UNIT 5.4
EXCEL

Getting Ready :

1. Make sure you have Microsoft Excel (or equivalent) installed on the class computers.

2. You might want to decide on a particular theme for the maths quizzes (e.g. 3 digit by 3 digit questions).

3. Consider *who* pupils will be asking to take part in the quizzes (others in the class or pupils from another year group)? Decide *how* these pupils will take part in the quizzes.

LESSON ONE :

L.O. Use simple formulae to make a spreadsheet quickly and accurately perform maths calculations.

RESOURCE 1 : WAGOLL

Instructions : Display Excel on the IWB and introduce pupils to some key spreadsheet terminology such as *'row', 'column'* and *'cell'*. Ensure that pupils understand what these are by referring to them on a blank Excel sheet of your own. Explain that every cell has a unique name and this is found in the same way as reading co-ordinate positions (i.e. read along the top of the sheet in order to find the letter of the cell and then match this up with a number as you read down vertically). Demonstrate how to enter data in a cell and assess pupils ability to reference cells correctly by asking them to tell you the names of the different cells where you have put data. Play the **WAGOLL (resource 1)** and tell pupils that they will be making their own similar maths quiz for others to play on.

Note: If you want your pupils to create a particular type of quiz, make sure you tell them what type of questions they need to come up with (e.g. "2 digit sums for year 2 pupils to answer").

Task 1 : Ask pupils to open up a blank Excel spreadsheet and instruct them to enter in the following '*fields'* (headings) '**1st Number**' '**Operator**' '**2nd Number**', '**Answer**'

* N.B. You might need to show pupils how to stretch the width of a cell in order to display the whole text.

* N.B. You might wish to show pupils how they can use the formatting toolbar to make the text stand out - as you can see here, I have made the text size 14, bold and the colour red.

Task 2 : Next, instruct pupils to write down a **minimum of 10 questions** that they will use in their quiz.

Note: *It is important that pupils include all four types of question types - **addition, subtraction, multiplication and division** - to enable them to gain experience of typing the different calculation formulae needed. It is also important that pupils include some deliberately challenging questions so that not every question gets answered correctly!*

Once pupils have decided on their questions, they will then need to input the **first number**, **operator** and **2nd number** into each row (similar to the example below). Model this with your own example.

1st Number	Operator	2nd Number
5	Multiply	7
4	Add	9
3	Subtract	2

Instructions : Once pupils have completed task 2, bring them back together and explain how you can next input simple formulae in order to make the spreadsheet quickly and accurately perform the calculations on each row. Write the different formulae that need to be used for each type of calculation (including the operation sign used), and have this displayed on large flip chart paper for pupils to refer to. This should look something like the table below:

TYPE OF CALCULATION YOU WANT TO PERFORM	FORMULA YOU NEED TO TYPE INTO THE CELL WHERE YOU WANT THE DATA DISPLAYED (THEN PRESS ENTER)
Addition	e.g. **=B2+C2**
Subtraction	e.g. **=C2-B2**
Division	e.g. **=C2/B2**
Multiplication	e.g. **= B2*C2**

Task 2 : After demonstrating how to input the different formulae on your own modelled example, instruct pupils to do the same for their spreadsheet, until their answer column is populated with all the correct answers for each of their sums.

Maths Spreadsheet Quiz

1st Number	Operator	2nd Number	Answer
5	Multiply	7	35
4	Add	9	13
3	Subtract	2	=A6-C6

Pupils type in the correct formulae for each of their answer cells in order for the cell to display the correct answer.

To Finish : If you haven't done already and you have enough time, show pupils some of the formatting tools available to them for making their spreadsheet more attractive. Give them the opportunity to experiment with these in order to make their '*fields'* (headings) stand out. Also make sure that you have completed all the steps on your own modelled example too and save this. Finally, make sure that all pupils save their spreadsheets, ready to continue with in the next lesson.

LESSON TWO :
L.O. To use the conditional formatting tool in Excel.

Preparation :

1. Ensure that you are confident with how to use the conditional formatting tool within Excel (watch the software demonstration video again if need be).

2. Have you modelled example spreadsheet quiz ready on display for the start of the lesson.

3. Make sure you have set up an effective way for pupils to share their competed quizzes with others.

Instructions : Using your modelled example, demonstrate how to use the conditional formatting tool. Explain that by applying this feature, players of your quiz will know whether they have put in the correct answer (or formulae) correctly or not. Tell pupils that by using the conditional formatting tool in this way, what you are doing is essentially creating a response which is dependant on a condition being met (i.e. if a player types in the correct answer the cell colour will go green **but** if the player types in the incorrect answer, the cell will go red instead). Explain that this is an important programming concept known as '**selection**'. Once you have completed your modelled example, explain to pupils that they will need to finish off their maths spreadsheet quiz by using the conditional formatting tool in the same way.

Task : Pupils should finish their maths spreadsheet quiz, using the conditional formatting tool in order to program each answer cell to be highlighted a particular colour depending on whether the answer is correct or not.

*Note : Ensure that pupils have enough time to regularly check both their own and their peers' quizzes; checking in particular that the conditional formatting tool has been used correctly. If there are any mistakes, encourage pupils to fix these, explaining that in programming terms this is referred to as '**debugging**'.*

Plenary : If possible, ask pupils to email their spreadsheet to pupils in other year groups or find other ways of providing links to the completed spreadsheet quizzes, (e.g. perhaps by posting links on your school blog).

Collecting the results : There are a few different ways of doing this, such as;

- Asking pupils to email the sheets back once they have completed the quiz.
- Asking pupils to print out the sheet (in colour) once they have finished the quiz and handing them back to the person who created it.
- Pupils creating a Google form and asking people to submit their scores once they have completed the spreadsheet quiz.
- Designing a simple table and recording the scores whilst others are playing their quizzes *(Note : if you are going to do this, you will need to carry out the next two lessons).*

LESSON THREE/FOUR (OPTIONAL)
L.O. To collect data scores for my spreadsheet quiz
L.O. To use the filter tool and subtotal function to filter cells by colour.

RESOURCE 2 (RECORDING SHEET) - OPTIONAL
RESOURCE 3 (TUTORIAL VIDEO)

Instructions : The next part of this project will be for pupils to create their own spreadsheet showing the different scores for each person who played their quiz. Before they can do that, they will need to ensure that as many people as possible take part in their quiz. Therefore, one option at this stage of the project is to have a 'game playing lesson' as this will enable pupils to gather a wide set of data. (*If pupils have created their quizzes for those in another class, you will need to arrange this accordingly and invite those pupils into the lesson*)

Task : The creator of the quiz needs to be keeping track of the score each time somebody else completes their game. For this you might choose to use **resource 2 (recording sheet)** or even better pupils could design their own similar database sheet and record the results on it accordingly (this doesn't have to be anything fancy, in fact pupils could simply just write down their scores on a piece of paper, jotter book or whiteboard - just make sure pupils don't lose these results)!

Note : *For large data sets, a useful feature within Excel is the filter tool. Therefore you might decide to show pupils how they can use the subtotal function and the filter tool as a way of quickly counting the number of cells highlighted in a particular colour* **(reference resource 3 for instructions on how to do this).**

Optional Task (particularly useful for large data sets) : Give pupils the opportunity to use the subtotal function and filter tool as a more efficient way of counting how many people answered correctly and incorrectly when taking part in their spreadsheet quiz. (*Even if pupils have a relatively small data set and it would be just as quick to count their results manually, it is useful for pupils to have a go at this*). Once they have done this, pupils should record the results on their recording sheet or paper/whiteboard.

*** It is important that by this point, pupils have collected and recorded a wide range of scores that they can then input into their results spreadsheet in the next lesson ***

LESSON FIVE/SIX
L.O. To create a spreadsheet to calculate and present data

RESOURCE 4 (TUTORIAL VIDEO)

Preparation :
1. Ensure that pupils have the results of the spreadsheet maths quizzes from the previous lesson.
2. If you are unsure how to use spreadsheet formulae for calculating the total, minimum, maximum and average, make sure you familiarise yourself with the tutorial video **(resource 4).**

Instructions : Explain that now other pupils have had the opportunity to play their maths quizzes and they have recorded these results, they are now able to see how many questions each person answered correctly. Explain that their next task will be for them to display this data in a spreadsheet. Demonstrate how to use different formulae in order to calculate the **sum, minimum, maximum and average** of a set of numbers (refer to the resource 4 if you are unsure of how to do this).

Task : Give pupils time to create a spreadsheet which clearly shows how a range of people did whilst playing their spreadsheet maths quiz. When they have typed in all the scores they then need to enter the =sum() formulae in order to work out each child's overall total score. Remind pupils of the importance of checking their formulae results to ensure that they are accurate.

At the bottom of their spreadsheet table, ask pupils to construct three additional formulae:
• a =min() formula to identify the minimum total points scored by a child
• a =max() formula to identify the maximum total points scored by a child
• a = average() formula to identify the average points scored by a child (You may need to explain the term 'average').

Note : *If time, let the children experiment with the formatting tools in order to improve the appearance of their work, including encouraging them to add borders around the table cells and to correctly align the numbers to the right.*

To finish : Ensure pupils have summited all their completed spreadsheet tasks to your shared work space/learning platform (e.g. Edmodo) so that you can assess their work.