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Medium term plan
Cycle 1, Term 2
ICT

Subject: Purple Mash unit 5.3 Online Safety

Key Concept/ Theme: • To use formulae within a spreadsheet to convert measurements of length and distance. • To use a spreadsheet to model a real-life problem. • To use spreadsheet tools to investigate probability. • To use the count tool to answer hypotheses about common letters in use.

Prior Learning links:

	Cycle 1	Cycle 2
Year 1/2		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 • Formula wizard • Cell formatting • Timer, random number and spin buttons • Budget planner sheet • Line graphs Unit 3.8 Graphing • Data representation in 2Graph • Use software to investigate data	
Year 5/6		Unit 6.3 spreadsheet • Calculations • Modelling and problem solving • Organising Data • Advanced formulae • Charts and graphs

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Key Spreadsheet Vocabulary

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

Columns
Boxes running vertically in a spreadsheet.

Computational model
Creating or using a simulation (a model) of a real-life situation, on a computer.

Count tool
Counts how many of a variable there are in a spreadsheet.

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

Dice tool
Simulates the roll of a die to a random number between 1 and 6 when

Expenses
A cost associated with a project. For example, the cost of buying ingredients for a cake sale, materials for making banners etc.

Format
The way that text looks. Formatting cells is helpful for interpreting a cell's contents for example you might want to format a cell to show a fraction e.g. 4 ½ or include units such as £ or $.

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

Formula Bar
An area of the spreadsheet into which formulae can be entered using the '=' sign to open the fomula.

Hypothesis
A concept or idea that you test through research and experiments. The plural of hypothesis is hypotheses.

Profit
Money that is earned in trade or business after paying the costs of producing and selling goods and services. For example, the amount of money there is from a cake sale when the cost of creating them has been subtracted.

Totalling tool
Adds up the value of every cell above it, next to it or diagonal to it according to which total tool is selected.

Rows
Boxes running horizontally in a spreadsheet.

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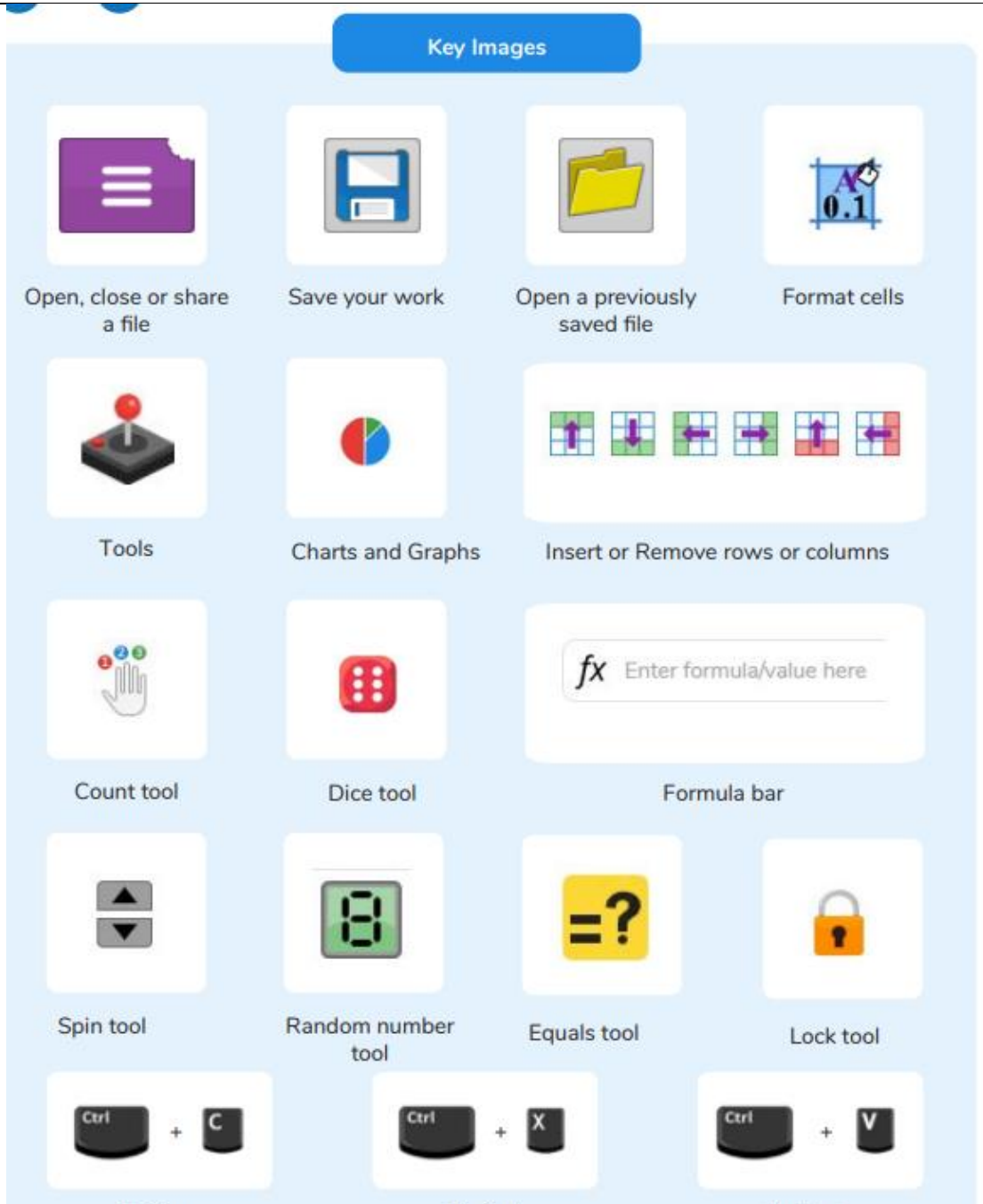

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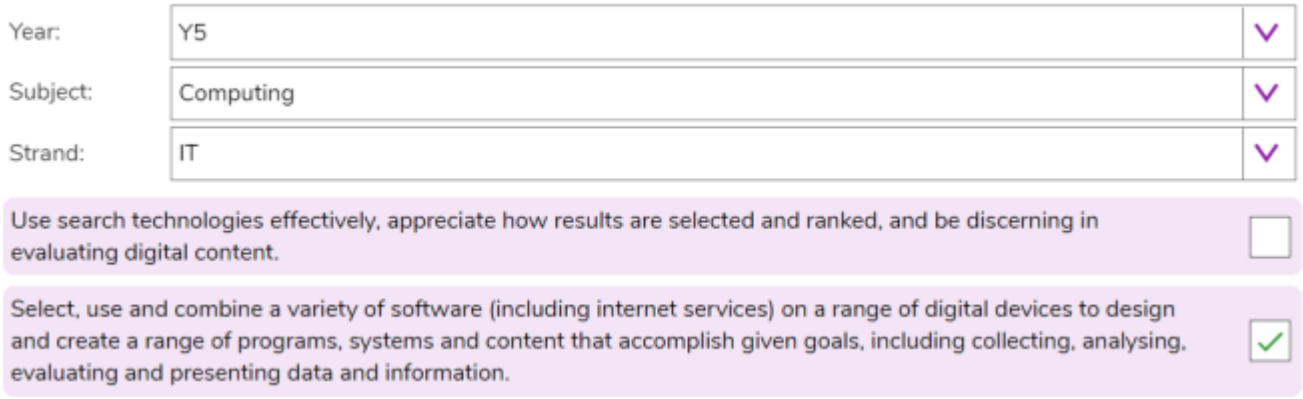
Resources needed for each lesson – 2dos to set.

Lesson 1:

• Converting Measures

• Set Converting Measures as a 2Do for the class.

You can select the following objectives when setting the 2Dos to make future assessment easier:



Lesson 2

• 2Calculate tool (Advanced Mode): This is found in the Tools area of Purple Mash.

• Set 2Calculate as a 2Do for pupils to enable easy access so they can then open it directly from their 2Dos selecting Advanced Mode.

You can select the following objectives when setting the 2Dos to make future assessment easier:

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Year:	Y5
Subject:	Computing
Strand:	IT

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	☐
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.	☑

Lesson 3

• • 2Calculate tool (Advanced Mode): This is found in the Tools area of Purple Mash

• Set 2Calculate as a 2Do for pupils to enable easy access so they can then open it directly from their 2Dos selecting Advanced Mode.

You can select the following objectives when setting the 2Dos to make future assessment easier:

Year:	Y5
Subject:	Computing
Strand:	IT

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	☐
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.	☑

Lesson 4&5

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• • IMPORTANT NOTE: The next two lessons focus on using spreadsheets to create computational models. It is expected that children will complete no more than two of the activities. Decide in advance which models to use and delete the slides that are not required, set only the required resources for the models that you have chosen as 2Dos, as advised in the sections below. The first two models provide more guidance than the last two, the final model being more open ended and less directed. Make choices dependent upon the interests, expertise and experience of children.

• All resources can be found on the Purple Mash page for this lesson. From here they can be set as 2Dos for children if required. Cupcake Sale Model

• Example recipe for cupcakes: this is linked to on slide 6. 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.

• Set Cupcake Model as a 2Do. This uses example prices, but you might want to show children how to look up real prices for their local supermarket.

Concert tickets Model

• Set Concert tickets starter as a 2Do.

Pocket Money Planning

• Children will need to use the Internet to research prices of items that they want to buy and find pictures to use.

• Yr6Lesson3ChallengeExample

School event

• Purple House Charity Day Plan sheet.

• You can select the following objectives when setting the 2Dos to make future assessment easier:

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Year:	Y5
Subject:	Computing
Strand:	IT

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. ☐

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. ☑

Lesson 6

• • Vowel Counter Starter, Teacher Completed Vowel Counter

• Set Vowel counter starter as a 2Do.

• You can select the following objectives when setting the 2Dos to make future assessment easier:

Year:	Y5
Subject:	Computing
Strand:	IT

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. ☐

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. ☑

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1. Unit 5.3 Lesson 1	**Deeper learning questions: Do you remember what a spreadsheet is? What can they be used for?** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To use formulae within a spreadsheet to convert measurements of length and distance. • (Optional) To explore the use of the display of decimal places. **Activity:** Go over new vocab for lesson Outline the learning objectives. This slide can be used to review words from previous spreadsheet units and introduce new vocabulary. The vocabulary is repeated at the end of the lesson where it can be used to review lesson vocabulary. Children saw this slide when they completed the spreadsheet unit in year 3. Click through the slide and ask children if they remember using spreadsheets before. Children saw this slide when they completed the spreadsheet unit in year 3. Click to point out the areas of a spreadsheet and associated vocabulary. Children might need a reminder about entering formulae in a spreadsheet Instruct children to open the file from their 2Dos and complete the formula. Decimal places are (optionally) discussed on the next slide. Rounding numbers is taught in the year 6 maths curriculum. This slide can be skipped if preferred. Support children in converting between a metric and imperial measure of distance. An alternative if this task is too difficult for some children is to convert between metres and kilometres; adapt the slide as desired. Go over vocab and success criteria. **Extension: Converting Measures of Temperature Create a spreadsheet that converts between ºF and ºC . – slide give full details and formula needed**
2.	**Deeper learning questions: Can you relate this situation to the terms area and perimeter?** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units.

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Unit 5.3 Lesson 2	**LO:** • • To use a spreadsheet to model a real-life problem. • To use formulae to calculate area and perimeter of shapes. **Activity:** Go over new vocab for lesson Give children time to consider the question. Click to reveal the answer when ready. Farmer McFlock keeps sheep. Each sheep needs at least **1m² of space in the field**. She wants to know the maximum number of sheep that can be kept with **12m of fence** Children should open 2Calculate from their 2Dos selecting Advanced Mode and create and save the spreadsheet. The details for filling in the data are on the next slide. There is no simple way to type a squared symbol on an iPad. Children could try using the colouring method but should then try to use the given formulae to enable the model to calculate automatically when widths and lengths are entered into the data table with the aim of answering the question. Can you experiment with different size fences and find the best configuration to achieve the maximum number of sheep for the fence length? Go over vocab and success criteria. **Extension: e if you can calculate volumes of cuboids using a spreadsheet.** **Create a new sheet in your file called 'cuboids'.** **Enter the correct formula into the volume column cells.** **Can you investigate and see whether you can find any mathematical patterns?**
3. Unit 5.3	**Deeper learning questions: When would calculating probability be helpful? Why do we look at results after 100 throws not 5?** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To use a spreadsheet to investigate the probability of the results of throwing many dice.

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Lesson 3	**Activity:** Go over new vocab for lesson You are going to be using the 'Dice Tool' in 2Calculate to try and work out the **probability** of throwing certain numbers. Do you think it is **more likely** that certain numbers will be thrown than others? Discuss with children if they think it will be an even chance of numbers thrown. Demonstrate throwing a die, use **Advanced Mode** of 2Calculate. The dice tool is found in the tools area. It simulates throwing a die. Once you have added a die, you can **click on the cell** with the die in to simulate throwing it. Demonstrate throwing multiple dice. Open 2Calculate from your 2Dos in **Advanced Mode**. Add multiple dice by dragging the blue square at the bottom right of the dice cell over other cells or by copying and pasting. Fill an area **10 columns** wide by **10 rows** high with dice. To select a cell with a die in, you need to click on the white space in the cell rather than on the die itself. Try throwing all the dice at once by selecting all the dice and then clicking on the dice tool in the menu bar. Demonstrate the count tool. Demonstrate the use of colour. Select all cells with dice and give them a **background colour**. Create a table like this example in a space on your sheet, use the **same background colour** that you used for the **dice cells**. Save work You should see your results straight away. Try 'throwing' the 100 dice again to see the change in the data. It might be useful to see the results over 1000 throws. You can use the spreadsheet to do this. Add a new sheet to the spreadsheet and create a data table like this example:

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	Support children in completing the activity and encourage them to interrogate the data to answer the questions. Dependent upon mathematical ability you could discuss how closely the data matches the mathematical expectation that each number will be thrown and equal number of times. Go over vocab and success criteria. **Extension: Find some space on your accumulator sheet to put the data in a suitable format, change the background colour and make a table like this, filling in the totals from your data:** **Select the data and create a chart using the chart tool.** **Use the text button to edit the headers and axis labels.** **What do the results show?** **Remember to save your work.**
4. Unit 5.3 Lesson 4&5	**Deeper learning questions:** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To use spreadsheets to model real-life situations. • To use the created spreadsheet to make decisions about these situations. **Activity:** Go over new vocab for lesson **It is expected that children will complete no more than two of the activities. Decide in advance which models to use and delete the slides that are not required, set only the required resources for the models that you have chosen as 2Dos as advised on the title slide and in the Resources and Planning section of the lesson plan document.** Choose which models you are doing and demo. Can you create a spreadsheet showing the different activities and their costs to help you work out what the year 6s should charge for each activity to make a profit? Make sure you use **formulae** rather than 'hard coding' **totals**, this means that if you find materials from a cheaper source e.g. there is a supermarket offer on an ingredient you need, you can just update the price in one place and all the totals will be automatically updated.

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	What snacks should be bought for children to buy? How much should they be sold do to make a **profit**? The **cupcake sale budget planner** activity is good to help with this. Include a **calculation** of the **mean** number of children in each class (use your own school data for this one) to work out the **number of required activities** at each session. For activities with prizes, work out the **number of prizes required** so they don't run out by the end of the day. How should the activities be **priced** so that the cost of prizes and materials are covered, and a **profit** is made but the price is still appealing to children? Go over vocab and success criteria. **Extension: You could also add another section to the spreadsheet which works out the amount needed to save each week in order to be able to buy certain items within a particular number of weeks.** **Use formulae wherever possible so, for example, you could change the number of weeks and the amount to be saved each week so it would automatically update.**
4. Unit 5.3 Lesson 6	**Deeper learning questions:** Why does the colour background guard against errors? Is 'e' is the most common vowel? What are the least common vowels? Would different genres affect the count? **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To use the count tool to answer hypotheses about common letters in use. **Activity:** Go over new vocab for lesson Discus the definition of the word 'hypothesis'. Share the hypothesis you want the children to test: Is 'e' the most popular vowel in English? You may wish children to list all the vowels and discuss why someone would think they are likely letters to appear in English texts. In the probability lesson you used the **count tool** to count the numbers appearing on each throw of the dice: See the screenshot extracts below. Remember that the count tool will **count all cells** with the given variable **and colour background** in the sheet. Why does the colour background guard against errors?

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	Open the vowel counter starter from your 2Dos. The vowels shown are the variables that you will be counting. Colour the cells containing the **vowels** with a colour of your choice. Insert the **count tool** into the **cell** to the right of each vowel Colour some of the currently **empty cells** with the same colour (some of those in the **columns D-G**). Enable **word wrap** for these cells: Save your work It is useful to do the first steps of this activity as a class as an error handling step is revealed as children investigate (click to reveal the steps). The initial error to be spotted is that the capital letter 'I' is not counted. You might need to explain what 'case-sensitive' means if children are not familiar with this term; the tool ***is*** case sensitive. A completed example is available for teachers that shows how the sheet referencing is completed. Remind children to save their work. Support children in reflecting upon the hypothesis. Is there a class consensus? Go over vocab and success criteria. **Extension: Can you add consonant counting to your spreadsheet? What are the most common letters?** **What are the least common letters?** **Do different genres affect the count? For example, copying from an encyclopaedia versus a piece of fiction?**
	End of unit quiz & reflect on gaps from the unit: Unit 5.3 Quiz – found on unit page on PM Questions: Which of these icons could you use to create a formula in a cell? In this spreadsheet, which formula would you use in cell B2 in order to create a conversion tool?

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	How does this spreadsheet tool work? What calculation does this formula work out? In this spreadsheet, what would the formula to calculate the volume of a rectangular shape be? Which of these icons is used to copy the contents of one cell into another cell automatically within a spreadsheet? What does the formula in this highlighted cell do within this recipe spreadsheet? End of unit vocabulary check. Match the words learnt in this unit with their definition.

End Points:

How would you add a formula so that the cell shows the product of two other cells? Click on the cell where you want the product to be displayed then click the formula wizard button. Click on the cell that contains the first number. Choose the x operation then click on the second number. Click OK.

What would you use in 2Calculate to have a cell that automatically calculates the number of days since a certain date? You could use formulae and the totalling tools. To make the spreadsheet easier to understand, you could use named variables.

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. Using the existing data to predict what time your shadow will be a certain length etc.

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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