a	Slides (ncce.io/pg6b-5-s) Design template: A2 worksheet (ncce.io/pg6b-5-a2-hd) Completed design example: A2 handout (ncce.io/pg6b-5-a2-hc) Micro:bits with battery packs and batteries
		Lesson 6	I can develop a program to use inputs and outputs on a controllable device In this lesson, learners will use the design that they have created in Lesson 5 to make a micro:bit-based step counter. First they will review their plans, followed by creating their code. Depending on their level of confidence, they can use a scaffolded or part-complete project, otherwise they can start a new project. Learners will test and debug their code, using the emulator and then the physical device. To successfully complete this project, learners will need to use all four programming constructs: sequence, repetition, selection, and variables	Slides (ncce.io/pg6b-6-s) Project designs from Lesson 5 Task description resource (ncce.io/pg6b-6-a0-rt) Computers connected to the internet Micro:bits with micro USB lead and battery pack A1 code: Scaffolded project (ncce.io/pg6b-6-a1-cb) A1 code: Explorer project (ncce.io/pg6b-6-a1-cc) A2 code: Compete project (ncce.io/pg6b-6-a2-c) AP code: Complete project with sensitivity (ncce.io/pg6b-6-ap-c)

Summer Term 1 —Web Page Creation

Prior Learning	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
End Points	To be able to: Design and create a web page using software, ensuring that the web page observes copyright laws, has effective links and includes strong navigation paths.
Vocabulary	Website, web page, browser, media, Hypertext Markup Language (HTML), website, logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, hyperlink, evaluate, implication, external link, embed

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 review an existing website and consider its structure In this lesson, learners will explore and review existing websites and evaluate their content. They will have some understanding that websites are created by using HTML code.	L1 Slides 'What makes a good website?' activity worksheet Whiteboards, pens, and rubbers Devices Internet access
		Lesson 2	I can plan the features of a web page Learners will look at the different layout features available in Google Sites and plan their own web page on paper.	Access to Google Sites L2 Slides A3 Handout - Web page design support sheet learner activity sheet — one per person A3 Worksheet - web page design options one and two - A3 size learner activity sheet — one per person A3 Handout Exploratory task learner activity sheet — one per person Homework For the homework activity, teachers could provide printed 'home page' images for anyone who doesn't have internet access at home.
		Lesson 3	I can consider the ownership and use of images (copyright) During this lesson learners will become familiar with the terms 'fair use' and 'copyright'. They will gain an understanding of why they should only use copyright-free images and will find appropriate images to use in their work from suggested sources.	Slides Activity scenario sheets Activity recording sheet Homework Devices with access to Pixabay: www.pixabay.com
		Lesson 4	I can recognise the need to preview pages Today learners will revise how to create their own web page in Google Sites. Using their plan from previous lessons, learners will create their own web page/home page. They will preview their web page as it will appear on different devices and suggest or make edits to improve the user experience on each device.	L4 Slides Exploratory task handout 'Does your web page look nice on each device?' worksheet
		Lesson 5	I can outline the need for a navigation path During this lesson learners will begin to appreciate the need to plan the structure of a website carefully. They will plan their website, paying attention to the navigation paths (the way that pages are linked together). They will then create multiple web pages for their site and use hyperlinks to link them together as detailed in their planning.	L5 Slides 'Where will you go?' activity worksheet 'Planning your website' activity worksheet Exploratory task
		Lesson 6	I can recognise the implication of linking to content owned by other people Learners will consider the implications of linking to content owned by other people and create hyperlinks on their own websites that link to other people's work. They will then evaluate the user experience when using their own website and that of another learner.	Slides 'Website evaluation' worksheet Website example (ncce.io/cm6w-6-a3-r)

Summer Term 2—Spreadsheets

Prior Learning	Children should know about: Databases and that they can be used to select relevant and accurate information That data can be grouped and sorted using fields Different databases and how they can be used in real world applications (finding flight times and dates etc)
End Points	To be able to: Plan a budget for an event using formulas to calculate and organise data.
Vocabulary	Spreadsheet, data, data heading, data set, cells, columns and rows, data item, data set, object, spreadsheet application, format, common attribute, formula, calculation, spreadsheet, input, output, reference, calculate, operation, formula, cell, range, duplicate, sigma, propose, question, organised, graph, chart, evaluate, results, comparison, questions, software, tools

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 identify questions which can be answered using data During this lesson learners will understand that a spreadsheet is a computer application which allows users to organise, analyse, and store data in a table. They will begin to realise the importance of data headings. Learners will answer questions about a spreadsheet, and then create their own questions that can be answered using a given set of data.	Slides (ncce.io/dat6-1-s) Spreadsheet questions: worksheet (ncce.io/dat6-1-a2-w) Spreadsheet (ncce.io/dat6-1-a2-rs) Access to Google Sheets (or another appropriate application e.g. Microsoft Excel, or 'Purple Mash – 2Calculate') Whiteboards, pens, and rubbers
		Lesson 2	I can explain that objects can be described using data During this lesson learners will be taught that objects can be described using data. They will build a data set (a collection of related data that can be manipulated using a computer) within a spreadsheet application, and apply appropriate number formats to cells.	Slides (ncce.io/dat6-2-s) Google Maps Attractions in the UK: handout (ncce.io/dat6-2-a1-ha) Spreadsheet (ncce.io/dat6-2-a1-rs) and completed spreadsheet (ncce.io/dat6-2-a3-rc)
		Lesson 3	I can explain that formulas can be used to produce calculated data During this lesson learners will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). Learners will create formulas to use in their spreadsheet using cell references and identify that changing inputs will change the output of the calculation.	Slides (ncce.io/dat6-3-s) Whiteboards, pens, and rubbers Explorer task: handout (ncce.io/dat6-3-a2-he) Example spreadsheet (ncce.io/dat6-3-re)
		Lesson 4	I can apply formulas to data, including duplicating During this lesson learners will recognise that data can be calculated using different operations: multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. Learners will then begin to understand the importance of creating formulas that include a range of cells and the advantage of duplicating in order to apply formulas to multiple cells.	Using the four operations spreadsheet (ncce.io/dat6-4-a1-ru) and solutions (ncce.io/dat6-4-a1-s) Times table test: worksheet (ncce.io/dat6-4-a2-w) and solutions (ncce.io/dat6-4-a2-s) Times table scores spreadsheet (ncce.io/dat6-4-a2-rt) and solutions (ncce.io/dat6-4-a2-rs) Shopping spreadsheet (ncce.io/dat6-4-a3-rs) and solutions (ncce.io/dat6-4-a3-s) Formula scaffold: handout (ncce.io/dat6-4-a3-hf) — optional
		Lesson 5	I can create a spreadsheet to plan an event During this lesson learners will plan and calculate the cost of an event using a spreadsheet. They will use a predefined list to choose what they would like to include in their event, and use their spreadsheet to answer questions on the data they have selected. Learners will be reminded of the importance of organising data and will then create a spreadsheet using formulas to work out costs for their event.	Slides (ncce.io/dat6-5-s) Activities: Event planning: handout (ncce.io/dat6-5-a1-he) Data calculations: handout (ncce.io/dat6-5-a1-hd) Party spreadsheet (ncce.io/dat6-5-a1-rp) Completed party spreadsheet example (ncce.io/dat6-5-a3-rc)
		Lesson 6	I can choose suitable ways to present data During this lesson learners will acquire the skills to create charts in Google Sheets. They will evaluate results based on questions asked using the chart that they have created. Finally, learners will outline their understanding that there are different software tools available within spreadsheet applications to present data.	Slides (ncce.io/dat6-6-s) Whiteboards, pens, and rubbers Party spreadsheet pie chart example (ncce.io/dat6-6-a1-rp) Completed party spreadsheet example (ncce.io/dat6-6-a1-rc) Learners will need access to their own saved spreadsheet from Lesson 5

Summer Term 2—3D Modelling

Prior Learning	Children should know about: How software can be used to create images and models How to use tools to create and alter images Vector images How shapes can be grouped together to create larger images How to duplicate objects
End Points	To be able to: **Create 3D designs for real-world physical objects (pencil holder and picture frame)**
Vocabulary	2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimensions, placeholder, hole, group, ungroup, design, modify, evaluate, improve

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 use a computer to create and manipulate 3D digital objects This lesson introduces learners to the concept of 3D modelling by creating a range of 3D shapes that they select and move. They also examine the shapes from a variety of views within the 3D space.	Slides (ncce.io/cm6m-1-s) Activities: A1 resource: Tinkercad (ncce.io/cm6m-1-a1-r) A1 resource: Learner accounts and class code (ncce.io/cm6m-1-a1-rb) A selection of 3D shapes A computer mouse for each device (optional; 3D modelling is often simpler using a mouse, rather than a trackpad, as the right mouse button and scroll wheel can be used to navigate around the environment)
		Lesson 2	I can compare working digitally with 2D and 3D graphics This lesson examines the similarities and differences between working digitally with 2D and 3D graphics. Learners initially discuss the similarities and differences they have identified so far, then move on to combine 3D shapes, including lifting the 3D object, to produce a house. Learners then colour their 3D shapes, followed by adding further shapes and undertaking further reflection on the similarities and differences between working digitally with 2D and 3D graphics.	Slides (ncce.io/cm6m-2-s) Activities: A2 resource: Enhancing a 3D model using Tinkercad (ncce.io/cm6m-2-a2-r) A computer mouse for each device (optional; 3D modelling is often simpler using a mouse, rather than a trackpad, as the right mouse button and scroll wheel can be used to navigate around the environment)
		Lesson 3	I can construct a digital 3D model of a physical object During this lesson, learners will produce a 3D model of a physical object, which will contain a number of different 3D objects. 3D objects will need to be rotated and placed into position in relation to other 3D objects.	Slides (ncce.io/cm6m-3-s) Activities: A1 Rotating a 3D object checklist worksheet (ncce.io/cm6m-3-a1-wr) A2 Changing workplanes resource (ncce.io/cm6m-3-a2-rc) A2 Tinkercad 3D model of key ring base resource (ncce.io/cm6m-3-a2-r)
		Lesson 4	I can identify that physical objects can be broken down into a collection of 3D shapes During this lesson, learners will produce a 3D model of a pencil holder desk tidy. The 3D model will contain a number of 3D objects that are of specific dimensions and use other 3D objects as placeholders to create holes with them.	A1 3D objects with specific dimensions handout (ncce.io/cm6m-4-a1-r3) A2 Pencil holder dimensions handout (ncce.io/cm6m-4-a2-rp) A2 Exploratory task handout (ncce.io/cm6m-4-a2-re) A2 Example of a basic pencil holder resource (ncce.io/cm6m-4-a2-ra) A2 Example of an advanced pencil holder resource (ncce.io/cm6m-4-a2-rb)
		Lesson 5	I can design a digital model by combining 3D objects During this lesson, learners will resize and enhance their 3D model of a pencil holder desk tidy. Learners will also plan their own 3D model of a photo frame, which will be developed during the next lesson.	Slides (ncce.io/cm6m-5-s) Activities: A1 Grouping 3D objects worksheet (ncce.io/cm6m-5-a1-rg) A1 Grouping 3D objects project resource (ncce.io/cm6m-5-a1-r) A1 Grouping 3D projects outcomes resource (ncce.io/cm6m-5-a1-rb) A2 3D model planning resource (ncce.io/cm6m-5-a2-r3)
		Lesson 6	I can develop and improve a digital 3D model During this lesson, learners will produce their own 3D model based on their planning during the previous lesson. They will evaluate their work and make improvements based on feedback from their peers.	Slides (ncce.io/cm6m-6-s) Activities: A2 Photo frame 3D model evaluation worksheet (ncce.io/cm6m-6-a2-rp) Planning sheet from the previous lesson