Understanding whole and parts

Learning focus

In this lesson, children will learn to write numbers that are made of whole and parts. Children will also write the fraction that is needed to make another whole.

Small steps

- Previous step: Understanding a whole
- **This step: Understanding whole and parts**
- Next step: Counting in halves

NATIONAL CURRICULUM LINKS

Year 2 Number – Fractions

Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity.

ASSESSING MASTERY

Children can understand and write whole numbers and fractions together based on a picture and understand that wholes can be divided into the number of equal parts of the fraction, such as a whole also being $\frac{3}{3}$. Children can work out what fraction to add in order to make the next whole and can use the part-whole model to partition a mixed number into its whole and parts.

COMMON MISCONCEPTIONS

Children may find it difficult to count forwards from a whole number and a fraction to the next whole number. The presence of the whole number may confuse children as they may think that this number is related to the fraction, such as dividing $4\frac{2}{3}$ into quarters because there are four wholes. A picture of the parts that they need to add will help children to see how many parts are missing and what the whole has been divided into. Ask:

- *Draw the fraction that you have. How many parts have you divided the whole into? How many parts are missing?*

STRENGTHENING UNDERSTANDING

Model the ideas in this unit using objects that contain a set amount, such as egg boxes, ice cube trays or divided pencil pots. These objects can be cut up or arranged so that they have two, three or four parts. Smaller objects, such as marbles or erasers, can be placed within them to represent the numerator of the fraction. For example, cut a six-egg egg box in half and put one marble into one of the halves to represent $\frac{1}{3}$.

GOING DEEPER

If children are confident putting wholes and fractions into the part-whole models, can they write all of the different addition and subtraction number sentences that they can see around them like they have done in previous units on number?

KEY LANGUAGE

In lesson: how many?, fraction, whole, part, altogether, share, equally

Other language to be used by the teacher: mixed number, array, part-whole model

STRUCTURES AND REPRESENTATIONS

Part-whole model

RESOURCES

Mandatory: multilink cubes

Optional: containers to represent denominators, such as egg boxes, ice cube trays and divided pencil pots; objects to represent numerators, such as marbles, erasers and pencils

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

Before you teach

- Were children confident that a fraction with the same numerator and denominator represents one whole in the previous lesson?
- Do children understand that one whole can represent different things in different contexts?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What fraction does each piece of chocolate represent?*
- Question 1 b): *How many of those pieces make up a whole chocolate bar?*

IN FOCUS Discuss whether the chocolate bars in the picture are all the same and all complete. Guide children to decide that four squares of chocolate make up one whole bar, then ask them to tell you how many whole bars of chocolate there are and how many pieces are left over.

ANSWERS

Question 1 a): There are three whole chocolate bars and three parts. There are 3 and $\frac{3}{4}$ chocolate bars.

Question 1 b): Another $\frac{1}{4}$ is needed to make four whole chocolate bars.

Unit 10: Fractions, Lesson 12

Understanding whole and parts

Discover

1 a) How many **whole** chocolate bars are there, and how many parts?

b) What fraction is needed to make 4 **whole** chocolate bars?

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Share

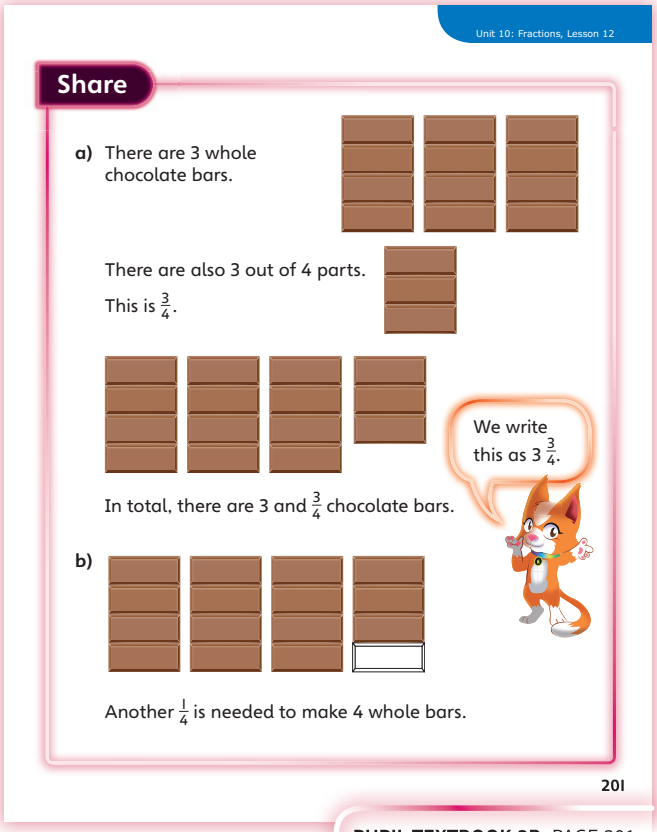
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *How do you know what the denominator should be for the three pieces?*
- Question 1 b): *How many more of those pieces need to be added in order to make one whole?*

IN FOCUS Three chocolate bars, each divided into four equal parts, are shown next to the sentence explaining that they are wholes. The three other equal pieces are shown to be $\frac{3}{4}$ of one whole bar. Explain to children that these three pieces do not form a whole chocolate bar so must be represented as a fraction.

ASSESSMENT CHECKPOINT Do children want to use 3 as the denominator for the three leftover pieces? If they do, they are treating the three leftover pieces as a whole that has been divided into three equal parts rather than as three parts of a bigger whole.



Unit 10: Fractions, Lesson 12

Share

a) There are 3 whole chocolate bars.

There are also 3 out of 4 parts.

This is $\frac{3}{4}$.

In total, there are 3 and $\frac{3}{4}$ chocolate bars.

We write this as $3\frac{3}{4}$.

b)

Another $\frac{1}{4}$ is needed to make 4 whole bars.

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Think together

WAYS OF WORKING Whole class teacher led (I do, We do, You do)

ASK

- Question 1 : *How many slices are there in one pizza? What part of the fraction does this number represent?*
- Question 1 : *How many more slices do you need to add to the leftover slice to make one whole pizza? What does each slice represent?*

IN FOCUS Question 1 a) requires children to visualise the other slices of pizza to know that the whole is divided into three equal parts, so the denominator should be 3, and that the extra slice represents one of those equal parts, so the numerator is 1.

In question 3 , Astrid suggests sharing out each bar, which would involve children drawing three sorting hoops and counting out the correct number of multilink cubes to represent the number of pieces each child gets. Discuss the benefits of Flo's alternative suggestion.

STRENGTHEN Label each of the pizza slices in question 1 as $\frac{1}{3}$ to show that each pizza is one whole made up of three thirds. Ask children to use a visually different physical resource to show what $4\frac{1}{3}$ would look like, such as using a resource where the whole is not a circle.

DEEPEN After working through question 3 , show children an array of 4 × 6 chocolate pieces and ask how many pieces each child would get if the chocolate was shared between three children. What fraction of the whole would each child get? Children will either share out the pieces equally or redistribute the pieces in the array so that there are eight pieces in each group.

ASSESSMENT CHECKPOINT In question 1 , when working out what fraction is represented by the leftover slice of pizza, do children know to refer to the whole pizza in order to determine the number of equal parts in the whole? When working out what fraction needs to be added to make one whole, do children know that the denominator will be the same before they look at the picture?

In question 3 , which strategy do children use to share out the pieces of chocolate? Do they immediately use a division strategy of sharing or are they able to manipulate the pieces of chocolate to make three columns of 4?

ANSWERS

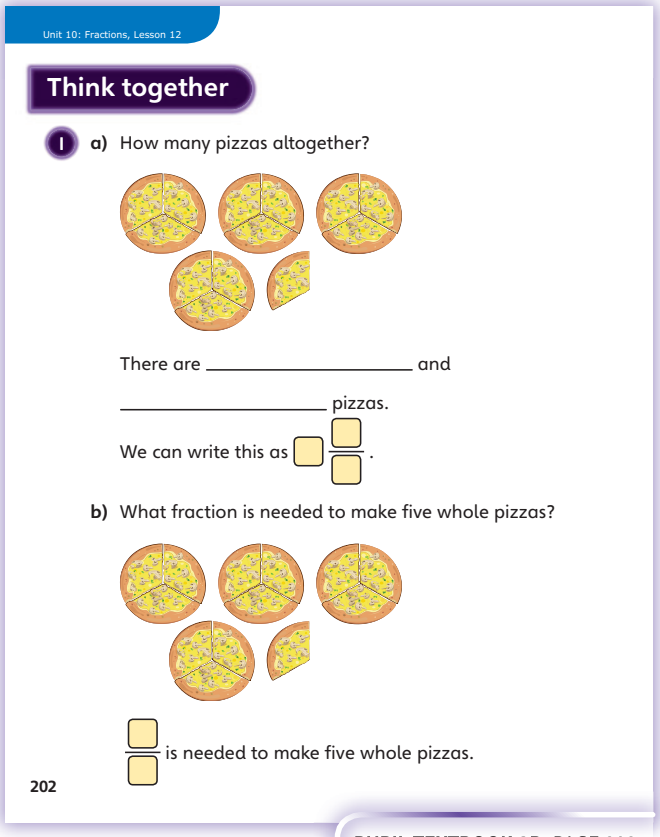
Question 1 a): There are four and a third pizzas. We can write this as $4\frac{1}{3}$.

Question 1 b): $\frac{2}{3}$ is needed to make five whole pizzas.

Question 2 :

	Wholes	Part
$2\frac{1}{2}$	2	$\frac{1}{2}$
$7\frac{3}{4}$	7	$\frac{3}{4}$
$5\frac{1}{4}$	5	$\frac{1}{4}$
$9\frac{3}{4}$	9	$\frac{3}{4}$

Question 3 : Each child gets $\frac{1}{3}$. Each child gets four pieces of chocolate.


Unit 10: Fractions, Lesson 12

Think together

1 a) How many pizzas altogether?

There are _____ and

_____ pizzas.

We can write this as $\frac{\square}{\square}$.

b) What fraction is needed to make five whole pizzas?

$\frac{\square}{\square}$ is needed to make five whole pizzas.

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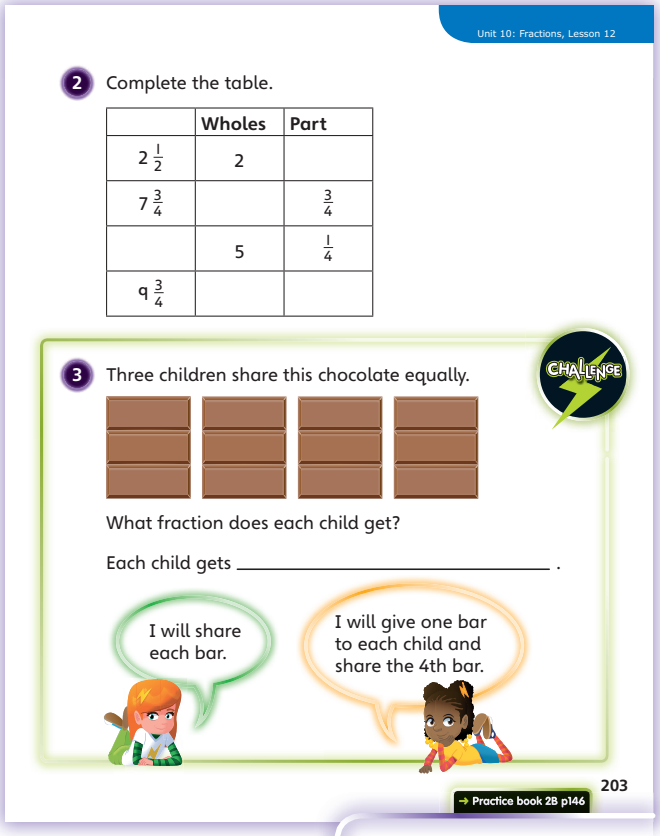
Unit 10: Fractions, Lesson 12

2 Complete the table.

	Wholes	Part
$2\frac{1}{2}$	2	
$7\frac{3}{4}$		$\frac{3}{4}$
	5	$\frac{1}{4}$
$9\frac{3}{4}$		

3 Three children share this chocolate equally.

CHALLENGE

What fraction does each child get?

Each child gets _____ .

I will share each bar.

I will give one bar to each child and share the 4th bar.

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Practice

WAYS OF WORKING Independent thinking

IN FOCUS Question 1 requires children to count up the parts that form one whole and then to work out the fraction that is left over. The apples in question 1 a) are obviously grouped into wholes of four slices each. In question 1 b), it is less obvious that the cake left over has been split into quarters and that three quarters of the last cake is left over.

Question 3 gives different representations of $2\frac{1}{4}$ and asks children to circle the correct representations. The quarters are different shapes and sizes but all represent $\frac{1}{4}$ of the whole.

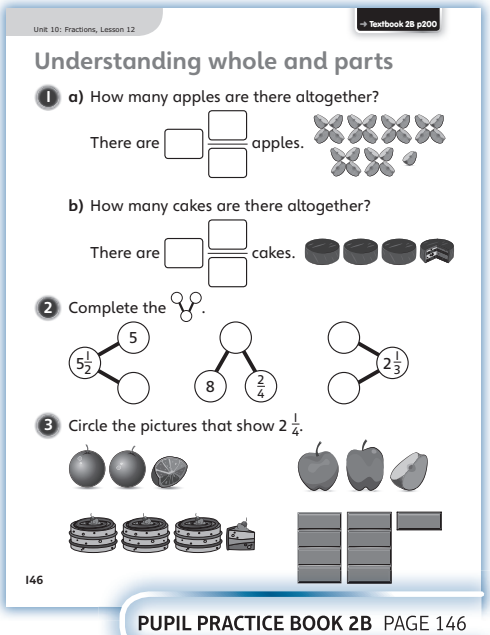
Question 5 involves splitting $2\frac{1}{2}$ into two parts. Guide children to split the $\frac{2}{4}$ into two separate quarters.

STRENGTHEN In question 6, the part-whole model can be completed in different ways because $\frac{1}{2}$ is equivalent to $\frac{2}{4}$. Use physical resources to model six wholes and two quarters. Children should be able to write $6\frac{1}{2}$ and $6\frac{2}{4}$ based on what they have already learned.

DEEPEN Can children count the number of halves in total, using physical resources to help them, and write it down or say it aloud? If children can do that, do they notice a pattern between the number of halves and the number of wholes? Can they discuss why they think that might be?

ASSESSMENT CHECKPOINT Do children split up the wholes and fractions with ease in the part-whole models in question 2 or do they get confused about how to separate them?

ANSWERS Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.


Unit 10: Fractions, Lesson 12

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Understanding whole and parts

1 a) How many apples are there altogether?

There are ☐ ☐/☐ apples.

b) How many cakes are there altogether?

There are ☐ ☐/☐ cakes.

2 Complete the ✂.

$5\frac{1}{2}$ 5 8 $\frac{2}{4}$ $2\frac{1}{3}$

3 Circle the pictures that show $2\frac{1}{4}$.

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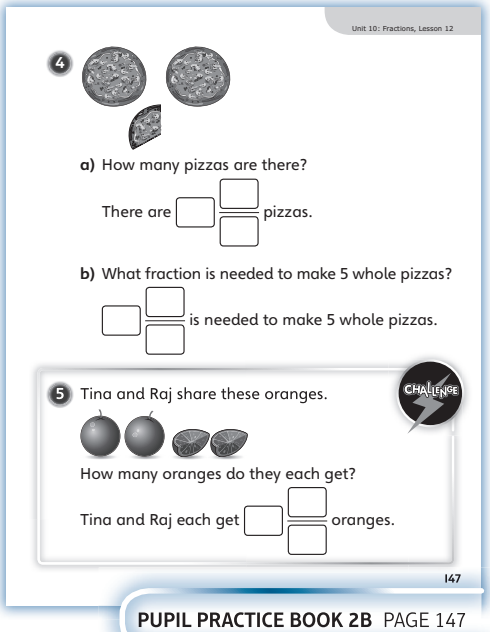
PUPIL PRACTICE BOOK 2B PAGE 146


Unit 10: Fractions, Lesson 12

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a) How many pizzas are there?

There are ☐ ☐/☐ pizzas.

b) What fraction is needed to make 5 whole pizzas?

☐/☐ is needed to make 5 whole pizzas.

5 Tina and Raj share these oranges.

CHALLENGE

How many oranges do they each get?

Tina and Raj each get ☐ ☐/☐ oranges.

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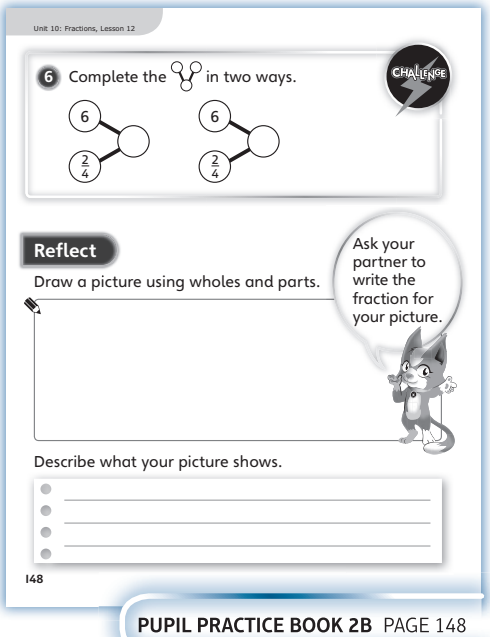
PUPIL PRACTICE BOOK 2B PAGE 147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6 Complete the ✂ in two ways.

CHALLENGE

6 $\frac{2}{4}$ 6 $\frac{2}{4}$

Reflect

Draw a picture using wholes and parts.

Ask your partner to write the fraction for your picture.

Describe what your picture shows.

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Reflect

WAYS OF WORKING Pair work

IN FOCUS This open-ended question asks children to come up with and draw a whole and part of their own. If children are unsure, suggest objects that they could draw, such as apples, pizzas or chocolate bars. Ask children to compare their work with a partner and discuss what is similar or different about their pictures.

ASSESSMENT CHECKPOINT Do children's drawings match their written fractions? Are all of their wholes the same size or do they look different? Have children drawn the outline of the other parts in their fraction to show what the whole has been divided into? Do children accurately draw the part of their whole based on the size of their original whole?

ANSWERS Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

After the lesson

- Did children understand what is meant by a whole number and a fraction?
- Did children recognise a mixture of whole numbers and fractions? Were they able to draw this?
- Did children work out the fraction that needed to be added to make one whole and understand that it had to have the same denominator?