

Computing Long Term and Medium Term Plans – Year Three

	Reception	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
Autumn	Awesome Autumn	Programming MGL*	CM Digital Photography PE – Self-Image		CSN The Internet PE – Online Rep'		D & I Spreadsheets PE – Online Info
	Winter Warmers	D & I Grouping Data PE – Priv & Sec'	Programming MGL*	CM Desktop Publishing PE – Copyright		CSN Sharing Info' PE – Online Rel'	
Spring	Spring Time		D & I Pictograms PE – Priv & Sec'	Programming MGL*	CM Photo Editing PE – Copyright Self-Image		CSN Communication PE – Online Rep'
		CSN Technology Around Us PE – Well-Being		D & I Branching Databases PE – Online Info'	Programming MGL*	CM Vector Drawing PE – Copyright	
Summer	Summer Fun		CSN IT Around Us PE – Well-Being		D & I Data Logging PE – Online Info'	Programming MGL*	CM Web Page Creation PE – Copyright Online Rel'
		CM Digital Writing PE – Self-Image		CSN Connecting Computers PE – Priv & Sec'		D & I Flat-file Databases PE – Online Info'	Programming MGL*
Ongoing Skills		Project Evolve – Safer Internet Day Software & Keyboard/Tablet Skills					

Autumn 2: Year 3 – Desktop publishing

Unit introduction

During this unit, learners will become familiar with the terms ‘text’ and ‘images’ and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms ‘templates’, ‘orientation’, and ‘placeholders’ and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.

Overview of lessons

Lesson	Brief overview	Learning objectives
1. Words and pictures	In this lesson, learners will become familiar with the terms ‘text’ and ‘images’ and understand that text and images need to be used carefully to communicate messages clearly. Learners will be able to give advantages and disadvantages of using text, images, or both text and images to communicate messages effectively.	To recognise how text and images convey information • I can explain the difference between text and images • I can recognise that text and images can communicate messages clearly • I can identify the advantages and disadvantages of using text and images

2. Can you edit it?	This lesson will build on last week's lesson, in which we looked at using images and text to communicate a message effectively. In this lesson we will look at desktop publishing. Learners will think about how to make careful choices regarding font size, colour, and type in an invitation. The use of the Return, Backspace, and Shift keys will be explored and learners will be taught how to type age-appropriate punctuation marks. This will build on the typing skills learned in the Year 1 'Digital painting' unit. Learners will understand that once content has been added, it can be rearranged on the page.	To recognise that text and layout can be edited • I can change font style, size, and colours for a given purpose • I can edit text • I can explain that text can be changed to communicate more clearly
3. Great template!	Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software. The learners will create their own magazine template, which they will add content to during the next lesson. This lesson has been designed on a laptop using Adobe Spark and this is reflected in the screenshots and videos. Teachers may decide to use the Adobe Spark app, or other software such as Canva or Microsoft Publisher.	To choose appropriate page settings • I can define the term 'page orientation' • I can recognise placeholders and say why they are important • I can create a template for a particular purpose
4. Can you add content?	In this lesson, learners will add their own content (text and images) to the magazine templates they created in lesson 3. They will copy the information for the front of their magazine from a prewritten document and paste it into the chosen place on their magazine cover. Images will be added from within the search facility in Adobe Spark. Teachers could ask learners to gather copyright-free images from http://www.pixabay.com if using a different application.	To add content to a desktop publishing publication • I can choose the best locations for my content • I can paste text and images to create a magazine cover • I can make changes to content after I've added it

5. Lay it out	In this lesson, learners will think about the different ways information can be laid out on a page. They will look at a range of page layouts such as letters and newspapers, and begin to think about the purpose of each of these.	To consider how different layouts can suit different purposes • I can identify different layouts • I can match a layout to a purpose • I can choose a suitable layout for a given purpose
6. Why desktop publishing?	In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.	To consider the benefits of desktop publishing • I can identify the uses of desktop publishing in the real world • I can say why desktop publishing might be helpful • I can compare work made on desktop publishing to work created by hand

Progression

This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; Digital Writing Year 1, Digital painting Year 1, and Digital Photography Year 2.

Please see the learning graph for this unit for more information about progression.

Curriculum links

[National curriculum links](#)

Computing

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information

[English programmes of study links](#)

- Pupils should be taught to draft and write by: in non-narrative material, using simple organisational devices [for example, headings and subheadings]
- Evaluate and edit by assessing the effectiveness of their own and others' writing and suggesting improvements
- Proofread for spelling and punctuation errors

[Education for a Connected World links](#)

Managing online information

- I can use key phrases in search engines
- I can use search technologies effectively

Copyright and ownership

- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it
- I can demonstrate the use of search tools to find and access online content which can be reused by others

Assessment

Summative assessment rubric

Please see the assessment rubric document for this unit.

Subject knowledge

This unit focuses on desktop publishing.

Enhance your subject knowledge to teach this unit through the following training opportunities:

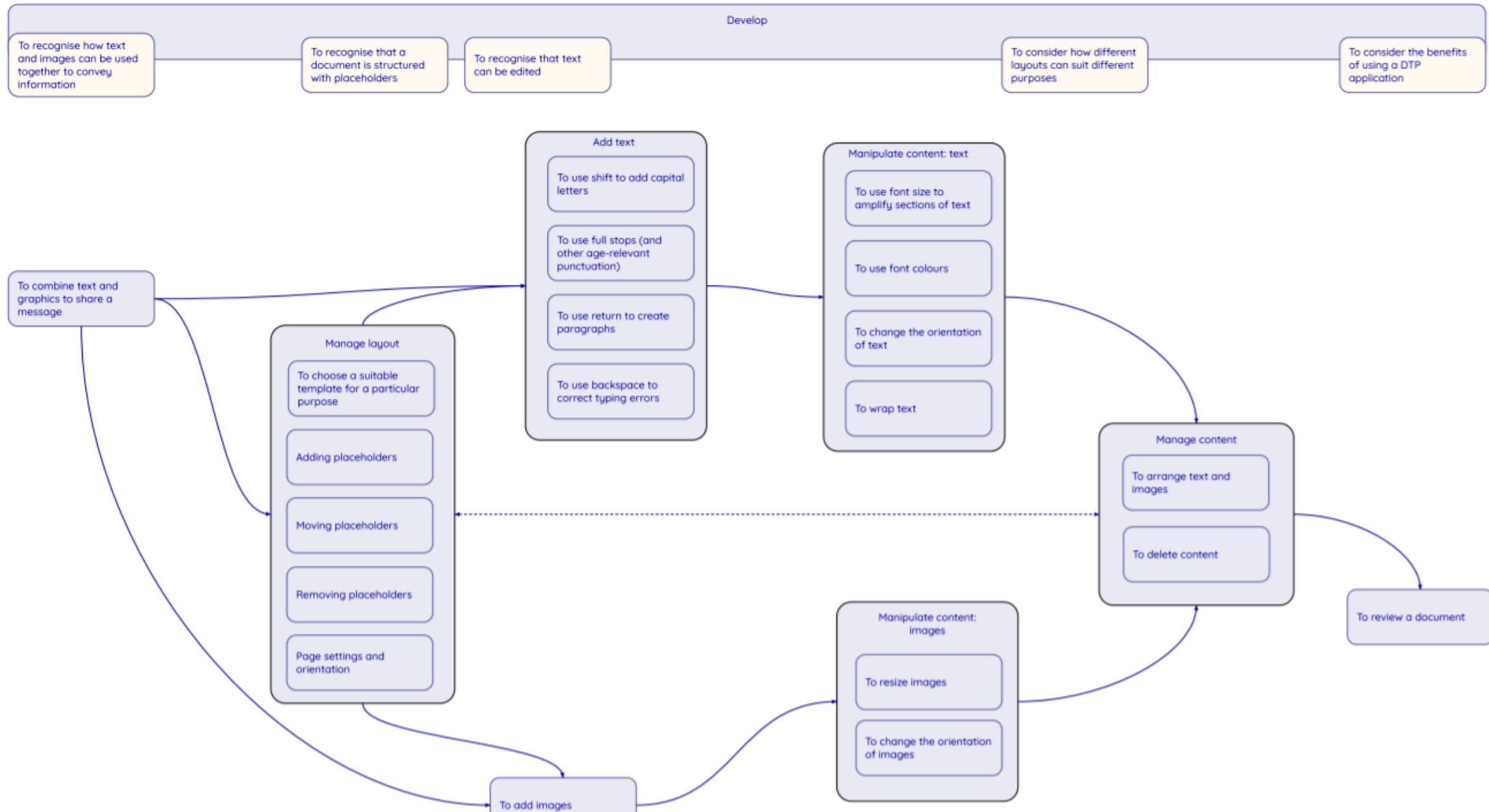
Online training courses

- [Raspberry Pi Foundation online training courses](#)

Face-to-face courses

[National Centre for Computing Education face-to-face training courses](#)

Learning graph Year 3 - Desktop publishing



Desktop publishing assessment rubric

Name:		Teacher:		Date:	
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Aspect of desktop publishing	Emerging [1]	Meets expectations [2]	Exceeds expectations [3]	Score
Creating a template	Some placeholders have been used to divide the page	Placeholders are used appropriately to divide the page (magazine)	- Background colours are changed - Images are added - Word art is included	
Creating a magazine	Some text has been added	- Text and images have been added - Some formatting has been done to the text	- Text changes include resizing, colours, and font types - Images and text are placed appropriately on the page	
Layout	Recognise that text and images can be laid out in different formats	Choose the best layout for a given scenario	Explain why that layout is most suited to the scenario	

Teacher feedback	
Learner response to feedback	

MGL UNIT - Spring 1: Year 3 – Programming A - Sequencing sounds

Unit introduction

This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.

There are two Year 3 programming units:

- Programming A - Sequencing sounds
- Programming B - Events and actions in programs

This is unit A which should be delivered before unit B.

Overview of lessons

Lesson	Brief overview	Learning objectives
• Introduction to Scratch	This lesson introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen.	To explore a new programming environment • I can identify the objects in a Scratch project (sprites, backdrops) • I can explain that objects in Scratch have attributes (linked to) • I can recognise that commands in Scratch are represented as blocks

• Programming sprites	In this lesson, learners will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks.	To identify that commands have an outcome • I can identify that each sprite is controlled by the commands I choose • I can choose a word which describes an on-screen action for my design • I can create a program following a design
• Sequences	In this lesson, learners will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different ways. In doing this, they will apply principles of design to plan and create a project.	To explain that a program has a start • I can start a program in different ways • I can create a sequence of connected commands • I can explain that the objects in my project will respond exactly to the code
• Ordering commands	This lesson explores sequences, and how they are implemented in a simple program. Learners have the opportunity to experiment with sequences where order is and is not important. They will create their own sequences from given designs.	To recognise that a sequence of commands can have an order • I can explain what a sequence is • I can combine sound commands • I can order notes into a sequence
• Looking good	This lesson develops learners' understanding of sequences by giving them the opportunity to combine motion and sounds in one sequence. They will also learn how to use costumes to change the appearance of a sprite, and backdrops to change the appearance of the stage. They will apply the skills in Activity 1 and 2 to design and create their own project, including sequences, sprites with costumes, and multiple backdrops.	To change the appearance of my project • I can build a sequence of commands • I can decide the actions for each sprite in a program

		I can make design choices for my artwork
Making an instrument	In this lesson, learners will create a musical instrument in Scratch. They will apply the concept of design to help develop programs and use programming blocks — which they have been introduced to throughout the unit. They will learn that code can be copied from one sprite to another, and that projects should be tested to see if they perform as expected.	To create a project from a task description - I can identify and name the objects I will need for a project - I can relate a task description to a design - I can implement my algorithm as code

Progression

This unit assumes that learners will have some prior experience of programming; the KS1 NCCE units cover floor robots and ScratchJr. However, experience of other languages or environments may also be useful.

Please see the learning graph for this unit for more information about progression.

Curriculum links

[National curriculum links](#)

- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Assessment

Formative assessment

Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide deck at the beginning of each lesson, and then reviewed at the end. Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down.

Summative assessment

- Please see the assessment rubric document for this unit.

We recommend the use of teacher accounts in Scratch to help with assessment throughout this unit. For guidance on setting up teacher accounts, please visit [the Scratch website](https://scratch.mit.edu/educators/faq). (<https://scratch.mit.edu/educators/faq>)

Subject knowledge

This unit focuses on developing learners' understanding of sequences in a new programming language. It highlights that the order of sequences is important. This unit also develops learners' understanding of design in programming, using the approach outlined below.

When programming, there are four levels which can help describe a project (known as levels of abstraction). Research suggests that this structure can support learners in understanding how to create a program and how it works:

- Task - what is needed
- Design - what it should do
- Code - how it is done
- Running the code - what it does

Spending time at the task and design levels before engaging in code-writing can aid learners in assessing the 'do-ability' of their programs. It also reduces a learner's cognitive load during programming.

Learners will move between the different levels throughout the unit and this is highlighted within each lesson plan.

Enhance your subject knowledge to teach this unit through the following training opportunities:

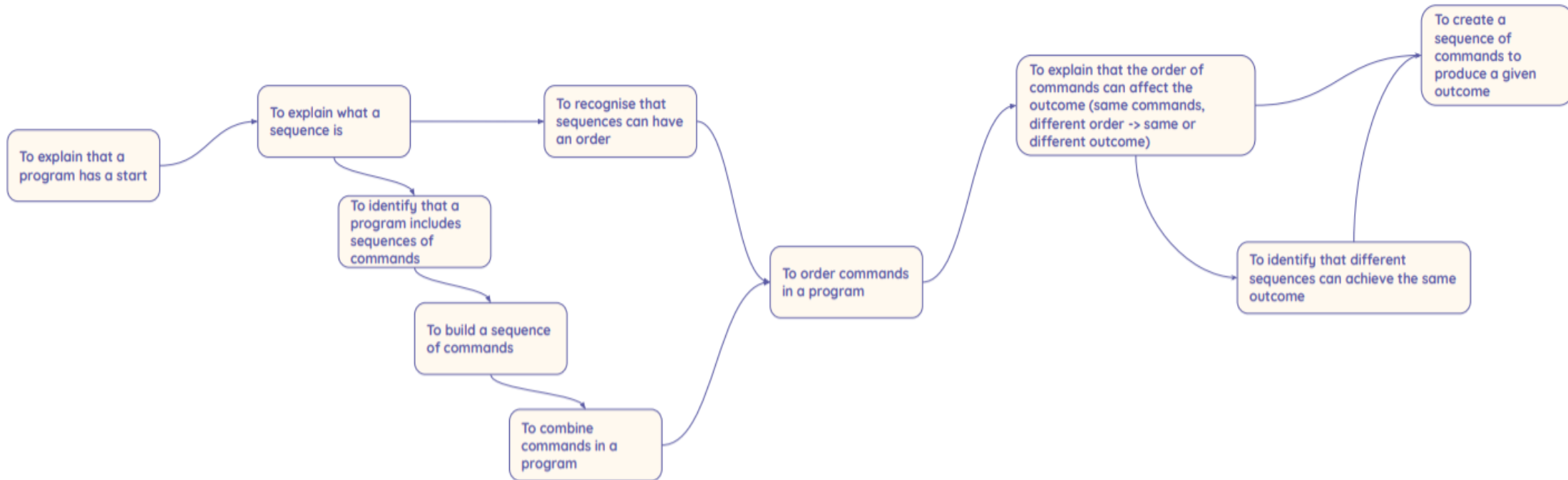
Online training courses

- [Raspberry Pi Foundation online training courses](#)

Face-to-face courses

- [National Centre for Computing Education face-to-face training course](#)

Learning graph Year 3 – Sequencing sounds



Sequencing sounds assessment rubric

Learner:		Teacher:		Date:	
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	Emerging [1]	Expected [2]	Exceeding [3]	Score
Task	Describe the genre of the project, e.g. musical instrument	Describe the purpose of the project, e.g. to create sounds when keys are pressed	Describe the needs of the audience of the project, e.g. the keys will show which one you pressed to help you remember	
Design	- Rename a sprite - Choose a backdrop and costumes - An algorithm that associates a sound with an event	- Choose a name which describes the action of the sprite - Choose relevant backdrops and costumes - An algorithm for each sprite	- Identify the attributes of the sprite e.g. code, costume, and sound - Change the appearance of the sprite and backdrop in response to user input - Identify aspects of the algorithm that can be reused for subsequent sprites	
Code	Translate their design into code for an individual sprite	Adapt their code for additional named sprites	Include additional code which enhances the function of the program, reflecting design choices	
Running the code	- Runs successfully, meeting elements of the task - Identify which elements of the task have been achieved	- Run their code and identify if it meets the requirements of the task - Evaluate how successfully they met the task	- Run their code and explain how it meets the requirements of the task - Identify how their project could be improved	

Teacher feedback	
Learner response to feedback	

Spring 2: Year 3 – Data & Information - Branching databases

Unit introduction

During this unit, learners will develop their understanding of what a branching database is and how to create one. They will gain an understanding of what attributes are and how to use them to sort groups of objects by using yes/no questions. The learners will create physical and on-screen branching databases. Finally, they will evaluate the effectiveness of branching databases and will decide what types of data should be presented as a branching database.

Overview of lessons

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

3. Creating a branching database	During this lesson, learners will continue to develop their understanding of ordering objects/images in a branching database structure. They will learn how to use an online database tool to arrange objects into a branching database, and will create their own questions with yes or no answers. The learners will show that their branching database works through testing.	To create a branching database • I can select objects to arrange in a branching database • I can group objects using my own yes/no questions • I can prove my branching database works
4. Structuring a branching database	During this lesson, learners will continue to develop their understanding of how to create a well-structured database. They will use attributes to create questions with yes or no answers and apply these to given objects. The learners will be able to explain why questions need to be in a specific order and will compare the efficiency of different branching databases.	To explain why it is helpful for a database to be well structured • I can create yes/no questions using given attributes • I can explain that questions need to be ordered carefully to split objects into similarly sized groups • I can compare two branching database structures
5. Using a branching database	During this lesson, learners will independently create a branching database that will identify a given object. They will continue to think about the attributes of objects to write questions with a yes or no answer, which will enable them to separate a group of objects effectively. The learners will then arrange the questions and objects into a tree structure, before using their branching database to answer questions.	To identify objects using a branching database • I can select a theme and choose a variety of objects • I can create questions and apply them to a tree structure • I can use my branching database to answer questions
6. Presenting information	During this lesson, the learners will compare two ways of presenting information. They will demonstrate their ability to explain what information is shown in a pictogram and a branching database. The learners will begin to compare the two ways of presenting information.	To compare the information shown in a pictogram with a branching database • I can explain what a pictogram tells me

		• I can explain what a branching database tells me • I can compare two ways of presenting information
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Progression

This unit progresses students' knowledge and understanding of presenting information. It builds on their knowledge of data and information from key stage 1. They continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.

Please see the learning graph for this unit for more information about progression.

Curriculum links

[National curriculum links](#)

- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information
- Use technology safely, respectfully, and responsibly

[Education for a Connected World links](#)

Assessment

Summative assessment

- Please see the assessment question and answer documents for this unit.

Subject knowledge

This unit focuses on branching databases. A branching database is a collection of data organised in a tree structure using yes/no or true/false questions. In computer science, these are known as binary trees. In the final lesson of this unit, learners will begin to recognise that information can be presented in different ways. Teachers will need to be familiar with pictograms. A pictogram is a pictorial representation of information, usually used to present numerical data, such as common methods of transport amongst a group of people.

Teachers will also need to be familiar with the term attributes. An attribute includes its name and a value. For example, a ball will have a colour which might be red. Colour is the attribute name, red is the attribute value. Learners may be familiar with the term property introduced in Year 1 – ‘Grouping data’. Property and attribute are interchangeable; however, property has been used with younger children to make it more accessible.

Throughout this unit, learners will use the online database tool j2data. You should be familiar with using the ‘Branch’ tool. Support with navigating the ‘Branch’ tool can be found at <https://www.j2e.com/help/videos/datags3>. Teachers would also benefit from having an understanding of the ‘Pictogram’ tool. Support with navigating the ‘Pictogram’ tool can be found at <https://www.j2e.com/help/videos/ks1datavideo1>.

Enhance your subject knowledge to teach this unit through the following training opportunities:

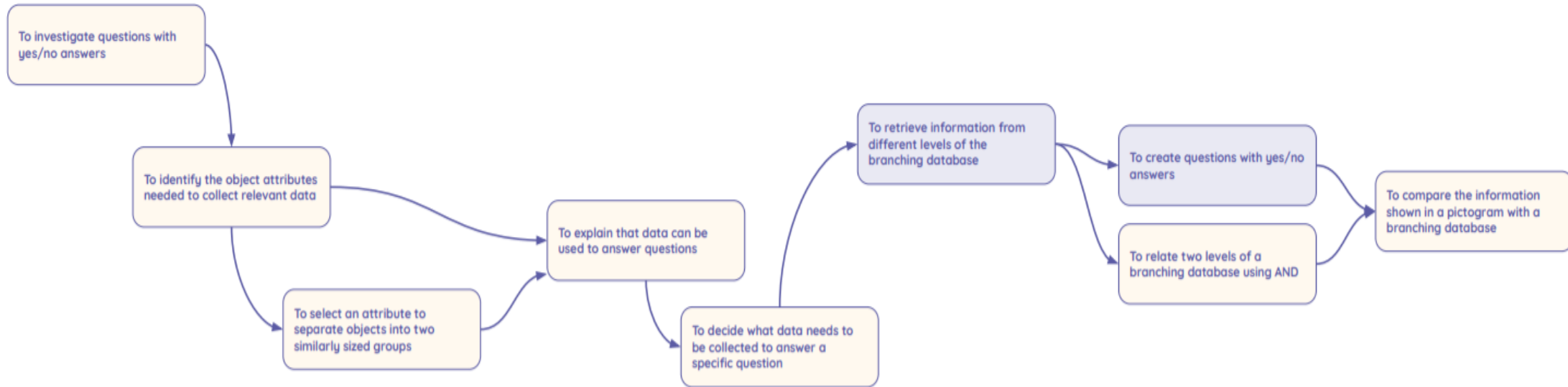
Online training courses

- [Raspberry Pi Foundation online training courses](#)

Face-to-face courses

- [National Centre for Computing Education face-to-face training courses](#)

Learning graph Year 3 – Branching databases



Summer 2: Year 3 – CSN - Connecting computers

Unit introduction

During this unit, learners develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They also compare digital and non-digital devices. Following this, learners are introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. The unit concludes with learners discovering the benefits of connecting devices in a network.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 How does a digital device work? ncce.io/csn3-1-p	This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process
2 What parts make up a digital device? ncce.io/csn3-2-p	In this lesson, learners will develop their knowledge of input, process, and output and apply it to devices and parts of devices that they will be familiar with in their everyday surroundings.	To identify input and output devices • I can classify input and output devices • I can model a simple process • I can design a digital device
3 How do digital devices help us?	In this lesson, learners will apply their learning from lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one	To recognise how digital devices can change the way we work

ncce.io/csn3-3-p	piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	• I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and non-digital tools • I can suggest differences between using digital devices and non-digital tools
4 How am I connected? ncce.io/csn3-4-p	Many digital devices are now connected to other digital devices, e.g. computers through wires, tablets through WiFi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch
5 How are computers connected? ncce.io/csn3-5-p	This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices • I can explain the role of a switch, server, and wireless access point in a network

6 What does our school network look like? ncce.io/csn3-6-p	In this lesson, learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in the last lesson.	To recognise the physical components of a network • I can identify how devices in a network are connected with one another • I can identify networked devices around me • I can identify the benefits of computer networks
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Progression

This unit progresses students' knowledge and understanding of technology by focussing on digital and non-digital devices, and introducing the concept of computers connected together as a network. Following this unit, learners will explore the internet as a network of networks.

[Year 3 learning graph](https://ncce.io/csn3-og) (ncce.io/csn3-og)

Curriculum links

[National curriculum links](#)

Computing

- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration

Maths (lesson 1)

- **Number and place value:** Solve number problems and practical problems

Art (lesson 3)

- To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials

Assessment

Formative assessment

Assessment opportunities are detailed in each lesson plan. The learning objective and success criteria are introduced in the slide deck at the beginning of each lesson and then reviewed at the end. Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down.

Summative assessment

There are ten multiple choice questions in the quiz at the end of the unit. The questions are drawn from all six lessons.

- [Year 3 multiple choice questions](https://ncce.io/csn3-saq) (ncce.io/csn3-saq)
- [Year 3 multiple choice answers](https://ncce.io/csn3-saa) (ncce.io/csn3-saa)

Subject knowledge

Lesson 1: You will need an understanding of digital and non-digital devices. The key difference is that a digital device is capable of some processing, i.e. it has functions beyond being either on or off. You will also need to be familiar with the concept of input, process, output (IPO) which underpins all digital devices. There are cross-curricular links with maths for IPO which can be referenced during this lesson.

Lesson 2: You will need to be familiar with the inputs and outputs of a range of digital devices and you will need an understanding that devices can have one input which leads to several outputs (e.g. starting a video leads to outputs from the screen and the speaker) and that many inputs can lead to one output (e.g. using a mouse and keyboard to produce a document).

Lesson 3: You will need to be familiar with your chosen digital paint program, including the draw, fill, edit and undo functions.

Lesson 4: You will need a basic understanding of how information (data) flows around a computer network, and how this benefits us. You will also need to know that a network switch manages the way in which data moves around a network.

Lesson 5: This lesson requires further knowledge of a simple school network. It introduces a server, which for the purposes of this lesson is defined as a location to store files (they can, and usually do, carry out more functions than this). It also introduces wireless access points, which send and receive wireless signals from wireless devices such as tablets or laptops. There is likely to be a wireless access point in most classrooms or communal areas in school. It will be connected to the network via a physical cable.

Lesson 6: You will need to be familiar with how the main devices (network switch, server, wireless access point, router, printer/copier) on your school's network are connected with one another and where the devices are located. You may wish to discuss this with the IT technician prior to the lesson.

Enhance your subject knowledge to teach this unit through the following training opportunities:

Online training courses

- [Raspberry Pi Foundation online training courses](#)

Face-to-face courses

[National Centre for Computing Education face-to-face training courses](#)

Learning graph Year 3 – Connecting computers

Computing systems

To explain how digital devices
function (IPO)

To identify input and output
devices

Computing networks

To explain how a computer
network can be used to share
information

To explore how digital devices
can be connected

To recognise the physical
components of a network

