How Teach computing links to the national curriculum.

Teach Computing Unit Year 1	Learning Outcomes	NC Links
Computing Systems and Networks – Technology all around us *https://paintz.app/*	Learners develop their understanding of **technology and how it can help us**. They start to become familiar with the different components of a computer by developing their **keyboard and mouse skills**. Learners also consider **how to use technology responsibly.**	1, 2
Creating Media – Digital Painting *https://paintz.app/ or PM 2Paint*	Learners develop their understanding of a range of **tools used for digital painting**. They use these tools to create their own digital paintings, while gaining inspiration from a range of artists' work. The unit concludes with learners considering their **preferences when painting** with and without the use of digital devices.	2
Creating Media – Digital Writing *Google Docs/Google Slides or PM 2Publish*	Learners develop their understanding of the various aspects of using a computer to **create and manipulate text**. Learners become more familiar with using a keyboard and mouse to **enter and remove text**. Learners also consider how to **change the look of their text** and justify their reasoning in making these changes. Learners **explain the differences between using a computer to create text and writing text** on paper and explain their preferences.	2,3
Data and Information – Grouping Data *Google Docs/Google Slides*	This unit introduces pupils to **data and information**. Learners use labels to **put objects into groups and labelling** these groups. Pupils begin to demonstrate their ability to **sort objects into different groups**, based on the properties they choose. Pupils use their ability to **sort objects into different groups to answer questions about data.**	2,3
Programming A – Moving a Robot *Beebots*	This unit introduces learners to **early programming concepts**. Learners explore **using individual commands**, both with other learners and as part of a computer program. They **identify what each floor robot command does** and use that knowledge to **start predicting the outcome of programs**. Learners are also introduced to the early stages of program design through the **introduction of algorithms.**	1, 4,5,6
Programming B – Introduction to Animation *Scratch Junior*	This unit introduces learners to **on-screen programming** through ScratchJr. Learners explore the way a project looks by **investigating sprites and backgrounds**. They **use programming blocks to use, modify, and create programs.** Learners also be introduced to the early stages of program design through the **introduction of algorithms**.	4,5,6

Teach Computing Unit Year 2	Learning Outcomes	NC Links
Computing Systems and Networks – IT all around us *Unplugged/Google Slide sorting activity*	Learners look at **information technology at school and beyond**, in settings such as shops, hospitals, and libraries. Learners investigate **how information technology improves our world**, and they learn about **using information technology responsibly**.	1
Creating Media – Digital Photography *Digital camera device; https://pixlr.com/x/*	Learners learn to recognise that **different devices can be used to capture photographs** and gain experience **capturing, editing, and improving photos**. Finally, they use this knowledge to recognise that **images they see may not be real.**	2

Creating Media – *https://musiclab.chrome experiments.com/Song-*	Learners **use a computer to create music**. They listen to a variety of pieces of music and consider **how music can make them think and feel**. Learners compare creating music digitally and non-digitally. Learners look **at patterns and purposefully create music**.	2
Data and Information – **Pictograms** *2Count*	Learners are introduced to the term 'data'. They begin to understand **what data means** and how this can be **collected in the form of a tally chart**. They learn the **term 'attribute'** and use this to help them **organise data**. They then progress onto presenting data in the form of **pictograms** and finally **block diagrams**. Learners **use the data presented to answer questions**.	2, 3
Programming A – Robot Algorithms *Beebots*	Pupils' develop understanding of **instructions in sequences** and the use of **logical reasoning to predict outcomes**. Pupils use given commands in different orders to **investigate how the order affects the outcome.** Pupils also learn about **design in programming**. They **develop artwork** and test it for use in a program. They **design algorithms**, **test those algorithms as programs and debug them**.	3,4,5,6
Programming B – An introduction to Quizzes *Scratch Junior*	Learners begin to understand that **sequences of commands have an outcome** and **make predictions based on their learning**. They **use and modify designs** to **create their own quiz questions** in ScratchJr and realise these designs in ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming projects.	4,5,6

Key stage 1
Pupils should be taught to:
1. **Recognise common uses of information technology beyond school**
2. **Use technology purposefully to create, organise, store, manipulate, and retrieve digital content**
3. **Use technology safely and respectfully, keeping personal information private**
4. **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions**
5. **Create and debug simple programs**
6. **Use logical reasoning to predict the behaviour of simple programs**

Teach Computing Unit Year 3	Learning Outcomes	NC Links
Computing Systems and Networks – **Connecting Computers**	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**.	2,4,6

Creating Media – Animation *iMotion*	Learners use a range of techniques to create a **stop frame animation** using tablets. Next, they apply those skills to **create a story-based animation**. This unit concludes with learners **adding other types of media to their animation, such as music and text**.	5, 6
Creating Media – Desktop Publishing *Adobe Spark*	Learners become **familiar with the terms 'text' and 'images'** and understand that they can be used to communicate messages. They **use desktop publishing software** and consider careful **choices of font size, colour and type to edit and improve** premade documents. Learners are 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 **start to add text and images** to create their own pieces of work **using desktop publishing software**. Learners 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.**	5, 6
Data and Information – Branching Databases *2Question*	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.**	6,7
Programming A – Sequence in Music *Scratch*	This unit explores the concept of **sequencing in programming through Scratch**. It begins with an **introduction to the programming environment**. They are introduced to a **selection of motion, sound, and event blocks** which they 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.	1,2,3,6
Programming B – Events and Actions *Scratch*	This unit explores the **links between events and actions**, while consolidating prior learning relating to sequencing. Learners begin by **moving a sprite in four directions (up, down, left, and right).** They then explore **movement within the context of a maze**, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through **the use of Pen blocks**. Learners are given the opportunity to **draw lines with sprites** and **change the size and colour of lines**. The unit concludes with learners **designing and coding their own maze-tracing program.**	1,2,3,6

Teach Computing Unit Year 4	Learning Outcomes	NC Links
Computing Systems and Networks – The Internet *Online services*	Learners **apply their knowledge and understanding of networks**, to appreciate **the internet as a network of networks** which need to be kept secure. They learn that the **World Wide Web is part of the internet** and are given opportunities to **explore the World Wide Web** for themselves to learn about **who owns content and what they can access, add, and create.** Finally, they **evaluate online content** to decide how honest, accurate, or reliable it is, and **understand the consequences of false information**.	4
Creating Media – Audio Editing *Audacity*	Learners initially **examine devices capable of recording digital audio**, which include **identifying the input device (microphone) and output devices (speaker or headphones)** if available. Learners discuss the **ownership of digital audio and the copyright implications** of duplicating the work of others. Learners **use Audacity to produce a podcast**, which includes editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners **evaluate their work and give feedback to their peers.**	6,7
Creating Media – Photo Editing *paint.net*	Learners develop their understanding **of how digital images can be changed and edited**, and how they can then be **resaved and reused**. They consider the **impact that editing images can have** and **evaluate the effectiveness** of their choices.	5,6
Data and Information – Data Logging *Google Science Journal*	Pupils consider **how and why data is collected over time**. Pupils consider the senses that humans use to experience the environment and **how computers can use special input devices called sensors** to monitor the environment. Pupils **collect data** as well as **access data captured over long periods of time**. They look at **data points, data sets, and logging intervals**. Pupils spend time **using a computer to review and analyse data**. Pupils **pose questions** and then use **data loggers to automatically collect the data needed to answer those questions.**	2,6
Programming A – Repetition in Shapes *PM Logo*	This unit looks at **repetition and loops** within programming. Pupils create programs by **planning, modifying, and testing commands to create shapes and patterns**. They use **Logo**, a text-based programming language.	1,2,3
Programming B – Events and Actions *Scratch*	This unit explores the concept of **repetition** in programming using the Scratch environment. It begins with a Scratch activity similar to that carried out in **Logo** in Programming unit A, where learners can discover **similarities between two environments**. Learners look at the difference between **count-controlled and infinite loops**, and use their knowledge to **modify existing animations and games using repetition**. Their final project is to **design and create a game which uses repetition**, applying stages of programming design throughout.	

Teach Computing Unit Year 5	Learning Outcomes	NC Links
Computing Systems and Networks – Sharing Information *Google Slides*	Learners develop their **understanding of computer systems** and **how information is transferred between systems and devices**. Learners consider **small-scale systems** as well as **large-scale systems**. They **explain the input, output, and process aspects of a variety of different real-world systems**. Learners take part in a collaborative online project with other class members and develop their skills in working together online.	1,4,6,7
Creating Media – Vector Drawing *Google Drawings*	Learners find out that **vector images** are made up of shapes. They learn how to use the different **drawing tools** and **how images are created in layers**. They explore the ways in which **images can be grouped and duplicated** to support them in creating more complex pieces of work. This unit is planned using the **Google Drawings** app other alternative pieces of software are available.	6
Creating Media – Video Editing *Green Screen – Do Ink*	Learners learn how to **create short videos** in groups. As they progress through this unit, they are exposed to topic-based language and develop the skills of **capturing, editing, and manipulating video**. Active learning is encouraged through guided questions and by working in small groups to **investigate the use of devices and software**. Learners are guided with step-by-step support to take their idea from conception to completion. The use of **green screen** can be incorporated into this unit. Learners can reflect on and assess their progress in creating a video.	6
Data and Information – Flat-File databases *2Investigate*	This unit looks at how a **flat-file database** can be used to **organise data in records**. Pupils use tools within a database to **order and answer questions about data**. They **create graphs and charts** from their data to help solve problems. They use a **real-life database** to answer a question, and present their work to others.	6
Programming A – Selection in physical computing *Crumbles or Lego Wedo?*	Learners use **physical computing** to explore the concept of selection in programming using the **Crumble** programming environment. Learners are introduced to a **microcontroller** (Crumble controller) and learn how to **connect and program components**. Learners are introduced to **conditions as a means of controlling the flow of actions** and explore how these can be used in **algorithms and programs with an input device** (push switch). Learners make use of their knowledge **of repetition and conditions** when **introduced to the concept of selection** (through the 'if... then...' structure) and **write algorithms and programs** that utilise this concept. Learners design and **make a working model of a fairground carousel** that incorporates their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model.	1,2,3
Programming B – Selection in Quizzes *Scratch*	Pupils develop their knowledge of **'selection'** by revisiting how **'conditions'** can be used in programming, and then learn how the **'if... then... else...'** structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They **represent this understanding in algorithms**, and then by constructing programs using the Scratch programming environment. They learn how to **write programs that ask questions** and **use selection to control the outcomes based on the answers given**. They use this knowledge to **design a quiz** in response to a given task and	

	implement it as a program. Learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.	

Teach Computing Unit Year 6	Learning Outcomes	NC Links
Computing Systems and Networks – Communication *Online websites*	The class learn about the **World Wide Web as a communication tool**. They learn how we find information on the World Wide Web, through learning **how search engines work** (including how they select and rank results) and **what influences searching**, and through comparing different search engines. They investigate **different methods of communication**, before focusing on internet-based communication. They evaluate which methods of internet communication to use for particular purposes.	1,4,5,6, 7
Creating Media – 3D Modelling *TinkerCAD or SketchUp*	Learners develop their knowledge and understanding **of using a computer to produce 3D models**. Learners familiarise themselves with working in a 3D space, including **combining 3D objects** to make a house and examining the **differences between working digitally with 2D and 3D graphics**. Learners progress to **making accurate 3D models of physical objects**, such as a pencil holder, which include using 3D objects as placeholders. Learners examine the need to group 3D objects, then **plan, develop, and evaluate their own 3D model of a photo frame**.	6,7
Creating Media – Web page creation *Google Sites*	Learners investigate the **creation of websites** for a chosen purpose. They identify what **makes a good web page** and use this information to **design and evaluate their own website** using Google Sites. Throughout the process learners pay specific attention to **copyright** and **fair use of media**, the **aesthetics of the site**, and **navigation paths**.	6,7
Data and Information – Spreadsheets *Google Sheets or MS Excel*	This unit introduces the learners to **spreadsheets**. They are supported in organising data into columns and rows to **create their own data set**. Learners are taught the importance of **formatting data to support calculations**, while also being introduced to **formulas** and beginning to understand how they can be used to produce **calculated data**. Learners are taught how to **apply formulas that include a range of cells and apply formulas to multiple cells by duplicating them**. Learners **use spreadsheets to plan an event and answer questions**. They **create graphs and charts** and evaluate their results in comparison to questions asked.	6
Programming A – Variables in games *Scratch*	This unit explores the concept of **variables** in programming through games in Scratch. Pupils learn what variables are and relate them to real-world examples of values that can be set and changed. Pupils use variables to **create a simulation of a scoreboard**. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, **experiment with variables in an existing project**, then modify them, then they **create their own project**. In Lesson 4, pupils **focus on design**. In Lesson 6, pupils apply **their knowledge of variables and design to improve their game** in Scratch.	6,7
Programming B – Sensing *Microbit or Crumble??*	This final KS2 programming unit brings together elements of all the four programming constructs: **sequence** from Year 3, **repetition** from Year 4, **selection** from Year 5, and **variables.** It offers learners the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a **physical device** — the micro:bit. The unit begins with a simple program for learners to **build in** and **test in the programming environment**, before transferring	6,7

	it to their micro:bit. Learners then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.	
https://makecode .microbit.org/	Design features prominently in this unit. **A design template** is introduced in Lesson 3, initially scaffolded to give learners the opportunity to create code from a given design. In Lesson 4 that scaffolding is gradually reduced, then in Lesson 5, learners **create their own design**, using the same template. In the final lesson, learners apply their knowledge of the programming constructs and use their design to **create their own micro:bit-based step counter.**	

Key stage 2

Pupils should be taught to:

1. **Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts**
2. **Use sequence, selection, and repetition in programs; work with variables and various forms of input and output**
3. **Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs**
4. **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**
5. **Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content**
6. **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**
7. **Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.**
8. **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.**