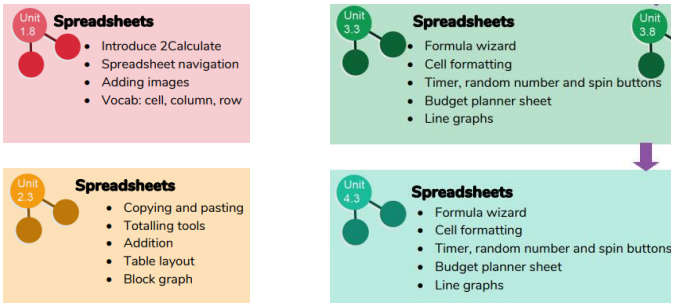
Year 5. Spreadsheets

Prior learning links:



This unit has a strong maths focus throughout, so it is important that teachers are mindful of this and are prepared to support any students who may struggle conceptually with some of the challenges. Taking a simple teach-model-task-review approach several times throughout lessons should help to keep the emphasis on the technical aspects of these activities rather than mathematical, with regular questioning throughout to ensure that the majority of pupils have a strong conceptual understanding of what they are creating and why. Lesson 3 in this unit will require a lot of explanation and support in this way; the children are presented with a maths problem and will use a spreadsheet to quickly and easily calculate answers. This will allow the children to focus on the investigation process more fully, but it is key they understand why they are following the steps shown. Lesson 4 requires some mindfulness about the class' understanding of units of time, and it is key that teachers anticipate varying levels of knowledge in this area in preparation for this lesson. Up to this point, the children have become familiar with a range of tools 2calculate uses, and began to have more of a focus on calculating towards the end of their year 4 unit of work. This unit develops that focus further, and requires much greater use of formulae to automatically calculate values. They also conduct a statistical investigation of their own for the first time in this unit, using the spreadsheet to explore trends in language.

Adaptive teaching – Recommended tried and tested practise in these lessons:

Due to the nature of Computing lessons and the common 'firefighting' required in lessons with technical issues or children who are individually confused over what may be considered small stumbling blocks, it is recommended that teachers put time and effort into reinforcing the use of school-wide learning ethos and systems (for example, the use of the 4B's – brain, board, buddy, boss) to encourage children to try to solve their problems in the right way rather than going straight to the teacher, or lessons will quickly become unmanageable. It is also recommended to follow our school's use of the Rosenshine model of mastery teaching strategy and teach lessons in a series of stages, with short, simple tasks being set, and children who finish early can be given encouragement to support and 'lifeguard' other students. This has twofold benefits; the process of teaching others cements and secures pupils' own mastery, as well as ensuring the teacher isn't overwhelmed with personal requests for help. If one-to-one support is unavailable for high need children, it is a good idea to make sure these children are sat next to or near a higher ability student who may act as peer support for them, and these children are monitored carefully throughout lessons to ensure they stay on task and understand each objective given. Ensure that any hardware support that is required for individual's SEND requirements are adjusted appropriately and are tied to those students' individual log ins (e.g. Zoom tools or screen tints for students with visual impairments etc). Teachers should have a knowledge of Pupil Premium children, particularly those who have been seen to struggle in Computing lessons, and these children should be monitored alongside those with SEND during lesson time to help ensure they access lessons along with the rest of the class.

Knowledge covered:

NC	Ladders Objectives
(2.1) Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	
(2.2) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	
(2.3) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	
(2.4) 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.	Y5 - IT5 - I can recognise the role of computer systems in our lives

Year 5 Spreadsheets

(2.5) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	**Y5 - IT1 (KPI)** - I am aware of several different search engines and can explain their difference (e.g: google, Bing)
(2.6) 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.	Y5 - IT2 - I can combine more than one source of information (e.g. text, picture, video, animation, sound) in my work and can present this well to other people. Y5 - IT3 - I can use software to collect, present and analyse data appropriately. I can explain what I have done to other people. Y5 - IT4 - I can create and edit a presentation to provide information clearly and can include hyperlinks in it (e.g. using PowerPoint/Sway/Keynote/Other).
(2.7) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	

Medium Term Lesson Plan:

Lesson 1	Conversions of measurements L.I I can use formulae within a spreadsheet to convert measurements of length and distance. L.I I can explore the use of the display of decimal places. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can can create a formula in a spreadsheet to convert metric measurements of length and distance. I can apply this to creating a spreadsheet that converts between metric and imperial measures. I can use a spreadsheet to set the number of decimal places displayed.	<u>Key Questions</u> *Prior knowledge* What are formulae in spreadsheets? How can they help to make things easier for the user? Would it be better to measure a carpet in cm or m? Why might we need to convert measurements in our everyday lives? What is copying and pasting? How many centimetres are there in a metre? Will our answers look bigger or smaller?	Introduces measures, with some comment on imperial and metric measurements. Discuss why different units of measurements may be needed with some real world examples. Children are given an example spreadsheet and are asked to use simple operators to convert from m to cm and back (no formulae for now). Formulae are introduced to make the spreadsheet more efficient.
Lesson 2	Using Formulae L.I I can use a spreadsheet to model a real-life problem. L.I I can use formulae to calculate area and perimeter of shapes. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can use a spreadsheet to model a real-life problem. I can use formulae to calculate area and perimeter of shapes.	<u>Key Questions</u> *Prior knowledge* What is computer modelling? When might it be useful to model a real life situation using a computer? What is area? What is perimeter? What would you have to do if you were calculating this on paper? How will this spreadsheet help us?	Children are given a mathematical problem which requires them to calculate different perimeters from a set area using formulae. Support will be needed for children struggling with the mathematical concepts – encourage children to follow your modelling one step at a time until they are able to replicate the process for themselves. Extension: Using the spreadsheet to calculate volumes of cuboids
Lesson 3	Exploring Probability L.I I can use a spreadsheet to investigate the probability of the results of throwing many dice **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can create a spreadsheet to answer a mathematical question relating to probability. I can problem solve using the count tool	<u>Key Questions</u> *Prior knowledge* What does 'probability' mean? On a dice, do you think it is more likely that certain numbers will be thrown than others? How likely is it that we roll a 4? What patterns do you notice?	Children are shown step by step how to add the dice tool to a spreadsheet, then are shown how to copy and paste it across cells so there is a 5 x 10 grid. Dice generate a random number. Children then use a 'count' tool to calculate all the results of each set of dice throws. Children answer questions relating to probability; hopefully a consensus will be reached by the end of the lesson that each number has a 1 in 6 chance of occurring. Children then create an additional spreadsheet to

				record their results, then create a graph. Extend by asking children to do and record more throws as more results = more reliable data. Support struggling pupils through peer support and one step at a time modelling.
Lesson 4 & 5	Computational Modelling L.I I can use spreadsheets to model real-life situations. L.I I can use the created spreadsheet to make decisions about these situations. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can use spreadsheets to model real-life situations and produce solutions that can be practically applied	Key Questions *Prior knowledge* What do you think a 'computatiional model' might be? What is a 'budget'? What does 'profit' mean? What are 'expenses'?	Purple Mash planning suggests children complete 2 activities. However, teachers may elect to explore one activity in greater depth – School Cupcake, Concert Tickets, Pocket Money, School Event. Recommended activities: Pocket Money and Concert Tickets Children base their models on 2do's set in Purple Mash, and follow step by step. Pocket money is more personal and the children research things they want to save up for, Concert Tickets is mathematical calculation, but very structured and shows how formulae are very useful for calculating values which can change on a spreadsheet. Extension for pocket money: Calculate how many weeks are needed to save for an item Extension for concert tickets: Additional cost adjustments
Lesson 6	Testing a hypothesis L.I I can use the count tool to answer hypotheses about common letters in use. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can use a spreadsheet to work out which letters appear most often. I can use the count tool.	Key Questions *Prior knowledge* Which letter do you think is the most common one in our language? How could we find out? What is a vowel/consonant? What is the most common letter so far?	Children are challenged with the question: Is the letter 'e' the most common/popular letter in our language? How could we find out? Children use a count tool within 2calculate to automatically calculate which letters appear on the spreadsheet. Children to copy and paste text from the Internet (as much as possible to test more accurately). Recommend using Wikipedia and searching for their favourite animal, to help control where children where text comes from. Extensions – make a sheet which counts conjunctions/pronouns/verbs/this week's spellings