Mendell Primary School

Aspire Challenge Achieve

Medium Term Plan Design Computing

Year Group: 5	**Term:** Sum #2 2022	**Teacher:** Jordyn Keelan	**Subject lead:** Justin Cowley	**Overview: Spreadsheets:** Organising data into columns,	**Key End Points: By the end of this unit children will be able to:** -
Links to other learning:	**Prior Learning:** Y4: Animation	**Future Learning:** Y6 Film making	**High Quality Text:**	**Risk Assessment:**	**Misconceptions:** / **Teacher CPD:**

	Learning Intention	Lesson Outline (Key Questions in colour)	Resources	Vocabulary	Lowest 20% Adaptations
1	- I can collect data in a format of my choice.	**Computing is the use of devices to create, store and manipulate data** In this lesson we are going to collect data in a format of our choice, learn how to organise it into a table and then how to input it into a spreadsheet. Show first slide and explain that in this lesson they will collect and organise data. Ask the children to suggest what data they could collect and how it could be organised. At this stage, responses will probably be wide and varied. However, the use of the word 'spreadsheets' may influence some responses. Show slide 2. Tell learners that they will roll a dice to generate their data. Explain that in their table groups (typically four to six children), each child will roll the dice five times and collect their scores. They should then collect the scores for the whole table and record them in the same place. Children could use dry wipe boards or pens/pencils and paper. Explain that the purpose of the exercise is to find out who on the table rolled the highest overall total. Do not provide any guidance or suggestions, this is an opportunity for them to decide for themselves how they will complete the task. In subsequent activities, you will model how they could complete the task effectively. Show slide 3. Ask the children to reflect on how they recorded their data. Show the class the blank table on slide 4. Ask them to suggest what they think the column headings (highlighted in blue) could be. After a short discussion, move on to slide 5 and explain that this is one way that they could record their data. Give out the activity sheet (in resource folder) which has a template table and ask the children to organise their data on the sheet. There is an example of what this could look like on slide 6. Show slide 7. Ask the children what they could use to make a table on a computer. Depending on their prior experience, they may suggest word processing packages, such as MS Word or Google Docs; presentation tools, such as MS PowerPoint or Google Slides; or spreadsheet packages, such as MS Excel or Google Sheets. These are all valid answers. Build the slide to reveal (without explanation as to why) that in this case they will record their information in a spreadsheet. Show slide 8 and explain that they need to copy the column headings from the table they completed in the previous activity and enter the data. To do this, they need to open a new spreadsheet in Microsoft Excel. Model on the class interactive board how to find the folder with Microsoft Office and then how to open Excel.	Class set of laptops 10 dice (six sided)	Data Collecting Table Structure Spreadsheet	

		Because they are entering data that does not require any formatting, the children should not need much support for this activity, even if they have not previously used a spreadsheet application. Ask the class to explain what they entered into their spreadsheets. They should identify that they entered column headings and numbers in the main part of the table. **Note:** Some learners may differentiate between the individual rolls and the totals. They will learn how they can create totals using formulas in future lessons of this unit. Ask the children what else they think they could record in a spreadsheet. Model how to save their spreadsheet into the shared drive (ask them to put their own name as the file name).			
2	- I can edit and format a spreadsheet	**Computing is the use of devices to create, store and manipulate data** In this lesson we are going to develop our understanding of the structure of a spreadsheet. We will be introduced to cell references, data items, and the concept of formatting cells. Show the first slide and tell the class that each of the boxes that make up a spreadsheet is called a cell. Show the next slide and explain that each cell has a unique cell reference. This means that the children can say where a particular piece of data is stored. Explain to them that they can find out a cell reference by using the letters along the top of the columns in the table and the numbers down the left-hand side of the rows (quick recap of coordinates) On slide 3, demonstrate that the word 'Name' is in cell A1. Show slide 4. Ask the class to write on their whiteboards what is contained in cells A2, B5, C3, and B1. Ask them what they notice about the contents of these cells. Build the slide to show that each cell contains a data item, and these data items can be different formats. In this case, plain text, number, and currency. Explain to the children that there are several formats that can be selected for cells in a spreadsheet. Some of the most commonly used formats are displayed on slide 5 in the form of a screenshot from the 'format' menu in Google Sheets (demonstrate the same drop down menu on Excel) Distribute the handout and ask learners to mark where they think the following formats have been applied: • Plain text • Date • Number • Duration • Currency Click onto slide 6 to show the answers. Explain to class that they are going to create their own version of the travel to school table from the previous activity. Children's tables will be based on the travel habits of children on their table or in their group. Emphasise that it is not crucial that the data is accurate (they can include approximate figures). If necessary, help the children to create a class data set that they can use. Once a data set has been created, model to the class how to open the spreadsheet resource (pre-save this into the shared folder for them) and ask them to populate it with the data set. **Note:** The example data set is included in the first tab of the spreadsheet. The column headings are included in the second tab — this is the tab learners should complete.	Lesson Powerpoint Class set of laptops 'Which format' resource sheet	Cell Cell reference Data item Format	

		Once they have entered the data into their spreadsheet, display slide 8, which explains how to apply formatting to a cell. These instructions are also included in the activity handout. Ask them to apply formatting to the cells on their spreadsheet. Note: Some learners may need support for the 'duration' column. Slide 9 provides an explanation of how the duration format will interpret an unformatted number. For simplicity, you may wish to encourage learners to enter the data in the duration format, eg 23 minutes would be 00:23:00. Ask learners to reflect on what they have learned in this lesson and discuss with their partner or group why it is useful to apply formatting to cells in spreadsheets. After learners have given some responses, build the slide to show three possible reasons: • It makes them easier to use • It makes them easier to read • It shows what each cell contains Ask the class to write an explanation in their books about why it is important to use formatting in their spreadsheets.			
3	- I can construct a formula to use in a spreadhseet.	**Computing is the use of devices to create, store and manipulate data** In this lesson we are going to begin to use formulas to produce calculated data. We will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). We will then create formulas to use in a spreadsheet using cell references and identify that changing inputs will change the output of the calculation. Show the first slide to the class and explain that calculations can be performed in spreadsheets using the mathematical operation shown on the slide. **Note:** The * and / symbols are used on this slide to represent multiply and divide. This is because they are the symbols that are used in formulas. You may need to explain to the class that these may be different symbols to those they are familiar with from maths lessons, but they perform the same function. Show the next slide and tell the class that some data items can be used in calculations but that others cannot. Ask the chlidren, "Can you multiply a number cell by a number cell to answer a calculation?". Ask the class to show thumbs up or thumbs down to demonstrate their answer. Move on to slide 3 to show that you can multiply number cells together. Show slide 4. Ask them "Can you add a plain text cell to a number cell to answer a calculation?". Ask them again to show thumbs up or thumbs down to demonstrate their answer. Move on to slide 5 to show that you cannot add a plain text cell to a number cell. Explain that if you tried to, the spreadsheet would show an error message similar to that on the slide. Show slide 6. Ask them "Can you subtract a number cell from a currency cell to answer a calculation?". Ask them again to show thumbs up or thumbs down to demonstrate their answer. Move on to slide 7 to show that you can subtract a number cell from a currency cell, and explain that the spreadsheet would display the answer as currency. Show slide 8. Ask them "Can you multiply a plain text cell by a number cell to answer a calculation?". Ask them again to show thumbs up or thumbs down to demonstrate their answer. Move on to slide 9 to show that you cannot multiply a plain text cell by a number cell in a spreadsheet. Show slide 10. Tell the class that when they use spreadsheets, they can only use numerical data items to form the basis of calculations and the data needs to be entered in a suitable format. Show slide 11. Inform the group that to do calculations in a spreadsheet they can create something called a formula. Tell them that a formula can tell a computer which mathematical operation to use for a calculation: add, multiply, divide, or subtract. It also tells the computer which pieces of data to use within the calculation. Tell the class that they will use a spreadsheet, similar to the one from the last lesson, to do some multiplication calculations.	• Class set of laptops	Formula Calculation Input Output Cell reference	

		Show slide 12. Explain that the spreadsheet shows the travel duration, distance and cost per mile from a school to various tourist attractions in the UK. The data headings used: attraction, location, travel duration, distance in miles, and cost per mile. Explain that they will use the cost of petrol (cost per mile) and other data in the spreadsheet to work out how much it would cost to travel to each of the attractions from school. Think, pair, share: "How would you calculate the cost of petrol from school to one of the attractions?". Explain that first they would need to look at the **distance in miles**. Then they need to multiply this by the value in the **cost per mile**. Click to animate the answer. Show slide 13. Tell them that when they want to do a calculation in a spreadsheet they can use the cell reference. Explain that they will look at the cost of petrol to Alton Towers. Tell the learners that the cell references they need are D2 and E2. Open the 'Example spreadsheet' resource and model entering the **=** symbol, clicking the cells you need to create a formula to calculate the cost of the journey to Alton Towers (=D2*E2). This process is also demonstrated in the video on slide 14. Explain that the formulas used started with **=.** By putting an **=** in a cell you are preparing the computer for a formula to be entered, ensuring it is not treated as text. **Note:** You may encourage learners to type in their formulas initially to ensure they have demonstrated the skill, but could then encourage the use of dragging the formula down as demonstrated in the video to ensure all learners are able to complete the task. Allow learners time to create the formulas to work out the cost of a trip from school to each of the attractions on their spreadsheet. Show slide 16. Tell the class that they are going to look at two examples of calculations. One which uses numbers and the other that uses cell references. Show the learners the video. At the end, think, pair, share: "Why do the formulas with cell references update but the formulas using just numbers don't?". Answer: Within a calculation the cell reference refers to the cell holding the data. If the data input into the cell changes, then the output of the calculation changes too. Share the challenge with the learners and explain that they need to change their spreadsheets to reflect the price increase. Show slide 18. Think, pair, share: "What are the benefits of duplicating formulas rather than typing each individual formula in?". Show slide 19. Explain it is quicker to type in one formula and duplicate it rather than typing in each formula individually. Show slide 20. Explain that when a user types in the formula individually, there is more chance of them making a mistake. As long as the initial formula is correct the computer will only duplicate what is written.			
4	- I can create a formula which includes a range of cells	**Computing is the use of devices to create, store and manipulate data** In this lesson we are going to calculate data using the operations of multiplication, subtraction, division, and addition. We will use these operations to create formulas in a spreadsheet and 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. Show the first slide and remind the children that spreadsheets can be used to perform calculations including the following operations: addition, subtraction, multiplication, and division. Explain that more complex processes can be completed in spreadsheets using functions. The examples given are: • Calculating averages: a single function can calculate the average of a large range of cells • Finding the sum of multiple cells: this is useful as it means you do not have to create a long and complex formula • Counting a number of object **Note:** To support learners you may need to model how to use the shift & number keys to type the mathematical operations, drawing particular attention to the use of * and / for multiplication and division respectively, and the difference between the minus and underscore symbols which are often represented on the same key.	Class set of laptops	Data Calculation Operation Formula Cell Sigma Range Duplicate	

		Show slide 2. Explain that they will practise using the four operations within formulas. Explain that the spreadsheet they will be using has a number of questions they need to answer, using cell references and mathematical operators. (Save the L4 resource spreadsheet into the shared folder prior to the lesson and model how to open it) Click through the animation. Tell the learners that there are four tabs along the bottom of the page, each referring to one of the different operations. Tell them that they should click on a tab and complete the calculations for each operation. Ask the learners, "What formula would you type into cell C1 to answer this question?" (answer: = A1 + B1). Remind them that they are on the 'Add' tab. Highlight that formulas start with =. Model locating cell A1 for the first piece of data. Tell them that addition is shown using + in a spreadsheet. Model locating cell B1 for the second piece of data. **Note:** In the 'Using the four operations' solutions spreadsheet, columns A-C are what the learners should have included in their spreadsheets. When clicking on the learners' answers in column C, you should be able to see the formulas shown on the solutions spreadsheet in column D. This will ensure that the learners have used the correct formulas rather than typing in the answer themselves. Show slide 4. Tell the class that there are functions and tools within spreadsheet applications that can support people in performing calculations using large quantities of data. Show slide 5 and tell them that functions in spreadsheets can be found by clicking on the sign ∑, which is called sigma. Show slide 6 and inform them that during this activity they are going to practise creating formulas using the ∑ function button with a small amount of data. Talk the class through the scenario: a group of children's times table scores have been recorded over a six-week half term. The teacher will award a prize to the pupil who has the highest total over the six weeks. They also work out the average score so that they can compare the scores with the children in other classes. The teacher makes a spreadsheet to record the data. Show slide 7. Explain that within the sigma button there is a function called SUM. This enables you to calculate the sum (or total) of a range of cells. This is helpful when you have large amounts of data to add together. Open the 'Times tables scores' spreadsheet. Model using the SUM function to total the children's scores in the **Total** column. Then model dragging the cell down the column to duplicate the formula. A video of this process is included on slide 8 Show slide 9. Explain that within the sigma button there is also a function called AVERAGE. This will calculate the mean (average) of a range of cells. Remind the learners that to work out the average you add the numbers together to find the total then divide that number by how many numbers there are. Open the 'Times tables scores' spreadsheet. Model using the AVERAGE function to find the average for the children's scores in the **Average** column. Then model dragging the cell down the column to duplicate the formula. A video of this process is included on slide 10. **Note:** It is important that learners understand that when they calculate the average they should only select the weekly scores and not the **Total** column. The average scores would be clearer if they were rounded, however this skill has not been demonstrated in this unit. Provide each child with the 'Times table test' worksheet (pre-save this in the shared folder). The children need to answer the questions by using a copy of the 'Times table scores' worksheet to work out the SUM and AVERAGE for each child. The questions are also displayed on slide 11. . Show slide 12. Explain that during the previous activity they used a small amount of data to calculate the SUM and AVERAGE of a range of data and learnt how to duplicate formulas. During this activity they are going to use a larger data set to complete calculations. They will need to work out which calculations to complete and how to do this. Show the class the screenshot of part of the 'Shopping' spreadsheet. Discuss that this is only part of the spreadsheet that they will use as they will be dealing with more data and that they may need to scroll down their page when they come to do their activity. Talk the group through the different data headings.			

		Ask the children: “How would you work out the missing values?”. • Total stock sold – =Stock (start of week) – Stock (end of week) • Income subtotal – =Price*Stock sold • Total income – =SUM(Income subtotal column) Remind them that they could use their newly learnt skills of duplicating formulas and applying formulas to a range of cells. Give the class a copy of the ‘Shopping’ spreadsheet.			
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