purple mash

Computing Scheme of Work

Unit 5.3 – Spreadsheets

Contents

Introduction

These spreadsheet lessons have been designed to be used on a range of devices including tablets. We advise when you are dealing with larger spreadsheet data sets then laptops or desktops are the preferred devices.

2Calculate is a simple to use spreadsheet (and more!) for beginners and beyond.

A user guide can be found at 2Calculate User Guide.

The lessons show a progression of knowledge and skills from lesson to lesson and year to year. Classes who have not used 2Calculate before will benefit by using the Y5 spreadsheets catch-up unit instead of this unit. Teachers who are not familiar with the tools in 2Calculate might find reviewing the lessons for younger children helpful to build up their own knowledge.

The lessons assume that children are logged onto Purple Mash with their own individual usernames and passwords so their work will be saved in their own folders automatically and can be easily reviewed and assessed by the class teacher.

If you are currently using a single login per class or group and would like to set up individual logins yourself, then please see our guide to doing so at Create and Mange Users. Alternatively, please contact support at support@2simple.com or 0208 203 1781.

Differentiation

The use of spreadsheets has a strong link to mathematics. Some children might have difficulty with the mathematical concepts in some lessons and might need guidance with this aspect. For example, in lessons about area and perimeter of shapes, some children might need more experience of drawing the shapes on the spreadsheet and counting squares before moving onto using formulae to calculate area and perimeter.

Where appropriate, guidance has been given on how to simplify tasks within lessons or challenge those who are ready for more stretching tasks. The lesson plans are progressive so if a child has not completed plans from a previous year, there might be tools that they are unfamiliar with and will need extra guidance.

Note: To force links within this document to open in a new tab, right-click on the link then select 'Open link in new tab'.

Medium-Term Plan

Lesson	Title	Success Criteria
1	Conversions of Measurements	• Children can create a formula in a spreadsheet to convert m to cm. • Children can apply this to creating a spreadsheet that converts miles to km and vice versa.
2	The Count Tool	• Children can use a spreadsheet to work out which letters appear most often. • Children can use the 'how many' tool.
3	Formulae Including the Advanced Mode	• Children can use a spreadsheet to work out the area and perimeter of rectangles. • Children can use these calculations to solve a real-life problem.
4	Using Text Variables to Perform Calculations	• Children can create simple formulae that use different variables. • Children can create a formula that will work out how many days there are in x number of weeks or years.
5	Event Planning with a Spreadsheet	• Children can use a spreadsheet to model a real-life situation and come up with solutions that can be practically applied.

Lesson 1 – Conversions of Measurements

Aim

- To use formulae within a spreadsheet to convert measurements of length and distance.

Success Criteria

- Children can create a formula in a spreadsheet to convert m to cm.
- Children can apply this to creating a spreadsheet that converts miles to km and vice versa.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.3 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 2Calculate – found in the Maths tools section of Purple Mash.
- Conversion example spreadsheet.
- Temperature conversion example file (for extension).

Activities

Introduction	***Be aware of children's mathematical understanding of converting between measures. You might need to adapt for some children or provide pre-teaching.** Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Introduction: Converting Measures	Display **slide 4.** Explain that we will be using a spreadsheet to convert measures of lengths and distance. Discuss why we would need to convert in real-life and reveal possible ideas. Reveal key vocab and tools for today.
Example Spreadsheet	Show **slide 5**. Open the example spreadsheet to show the class and ask them to open on their devices too. Discuss calculation needed to convert between cm and m and click reveal to show the answers. Children then practise on their devices. *When entering = in a cell, children must press enter key. ***When entering (=) in a cell, children must press enter key.**

Advanced Mode and Headings	Display **slide 6**. Explain that we want to use formulas to calculate conversions and will need to use advanced mode to do so. Children open 2Calculate advanced mode on their devices and create headings shown on the slide.
Activity 1: Formula for Converting CM to M	Display **slide 7**. Explain to children that we can start putting some formulas into our sheet. Show children how to put a formula into a cell that calculates a CM conversion from M. Let the children try it out on their sheets, entering different numbers into cell A2 (Metres).
Activity 2: Copying and Pasting Formula	Display **slide 8**. Explain to the children that copying and pasting formula is a lot more efficient. Demonstrate the process of doing this as shown on the slide. Children to try to copy and paste on their own sheets and to enter numbers into column A. ***Tablet instructions for copying and pasting on slide 9.**
Activity 3: Formula for Converting to M	Display **slide 10**. Children to enter formula and copy and paste it in order to convert between Centimetres and Metres. Children to then test whether their sheet works. Click to reveal hint on the slide if needed.
Activity 4: Converting Between KM and Miles	Use **slide 11** to show children the relationship between miles and kilometres. Children to attempt to create a spreadsheet that converts between these units. Click to reveal hint if required.
Activity 5: Extension	Display the extension activity on **slide 12**. Children to follow steps to create a spreadsheet that converts from °F to °C.
Review Success Criteria	Display **slide 13.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 2 – The Count Tool

Aim

- To use the count tool to answer hypotheses about common letters in use.

Success Criteria

- Children can use a spreadsheet to work out which letters appear most often.
- Children can use the 'how many' tool.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.3 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 2Calculate – found in the Maths tools section of Purple Mash.
- Example Vowel Counter (import text to enable it to function).
- Example Vowel and Consonant Counter (import text to enable it to function).

Activities

Introduction	Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Introduction: Investigations	Display **slide 4.** Explain that spreadsheets can be used for carrying out investigations. Reveal the lesson's key tools and vocabulary. Then share the hypothesis you want the children to test: Is 'e' the most popular vowel in English?
Activity 1: Creating a Vowel Counter	Show **slide 5**. Ask the children to open a new 'Advance Mode' 2Calculate file on their devices. Then they need to copy the example displayed or you could launch the example spreadsheet.
	Show **slide 6**. Explain that the vowels are the variable we want the spreadsheet to count. Reveal the slide to demonstrate adding a count tool next to the letter (a) vowel. Then ask children to do the same for all vowels on their sheet. Children then test typing words or sentences on the empty cells above the counters to see if 'e' is the most common vowel. Children to save their file.
Activity 2: Adding Consonant Counters	Show **slide 7**. Open the example spreadsheet 'Vowel & Consonant Counter Example'. Explore it together and then ask the children to add consonant counters to their spreadsheets. Children experiment

	typing/pasting text and answering questions on the slide. Remind children to save their file.
Activity 3: Extension	Display **slide 8**. Explain that 2Calculate could count words. Children explore creating various word class counters such as conjunctions.
Review Success Criteria	Display **slide 9.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 3 – Formulae Including the Advanced Mode

Aims

- To use a spreadsheet to model a real-life problem.
- To use formulae to calculate area and perimeter of shapes.

Success Criteria

- Children can use a spreadsheet to work out the area and perimeter of rectangles.
- Children can use these calculations to solve a real-life problem.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.3 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 2Calculate – found in the Maths tools section of Purple Mash.
- Cuboids Example - Extension

Activities

Introduction	***Be aware of children's mathematical understanding of area and perimeter. You might need to spend a little time reminding them about what they are and how they are calculated on simple 2D shapes.** Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Introduction: Modelling	Display **slide 4**. Explain that we will be using computer modelling to solve a problem. Ask the children what is meant by computer modelling and if they can give an example, before revealing. Share the key vocabulary and tools needed for the lesson.
Activity 1: Helping Farmer McFlock	Display **slide 5**. Explain the farmer's problem and discuss with the children. Ask the children to open a new 'Advanced Mode' sheet and recreate what is shown on the slide. Elicit that the maximum number of sheep with the current configuration that can be kept is 8.

	Display **slide 6**. Explain we can use formula to help work out the maximum number of sheep for 12m of fencing. Remind children about how to calculate area and perimeter. Children to create headings shown on their sheet and attempt entering formula that calculates area and perimeter. Example formula shown on slide. See if the children can find the best configuration.
Activity 2: Changes to Fence Length	Using **slide 7**, remind children to save their file before continuing. Explain you want the children to add to their table as shown on the slide. Children to copy and paste formula for area and perimeter in the respective columns and find the best length and width configurations for the new fence lengths given on the slide.
Activity 3: Extension	Display **slide 8** to introduce an extension activity where children calculate volume of cuboids shown on example file.
Review Success Criteria	Display **slide 9.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 4 – Using Text Variables to Perform Calculations

Aim

- To create formulae that use text variables.

Success Criteria

- Children can create simple formulae that use different variables.
- Children can create a formula that will work out how many days there are in x number of weeks or years.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.3 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 2Calculate – found in the Maths tools section of Purple Mash.
- A calendar: ideal calendars are wall calendars with a whole month to view or similar to one that appears when you click the clock in the bottom right-hand corner of a PC. It can be any calendar that children could use to count the number of weeks since their last birthday.
- If children want to work out the number of hours and minutes since they were born, then they need to find out their exact time of birth in advance of the lesson.

Activities

Introduction	***Be aware of children's mathematical understanding of units of time.** Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Introduction: Creating Formulas that Use Variables.	Display **slide 4**. Explain to the children that we will be using a spreadsheet to calculate the number of days in a given amount of years. We will create formulas that use variables to do so. Go through relationship of units of time and key vocabulary & tools.
Activity 1: Creating Variables	Display **slide 5**. With the children on their devices, create two variables 'weeks' and 'years'. Remind the children what variables are. Explain we will be changing these a little later to reflect our age.

Activity 2: Creating Formulas	Use **slide 6** to show children how to create formula (calculations) to work out the number of days from weeks and years. Support maybe required based on children's mathematical knowledge. Children to do this on their devices. Children to test changing the variables 'weeks' and 'years' and the effect this has on the number of days.
Activity 3: Formatting Cells	Display **slide 7.** Show the children that you can enter decimals into the years variable, for example a child who is 4 years and 3 months old would be 4.25 years. Children to try this out. Ask children to change the format for the number of days to a fraction using format cell.
Activity 4: Calculating Age in Days	Display **slide 8**. Remind the children to save their file. Support children in working out the number weeks and days since their last birthday. Children to add an 'extra days' variable to spreadsheet and total tool. Children to try entering their data to calculate their age in days.
Activity 5: Calculating Minutes	Display **slide 9.** Prompt children to save their file and open a new advanced mode sheet. Share with the children how we could calculate the number of minutes since they were born. Create the variables displayed and go through creating the formula for calculating minutes for each variable. Show the copy cell tool which will help them put their totals for each 'minute' calculation in the totals bar. Children to add totalling tool.
Activity 6: Extension	Use **slide 10** to explain the extension of adding a timer that will help work out how many seconds it has been since a child was born. Show how to add a timer with zero placed in cell next to it. Use **slide 10** to explain the extension of adding a timer that will help work out how many seconds it has been since a child was born. Show how to add a timer with zero placed in cell next to it. Then elicit that we need a formula that multiplies the total number of minutes by 60 in order to convert to seconds and that it also needs to add on the seconds elapsed from the timer. If children have done this correctly, the cell with the formula in should be updating every second once the timer is clicked.
Review Success Criteria	Display **slide 11.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 5 – Event Planning with a Spreadsheet

Aim

- To use a spreadsheet to help plan a school cake sale.

Success Criteria

- Children can use a spreadsheet to model a real-life situation and come up with solutions that can be practically applied.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.3 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 2Calculate – found in the Maths tools section of Purple Mash.
- Example recipe for cupcakes - You could add variety by using additional recipes for children to work in small groups to plan e.g. some children could work with an egg or milk free recipe to cater for those with allergies, some could plan chocolate cupcakes or different decorations such as fruit. They could even design their cupcakes beforehand and research their own recipes to make the lesson more relevant to real life and combine with design and technology learning objectives.
- Lesson 5, example 1 uses example prices but you might want to show children how to look up real prices for their local supermarket.

Activities

Introduction	Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Introduction: Using a Spreadsheet to Plan a Cake Sale	Display **slide 4**. Explain to the children we will be using a spreadsheet to help us plan a cupcake sale. Open the recipe for cupcakes, children should open on their devices too. Go through the points to consider and decide upon the amount of cupcakes we should make for the sale.
Activity 1: Creating a Spreadsheet of Things to Buy	Display **slide 5**. Tell children to open an 'Advanced Mode' 2Calculate file and start creating a list of items we need to buy. Reveal example image

	when appropriate. **Note* you might decide a different layout and might decide to calculate salt and food colouring.**
Activity 2: Calculating the Amount of Ingredients Needed	Display **slide 6**. Explain that we know what the amount of ingredients is for 24 people as it shows this on the recipe, but we need to find out what this is for 1 person. When we know for 1 person, we can calculate it for any number of people. Children to enter amounts for 24 people then create formula for calculating for 1 person.
Activity 3: Calculating Amount of Ingredients for Desired Number of People	Display **slide 7**. Explain that we need to create a variable called 'people' and set this to the amount we decided. Children to create variable then show children how to create a formula which calculates the amount of each item needed for the number set in the variable. ***Remind the children about copying and pasting formula for efficiency. This is not possible on iPads.**
Activity 4: Finding Prices of Ingredients	Display **slide 8**. Children to save their spreadsheet and open a new 'Advanced Mode' spreadsheet in a new tab. Children to enter prices of ingredients as modelled on slide. Either allow children to research the prices of ingredients or provide them with the example spreadsheet to use.
Activity 5: Calculating Costs	Use **slide 9** to explain that the children need to start calculating the cost of the ingredients needed. Children to refer to their previous spreadsheet to help them work out the quantity of each ingredient needed. Children to then add formulas into a 'Cost' column that multiplies the ingredient price by the quantity needed.
	Use **slide 10** to explain to the children how to calculate the total cost of making the cakes. Note that if cost of ingredients is in more than one column, the formula used must add both sums of each column together as shown on the slide.
Activity 6: Finding Operating Cost and Profit	Display **slide 11**. Explain that we need to work out the profit we want to make on each cupcake. To do this we need to calculate the cost of making one cupcake. Support children in working out that we divide the total cost by the number of people (cupcakes) needed. Children add appropriate formula as shown on slide. Then decide on the profit for each cake and create a formula e.g. 12pence profit + cost of making cake as shown on slide.
Review Success Criteria	Display **slide 12.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Assessment Guidance

The unit overview for year 5 contains details of national curricula mapped to the Purple Mash Units. The following information is an exemplar of what a child at an expected level would be able to demonstrate when completing this unit with additional exemplars to demonstrate how this would vary for a child with emerging or exceeding achievements.

Assessment Guidance	
Emerging	With support throughout, children can create a simple formula with limited success using 2Calculate that converts metres into centimetres (Lesson 1). Children understand what a variable is and can program a variable that converts weeks into years (Lesson 4). Furthermore, they can represent their data as a simple graph (Lesson 2).
Expected	Children can create a formula using 2Calculate that converts metres into centimetres (Lesson 1). Children can program different variables to convert data from one format and present it in an alternative way (Lesson 4). Furthermore, they can convert their data into a graphical format (Lesson 2). Throughout this unit, children will be tasked with creating spreadsheets which are contextualised and evaluating them. Most children can use suitable layouts and content (and explain this) which achieve a specific goal, such as creating a spreadsheet to work out the area and perimeter of rectangles (Lesson 3). Their layouts and contents will be fit for purpose for their intended audience, such as applying graphs to represent data (Lesson 2). Children will use, manipulate, and create spreadsheets within this unit. Their improving skill of using text variables to perform calculations, advanced mode and count tools will lead to the creation of their own purposeful spreadsheet. Children will invite feedback through sharing their spreadsheets, focusing on the functionality, layout, clear purpose and whether it achieve it. Most children can use 2Calculate to produce functional spreadsheets with clear purpose and their spreadsheets are set up so that interrogation of data is easily achieved. They demonstrate they can use formulae such as converting between measures and incorporating text variables to perform calculations. Automatic graph creation from data sets is easily achieved by the children, including appropriate labelling and graph type for data type.
Exceeding	Children demonstrating greater depth can use their understanding of converting metres into centimetres and apply this to other mathematical conversions (Lesson 1). Furthermore, they choose the most appropriate way to convert and represent their data and can give their reasons behind this choice (Lesson 2).