

Fractions, Decimals and Percentages

Fractions 1

Go deeper investigations

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Schofield&Sims

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Chocolate bar investigation

Objectives

- Understand the words 'half' and 'whole'.
- Begin to use the notation ' $\frac{1}{2}$ '.
- Find one-half of sets of objects.
- Work out half of small numbers.



Introduction

Give the children the worksheet and explain that it shows several different chocolate bars. Each bar is made up of chunks. Some of the chocolate bars can be shared equally with a friend but some are more difficult to share.

Ask the children to investigate which of the chocolate bars they can easily split into halves (using whole chunks) and to work out how many pieces they and their friend would each get. Complete the first row of the worksheet with the class.



The maths

The children will explore which numbers of chunks can be equally shared between two people. They should realise that these numbers are even.

Challenge the children to find a way to equally share bars with odd numbers of chunks. Encourage them to suggest that the leftover chunk could be cut in half. In these instances, ask the children to describe the number of chunks each person would get, for example, 'two and a half chunks'.

Ask:

- *How many of the chocolate bars can you easily split into two equal parts? What do the number of chunks in these bars have in common?*
- *What about a bar with 2, 7 or 12 chunks?*
- *Can you guess whether a bar with 6 or 11 chunks can be easily split?*



Solutions

Dairy way	4	Yes	2
Family bar	10	Yes	5
Nutty choc	3	No	$(1\frac{1}{2})$
Yum bar	8	Yes	4
Big bar	9	No	$(4\frac{1}{2})$
Chick-chock	5	No	$(2\frac{1}{2})$



Support

Provide the children with interlinking cubes to represent each bar, so that they can physically share the chunks between two.

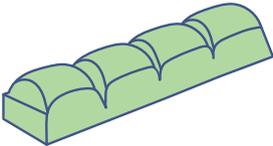
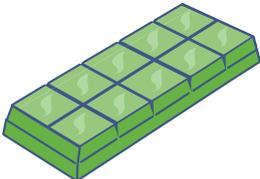
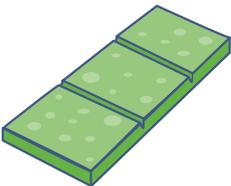
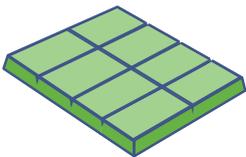
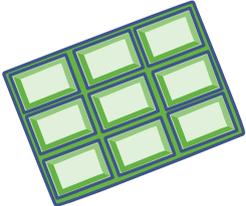
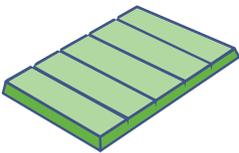


Extension

Encourage the children to investigate sharing bars with different numbers of chunks, looking at every number from 1 to 20, and to record their results. As a further extension activity, ask the children which bars could be shared equally if two more friends joined them. They will then have to work out which bars they can split into quarters easily. The children will find that fewer bars can be easily split into quarters than can be split into halves.

Chocolate bar investigation

Complete the table to work out which bars you can easily share with a friend.

	How many chunks are there in total?	Can we each have half the chunks?	How many chunks do we each get?
Dairy way 	4		
Family bar 	10		
Nutty choc 			
Yum bar 			
Big bar 			
Chick-chock 			

Birthday cake investigation

Objectives

- Understand the word 'quarter'.
- Find quarters of an object in different ways.
- Understand two-, three- and four-quarters.



Introduction

Give each child several paper rectangles. These could be A5 in size (half A4). Ask the children to imagine that each piece of paper is a birthday cake. Explain that you want them to find different ways to cut a birthday cake into quarters using straight lines. The children can use the paper rectangles to help them do this, by folding the rectangles in different ways or drawing lines on them. The children can then draw their solutions on the worksheet.



The maths

The children should realise that the rectangle can be split into quarters in different ways. Quarters of a shape are all the same in terms of size, but they can be different shapes.

Ask:

- *How many different ways can you find to split the cake into four equal parts?*
- *Do all of the solutions have the same number of cuts/straight lines?*



Solutions

There are many possible responses to this activity, but these are the most common:



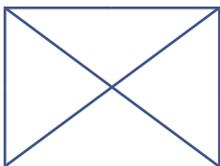
Support

Encourage the children to cut out and stack each set of quarters on top of each other to show they are the same size.

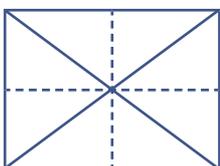


Extension

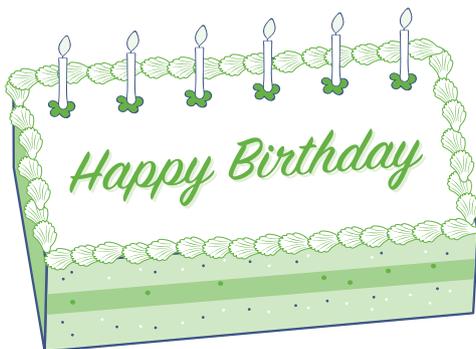
If any child gives the following shape as an example, use it to prompt a discussion about how to show that the parts are equal. If no child offers this, suggest it to them.



The children may find it difficult to accept that the four parts are equal as they are not the same shape. Ask if there is any way to prove that the parts are the same size. Show the children that if you cut each quarter in half, as shown below, you can see that each quarter is made up of two identical triangles.



Birthday cake investigation



How many ways can you split a birthday cake into quarters using straight-line cuts?

An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.An empty rectangular box with a blue border, intended for drawing a way to split a birthday cake into quarters.