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Medium term plan
Cycle B, Term 2
ICT

Subject: Purple Mash unit 4.3 Spreadsheets

Key Concept/ Theme: format cells as currency, use forula wizard to calculate averages, combine tools to make spreadsheet activities, use a spreadsheet to model a real-life situation, add forula to a cell to automatically make a calculation in that cell.

Prior Learning links:

	Cycle A	Cycle B
Year 1/2	Unit 1.8 Spreadsheets: Introduce 2Calculate • Spreadsheet navigation • Adding images • Vocab: cell, column, row	Unit 1.3 Pictograms: • What is data? • Representing data Unit 2.3 Spreadsheets: • Copying and pasting • Totalling tools • Addition • Table layout • Block graph Unit 2.4 Questioning: • Ways to represent data • Pictograms (2Count) • Binary trees (2Question)
Year 3/4	Unit 3.3 Spreadsheets: • Pie charts and Bar graphs • Boolean comparison tools (<=>) • Spin tool • Advanced mode • Cell references Unit 3.8 Graphing: • Data representation in 2Graph • Use software to investigate data	

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Vocabulary:

Key Vocabulary

Average
A number expressing the typical value in a set of data. Also known as the mean. It is calculated by dividing the sum of the values in the set by their number.

Column
Boxes running vertically in a spreadsheet.

Key Vocabulary

Spreadsheet
A computer program that represents data in **cells** in a grid of **rows** and **columns**. Any cell in the grid may contain either data or a **formula** that describes the value to be inserted based on the values in other cells.

Budget
The amount of money available to spend on a project.

Formula
A group of letters, numbers, or other symbols which represents a scientific or mathematical rule. The plural of formula is formulae.

Chart
A diagram that represents data. Charts include graphs and other diagrams such as pie charts or flowcharts.

Data
A collection of information, especially facts or numbers, obtained by observation, questions or measurement to be analysed and used to help decision-making.

Format Cell
The way that data is displayed in a cell. For example using units such as £ or $.

Percentage
'per' 'cent' means number of parts per hundred.

Timer
When placed in the spreadsheet, clicking the timer adds 1 to the value of the cell to its right every second until it is clicked again.

Key Vocabulary

Decimal place
The position of a digit to the right of a decimal point. In 2Calculate, the number of decimal places to be displayed can be chosen.

Formula Wizard
Use the formula wizard or type into the formula bar to create a formula in a cell, this will calculate the value for the cells based upon the value of other cells in the spreadsheet.

Place value
This is the value of each digit within a number. For example 354, the 3 = 3 hundreds, the 5 = 5 tens and the 3 = 3 ones.

Row
Boxes running horizontally in a spreadsheet.

Equals tool
Tests whether the entered calculation in the cells to the left of the tool has the correct answer in the cell to the right of the tool.

Line graph
A line graph is used to display information which can change over time. For example, temperature at different times of the day.

Random Number Tool
This tool, when clicked, will generate a random number.

Spin Tool
This tool changes a number to the right of it by one each time an arrow is pressed.

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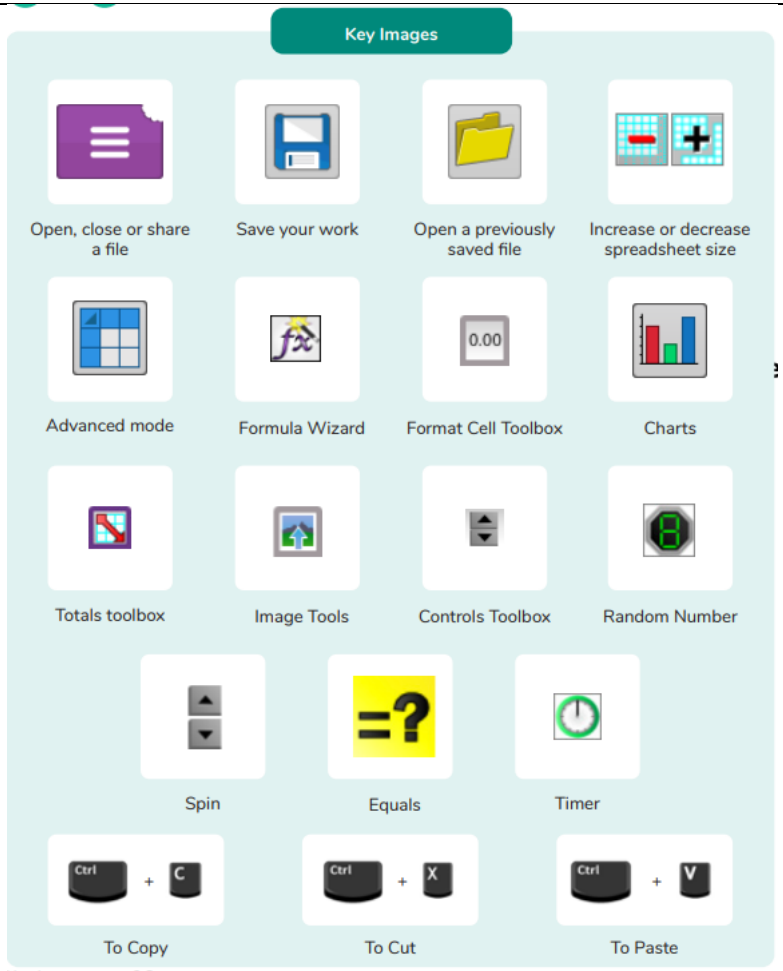
Key Images:



Resources needed for each lesson – 2dos to set.

Lesson 1:

- Sample file - Spelling Scores; set this as a 2Do for your class.

You can select the following ticked objective when setting the 2Do to make future assessment easier:

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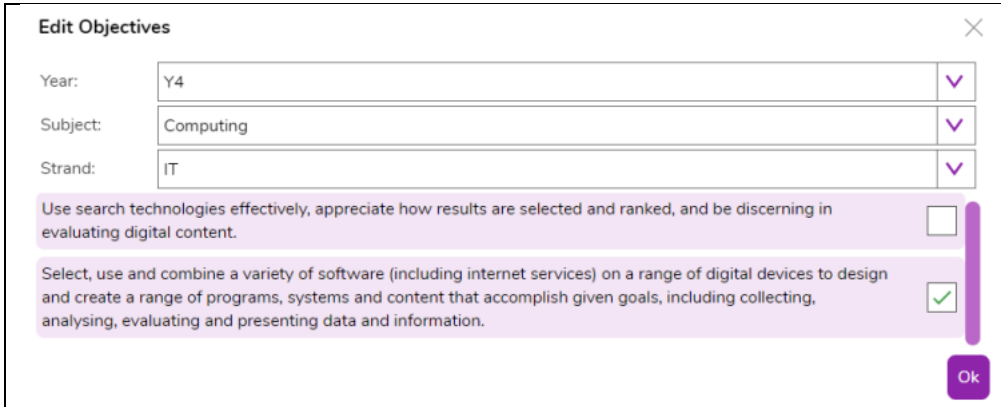
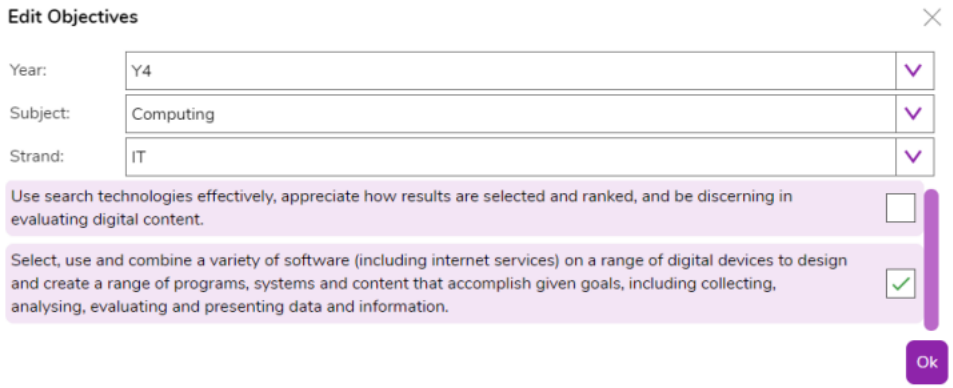


Lesson 2

- Maths Game Example

You can select the following ticked objective when setting the 2Do to make future assessment easier:



NB Part of the lesson plan takes children through the process of creating their own copy of this spreadsheet, if this is too difficult for some children, set the completed sheet as a 2Do. Then they can open the example sheet and adapt it as is suggested in the lesson activities.

Be aware of children's mathematical knowledge of times tables and number bonds. Adapt as appropriate.

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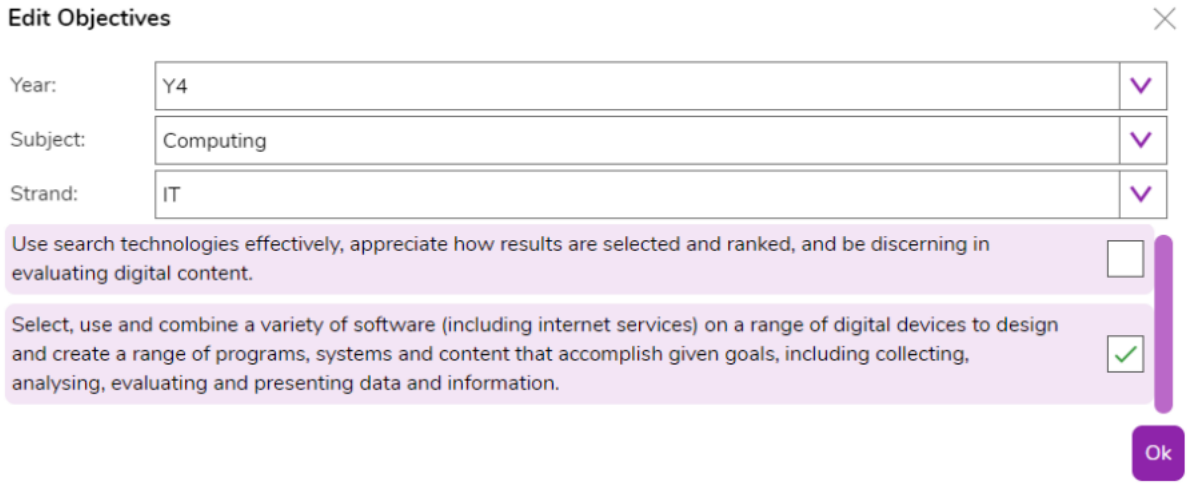
Lesson 3

- Line Graph example data photo; **the lesson uses example data; you could collect similar real data in advance of the lesson to make the activity more relevant to the children.**
- Blank Simple Leaflet: set as a 2Do if you wish children to save screenshots of the graphs (see Activity 3)
- Activities You can select the following ticked objective when setting the 2Do to make future assessment easier:



Lesson 4

- Party items price list file. Or PDF version
- Example budget sheets; budget sheet no formulae and budget sheet with formulae there are 2 versions of this sheet. The simpler version (budget spreadsheet no formulae) does not use formulas. The more advanced version (budget spreadsheet with formulae) uses formulae. If children are familiar with the formula wizard from previous lessons, they can use the formula version but some children might find the simpler version enhances their understanding of the process.

You can select the following ticked objective when setting the 2Do to make future assessment easier:

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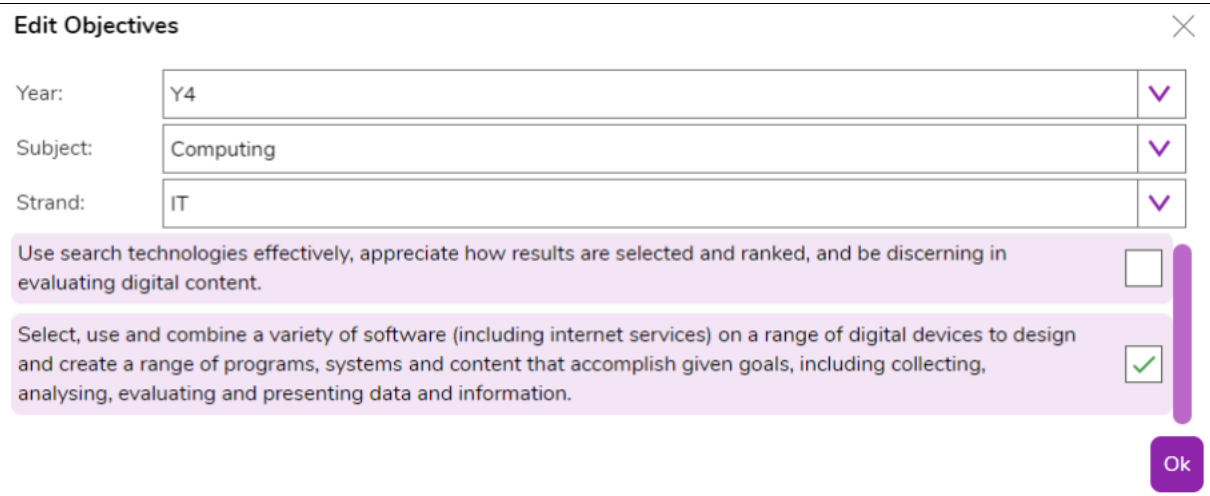
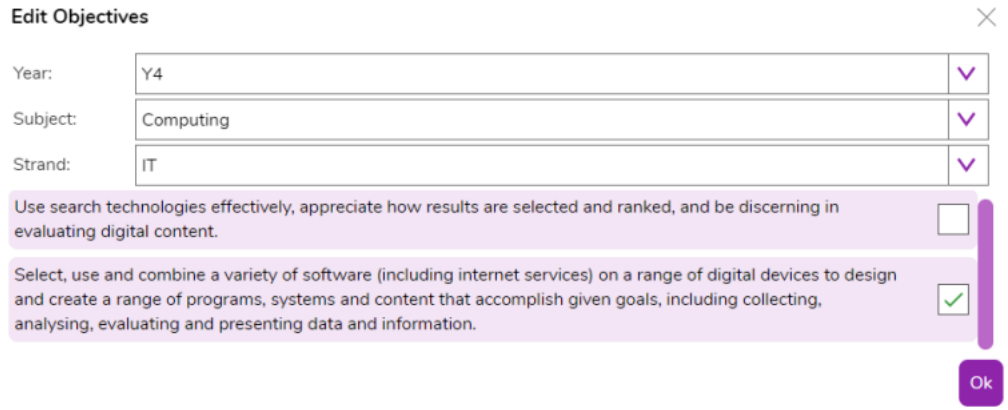


Lesson 5

- Example file - Place Value Resource; this is the finished game. **Set as a 2Do.**
- This activity can be made easier by just doing hundreds, tens and units or tens and units. You could challenge more able children to include tens of thousands. There are finished examples of these in the Maths Place Value category of Purple Mash.

You can select the following suggested computing objectives when setting the 2Do to make future assessment easier:



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1. Unit 4.3 Lesson 1	**Deeper learning questions:** What does minimum do? What does maximum do? How are they useful? How could you use a spreadsheet in real life? **Reconnection:** Go over online safety. Discuss prior learning – what can they remember about spreadsheets and how to use them. **LO:** To explore how the numbers entered into cells can be set to either currency, decimal or fraction. • To explore the use of the display of decimal places. • To find out how to add formulae to a cell. **Activity:** Reveal with the children the key vocabulary and tools that they will need for this lesson. You might need to adapt mathematical terms to suit ability of children within the class. Ask children to open the sample spreadsheet; Spelling Scores on their devices. Reveal the questions on the slide to discuss as a class. Support children with selecting all cells which require percentages format and use formatting tool to change it to this format. Working with the children, solve calculating percentages for 'Thomas'. Children have a go at working out percentages for 'Olivia' independently. Challenge to set decimal places. ***You might choose to leave this out and just focus on 0 d.p.*** Children copy and paste formula to complete the percentages. Be aware copy and pasting of formula is only possible column at a time. ***iPads - This is possible using a tablet (iPad) if you press and hold cell D4 until a blue border appears around the cell, press on the bottom blue border and then drag down through D5, D6 all the way to D12.*** Children calculate average score use 'Average' function in the Formula Wizard. ***iPad -Dragging down from the first to the last cells that are going to be used to calculate the average is possible on a tablet (iPad).*** **Extension:** Set decimal places to challenge. Children explore the minimum and maximum function in the advanced formula wizard.
2. Unit 4.3 Lesson 2	**Deeper learning question**: How do all cells in column change at the same time when using the spinning tool? **Reconnection:** Remind children of online safety rules. Go over previous words encountered last lesson. **LO**: To explore how tools can be combined to use 2Calculate to make number games. To explore the use of the timer, random number and spin button tools. **Activity**: Share with the class the key vocabulary and tools in 2Calculate they will be using today. *Formula Wizard was introduced previous session too. Open the example (children should open the game from their 2Dos). Explore the game and its functions. Identify when we change the spinning tool that all numbers change in column (c) by a value of 1. Children play the maths game, following the steps and explore.

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	Children adapt the copy of the spreadsheet to make their own version of the game. For those more confident, they can make a new sheet. **Extension:** Children attempt to make their own times table test machine.
3. Unit 4.3 Lesson 3	**Deeper learning question:** Why is a line graph better than a bar chart for this kind of data? What questions can the line graph answer? **Reconnection:** Remind children of online safety rules. Go over previous words encountered last lesson. **LO:** To use the line graphing tool in 2Calculate with appropriate data. To interpret a line graph to estimate values between data readings. **Activity:** Share with the children the key vocabulary and tools. Explore the example data shown on the slide with the children. Launch 2Calculate with the children on their devices. Children to enter data they can see into a table. Demonstrate creating a line graph using the chart button. Children to then try themselves on their 2Calculate file and try and answer the questions revealed on the slide. Support children in adding another data set. Children to attempt to answer the questions revealed on the slide. If you wish the children to save the charts, set the 2Publish Plus template 'Blank Simple Leaflet' as a 2Do, children should screenshot and save the graphs*. They can then open the leaflet 2Do and insert the saved graphs into the picture boxes by uploading the images from their device. The method will need to be demonstrated to children. *The method will depend upon device type and operating system. On a Windows PC press the windows button + Shift + 's' to open the snipping tool: children will need to be shown how to snip and save the snip. On an apple tablet, screen shots are often made by pressing the home and on\off keys together, on Android by pressing on\off key and volume button or swiping the screen up and then you get the option to screenshot: children will need to be shown how to screenshot then crop and save the image. Review Vocab & children review success criteria **Extension** Introduce an extension activity where children explore using other data to create a line graph. Can you think of other data that could be collected and put into a line graph?

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	Some of the information in the examples below could be researched on the Internet and plotted in a line graph such as average temperatures through the year in different countries. Examples: Age and height of a person or average height for a group of people and their age. Months of the year and average temperature. Car valuations over years since new. Sales of TVs/mobile phones/radios over the decades.
4. Unit 4.3 Lesson 4	**Deeper learning question:** As cells are formatted would we still need to enter £ symbol if you wanted to change a price? What is the cost of your chosen party? What would you change? Can you explain why? **Reconnection:** Remind children of online safety rules. Go over previous words encountered last lesson. **LO:** To use the currency formatting tool in 2Calculate. To use 2Calculate to create a model of a real-life situation **Activity:** Share with the class the key vocabulary and tools in 2Calculate the children will be using. Explain they will be planning a party with a budget using a spreadsheet. Launch the Party Price List file for children to see to get an idea of what they would include for their party. Explain that cells with prices in are formatted as currency using the format cell toolbox. Launch example budget sheet and reveal prompts. Children look at their copies and explore the layout, content and use of total tool. ***There are two budget sheet versions which you need to decide upon to share – No formula and with formula.** Ask children to make their own budget sheet using the key requirements revealed on the slide e.g. formatting cells. ***To save time, you might let the children adapt the example budget spreadsheet shown on slide 6 rather than start from scratch.** Go through the sudden changes shown on the slide and ask children to modify their budget spreadsheets to accommodate these changes.

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	Review Vocab & children review success criteria **Extension:** Introduce an extension activity. Tell the children the budget has gone down to £100. Ask them to consider the changes they will make and justify why.
5. Unit 4.3 Lesson 5	**Deeper learning question:** there is an 'Is equals to' tool. Can you remember what it does? What happens when you drag an image into a column with a total tool in it? **Reconnection:** Remind children of online safety rules. Go over previous words encountered last lesson. **LO:** To use the functions of allocating value to images in 2Calculate to make a resource to teach place value. **Activity**: Introduce a pre-built 2Calculate place value resource. Launch the example file to demonstrate and also ensure children launch their copy on their devices so they can explore with you. Explore with the children the images. Key points to discuss and identify are that each image has a value and that they are moveable. Display slide, focussing on the totalling tool and what happens when an image is dragged in a column with this tool in it. Look at the 'Is equals Support modelling of trying out the place value resource. Children to have a go on their copies of the resource too. Children to create their own place value resource. They might find it useful to refer to the example spreadsheet. You should remind them about headings and the totalling tool. Slide 8 shows how to insert an image from a file location where you have saved the maths images and how to give an image a value. ***You could ask children to adapt the example file for those less confident, otherwise leave the example file on the whiteboard for children to copy.** Model how to make an image draggable and how to copy images quickly. Show children the correct formula to enable 'number to make' to show in cell (I12). Recap vocab and review LO **Extension:** Can you use what you have learnt to create a spreadsheet that might be useful in life?

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	End of unit quiz & reflect on gaps from the unit: Unit 4.3 Quiz – found on unit page on PM Questions: Which of these icons would you use to format a cell, or a group of cells? In the formatting toolbox, what does this option do? Which icon would you use to open the formula wizard to help you make formulae to calculate values? What calculation does this formula work out? Match the action to the icon. Which type of chart would best represent a table of data showing the temperature throughout the day? Why would a spreadsheet be a useful tool to use when planning a party? In this spreadsheet, why have the images been given the values of 1000, 100, 10 and 1? Vocab to definition check

End Points:

How would you add a formula so that the cell shows the percentage score for a test? Click on the cell where you want the percentage score to be displayed then click the formula wizard button. Click on the cell that contains the score. Choose the ÷ operation then click on the cell that shows what the test was out of. Click OK. Click on the answer cell and then the formet cell button. Choose % as the format.

Which tools would you use to create a timed times tables test in 2Calculate? You could use the random tool, the spin tool, the equal tool and the timer tool.

Give an example of the data that could be best represented by a line graph. Data where both axes will contain continuous data so that you can see trends in the data. Such as ages and heights, time and temperature, years and costs.

Explain what a spreadsheet model of a real-life situation is and what it can be used for? It represents the data of a situation for example budgeting for a party, working out how big a field needs to be for a certain number of animals, working out how to spend your pocket money over time

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Evaluation: What have the end of unit quizzes, pupil self-reflections and termly work told you about what the children can remember and recall? What are the gaps? Ensure that the areas that need further reinforcement are documented in the next subject unit MTP. **Plan in time to revisit gaps within units, determined by the quizzes.**

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