Fractions – Finding Halves, Quarters and Thirds of Shapes

Key NC Statement

Recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity

Related NC Statements

- write simple fractions for example, $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
- identify 2-D shapes on the surface of 3-D shapes [for example a circle on a cylinder and a triangle on a pyramid]
- interpret and construct simple pictograms, tally charts, block diagrams and simple tables

Key Concepts

This learning builds directly from the previous sequence, 2LS28.

As in the previous sequence, the first step focuses upon the importance of equality or equivalence when finding fractions. Pupils explore shapes that have and have not been split into fractions. A wide variety of shapes, in a range of orientations and how they could be split, are included. Pupils then progress to draw halves, quarters and thirds on given shapes.

In Step 3, the connection is made between fractions of amounts and fractions of shapes. When pupils are asked to shade in half of a rectangle, which has been shown on a grid, they can do this visually or as a calculation. It is important that pupils make this connection.
This will support pupils to identify a fraction of a shape when it is not visually obvious and when calculating a fraction of an amount is needed instead. The inverse of this is explored in Step 4.
This is also an introduction to equivalent fractions that will be re-visited in 2LS31.

Steps within the Learning Sequence

Step 1: Recognising shapes split equally into halves, quarters and thirds

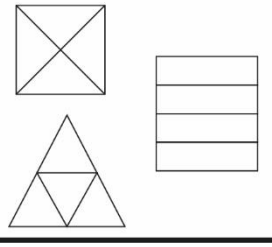
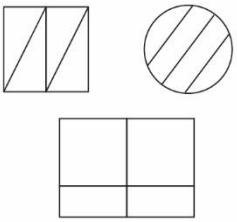
Step 2: Finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ of 2-D shapes

Step 3: Finding fractions of amounts within the context of shape

Step 4: Finding what fraction of a shape is given

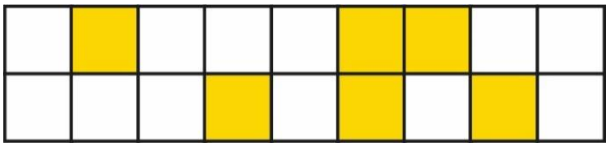
Destination Questions

1

Quarters	Not Quarters
	

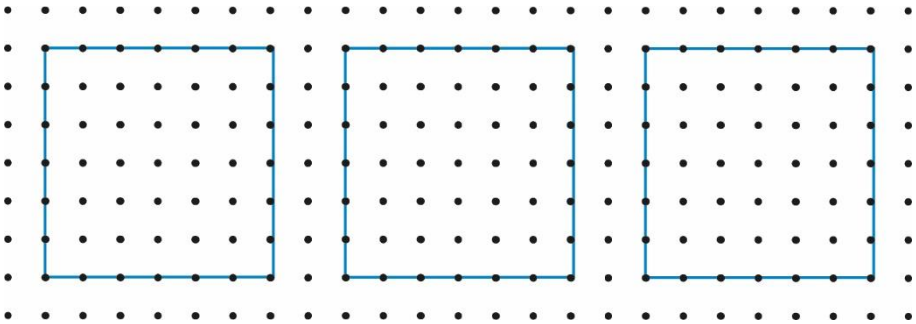
Spot the mistake in the table.

2



What fraction of the shape is shaded?

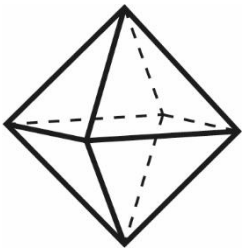
3



Show $\frac{1}{2}$ on the first square, $\frac{1}{4}$ on the second square and $\frac{1}{3}$ on the third square.

Can you complete each one in three different ways?

4



This is an Octahedron. It is a 3-D shape made up of 8 identical triangles.

Four of the faces are red and two are yellow.

What fraction of all the faces are red?
What fraction of all the faces are yellow?

Step one

Recognising shapes split equally into halves, quarters and thirds

Provide all pupils with a square piece of paper.

Fold the square in half.

How can you prove it is in half?

I know it is in half because the two parts are the same size.

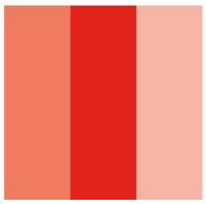
Establish that for the square to be in halves both parts must be equal.

Fold the square again so it is in quarters.

I know if I fold it in half the other way it makes quarters.

I know it is now in quarters because there are four equal parts.

Ask pupils to refold their square so it is in thirds.



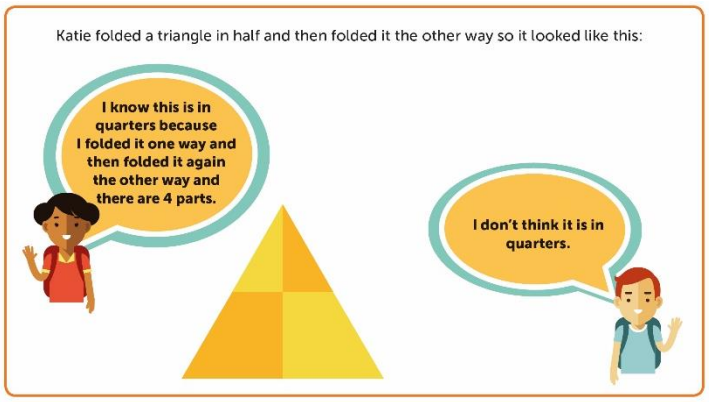
Why is it harder to fold a square into thirds?

You have to estimate where a third is.

It is harder to fold into thirds because you can't match edges together.

Display an equilateral triangle and fold it in half.

Show handout_2LS29_step1_conversation_cartoon. Discuss.



Check that the pupils recognise the misconception and understand that all parts must be equal in size for a shape to be split into a fraction.

Use the shapes on handout_2LS29_step1_shapes. Sort them using handout_2LS29_step1_shape_sort (printed on A3).

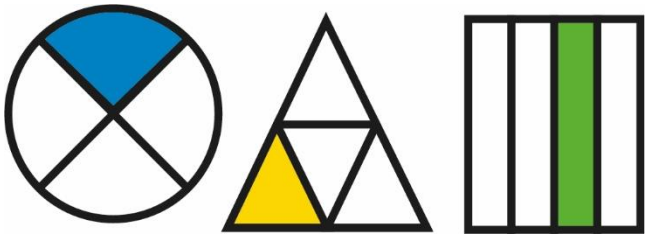
1

BUFFER ZONE

Step two

Finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ of 2-D shapes

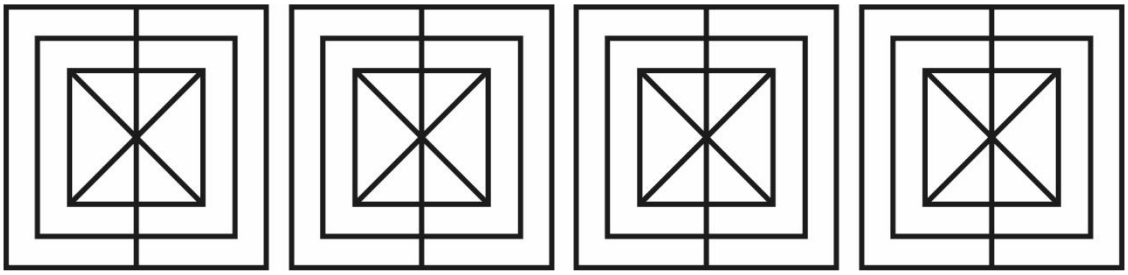
Display a selection of 2-D shapes.
Discuss how they could be split into quarters and $\frac{1}{4}$ be represented.



As all the shapes are split into 4 equal parts one of the four parts coloured in would show $\frac{1}{4}$.

Provide pupils with a selection of outlines of 2-D shapes like those in handout_2LS29_step2_2D_shapes.
Use a dice that has been changed so that $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$ are each show on two faces.
Pupils roll the dice and then select a shape they will use to represent the fraction.
Encourage pupils to show a range of representations for $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{3}$.

Activities for exploring ideas at greater depth

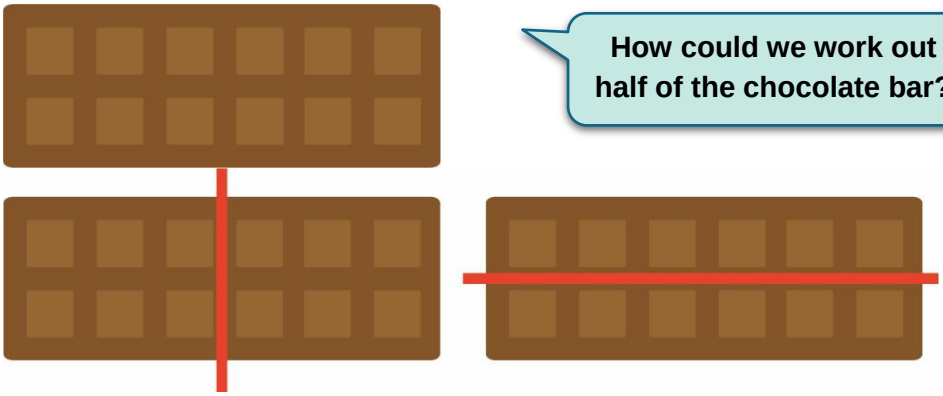


Shade one half of each of these shapes differently.

Step three

Finding fractions of amounts within the context of shape

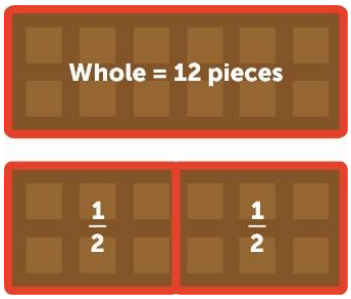
Show a chocolate bar with 12 pieces of chocolate.



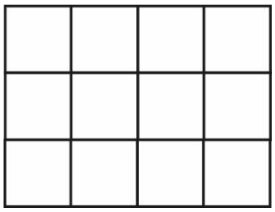
Pupils could split the bar horizontally or vertically and spot the two equal groups without knowing exactly how many are in each group.

They could also compare the two halves and then count how many are in each group.

Alternatively, they could identify the whole bar as 12 pieces and calculate $\frac{1}{2}$ of 12 = ☐



Display a rectangle made up of a 3 x 4 array. Ask pupils to shade $\frac{1}{3}$.

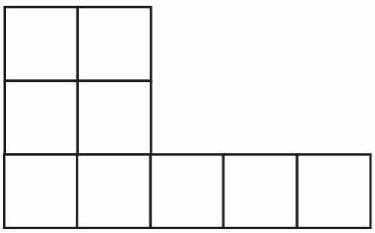


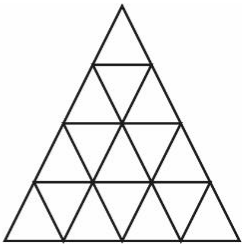
I can see there are three equal rows. To find $\frac{1}{3}$, I can colour in one row and count how many squares in the row.

I can see the whole is 12 squares. So I can calculate $\frac{1}{3}$ of 12 = 4, then colour in 4 squares.

Both strategies would result in the correct number of squares shaded. However, if the shape provided was not organised into an array, which could be split equally horizontally or vertically in a simple way, the first strategy might not always be obvious.

For example, find $\frac{1}{3}$ of these shapes.





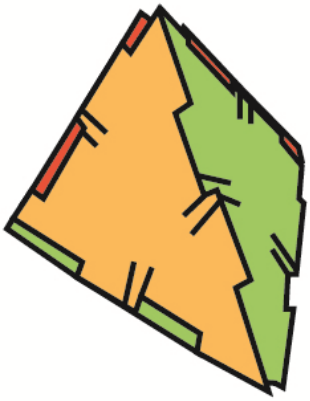
Provide pupils with a range of shapes split into equally sized pieces. Pupils show three or four different ways of shading $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{3}$.

2 3

Step four

Finding what fraction of a shape is given

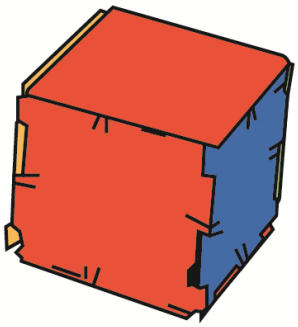
Create a cube and a tetrahedron made from shapes that click together.



The cube has 3 red faces, 2 blues faces and a different colour for the last face.

The tetrahedron that has 1 yellow face, 2 green faces and a different colour for the last face.

Display the cube.



Three of the faces are red.
What fraction of the faces are red?

There are 6 faces on a cube. This is the whole.
3 out of the 6 are red.
I know 3 is half of 6 so $\frac{1}{2}$ of the faces are red.

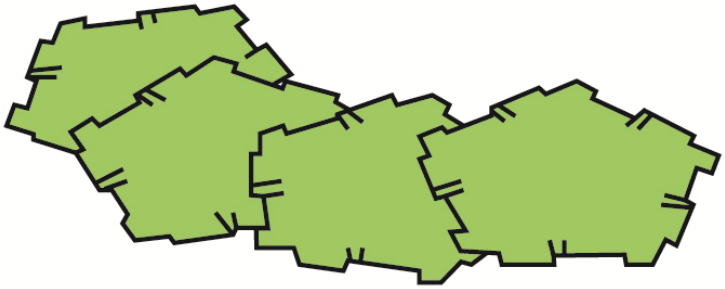
Ask further questions to explore what fraction of the faces are different colours.
For example:

- What fraction of the cube is blue?
- What fraction of the tetrahedron is green?

4

Activities for exploring ideas at greater depth

Provide pupils with four green pentagonal click-together shapes.



If this is one third of a shape, what would the shape be?