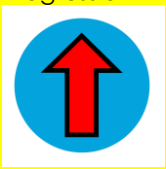
Computing Long Term Plan Hadrian Y4

Y4 Computing	
National Curriculum Objectives KS2	Key Links
By the end of KS2 Pupils should be taught to: • 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 • understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	**https://teachcomputing.org/curriculum** **Education for a Connected World links** https://www.knowsleyclcs.org.uk/2018-online-safety-sow/ PW: check emails

Topics		N.C Objectives	Key skills	Key Vocab
Autumn 1	The Internet	• Understand computer networks	• Use a search engine to find specific	Different

		including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	information. • -Recognise that school computers are connected together on a network.	networks Information collection Reliability Owners
Progression 	This unit progresses students' knowledge and understanding of networks in Year 3. In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.			
Teacher Subject Knowledge 	Teachers will need a knowledge of computer networks, including how data is routed around the internet. Teachers will need to be aware that the World Wide Web is one of many services which are offered over the internet. They will need to know the difference between a web page and a website, and a knowledge of where websites are stored. A knowledge of what content you can find on websites will also be useful. An awareness of copyright (and the reasons for it) and that people create and share false and inaccurate information is important for the last two lessons in this unit. The YouTube video titled 'A Packet's Tale' (www.youtube.com/watch?v=ewrBalT_eBM) provides an overview of networks and the internet. That the World Wide Web is part of the internet is explained in this video: www.bbc.co.uk/newsround/47523993			

Cross Curricular Links 	**PSHE (Lesson 6)** • Evaluating content for honesty and accuracy Education for a Connected World links **Managing online information** • I can analyse information to make a judgement about probable accuracy, and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others. • I can explain what is meant by fake news, e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't. • I can describe ways of identifying when online content has been commercially sponsored or boosted, (e.g. by commercial companies or by vloggers, content creators, or influencers). • I can describe how fake news may affect someone's emotions and behaviour, and explain why this may be harmful.			
Autumn 2	Programming A - Repetition in shapes	• 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	• To list an everyday task as a set of instructions including repetition • To use an indefinite loop to produce a given outcome • To use a count-controlled loop to produce a given outcome • To plan a program that includes appropriate loops to produce a given outcome • To recognise tools that enable more than one process to be run at the same time (concurrency) • To create two or more sequences that run at the same time	Type + edit logo commands Sensors Open-ended problems Bugs in programs Complex programming
Progression	This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops. Pupils will create algorithms and then implement those algorithms as code.			

				
Teacher Subject Knowledge 	You will need to be able to access and demonstrate the version of Logo that you are using. You will also need to be aware of the Logo commands used in this unit. You can find these in the glossary which is part of Lesson 3 of this unit. This unit focuses on repetition, where actions or commands in programming are repeated. The repeating commands can also be placed into a loop. Loops can be repeated indefinitely, or a set number of times — the latter are called 'count-controlled loops'. Different pedagogies are used in this programming unit. For example, pupils will encounter Parson's Problems, which are programming puzzles where the pupil is given the correct code, but the commands have been split and mixed up. Pupils will also carry out code tracing, where they will read through the code line by line and say exactly what each command will make happen when it runs. In Lesson 5, pupils will look at decomposition and procedures. They will decompose code snippets, breaking them down to make them easier to plan and work with. They will use these broken down chunks to help recognise patterns in their programming. Pupils will create and call procedures in Logo. Procedures are code snippets that are named and can be reused in their programming. When creating a procedure, the word 'TO' is typed, followed by the procedure name, eg `TO SQUARE`.			
Cross Curricular Links 	Maths Science DT			
Spring 1	**Creating Media - Audio Editing @ The Word**	• 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,	• To record sound • To edit audio • To locate recorded audio • To export audio	Creating + modifying Specific purpose Photo modifying Keyboard shortcuts Bullet points

		and presenting data and information • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact		Spell check Constructive
Progression 	This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5.			
Teacher Subject Knowledge 	**Lesson 1:** You will need to be familiar with the location of microphones and/or speakers on digital devices capable of recording sound. You will also need to be familiar with using Audacity to record sound. **Lesson 2:** You will need to be familiar with using Audacity to record audio, which should include how to delete individual tracks. **Lesson 3:** You will need to be familiar with using Audacity to record sound. **Lesson 4:** You will need to be familiar with using Audacity to edit audio, including altering the volume and fading sections of audio in and out. **Lesson 5:** You will need to be familiar with using the **Copy**, **Paste**, and **Time Shift** tools in Audacity. **Lesson 6:** You will need to be familiar with using Audacity to export audio recordings.			
Cross Curricular Links 	**Science – Year 4 (Lesson 2)** • **Sound:** Find patterns between the volume of a sound and the strength of the vibrations that produced it • **Sound:** Recognise that sounds get fainter as the distance from the sound source increases **English – Years 3 and 4 (Lesson 3)** • **Writing – composition:** Plan their writing by discussing and recording ideas • **Writing – draft and write by:** In non-narrative material, using simple organisational devices [for example, headings and			

	subheadings] • **Writing:** Read aloud their own writing, to a group or the whole class, using appropriate intonation and controlling the tone and volume so that the meaning is clear **Music – KS2 (Lesson 5)** • Improvise and compose music for a range of purposes using the interrelated dimensions of music **Education for a Connected World links** **Copyright and ownership** • I can explain why copying someone else's work from the internet without permission can cause problems (Y3) • I can give examples of what those problems might be (Y3) • 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 (Y4) • I can give some simple examples (Y4)			
Spring 1. 2	Creating Media - Photo editing	• Use search technologies effectively • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• To recognise that digital images can be manipulated • To recognise that images can be changed for different purposes • To use the most appropriate tool for a particular purpose • To recognise that not all images are real • To consider the impact of changes made on the quality of the image	Creating + modifying Specific purpose Photo modifying Keyboard shortcuts Bullet points Spell check Constructive

Progression 	Learners should have experience of making choices on a tablet/computer. They should be able to navigate within an application. This unit progresses students' skills through editing digital images and considering the impact that editing can have on an image. Learners will also consider how editing can be used appropriately for different scenarios, and create and evaluate 'fake' images, combining all of their new skills.
Teacher Subject Knowledge 	• You will need to be familiar with the tools used throughout the unit in paint.net or your chosen image editor, and know how to save a new version of an image from within the editor. You can find a guide to all tools in paint.net at www.getpaint.net/doc/latest/index.html. • You should consider how the learners will access the editor. For example, you may wish to create a shortcut to the program for them. **Lesson 1** • You will need to be familiar with the effect that cropping can have on an image. You can find more information at www.dpreview.com/forums/post/56318241. **Lesson 2** • You will need to know how to search for and save an image from pixabay.com. • You will need to be familiar with how to combine parts of two images in your chosen image editor. **Lesson 3** • You will need to be familiar with how to make image adjustments and change effects in paint.net or your chosen image editor. **Lesson 4** • You will need to be familiar with the following tools in paint.net or your chosen image editor. For more information about tools in paint.net, visit the following websites: ○ The 'clone stamp': www.getpaint.net/doc/latest/CloneStamp.html ○ The 'recolor' tool: www.getpaint.net/doc/latest/RecolorTool.html ○ The 'magic wand' tool: www.getpaint.net/doc/latest/MagicWand.html **Lesson 5** • You will need to be familiar with the 'lasso select' tool in paint.net or your chosen image editor. For more information about this tool in paint.net, visit www.getpaint.net/doc/latest/LassoSelectionTool.html. **Lesson 6** • You will need to be familiar with the text and shape tools in paint.net or your chosen image editor. For more information about these tools in paint.net, visit www.getpaint.net/doc/latest/TextShapeTools.html.
Cross Curricular Links 	**Education for a Connected World links** **Self-image and identity**

	• I can describe ways in which people might make themselves look different online. **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.			
Spring 2	Data and information - Data logging	• ...work with various forms of input • 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	• To choose how often to automatically collect data samples • To use a computer program to sort data by one attribute • To present data in a table • To present data in a graph	Database creation Database searches Inaccurate data
Progression 	This unit progresses pupils' knowledge and understanding of data and how it can be collected over time to answer questions. The unit also introduces the idea of automatic data collection.			
Teacher Subject Knowledge 	This unit focuses on using technology to automatically gather environmental data over time. It refers to data points and logging intervals. A data logger is a digital device that can collect data over time and store it. Data loggers designed for education will usually have built-in sensors for light, temperature, and sound, as well as the option to connect external sensors. You should be aware that input devices allow data to be entered into a computer. Keyboards, mice, and microphones are all input devices. A sensor is a type of input designed to allow computers to capture data from the physical environment. Sensors can be connected to a computer to capture data about temperature, light, sound, humidity, pressure, etc. A microphone can be used to record audio into a computer, or it can be used as a sound sensor.			

	You should also be aware that data loggers capture data at given time intervals. The interval is a regular time period between each data capture and can vary according to the experiment. For example, if data is being logged for a week, the interval might be every hour.			
Cross Curricular Links 	**Science – Lower key stage 2/Year 4** • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.			
Summer 1	Programming B - Repetition in games	• 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	• To list an everyday task as a set of instructions including repetition • To use an indefinite loop to produce a given outcome • To use a count-controlled loop to produce a given outcome • To plan a program that includes appropriate loops to produce a given outcome • To recognise tools that enable more than one process to be run at the same time (concurrency) • To create two or more sequences that run at the same time	Type + edit logo commands Sensors Open-ended problems Bugs in programs Complex programming
Progression	This unit assumes that learners will have some prior experience of programming. The KS1 NCCE units cover floor robots and ScratchJr, and			

	Scratch is introduced in the Year 3 programming units. However, experience of other languages or environments may also be useful.			
Teacher Subject Knowledge 	This unit focuses on developing learners' understanding of repetition within the Scratch programming environment. Repetition is where actions or commands in programming are repeated. The repeating commands can also be referred to as a 'loop'. Loops can be repeated indefinitely (known as 'infinite loops'), or for a set number of times (known as 'count-controlled loops'). 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.			
Cross Curricular Links 	Maths DT Science			
Education for a Connected World (Throughout the year)	My Online Life Y4 What is your Online Identity?	• use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about	•	Reputation Online Bullying Copyright Self Image

	Can you control your own online reputation? How do you build safe online relationships? What can you do to stop online bullies? How do you interpret online information? What does it mean for your own online profiles? How can you ensure technology does not take over your life? How can you protect your online information and accounts? Who owns content online?	content and contact.		Identity Trust Risks Profile Password Private
Key texts 	• Webster's Friend • Webster's Email • Webster's Manners			