Understanding other fractions

Learning focus

In this lesson, children will be introduced to non-unit fractions (fractions in which the numerator is not 1).

Small steps

- Previous step: Unit fractions
- **This step: Understanding other fractions**
- Next step: $\frac{1}{2}$ and $\frac{2}{4}$

NATIONAL CURRICULUM LINKS

Year 2 Number – Fractions

Write simple fractions, for example, $\frac{1}{2}$ of 6 = 3, and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

ASSESSING MASTERY

Children can recognise non-unit fractions and distinguish between these and unit fractions, and can explain the denominator and numerator of each fraction. Children can write the non-unit fractions they see in a picture and can draw their own non-unit fraction when they see it written numerically.

COMMON MISCONCEPTIONS

Children may mix up the meaning of the numerator and the denominator. For example, children may think that $\frac{3}{4}$ means having three parts and then get confused when they try to shade four parts. When seeing a number greater than one shaded for the first time, children may also take that to mean that the number of equal parts has increased. Ask:

- *How many equal parts are there? Does that change if you shade more parts?*

STRENGTHENING UNDERSTANDING

Use physical resources to represent a whole divided into three or four equal parts and count up to a whole in that fraction by moving each of the equal parts in turn while counting $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ and so on. Ask children questions about what happens to the denominator and numerator each time you move a part.

GOING DEEPER

Once children have practised counting up in unit fractions, do they recognise that $\frac{2}{2}$ or $\frac{3}{3}$ or $\frac{4}{4}$ is the same as one whole? Give children a scenario such as a cake split into quarters that were all eaten. Ask them to write the fraction that has been eaten.

KEY LANGUAGE

In lesson: **non-unit fraction**, numerator, denominator, equal parts, greater than, true, false

Other language to be used by the teacher: unit fraction

STRUCTURES AND REPRESENTATIONS

Counters

RESOURCES

Optional: counters, multilink cubes

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

Before you teach

- Could children explain a numerator and a denominator when studying unit fractions in the previous lesson?
- Were children confident drawing a unit fraction from seeing it written down in numbers in the previous lesson?

Discover

WAYS OF WORKING Pair work

ASK

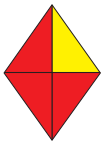
- Question 1 a): *How many children are there altogether?*
- Question 1 b): *What is the denominator of Ola's kite? How many equal parts does that mean it is split into?*
- Question 1 b): *Will Ola's kite be a little bit red or almost all red?*

IN FOCUS This picture portrays non-unit fractions for the first time. In question 1 a), children know how many children there are in the picture and will understand that they are the equal parts, so they will write three as the denominator. Children may be able to label each child as $\frac{1}{3}$ and say that there are three of them, but they may not know the proper non-unit fraction name. Similarly, for the kite, children may recognise that there should be four equal parts of the kite but not know how to represent the 3 in $\frac{3}{4}$. Try to avoid giving too much guidance: see what children do for a kite showing $\frac{3}{4}$ shaded. You might want to provide a rhombus for the kite for children to split up.

ANSWERS

Question 1 a): $\frac{2}{3}$ of the children are girls.

Question 1 b): Ola's kite has four equal parts, three of which are red, so it is $\frac{3}{4}$ red.



Unit 10: Fractions, Lesson 8

Understanding other fractions

Discover

Lily Noah Ola

1 a) What fraction of the children are girls?

b) Ola's kite is $\frac{3}{4}$ red.

Draw the kite.

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Share

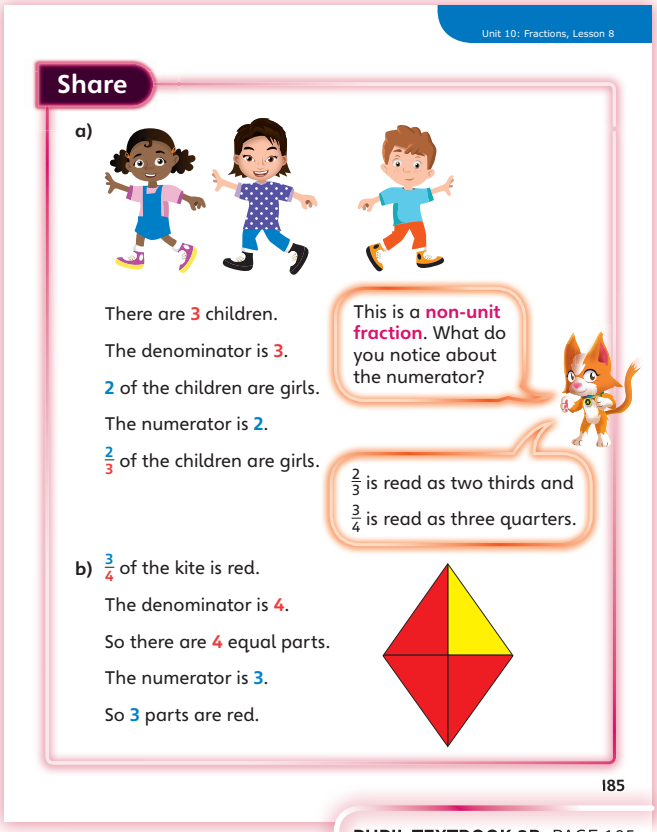
WAYS OF WORKING Whole class teacher led

ASK

- *How many equal parts are there altogether?*
- *How many parts do you have?*
- *Is this different to what you have learned before?*

IN FOCUS Questions 1 a) and 1 b) give a step-by-step explanation for each non-unit fraction and recap denominators at the same time. This is the first time children have met non-unit fractions, so they will need help with the reading. Explain that $\frac{2}{3}$ is read as two thirds and $\frac{3}{4}$ is read as three quarters. Ask children to label each child and each section of the kite with its unit fraction name and then circle how many they have. Explain that the total number of children or parts has not changed but that the number of each one you have has changed. Once you have explained and discussed each example, refer to what Sparks says and ask: *What do you notice about the numerator in non-unit fractions?*

STRENGTHEN The 3 in these examples has different roles. In question 1 a), it is the number of equal parts (the number of children). In question 1 b), it is the number of parts of the kite that are red. Point this out to children and discuss the distinction with them.



Unit 10: Fractions, Lesson 8

Share

a)

There are 3 children.

The denominator is 3.

2 of the children are girls.

The numerator is 2.

$\frac{2}{3}$ of the children are girls.

This is a **non-unit fraction**. What do you notice about the numerator?

$\frac{2}{3}$ is read as two thirds and $\frac{3}{4}$ is read as three quarters.

b) $\frac{3}{4}$ of the kite is red.

The denominator is 4.

So there are 4 equal parts.

The numerator is 3.

So 3 parts are red.

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Think together

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

ASK

- *How many equal parts has each kite been split into?*
- *Is the same amount of each kite shaded?*
- *Do unit fractions always have one part shaded?*

IN FOCUS Question 1 asks children to fill in the sentence scaffolds for a non-unit fraction, requiring them to make the link to the numbers in the sentence that form the fraction.

Question 2 requires children to distinguish between a unit fraction and a non-unit fraction.

Question 3 a) may cause confusion as there are five equal parts, which children have not seen before. This question also demonstrates a common mistake that children may make because the number of one type of fruit (two apples) is over the number of the other type of fruit (three bananas). Encourage children to see the apples and the bananas as equal parts of a collective whole.

STRENGTHEN Ask children to repeat the sentence scaffolds in question 1 with the different contexts from question 3. For example, question 3 b) would be phrased as, 'The group is made up of four equal parts. The denominator is 4. Three of the children are boys. The numerator is 3. $\frac{3}{4}$ of the children are boys.'

DEEPEN Refer to what Ash says about non-unit fractions being greater than unit fractions with the same denominator. If children immediately spot that this is true, can they say how much greater a non-unit fraction is than a unit fraction? Do they spot a pattern in the numerators depending on what the denominator is?

ASSESSMENT CHECKPOINT Do children use their knowledge about numerators from this and previous lessons to distinguish between unit and non-unit fractions? Are children able to apply previous knowledge and know that the denominator in question 3 a) should be 5 even if they do not know the fraction name?

ANSWERS

Question 1: The denominator is 3. The numerator is 2. $\frac{2}{3}$ of the kite is yellow.

Question 2 a): A and D show $\frac{3}{4}$ shaded.

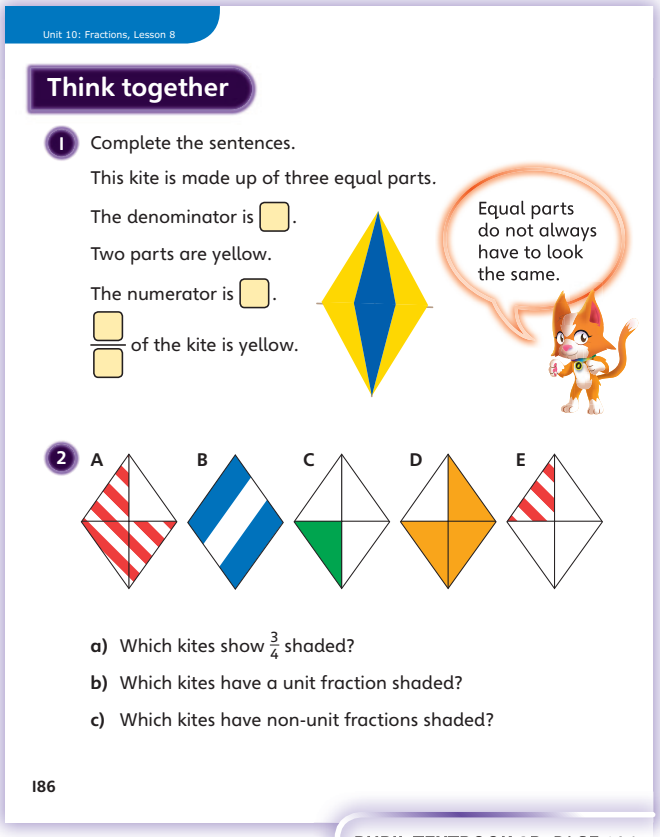
Question 2 b): C and E have unit fractions shaded.

Question 2 c): A, B and D have non-unit fractions shaded.

Question 3 a): False.

Question 3 b): True.

Question 3 c): True.


Unit 10: Fractions, Lesson 8

Think together

1 Complete the sentences.

This kite is made up of three equal parts.

The denominator is ☐.

Two parts are yellow.

The numerator is ☐.

☐/☐ of the kite is yellow.

Equal parts do not always have to look the same.

2 A B C D E

a) Which kites show $\frac{3}{4}$ shaded?

b) Which kites have a unit fraction shaded?

c) Which kites have non-unit fractions shaded?

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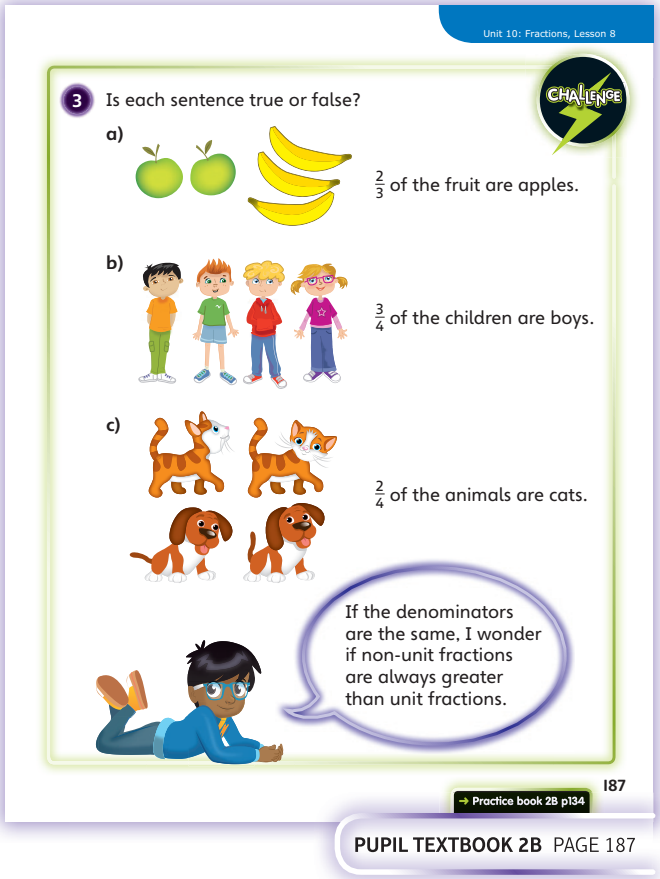
Unit 10: Fractions, Lesson 8

CHALLENGE

3 Is each sentence true or false?

a) $\frac{2}{3}$ of the fruit are apples.

b) $\frac{3}{4}$ of the children are boys.

c) $\frac{2}{4}$ of the animals are cats.

If the denominators are the same, I wonder if non-unit fractions are always greater than unit fractions.

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Practice

WAYS OF WORKING Independent thinking

IN FOCUS Question 1 asks children to fill in the sentence scaffolds, just as they did in the **Think together** part of the lesson, but this time using counters instead of kites.

Question 2 asks children to match up fractions, which requires them to write down what fraction each shape represents and to visualise what each written fraction looks like as a shape.

Questions 2 and 3 allow children to show an understanding of what non-unit fractions are by having to match the shape to the relevant fraction and then having to shade in or circle the non-unit fraction.

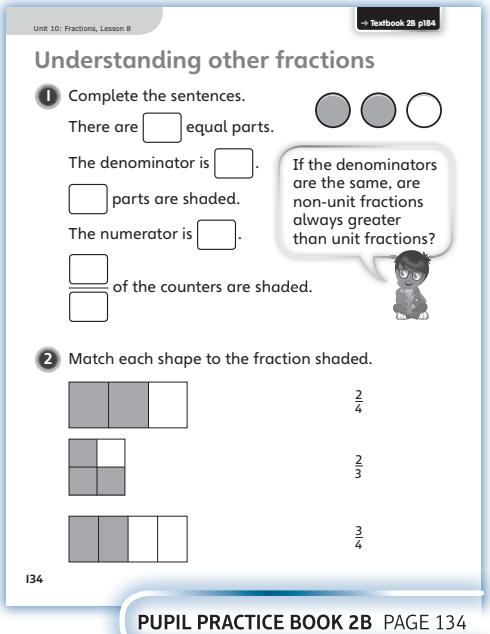
Question 5 asks children to write both the unit and the non-unit fractions that they see. Put this into real terms by referring to shaded and unshaded parts.

STRENGTHEN To help children explain their answer to question 4, ask them to draw or make their own representation of what is shown in the picture. Encourage children to label each part to help them see that 3 should be the numerator because there are three shaded counters.

DEEPEN If children have successfully shaded or circled the non-unit fraction in question 3, ask them whether they can work out what fraction is not circled or shaded.

ASSESSMENT CHECKPOINT Seeing $\frac{1}{3}$ in question 4 is a common mistake. This is because there are three shaded parts, which children can misinterpret as the number of equal parts. Are children able to spot that this is a mistake and explain why? Can children articulate why 3 has been mistakenly identified as the number of equal parts?

ANSWERS Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.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1 Complete the sentences.

There are ☐ equal parts.

The denominator is ☐.

☐ parts are shaded.

The numerator is ☐.

☐/☐ of the counters are shaded.

If the denominators are the same, are non-unit fractions always greater than unit fractions?

2 Match each shape to the fraction shaded.

$\frac{2}{4}$

$\frac{2}{3}$

$\frac{3}{4}$

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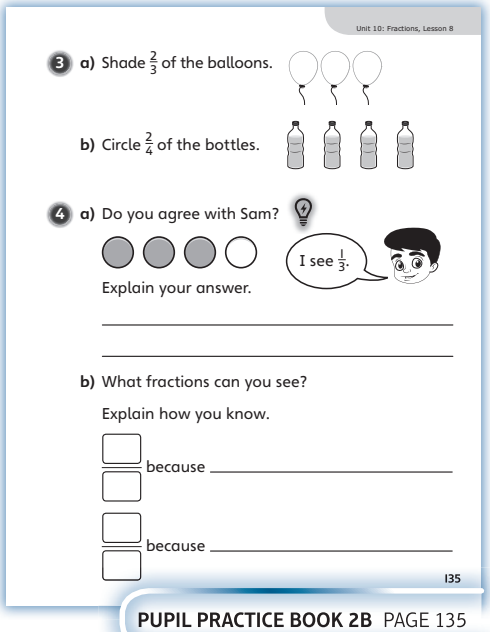
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3 a) Shade $\frac{2}{3}$ of the balloons.

b) Circle $\frac{2}{4}$ of the bottles.

4 a) Do you agree with Sam?

I see $\frac{1}{3}$.

Explain your answer.

b) What fractions can you see?

Explain how you know.

☐/☐ because

☐/☐ because

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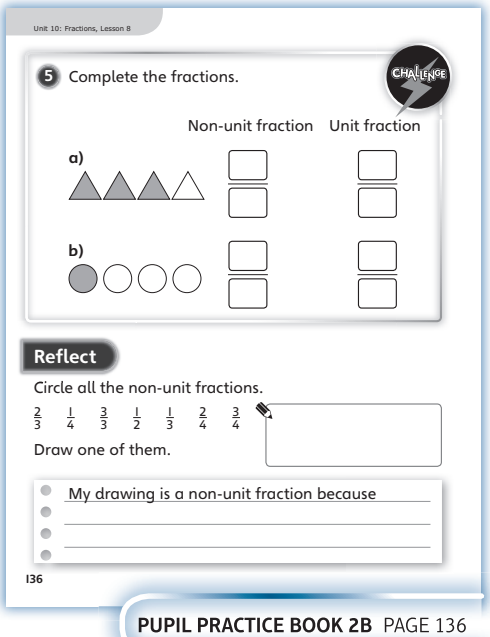
Reflect

WAYS OF WORKING Pair work

IN FOCUS Write the words 'numerator', 'denominator' and 'equal parts' on the board for children to use when explaining why they have circled the fractions that they have circled. No pictorial representation is given, requiring children to look closely at the numbers and apply what they have learned to the written fraction.

ASSESSMENT CHECKPOINT Can children instantly recognise unit fractions by looking at the numerator or do they still look at the denominator? Which fraction do children pick to draw? Do children draw a model or an image that they have seen previously or are they able to create one for themselves? In their explanation, do children refer to the numerator when explaining why their chosen fraction is a non-unit fraction?

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


Unit 10: Fractions, Lesson 8

5 Complete the fractions.

CHALLENGE

Non-unit fraction | Unit fraction

a)

b)

Reflect

Circle all the non-unit fractions.

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

Draw one of them.

My drawing is a non-unit fraction because

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After the lesson

- Were children confident in the distinction between unit and non-unit fractions and why there is a difference in the numerators?
- Were children easily able to include thirds in their thinking in this lesson or were thirds still too unfamiliar?