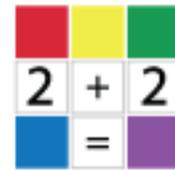# purple mash

Computing Scheme of Work

CRASH COURSE

2 + 2 =

Year 2 Spreadsheets Catch-up

For children in year 2 who haven't used 2Calculate before.

Year Group: 2
Number of Lessons: 4

From 2simple

Contents

Introduction

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

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

The following guide contains a catch-up unit of work forming part of the Computing Scheme of Work for teaching the use of spreadsheets. It is aimed at classes in which the children have not used 2Calculate in year 1.

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

If children are not familiar with computer keyboards and mice and are going to be using 2Calculate on computers rather than tablets, then they would benefit from doing some work to familiarise themselves with the keys such as the arrow keys, enter and space.

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 where spreadsheets are being used to add up prices; children who are not familiar with converting pence (45p) to pounds (£0.45) might need this aspect explained in more details; in lessons dealing with percentages and fractions some children might need extra support for the mathematical concepts.

Where appropriate, guidance has been given on how to simplify tasks within lessons or challenge those who are ready for more stretching tasks.

Year 2 Catch-up– Medium Term Plan

Lesson	Aims	Success Criteria
1	Introduction to spreadsheets	• Children can navigate around a spreadsheet. • Children can explain what rows and columns are. • Children can save and open sheets. • Children can enter data into cells. • Children can open the Image toolbox and find and add clipart. • Children can use the 'move cell' tool so that images can be dragged around the spreadsheet. • Children can use the 'lock' tool to prevent changes to cells.
2	Copying and Pasting Totalling tools.	• Children can use copying and pasting to help make spreadsheets. • Children can use tools in a spreadsheet to automatically total rows and columns. • Children can use a spreadsheet to solve a mathematical puzzle.
3	Using a spreadsheet to total currency amounts.	• Children can use images in a spreadsheet. • Children can work out how much they need to pay using coins by using a spreadsheet to help calculate.
4	Using the 'speak' and 'count' tools in 2Calculate to count items	• Children can give images a value that the spreadsheet can use to count them. • Children can add the count tool to count items. • Children can add the speak tool so that the items are counted out loud. • Children can use a spreadsheet to help work out a fair way to share items .

Lesson 1 – Introduction to spreadsheets

Aim

- To know what a spreadsheet looks like.
- To be able to navigate around a spreadsheet and enter data.
- To learn new vocabulary related to spreadsheets.
- To add clipart images to a spreadsheet.
- To use the 'move cell' and 'lock' tools.

Success criteria

- Children can navigate around a spreadsheet.
- Children can explain what rows and columns are.
- Children can save and open sheets.
- Children can open the Image toolbox and find and add clipart.
- Children can use the 'move cell' tool so that images can be dragged around the spreadsheet.
- Children can use the 'lock' tool to prevent changes to cells.
- Children can enter data into cells.

Resources

Unless otherwise stated, all resources can be found on the main unit 2.3 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 don't lose this page.

- Things to try out prompt sheet to display on the whiteboard.

Note for teacher: In this lesson, children are introduced to a variety of tools and time is given to allowing them to try out each in turn. Determine the time spent dependent upon the time that you have available. Alternatively, demonstrate the functions and then display the prompt sheet to help children then explore on their own.

Activities

1. Explain to the children that we are looking at a type of computer program called a spreadsheet today. Spreadsheets are used for organising information. For example, if you were planning a tea party you could input to the spreadsheet all the things you will need to get for the party and who you were going to invite. Can they think of any other things that could be stored in a spreadsheet for organising a party? (menus, gift list, entertainments).

2. Many people make lists on paper but the advantage of using a spreadsheet is that it can also do calculations for you. Explain what this means e.g. you could enter the cost of the different things that you will need for your party into the spreadsheet and then easily calculate how much money you will need to buy them all.

3. The aim today is to open a spreadsheet program in Purple Mash called 2Calculate and to learn how to enter information and do some simple calculations.

4. Open 2Calculate on the whiteboard. Show that when it starts, there is a smaller screen in the middle with different choices. The labels at the top ('Sheet' and 'Lesson') are called tabs. For today we are going to click on the 'Sheet' tab.
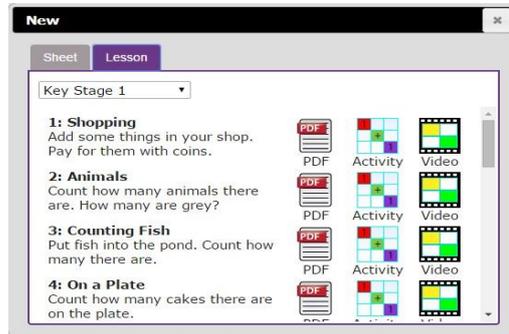
5. Click on the tab. This also gives a few choices but for today click on the first one: an empty sheet with big 'rectangles'.
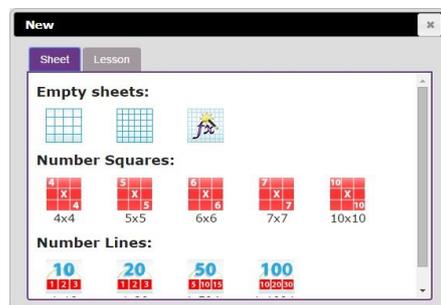
6. Spend some time showing children the following things, emphasising the new vocabulary in bold:

    - The **rows**; these are numbered 1 to 6
    - The **columns**; how many are shown?
    - The word '**cells**' is used to describe each box in a spreadsheet.
    - Each cell can contain words, numbers, colours, symbols (such as + - =)
    - How to move from cell to cell; this can be done by clicking or tapping in the cell and by using the **arrow keys** on the keyboard. If you press the enter key when in a cell you will move down 1 row.
    - How to type into cells; in 2calculate the writing will get smaller automatically to fit in the words that you type.
    - How to **delete** the contents of a cell; either by using the **backspace key** or the **Delete key**.

7. Children should now spend some time opening 2Calculate on their computers and try moving and typing. Can they enter their name into a cell?

8. Once they have all managed to do this, show the children how to save a file. They will need to give their file a sensible name that they haven't used before, why?

9. Now see if children can close 2Calculate then open it again and open their file. Let them spend some time experimenting with typing and colouring cells.

To colour cells, they first click on the cell, then click on the colour they want in the toolbox on the right-hand side.

If they select more than 1 cell by dragging the mouse over a few cells, then they can colour all these cells at once.
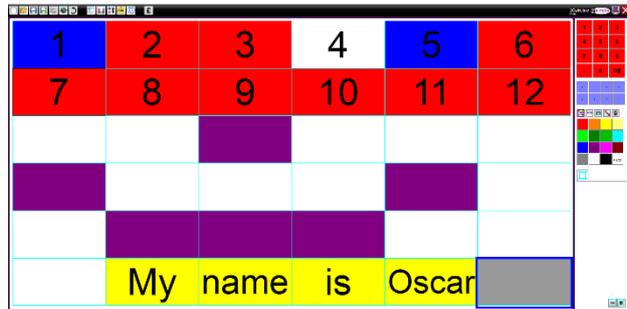
10. If the children are getting on well with this, show them how to put a simple sum into the cells and let 2Calculate work out the answer. First enter a number then go into the next cell to the right and click the '+' sign button on the right-hand side, then move to the next cell and enter another number. Now put the '=' sign in the next cell and see how 2Calculate works out the answer.

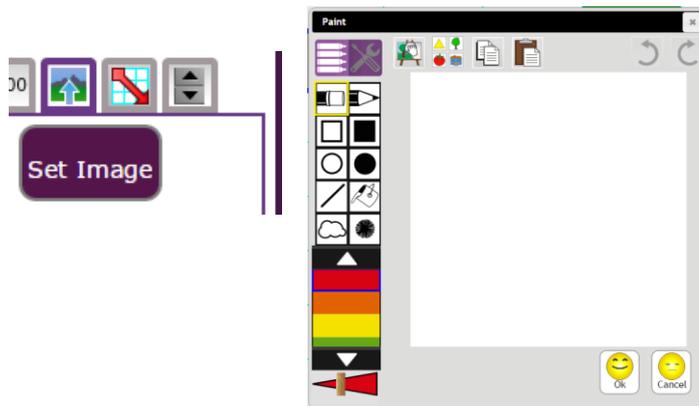Children can spend time experimenting with this performing some calculations.
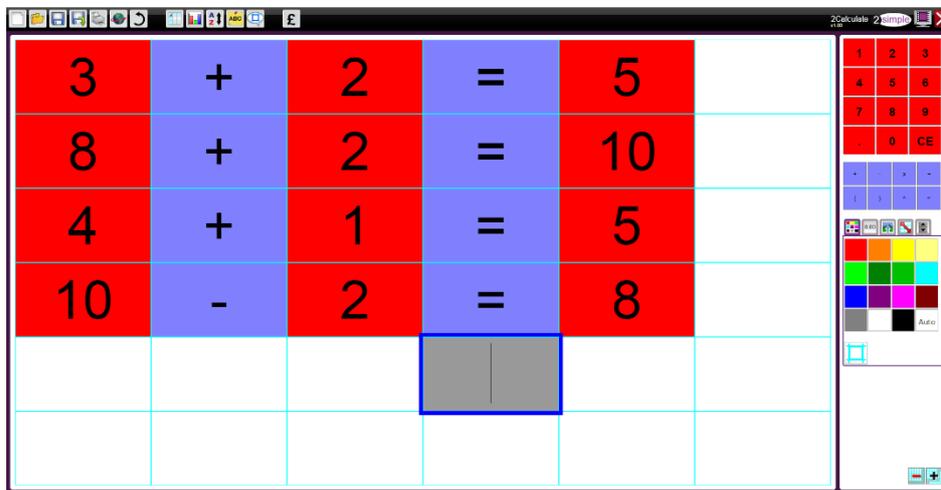
11. Next, show children where the Image toolbox is. They need to click on the images tab on the right-hand side:
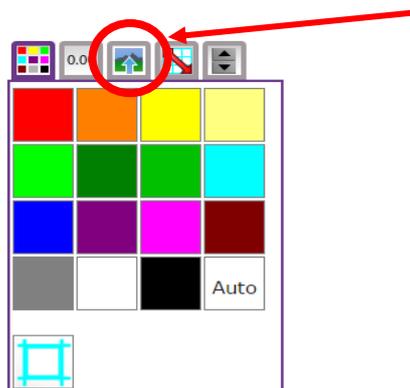
12. You will see a selection of coin images which will be useful later but for now, click on the 'Set Image' button to open the following screen.
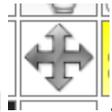
13. Click on the clipart button [image] to open the clipart picker. Show the children the different choices of topics and go to the Animals option (children could choose other items if they wish).

14. Select an animal and click on the OK button to add it to the spreadsheet. Add 2 further animals in the same way in different cells. You could show children that if they select more than one cell when adding images then they will get multiple copies of the same image.
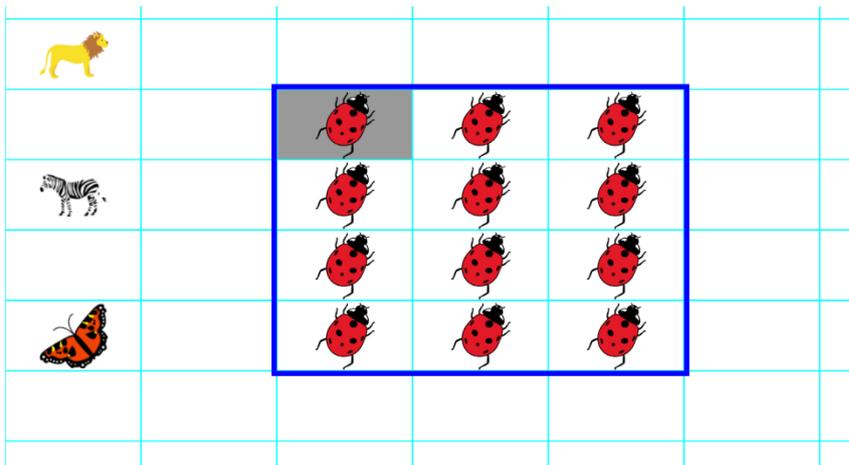
15. Show the children that you can't drag the animals around into different cells.

16. Click on one of the animals then click on the Controls toolbox
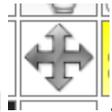
17. Now click on the 'move cell' tool. A little symbol will appear in the top right-hand corner of the image to show that it is now moveable. Try dragging it into a different cell.

18. This can also be done with several images selected at once to save doing it many times.

19. Unfortunately, all of the animals being able to move around the spreadsheet is quite dangerous for the smaller animals; show the children what happens to the ladybirds when the lion is dragged onto them! So, we are going to lock the ladybird cells so they can't be eaten.

20. To do this click on the cell that you want to lock, then click on the lock cell tool

21. Explain to children that this tool can be useful for other things too; such as when you have numbers or cells that you don't want to be accidently changed.

    Give children the opportunity to experiment with the lock and move tools. They could try making a 'zoo' by colouring cells to make walls and locking them, so they can't be changed and then locking or unlocking and moving animals into their cages/cells.

    NB If children find that their spreadsheets are too small and need more cells click on the + in the button on the bottom right of the screen to add more cells.
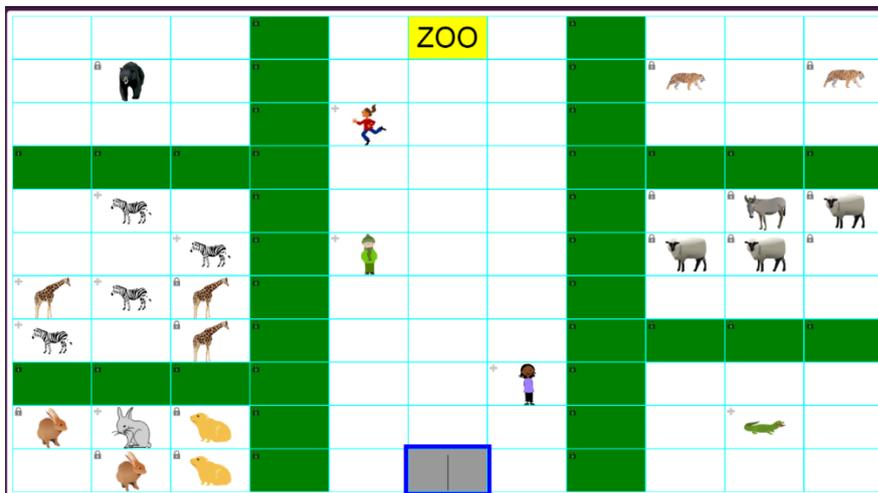
Lesson 2 – Copying, Pasting and totals

Aim

- To use copying and pasting shortcuts in 2Calculate.
- To use 2Calcuate totalling tools.
- To use 2Calculate to solve a simple puzzle

Success criteria

- Children can use copying a pasting to help make spreadsheets.
- Children can use tools in a spreadsheet to automatically total rows and columns.
- Children can use a spreadsheet to solve a mathematical puzzle.

Resources

Unless otherwise stated, all resources can be found on the main unit 2.3 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 don't lose this page.

- Examples of completed magic square puzzles. to be displayed on the whiteboard or printed for children.
- Cutting and Pasting prompt sheet to be displayed on the whiteboard or printed for children.
Note: The methodology is different dependent on whether you are using keyboard shortcuts or a tablet device. These are detailed in the lesson plan.

Activities

1. Review how to open a blank spreadsheet.

2. Discuss what a Magic Square is. Children will probably not know. Can they think of a way that a spreadsheet could help them fill in a magic square? Some children might remember that the spreadsheet can add up numbers for you.

3. Create the following pattern on a spreadsheet. The actual colours do not matter; it is just somewhere for the numbers to go.

Make the numbers 1 to 9 moveable by selecting them and clicking on the 'move' object in the Objects toolbox. .
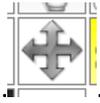
4. The numbers are ***deliberately*** too near the magic square to have space to add the numbers up; this is so you can demonstrate cutting and pasting. 'Pretend' to realise this fact and show the children how to copy and paste:

Using a keyboard

You can select the numbers, then hold down the control key `Ctrl` and press `X`. It won't look like anything has happened but move across a couple of columns then press `Ctrl` + `V` and the numbers will move.

On a tablet

This is a bit trickier with a tablet and might take children a few goes to master.
Select the numbers by dragging your finger over them; they should have a blue border.
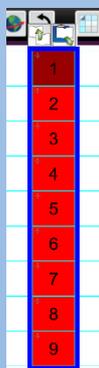
Press your finger down in the red area at the top corner of one of the cells for two seconds. Not on the number in the cells as the program will enter edit mode if you do this or on the blue border.

Here
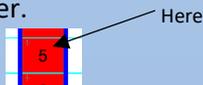
Copy and Paste buttons should appear. Ensure that the blue border is still around the correct cells:

Correct   **Incorrect**

Press the copy button

Move across a couple of columns then hold down your finger as before to make the copy and paste buttons appear [icons], press paste [icon].
You will then need to delete the contents of the cells that you no longer need.

5. We want to add totals that will add up the numbers in the rows and columns for us, so we can see if we have made a magic square. Click on the square to the right of the first row of the magic square.

6. The totalling tools can be found in the Copy and Total toolbox. Click on the correct tab. Now click on the button that will add up the row [icon]. Now, the total will be zero but drag in some numbers and it should change. Ask the children to check that it is working correctly.

7. Ask the children to create their own copy of this spreadsheet and add similar totals for the rest of the rows and for the columns. They could also investigate the diagonal totalling tool as well. (You could save the demonstration spreadsheet in the class folder and children could open it from here and then save a copy to their own work folder if preferred.)

8. Once they have done this they should save the file and then try to see if they can 'solve' the magic square.

9. Once they have solved the 3 by 3 square and saved the file. Show the children how to make their spreadsheet bigger by clicking on the + in the button on the bottom right of the screen to add more cells.

NB *Children will probably need to be reminded how to save their file and of the importance of a sensible filename such as 'magic square 3 by 3'.*

10. Then challenge them to use cutting and pasting and copying and pasting to enlarge the magic square to a 4 by 4 square to solve. Save this file with a different name.

Copying	Cutting	Pasting
Ctrl + C	Ctrl + X	Ctrl + V

In 2Calculate you can copy 1 cell and then paste it into several cells at once by selecting multiple cells as the target. This is useful when wanting multiple copies of an image or number.

Lesson 3 – Using a spreadsheet to total currency amounts.

Aim

- To explore the capabilities of a spreadsheet in adding up coins to match the prices of objects.

Success criteria

- Children can use images in a spreadsheet.
- Children can work out how much they need to pay using coins by using a spreadsheet to help calculate.

Resources

- Examples of coins. It would be useful if the children are familiar with how pence and pounds are written e.g. 17p is the same as £0.17 as the spreadsheet will automatically display as £s.

Activities

1. Open a blank spreadsheet. Explain that today we are going to add some images of things you can buy in a shop into the spreadsheet and their prices and then we are going to use the spreadsheet to work out which coins we need to pay for them.

2. Remind the children how to add images of items to the spreadsheet. Make sure that you are in the top left cell then go to the toolbar on the right-hand side and click on the images tab
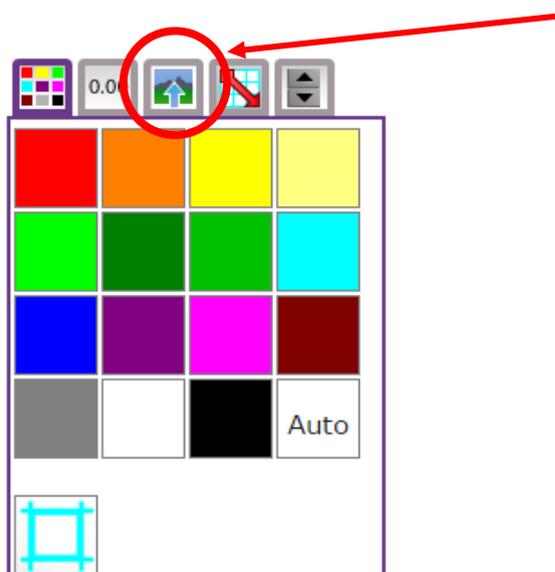
3. You will see a selection of coin images which will be useful later but for now, click on the 'Set Image' button to open the following screen.
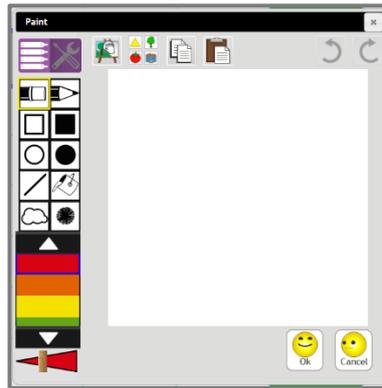
4. Today we are going to be using clipart. Click on the clipart button to open the clipart picker. Remind the children of the different choices of topics and go to the food option (children could choose other items to price if you wish).

5. Select an item and click on the OK button to add it to the spreadsheet. Add 2 further items on the rows under the first item and type in some made up prices for the items in the cell next to them.

6. Now we are going to use an area of the spreadsheet to be the 'shop'. At this stage you might need to add some more rows to the spreadsheet so show the children how to do this:

- Look at the bottom right of the screen and find the 'add and delete cells' icons. Click the add cells icon until the sheet is the size you want it to be.
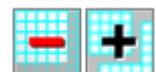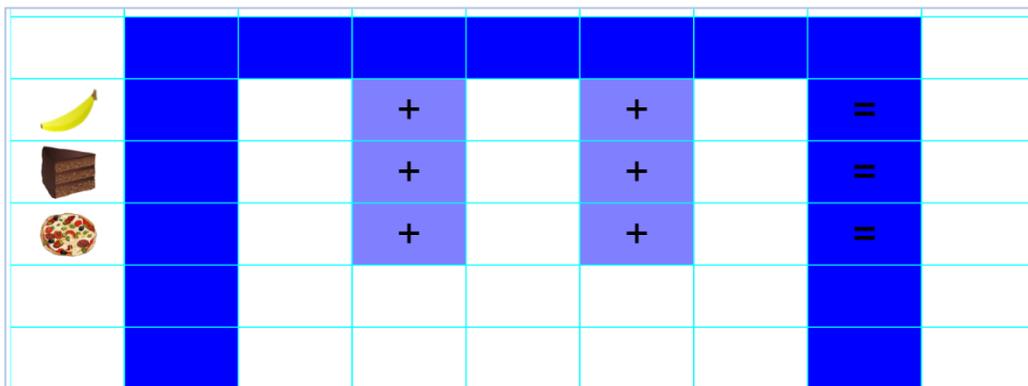
7. Colour in the cells as shown below (to make the shop front). Remind the children how to select more than 1 adjacent cell at a time to colour them. Then add the same images as before to the shop like the image below.
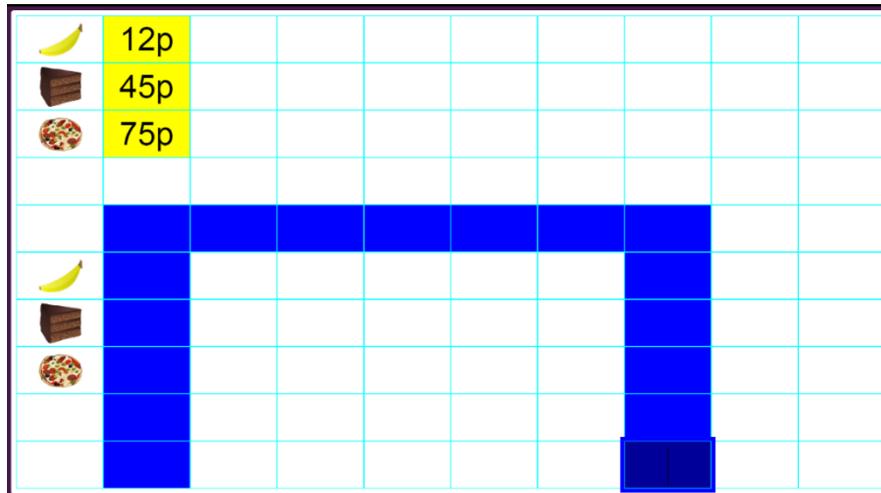
8. Now add **+** and **=** signs that will add up the coins:

9. Click on the first cell of the sum for the first item and in the toolbar on the right hand side go back to the images of the coins and click on a coin. It should appear in the cell. Do this for 2 more coins to fill in the whole and see how the spreadsheet has added up the coins.
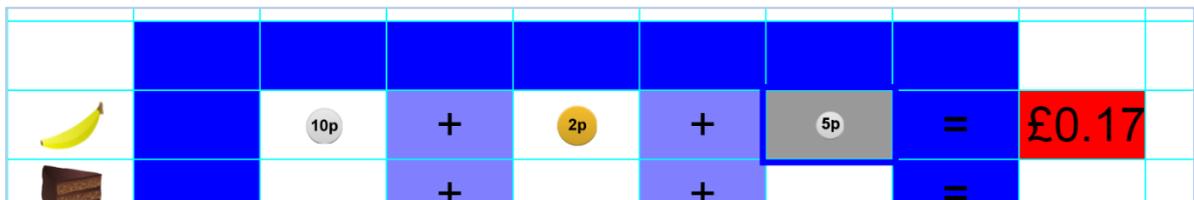
You may need to spend some time discussing the relationship between prices in pence and pounds.

10. Can children pick the right coins to add up to the cost of the first item?

NB if less than 3 coins are enough then you can delete the first plus sign (click on it and press the 'Delete' button on the keyboard) leaving only 2 coins to add together. If more coins are required, then you will need to resize the 'shop' to make space for another coin. Alternatively, the price of the item could be changed to make it easier for the children.

11. See if the children can create their own shops on their computers or save the shop in a shared class folder for children to open and then save to their work folder.

12. Once they have had time to create their shops you could introduce the 'equals' tool. Click on one of the cells with an '=' sign in and delete the '=' sign, then click on the 'Controls' tab in the toolbox and click on the 'equals tool'
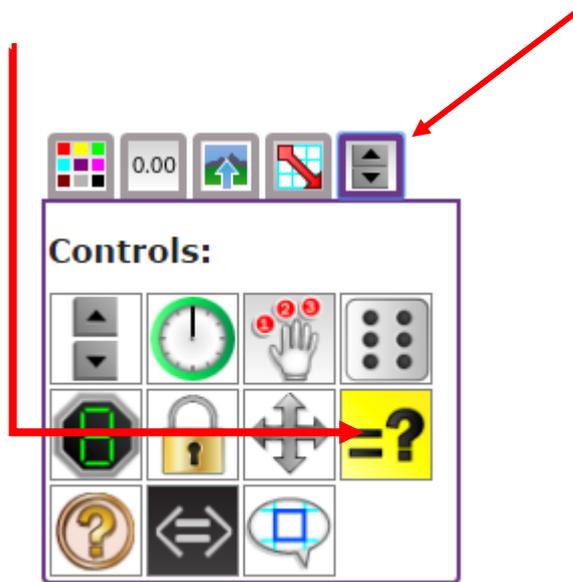
13. The equals tool symbol will appear in the cell. If you enter the price of the item in the cell next to it (as a decimal), the tool will indicate whether the coins add up to the correct amount. Try doing this for the other items as well.

14. Let children try out this tool on their own machines, remembering to save their work.

Lesson 4 – Using the 'speak' and 'count' tools to count items

Aim

- To use the 'speak' and 'count' tools in 2Calculate to count items.

Success criteria

- Children can give images a value that the spreadsheet can use to count them.
- Children can add the count tool to count items.
- Children can add the speak tool so that the items are counted out loud.
- Children can use a spreadsheet to help work out a fair way to share items.

Resources

Unless otherwise stated, all resources can be found on the main unit 2.3 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 don't lose this page.

- Spreadsheets; Example 1, Example 2 and Example 3. These files can be opened in 2Calculate to display on the whiteboard.
- For the speech tool, it is useful to have headphones, so children can hear the noise from their own computers without being confused by the noise from others'.

Activities

1. Remind children how to open 2Calculate and open a blank spreadsheet.

2. Today you are going to use 2Calculate to turn a spreadsheet into a counting machine.

3. The first stage of this is to create a spreadsheet like example 1 below by using the ⊟⊞ keys to make the spreadsheet the right size and then colouring cells. Remind children how to colour several cells at once:
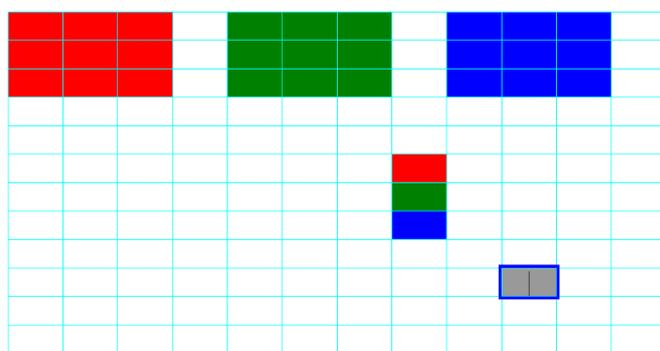
4. Next, see if they can remember how to add images; in this lesson we are adding food images.

5. See if they can remember how to make all the images moveable at once (by selecting them all and clicking the 'move' tool in the controls toolbox).

6. Display the example 2 spreadsheet on the whiteboard and give children time to add the food images shown on the left-hand side and make them moveable. The example contains 24 food items but if children are taking a long time to make their spreadsheet, suggest that they include less food items (a multiple of 3 is useful though) e.g. 3, 6, 9, 12 etc items. The images do not have to be the same as the example. Remind children to save frequently.
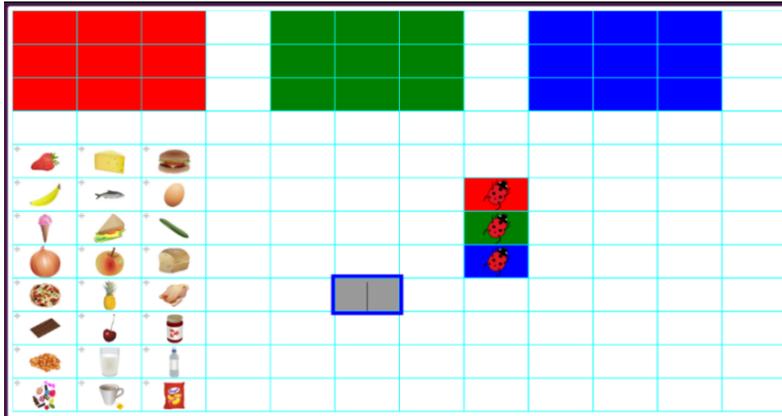
7. The ladybirds are going to be doing the counting; they could choose any images for this from the clipart e.g. dinosaurs or other animals. It's the colour of the cells that matters; They need to match the areas above. Children should add the ladybirds (or equivalent).

8. Once the children have created and saved their spreadsheet come back together to explain how to turn this into a counting machine.

9. Now the computer needs to know that each image is 1 item so it adds 1 each time. To do this, click on an image. In the image toolbox you will see a picture of the item followed by and = sign. Type '1' in the box next to the = sign for each image **including the ladybirds.**
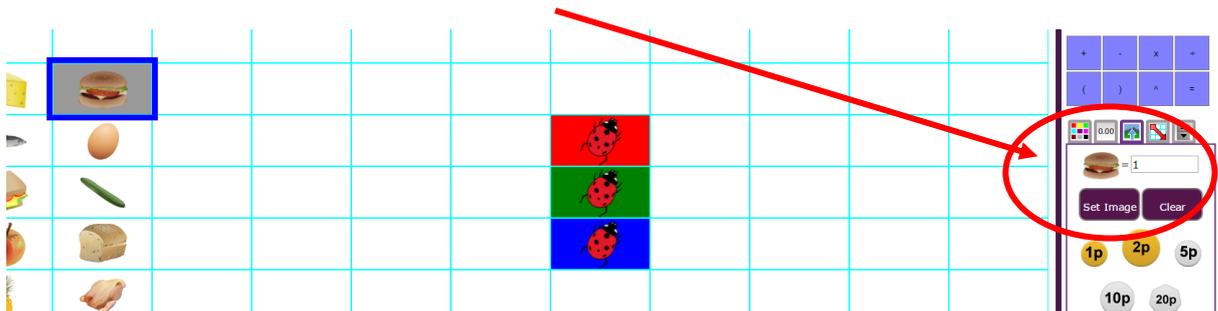
NB to do this in future once children are familiar with what a counting machine does, it is possible to enter a 1 into all the cells into which an image is to be placed then add the image and the value of 1 will remain.

Some children might notice that some of the food pictures have more than 1 item on them so shouldn't really count as 1; this is a good observation, they are correct and strictly speaking only food with 1 item should be included.

10. Now click on the cell to the right of one of the ladybirds, open the controls toolbox and click a 'How many' control. Repeat this for the 2 other ladybirds. The example 2 spreadsheet shows this tool as it should look.

11. Now the ladybird on the red cell will count all the items in the red box, the blue will count blue and the same for green. Try this out by dragging food items into the boxes.

12. We can also make the ladybirds say the value out loud when an item is added or taken away. To do this, select the cells where the answers for the count are and click on the 'speak cell' control.

13. Can children add the controls to their own spreadsheets to make a counting machine?

14. The children can use their counting machines to answer questions such as:

   • Each box is going to be given to a different person, can you share the items out equally between the 3 boxes to find out how many items each person will get?

   • Can you put all the fruit in the red box, the vegetables in the green box and tell me how many there are?

   • Put the foods that have lots of sugar in them in one box; how many foods did you have?

   • Put the foods that you like in one box, those you don't mind in another and those you really don't like in the third box.

15. The children could make counting machines with more 'boxes' to share items into (Example file 3 shows this). Just add some different coloured cells to the spreadsheet and a corresponding ladybird and count control (**make sure you set the ladybird's value to 1**).

Assessment Guidance

The unit overview for year 2 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, children can save and open sheets (Lesson 1), enter a limited quantity of data into cells (Lesson 1. Point 6), manipulate data using the 'move cell' tool (Lesson 1. Point 17) and use the image toolbox to add clipart (Lesson 1. Point 11).
	With support, they can manipulate data using copying and pasting allowing them to solve puzzles (Lesson 2) and allocate a value to an image (Lesson 4).
	Support in the form of a visual prompts should be given here to aid children in using keyboard short cuts).
Expected	Using the 2Calculate spreadsheet, children can save and open sheets (all lessons).
	Most children will be able to save their 2Calculate files, using a memorable file name, to their own personal space on Purple Mash and understand that this can be retrieved later.
	They can enter data into cells (Lesson 1), manipulate data using the 'move cell' tool (Lesson 1) and use the image toolbox to add clipart (Lesson 1).
	They can allocate a value to an image (Lesson 4) and manipulate data using copying and pasting allowing them to solve puzzles (Lesson 2).
	Most children will be able to produce a spreadsheet which can help them solve simple mathematical puzzles, calculate how many coins are required to pay for an amount (Lesson 3).
	Using spreadsheets, the children can model an idea through them.
Exceeding	Using the 2Calculate spreadsheet, children can save and open sheets (Lesson 1), enter data into cells (Lesson 1), manipulate data using the 'move cell' tool (Lesson 2) and use the image toolbox to add clipart (Lesson 2). Children will demonstrate greater depth by explaining the data and summarising this into simple 'more than and less than' statements (suggested extension).
	Using the 2Calculate spreadsheet, children can independently open, edit and save sheets and support others in doing this (Throughout Unit).
	Children can enter a wider amount data into cells, allocate a value to an image (Lesson 4) and manipulate data seamlessly using keyboard short cuts for copying and pasting, allowing them to solve puzzles (Lesson 2).