

Unit 6.1-Creating Formula

Year Group	Year 6
Unit Title	Creating Formula
Computing Area	Information Communication Technology
National curriculum	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
Skills Progression Points	<ul style="list-style-type: none"> • <i>Enter and organise data appropriately</i> • <i>Use the 'Formula' method to make calculations</i> • <i>Interpret and present the data they collect.</i> • <i>Use the skills developed to interrogate a spreadsheet</i>
Hardware	Laptops
Software/App	MS Excel
Unit Objective	To understand how to organise, calculate and present data within a spreadsheet so that calculations can be made for different purposes.
Unit Vocabulary	Cell, Column, Row, Formulae, Graph, Chart Spreadsheet, Cell Reference, Grid, Tab, Workbook, Merge, Auto Sum
Activity Progression	<p><u>Lesson 1</u> LO: To plan and organise a spreadsheet sheet effectively To enter and edit data.</p> <p><u>Introduction</u> Remind and discuss how spreadsheets are used in the wider world and give examples of where spreadsheets are used which the children will be familiar with e.g School register, household bills, library etc.</p> <p>Open up Microsoft Excel and explain to the children that a spreadsheet imitates a paper worksheet which it is made up of Cells and Columns. Explain that this helps to organise the data within the spreadsheet. Tell the children that the rectangular boxes are called 'Cells' and that each cell has a name known as a 'Cell Reference.' Click in a cell anywhere on the spreadsheet and ask the children to use the alphabet along the top and the numbers along the side to correctly name the cell e.g. A1, H7 etc. Further explain, that the cell reference can be seen in the 'Name Box' above the letter 'A' on the toolbar.</p> <p>Explain that users can put words or numbers into the cells, to make headings and store information. It is important that pupils understand that they can also move the grid lines around so that some cells are bigger than others, and change the colour or size of text/font, the same way they are changed in Microsoft Word.</p>

Discuss with the children the type of items they would need to purchase for a school trip.

Demonstrate, using Resource 1, how this information can be added into the spreadsheet as headings. Explain to the children that they will be adding items and the costings into the spreadsheet. Set a budget for the activity e.g. £200.00

Activity 1

Ask the children to open Microsoft Excel and insert Resource 1a. This could be either loaded onto the shared drive or uploaded to Google Classroom for children to access using Google sheets.

Children should then add the headings as described in the introduction. Next the children should list the detailed information in the columns below the headings. E.g. Coach, 2 (coaches), £80.00.

Activity 2

Task the children with editing their data by changing font, size and colour. Discuss why editing might be necessary and then further discuss which of the editing tools are most useful and appropriate. Children should save their work so it can be retrieved for the next session.

Plenary

On the whiteboard display one of the children's work examples.

Q. Ask the children why it is important for the data to be separated into different columns. Further discuss if editing the text was necessary.

Q. Does this make the data more organised?

Q. Does this make the data easier to interpret?

Lesson 2

LO: To make calculations using the formula method

Introduction

Using an example of the work from the previous session, briefly recap the objectives taught.

Explain that in this session the children will be calculating the total cost for each item within their spreadsheets using a method called Formula. Explain that a formula is a group of mathematical symbols and numbers that show how to make a calculation.

Explain that sometimes different symbols are used to make calculations when using formula e.g.

Add - + (add symbol)

Subtract - ' - ' (hyphen symbol)

Multiply - * (asterisk symbol)

Divide - / (forward slash symbol)

Explain how a formula can be created for the activity using the cell references e.g. **=sum(A5*B5)**.

Explain that the cell reference can also be generated within the formula by clicking onto a cell.

	<p>It is important that the children understand that in order to show the answer to their calculation they must click on the 'Enter' key after they have created their formula.</p> <p><u>Activity 1</u> Task the children with using the formula method to make their calculations for each item. This should be completed in the Total column.</p> <p>For the total of each item. Children will need to use the =sum(B4 * C4) formula</p> <p><u>Activity 2</u> Once the calculations have been completed the children should calculate the 'Overall Total Cost' by using the Auto Sum tool. Have they managed to stay within budget? Children should save their work so it can be retrieved for the next session.</p> <p>For the grand total children will need to use the =sum(C4,C5 etc)</p> <p><u>Plenary</u> Ask the children about the issues that arose when using the formula method. Q. What happens if the wrong cell reference is entered? Q. What happens if a part of the formula is missed out?</p>
<p>Activity Progression</p>	<p><u>Lessons 3</u> LO: To understand how modelling can affect calculations To create a pictorial representation of the data within a spreadsheet</p> <p><u>Introduction</u> Using an example of the children's work from the previous session, highlight the total cost spent overall. Some children would have kept within budget others would have gone over. Explain that they must work within the budget set and not go over or too much under.</p> <p>In order to meet the set budget demonstrate to the children how to change the data within the spreadsheet (this is known as modelling) e.g. Change the cost for the coach to £70.00. Explain that because the Formula method was used previously, the spreadsheet will automatically calculate the new total cost. Demonstrate a few more cost changes within the spreadsheet in order to consolidate this skill.</p> <p><u>Activity 1</u> Ask the children to review the amount spent. Have they gone under or over budget? Ask the children to change the data within their spreadsheet so that they stay within the set budget. This can be achieved by changing the cost or the amount of the item. Children should also notice that they do not need to enter a new Formula as the spreadsheet will automatically change the total cost.</p> <p><u>Activity 2</u></p>

	<p>Children should create a line graph of the Total cost column for each item within the spreadsheet. This can be achieved by first, highlighting the 'Items' column. Next, hold down the Ctrl button on the keyboard and select the Total cost column. Both the 'Items' column and the 'Total Cost' Column should now be highlighted.</p> <p>Next children should select the INSERT menu tab and choose the line graph. Children should label the graph appropriately.</p> <p><u>Plenary</u></p> <p>Q. Discuss with the children the reasons how the modelling exercise can help us?</p> <p>Q. Is this easier than a similar paper based exercise? If so how?</p> <p>Q. Discuss the results within their graphs can children interpret the graph?</p> <p>Q. Discuss why it is important to label the graph.</p> <p>Q. Is a line graph the most appropriate chart or would another graph show the results better?</p>
<p>Activity Progression</p>	<p><u>Lesson 4</u></p> <p>LO: To use the formula method to calculate averages</p> <p>Introduction</p> <p>Tell the children they will be completing a spreadsheet activity which will show an average calculation.</p> <p>Present the children with a table of football results, as shown in Resource 2, and explain that they will be working out the average goals scored for each team over 10 games.</p> <p>Remind the children how they would usually work out an average (Mean) by adding all the numbers together then dividing by the amount of numbers. Using whiteboards the children should complete some quick fire averages questions prepared by the teacher.</p> <p>Next, explain to the children that they will be using a formula to calculate the average number of goals scored for each team. Ask the children to suggest some ideas for the calculation discuss these ideas and try them out as a class.</p> <p>To reassure the children about the formula required, give an example for the first few teams e.g. =sum(A1:A10)/10. Explain to the children that by using a colon within their formula this defines a range of numbers which can be calculated. Draw attention to and remind the children of the symbol required for a division calculation (Forward slash /).</p>

Team	Game 1	Game 2	Game 3	Game 4	Game 5	Game 6	Game 7	Game 8	Game 9	Game 10	Average Goals Scored
Manchester United	3	2	1	0	2	1	0	4	2	3	1.8
Liverpool	2	3	4	2	1	1	3	2	3	0	2.1
Arsenal	2	5	2	1	0	3	2	2	2	1	2
Aston Villa	1	2	2	2	2	2	1	0	2	1	1.5
Manchester City	4	3	4	3	3	2	1	2	3	1	2.6
Everton	2	1	2	1	1	1	3	1	2	2	1.6
Chelsea	1	2	2	2	2	2	0	1	3	2	1.7
Tottenham Hotspurs	2	3	3	3	3	2	1	0	0	2	1.9
Newcastle	1	1	1	1	3	1	1	1	1	1	1.2
West Ham	1	2	2	2	1	0	0	0	3	2	1.3

Activity 1

Children should complete the prepared Football Results spreadsheet to find the average results of goals scored across 10 games, for each team as explained above. Children should use a suitable formula to achieve their results.

Activity 2

Children should graph the results of the football teams and the average goals scored. Children should work independently to choose an appropriate graph which should be labelled appropriately.

Follow the same process as previous lesson to insert a graph.

Plenary

Show the class example of the children's work in order to make a comparison on the formulas created.

Q. Did the children achieve the same results if not how are they different?

Q. Did they each get the same average scores?

Q. Observing a range of graphs chosen by the children to show their results can the class agree which one would be most appropriate and can they give a clear explanation why?

Once the children have understood how to create an average calculation, the teacher could demonstrate how to create an average result using the **Auto Sum** tool. E.g. Go to Auto Sum, from the drop down menu choose Average, press Enter.

End of Unit Assessment

Assessment Criteria:

- Enter and organise data appropriately

- Use the 'Formula' method to make calculations

- Interpret and present the data they collect.

Lesson 5: Assessment Task

Activity

Teachers should give the children a worksheet with a list of meals with prices. Children should create and organise a spreadsheet which shows the names of a group of children and their individual choice of meal and quantity for lunch.

Next, children should calculate the total cost spent for each meal using the formula method. Children will then calculate the overall money taken for all meals.

Finally, the children will work out an average cost spent for all meals and then graph the total cost spent for each child in the spreadsheet.

