Unit 10
Fractions (2)

Mastery Expert tip! "Children need a rich experience of seeing, touching and creating simple fractions in order to gain a more secure understanding of what a fraction actually is. We created a fraction museum on a whiteboard and each lesson we added examples of our learning with lots of colourful resources and drawings. It really helped my class to embed what they learnt, recall what they already knew and ask questions where they were unsure.

Don't forget to watch the Unit 10 video!

WHY THIS UNIT IS IMPORTANT

In this unit, children will learn to recognise and show (using diagrams) equivalent fractions with small denominators. They will explore a fraction wall and use it to find equivalent fractions. Children will order fractions on a number line and compare two fractions using bar models and the comparison signs < > or =. They will learn to add and subtract two or more fractions with the same denominator, answering questions in more than one way and comparing the efficiency of each method. They will develop their understanding of solving fraction problems and learn to find fractions of measures.

WHERE THIS UNIT FITS

- Unit 9: Fractions (1)
- **Unit 10: Fractions (2)**
- Unit 11: Time

Before they start this unit, it is expected that children:

- understand how to make a whole out of two fractional parts
- can recognise tenths
- understand fractions as a number
- can calculate a fraction of a set of objects
- can use a bar model to represent problems
- understand the concept of equal parts.

ASSESSING MASTERY

Children who have mastered this unit will be able to describe equivalent fractions and mark fractions with different denominators on a number line. They can compare pairs of unit fractions and fractions with small denominators and explain which is larger. Children can count in fraction steps of a constant size to help make sense of adding and subtracting fractions with the same denominator, and find pairs of fractions that total one. Children solve problems with confidence by adding and subtracting fractions, and reasoning mathematically.

COMMON MISCONCEPTIONS	STRENGTHENING UNDERSTANDING	GOING DEEPER
Children may find the concept of numerator and denominator confusing, particularly if the numerator is greater than 1.	Provide opportunities for children to use resources and model fractions, for example, using fraction rods, beads and fraction strips.	Encourage children to make a fraction wall from scratch to deepen their understanding. Give children number lines labelled 0 to 1. Ask them to create their own questions regarding the position of different fractions on the number line. Challenge children to find different ways to answer the same question. Often, more able children are less inclined to look for alternative options, but finding the answer is not as important as the way they find the answer!
Children may find it difficult to recognise fractions as points on a number line.	Revisit counting in fraction intervals by showing children pre-marked number lines with different denominators. Hide some of the fractions and ask children to find them.	
Children who find it difficult to solve problems may not know where to start and so may guess which method to use.	Offer real-life examples of problem solving situations. Encourage children to role-play the problem and sketch something that helps them make sense of it.	

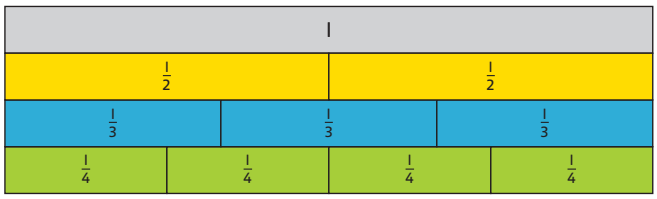
Unit 10: Fractions (2)

WAYS OF WORKING

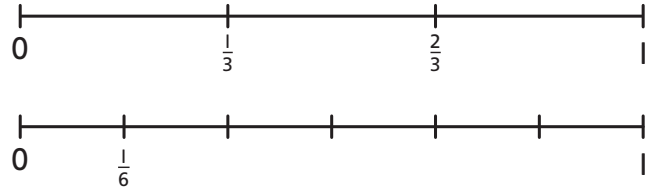
Use these pages to introduce the unit focus to children. You can use the characters to explore different ways of working too!

STRUCTURES AND REPRESENTATIONS

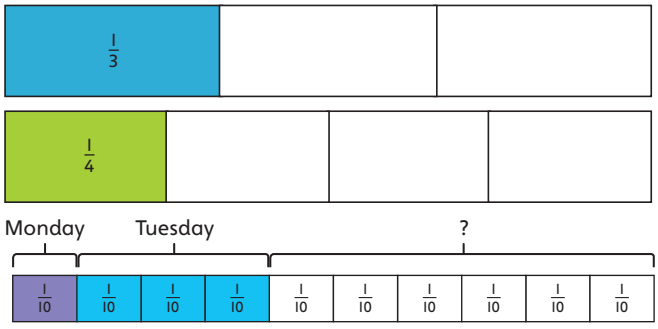
Fraction wall: This representation is crucial to allow children to find equivalent fractions. If children become confident using the fraction wall, it will increase their conceptual understanding of fractions. It can be used by itself or with a number line to compare fractions with different denominators.



Number line: This model helps children to understand fractions as numbers. Positioning fractions on a number line will require a secure understanding of the role of the numerator and denominator within a fraction.



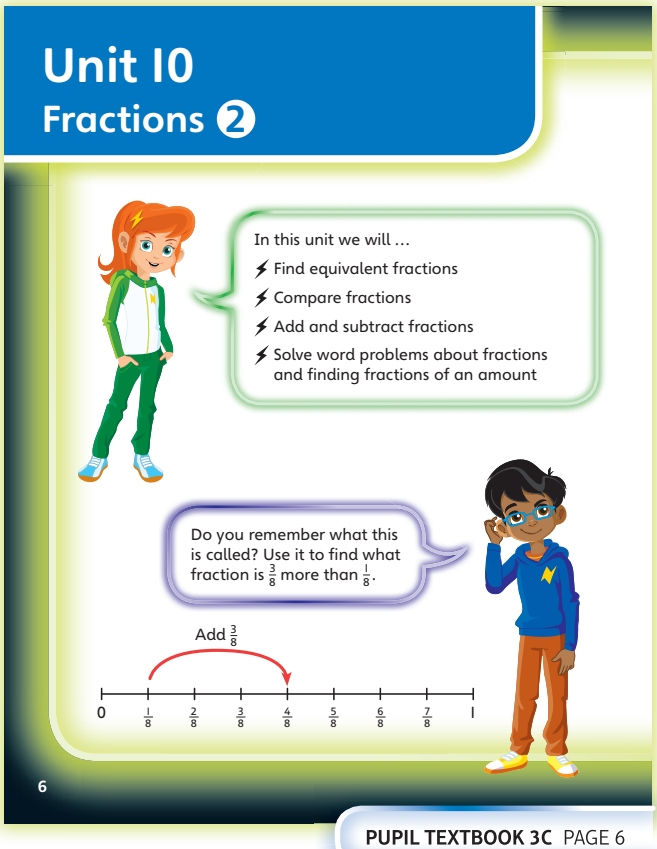
Fraction strip: This is a powerful representation that allows children to organise the information they are given visually, and understand how it should be manipulated in order to find the solution to a problem. It can be used alone, or with a number line to enhance understanding.



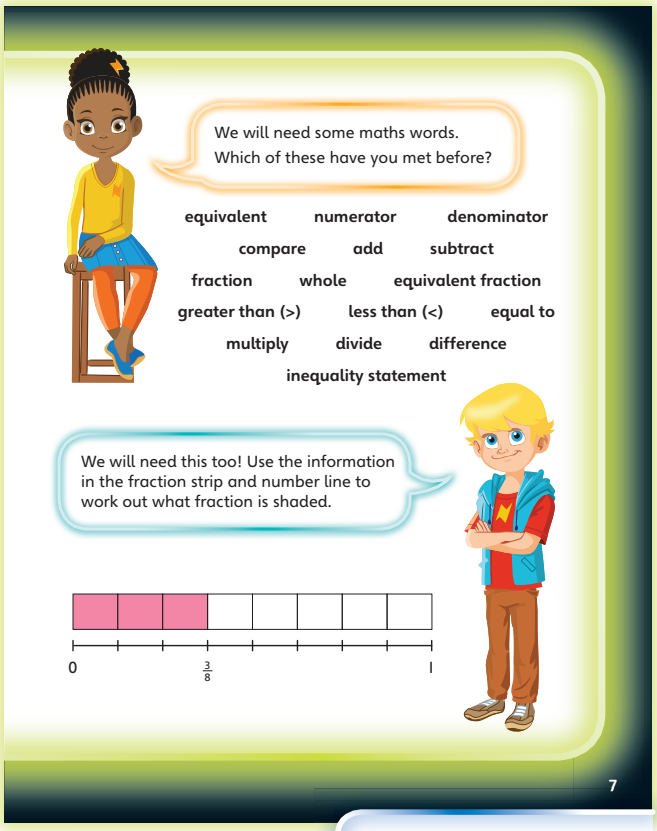
KEY LANGUAGE

There is some key language that children will need to know as part of the learning in this unit.

- part, whole, equal parts, unit fraction, non-unit fraction, denominator, numerator, equivalent fraction
- partition, split, share, count on, count back, compare, measure, calculate, method
- whole number, add, subtract, difference, multiply, divide, equal to, greater than (>), less than (<)



PUPIL TEXTBOOK 3C PAGE 6



PUPIL TEXTBOOK 3C PAGE 7

Equivalent fractions 1

Learning focus

In this lesson, children will learn to recognise equivalent fractions with small denominators. They will use diagrams to represent equivalent fractions.

Small steps

- Previous step: Problem solving – fractions
- **This step: Equivalent fractions (1)**
- Next step: Equivalent fractions (2)

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

Recognise and show, using diagrams, equivalent fractions with small denominators.

ASSESSING MASTERY

Children can explain and demonstrate when two fractions are equivalent.

COMMON MISCONCEPTIONS

Some children may be unsure of the meaning of numerator and denominator, particularly if the denominator is greater than 1. When using resources, they may find it difficult to identify the fraction strips they need to use by referring to the denominator. Ask:

- *Show me a fraction strip that represents $\frac{3}{5}$. How many parts will the bar be split into? How many parts are shaded?*

Some children may find the concept of an equivalent fraction tricky, as they may have found a rule that works for some fractions but not for others. For example, to find an equivalent fraction, all you do is double the top and the bottom ($\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$), but that rule cannot be used to complete the fractions $\frac{1}{2} = \frac{3}{?} = \frac{6}{?}$. Ask:

- *Tell me a fraction that is equivalent to $\frac{1}{2}$. How do you know? Are there others?*

STRENGTHENING UNDERSTANDING

Rather than simply learning a rule in order to solve a calculation, children need to know why the rule works as it does. Children should be given the opportunity to use fraction tiles, coloured rods and paper strips to show fractions in different ways. The more practical experience they have, the quicker they will understand the concept of equivalent fractions: that equivalent fractions are the same size, but can be split into different equal parts.

GOING DEEPER

Provide children with a fraction wall and ask them to create their own equivalent questions to show the depth of their understanding. How many equivalent fractions can they find?

KEY LANGUAGE

In lesson: whole, fraction, numerator, denominator, **equivalent fractions**, equal, equal parts

Other language to be used by the teacher: shared, multiply, divide

STRUCTURES AND REPRESENTATIONS

bar model, fraction wall

RESOURCES

Mandatory: fraction strips, bar model

Optional: paper strips

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

Before you teach 2

- Do children know what the numerator and denominator represent?
- Are they familiar with resources such as fraction strips?
- What opportunities will you be providing for children to gain hands-on experience with fractions?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What does the picture show? How far has Lee run?*
- Question 1 b): *What markings can you see on the tracks above and below the track Lee is running on? What do you think these markings show?*

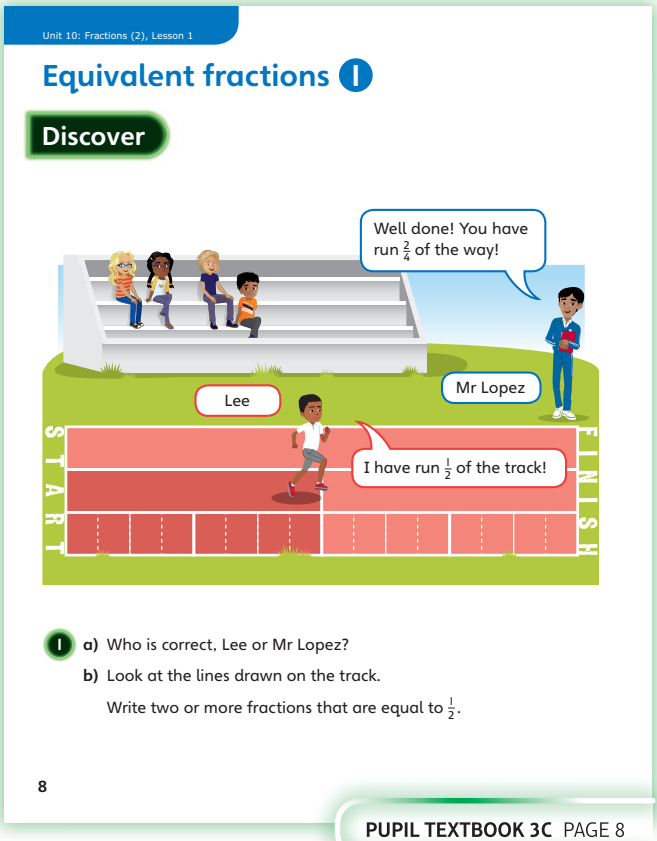
IN FOCUS Question 1 a) brings attention to the fact that a fraction can be the same size, but split into a different number of equal parts. The picture should encourage children to see that $\frac{1}{2}$ and $\frac{2}{4}$ are equal.

PRACTICAL TIPS Give children the opportunity to use a variety of different resources to create $\frac{1}{2}$, such as coloured rods and paper fraction strips. Children should use these resources to establish that $\frac{1}{2}$ can be presented in different ways.

ANSWERS

Question 1 a): Both Lee and Mr Lopez are correct.

Question 1 b): $\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{8}{16}$. These are all equivalent fractions.



PUPIL TEXTBOOK 3C PAGE 8

Share

WAYS OF WORKING Whole class teacher led

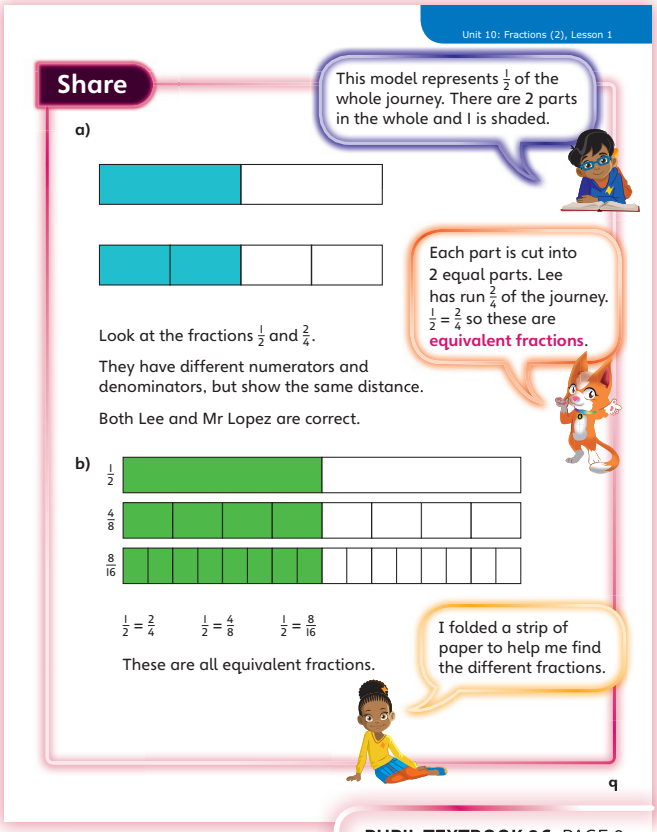
ASK

- Question 1 a): *How many parts is the first bar split into? How many of the parts are shaded? What fraction does the first model represent? What fraction does the second model represent? What do you notice about the size of the shaded part in each bar? How many $\frac{1}{4}$s do you think may be equivalent to $\frac{1}{2}$?*

IN FOCUS This may be a good opportunity to clarify any misconceptions children may have. Ensure they are confident that the first fraction represents $\frac{1}{2}$ and the second fraction represents $\frac{2}{4}$. Children should notice that both lengths are equal, and establish that $\frac{1}{2} = \frac{2}{4}$.

STRENGTHEN Discuss the relationship between the numerator and denominator. Ask: *What do you notice about the numerator and denominator of each fraction? What is the relationship between 1 and 2? 2 and 4? Are there other fractions that are equal to $\frac{1}{2}$? What is the relationship between the numerator and the denominator of these fractions?*

Provide children with two paper strips. Ask them to fold the first strip in half and the second strip into quarters. They then use scissors to cut the first strip into two parts, and the second strip into four parts. Ask children to align the two quarters below the half. What do they notice? How can they record their findings? Record that $\frac{1}{2} = \frac{2}{4}$ explaining that the = sign means 'equivalent' or 'the same as'.



PUPIL TEXTBOOK 3C PAGE 9

Think together

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

ASK

- Question 1: *How many parts are there? How many of them are coloured? If the paper is folded again, how many parts will there be? What do all the parts have in common? What happened to the original coloured parts? How many parts are coloured now?*
- Question 2: *What fraction of the paper is coloured? How can the information be recorded?*

IN FOCUS In questions 1 and 2, children may notice that $\frac{1}{6}$ is half of $\frac{1}{3}$, and $\frac{1}{10}$ is half of $\frac{1}{5}$. The questions highlight the fact that two $\frac{1}{6}$s are the same as $\frac{1}{3}$, and two $\frac{1}{10}$s are the same as $\frac{1}{5}$.

Question 3 asks children to use their knowledge of fractions to find the missing fractions on the fraction wall. They should then look for other fractions equivalent to $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ and $\frac{1}{12}$.

STRENGTHEN When children are working on questions 1 and 2, strengthen their understanding by giving them paper strips similar to the ones used in the questions. Encourage discussion on how the paper should be folded so that all the parts are equal. This may be an opportunity to clarify that in a fraction all the fraction-parts are of equal size. Encourage children to use the correct mathematical vocabulary to explain what they notice during this activity.

DEEPEN Deepen children's understanding by asking them to build their own fraction wall. Ask: *What fractions will they choose? How many of each unit fraction will they need to make a whole?* Encourage them to explain their reasoning clearly. Ask: *Write as many fractions equivalent to $\frac{1}{4}$ as you can.* They should try to be systematic in their approach.

ASSESSMENT CHECKPOINT At this point in the lesson, children understand what equivalent fractions are, and can recognise and show equivalent fractions by using paper fraction strips.

ANSWERS

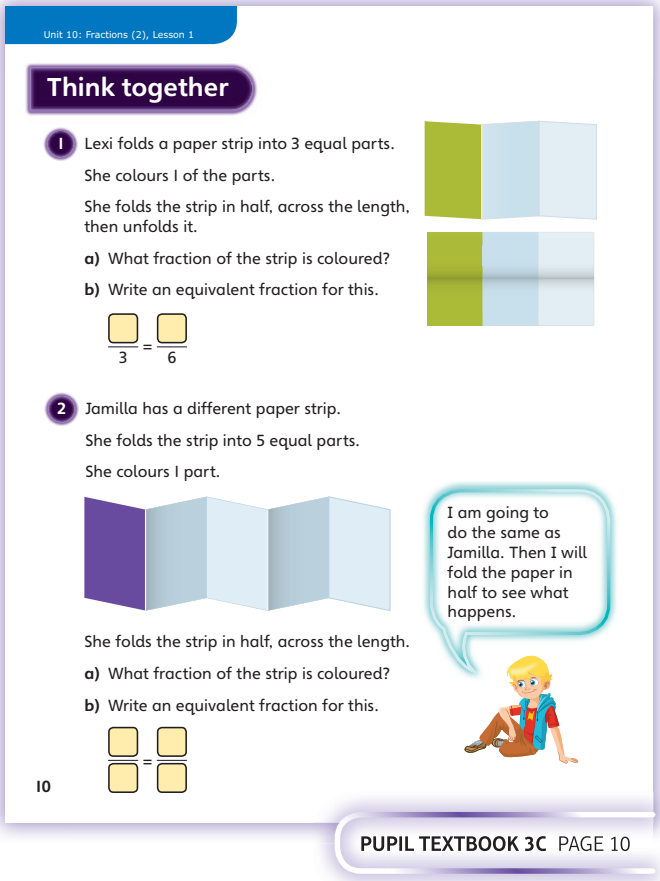
Question 1 a): $\frac{1}{3}$ or $\frac{2}{6}$

Question 1 b): $\frac{1}{3} = \frac{2}{6}$

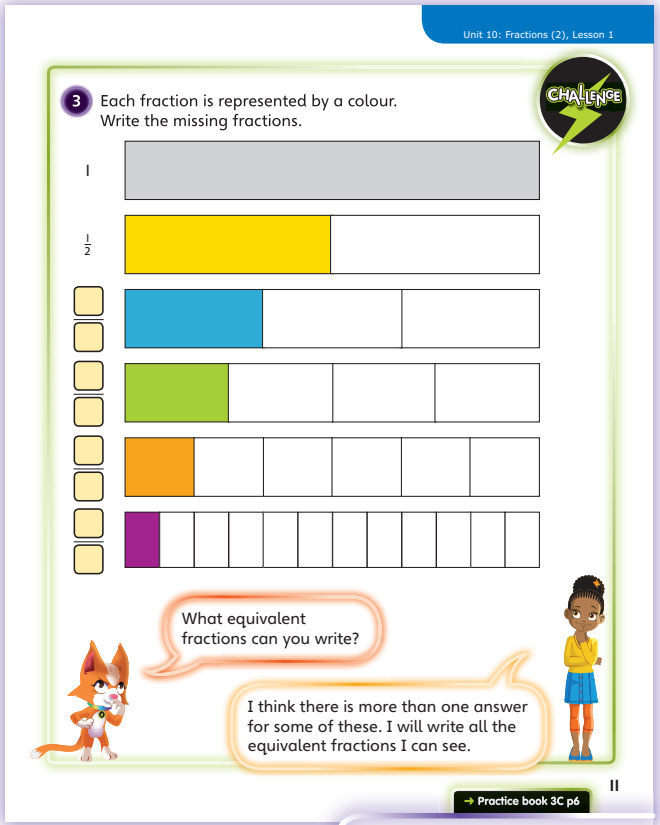
Question 2 a): $\frac{1}{5}$ or $\frac{2}{10}$

Question 2 b): $\frac{1}{5} = \frac{2}{10}$

Question 3: $\frac{1}{3}$, $\frac{2}{6}$ or $\frac{4}{12}$; $\frac{1}{4}$, $\frac{2}{8}$ or $\frac{3}{12}$; $\frac{1}{6}$ or $\frac{2}{12}$; $\frac{1}{12}$



PUPIL TEXTBOOK 3C PAGE 10



PUPIL TEXTBOOK 3C PAGE 11

Practice

WAYS OF WORKING Independent thinking

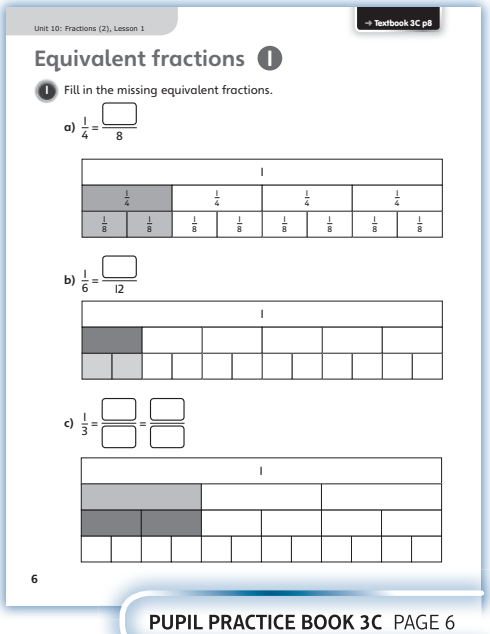
IN FOCUS When working independently on the questions in this section, children should continue to secure their understanding of identifying equivalent fractions using diagrams. They use bar models to find the missing numerator or denominator from the equivalent fractions given.

STRENGTHEN Strengthen understanding by giving children paper fraction strips so they can see a concrete representation of the question. In question 1, ask: *What is the same and what is different? Think of the example used in the lesson: what is the question asking? What does 'equivalent fraction' mean?*

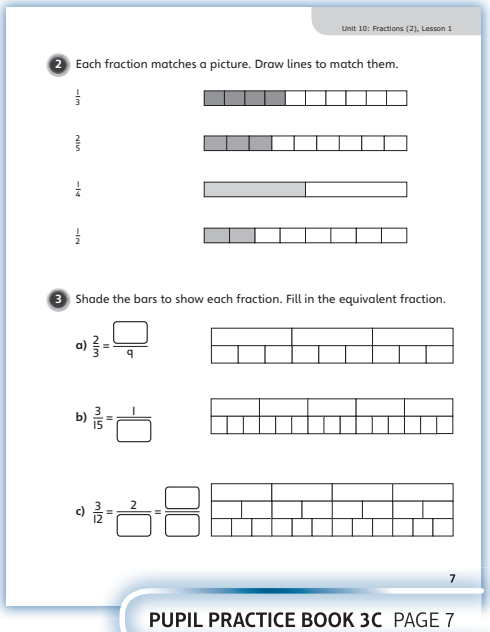
DEEPEN Provide children with similar questions to question 4, encouraging them to decide which representation they think best matches each part of the question. Ask: *Which bar represents the given fraction? How many parts should you shade? What will the numerator and denominator of the other fraction be, so that they are equal?* The more children have the opportunity to show a fraction in different ways, the deeper their understanding will be. Prompt children to explore the concept presented in question 5 in more depth. When discussing fractions, they need to pay attention not only to the number of parts shaded, but also to the size of each part. Ask: *Are they all equal? What is the numerator/denominator? What fraction is being represented?*

ASSESSMENT CHECKPOINT Children should be confident in identifying and showing equivalent fractions using diagrams. They can explain when two fractions are equal using the correct mathematical language. Successful answers and discussion around question 3 should offer an indication of the depth of their understanding.

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



PUPIL PRACTICE BOOK 3C PAGE 6



PUPIL PRACTICE BOOK 3C PAGE 7

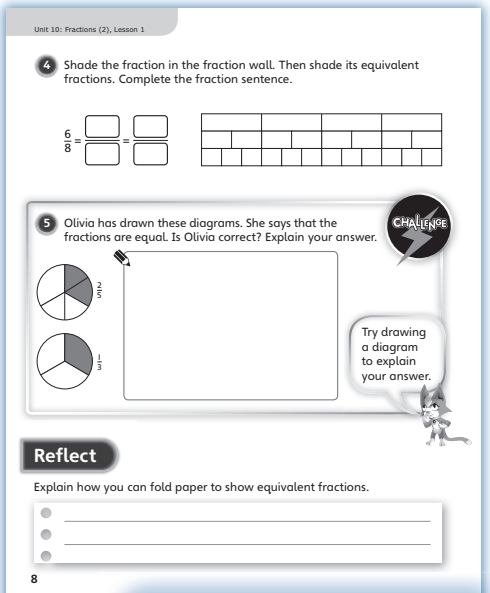
Reflect

WAYS OF WORKING Pair work

IN FOCUS Begin this activity by giving children time to discuss with a partner how they can make equivalent fractions by folding a piece of paper. Once children have discussed their methods, give them time to write their explanations. Can they draw a diagram to support their reasoning?

ASSESSMENT CHECKPOINT Look for clarity in children's explanations. They should refer to the fact that equivalent fractions are the same size, but can be split into a different number of equal parts. Some children may want to model the activity with a piece of paper to cement their understanding.

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



PUPIL PRACTICE BOOK 3C PAGE 8

After the lesson

- Do children know what equivalent fractions are?
- Can children explain how to make equivalent fractions?
- Which resources did children find most useful?

Equivalent fractions 2

Learning focus

In this lesson, children will learn to recognise and show equivalent fractions with small denominators, predominantly represented on number lines.

Small steps

- Previous step: Equivalent fractions (1)
- **This step: Equivalent fractions (2)**
- Next step: Equivalent fractions (3)

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

- Recognise and show, using diagrams, equivalent fractions with small denominators.
- Compare and order unit fractions, and fractions with the same denominators.

ASSESSING MASTERY

Children can show equivalent fractions on a number line. They can confidently describe how to use number lines to find equivalent fractions. Children use their knowledge of equivalence to mark fractions with different denominators on a number line. For example, on a number line labelled from 0 to 1, they can mark $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$.

COMMON MISCONCEPTIONS

Children may not have complete mastery of fractions – for example, they may find it difficult to place fractions on a number line. Some children may count the marks on a number line, rather than the intervals, and may be unsure of how to count in different fractional amounts. Ask:

- *How many equal parts has the number line been split into? What denominator will the fractions in this number line have?*

Some children may believe that to find equivalent fractions, you 'do the same to the top and the bottom', such as adding or subtracting the same number. For instance, some children may believe that $\frac{7}{8} = \frac{8}{9}$, since 7 + 1 = 8 and 8 + 1 = 9. Ask:

- *Can you think of a fraction that is equivalent to $\frac{1}{4}$? What did you do to find this equivalent fraction? What did you do to the numerator and the denominator?*

STRENGTHENING UNDERSTANDING

Allow time for all children to be confident when using a variety of resources. Revisit counting in fraction intervals, by showing children pre-marked number lines with different denominators. Hide some of the fractions and ask children to find them. If children generalise incorrectly, rather than telling them what is wrong, provide time for them to explain their findings. Ask: *Show me $\frac{7}{8}$. Show me $\frac{8}{9}$. Are they equal? How do you know?*

GOING DEEPER

Provide children with pairs of fractions that are equal and some that are not equal. Ask them to group them in 'equivalent fractions' and 'non-equivalent fractions'. Ask: *How can you prove your answers? What resources will you use?* By choosing their own resources and explaining their findings, children will gain a deeper understanding.

KEY LANGUAGE

In lesson: fraction, equivalent, equal, number line

Other language to be used by the teacher: whole, compare, intervals, shared, equal parts, numerator, denominator, multiply (×), divide (÷)

STRUCTURES AND REPRESENTATIONS

fraction wall, number line, bar model

RESOURCES

Mandatory: fraction wall, number line, fraction strips, bar model

Optional: paper strips, fraction tiles, fraction rods

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

Before you teach

- Do children know how to place unit fractions on a number line?
- What other experiences can you offer children so they understand how to recognise equivalent fractions?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What does the picture show? How many parts does the bracelet have? What fraction of the bracelet is blue? What fraction of the bracelet is pink? Which fraction strip on the wall is the same length as the blue part of the bracelet?*
- Question 1 b): *Is there another fraction strip that is the same length? How can you show your results?*

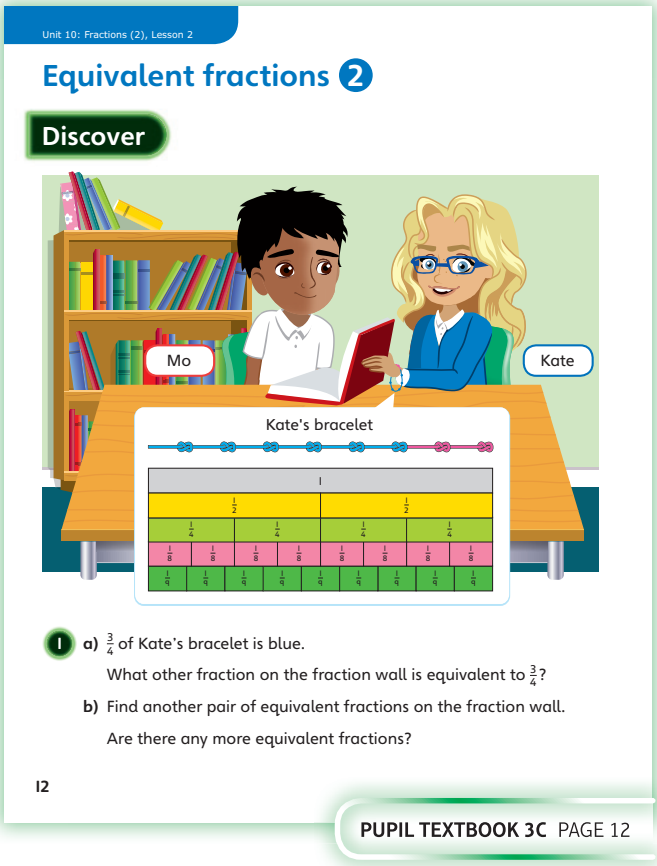
IN FOCUS Question 1 b) allows children to find pairs of equivalent fractions. The picture should encourage children to notice the fraction strips that are of equal length. Ask: *What does 'equivalent fraction' mean? What are you looking for on the fraction wall?*

PRACTICAL TIPS Give children the opportunity to recreate the question using concrete resources, such as fraction tiles or fraction rods, to build the fraction strips. They can use a string or paper strip to create a number line. They can measure the distance each bar represents and find the equivalent fractions. Moving from concrete to pictorial representations will deepen their understanding of equivalent fractions.

ANSWERS

Question 1 a): $\frac{3}{4} = \frac{6}{8}$

Question 1 b): $\frac{1}{4} = \frac{2}{8}$, $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$, $\frac{3}{4} = \frac{6}{8}$



PUPIL TEXTBOOK 3C PAGE 12

Share

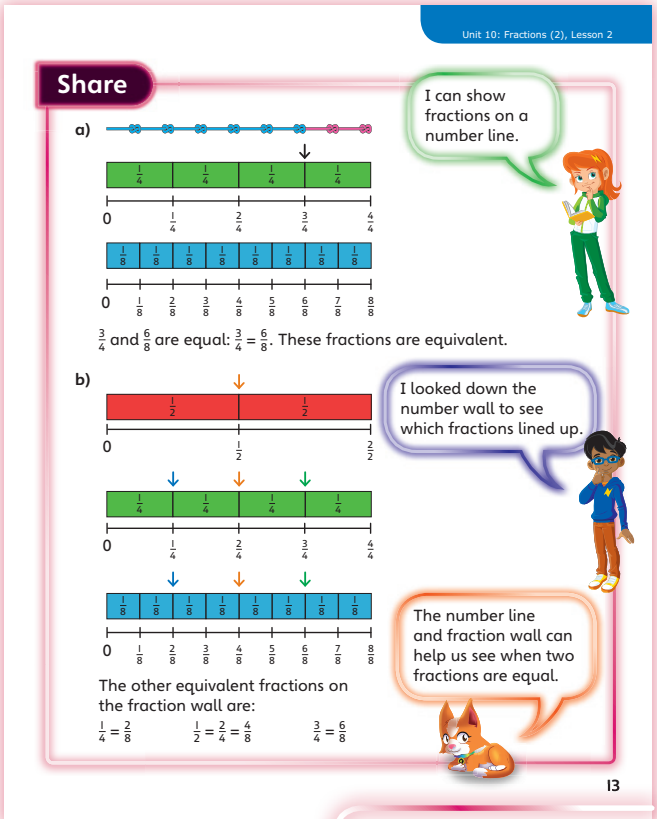
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *How many parts are there in total on the bar that shows $\frac{3}{4}$? What does the arrow show? What fraction do the top number line and fraction strip represent? What fraction do the second number line and fraction strip represent? Tell me a fraction that is equivalent to $\frac{1}{4}$. How do you know? Are there others?*
- Question 1 b): *What are the coloured arrows pointing to? Can you see any other fractions that are equivalent?*

IN FOCUS Use this opportunity to recap the potential misconceptions listed in the **Common misconceptions** section. Allow children to show their understanding of using a number line to show equivalent fractions.

STRENGTHEN Discuss the different equivalent fractions that children may have found. Ask: *How do you know these fractions are equal? How did you use the number line and the fraction wall to find the equivalent fractions? Choose one pair of equivalent fractions. What do these fractions have in common? How do they differ?*



PUPIL TEXTBOOK 3C PAGE 13

Think together

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

ASK

- Question 1 : *How many equal parts are there in each of the number lines? What would the denominator in each of these fractions be?*
- Question 2 : *How will you decide which of the number lines from question 1 you can use to help you?*

IN FOCUS Question 1 requires children to locate fractions with the same denominator on a number line.
In question 2, children are required to use the number lines again, this time to find the missing numerators and denominators. Listen to children's reasoning for their answers, and encourage discussion of how the number lines can be used to identify equivalent fractions.

Question 3 builds on the knowledge that children have gathered so far in the lesson and requires children to show how they can use number lines to find fractions equivalent to $\frac{2}{3}$. Children need to label the lines independently and use their understanding of equivalence to solve the question.

STRENGTHEN Question 3 strengthens children's understanding, by revising one of the potential misconceptions highlighted in the lesson (that they have identified the fraction that is one mark before the end of each of the number lines). Encourage children to explain why Zac is wrong, using diagrams and the correct mathematical vocabulary.

DEEPEN Deepen children's understanding by asking them to compare $\frac{3}{4}$, $\frac{7}{8}$ and $\frac{11}{12}$. Ask: *Which fraction is the biggest? Which fraction is the smallest? Can you place all these fractions on the same number line labelled from 0 to 1?*

ASSESSMENT CHECKPOINT At this point in the lesson, children know how to order fractions on a number line. They understand how to use number lines to find equivalent fractions. For an indication of their understanding, observe their work as they attempt to solve question 3 .

ANSWERS

Question 1 a): $\frac{2}{4}$, $\frac{3}{4}$

Question 1 b): $\frac{2}{8}$, $\frac{4}{8}$, $\frac{6}{8}$

Question 1 c): $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$

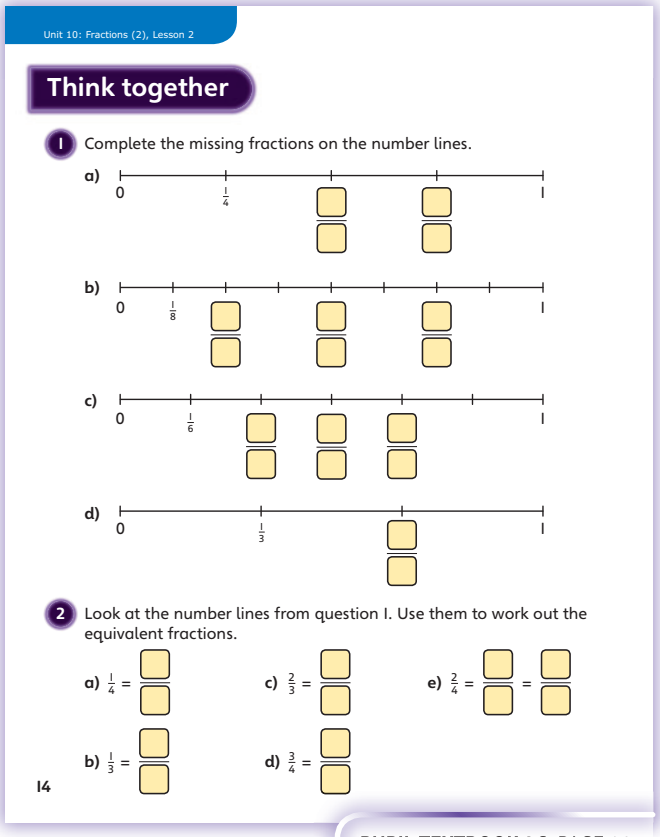
Question 1 d): $\frac{2}{3}$

Question 2 : Possible answers include a) $\frac{1}{4}=\frac{2}{8}$ b) $\frac{1}{3}=\frac{2}{6}$ c) $\frac{2}{3}=\frac{6}{9}$ d) $\frac{3}{4}=\frac{6}{8}$ e) $\frac{2}{4}=\frac{3}{6}=\frac{4}{8}$

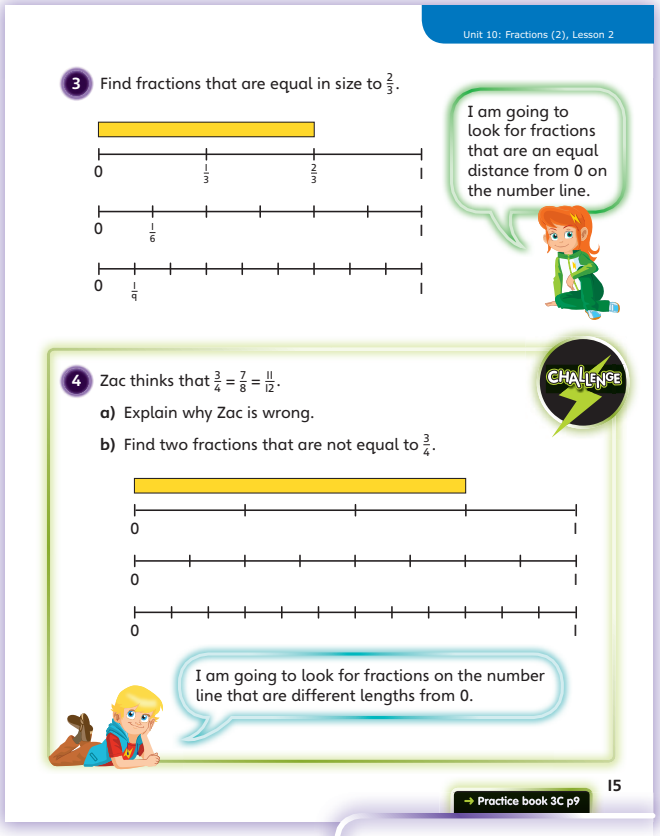
Question 3 : $\frac{4}{6}$, $\frac{6}{9}$

Question 4 a): Use the number lines to explain why the fractions are not equal.

Question 4 b): Various correct answers, such as $\frac{2}{8}$, $\frac{3}{12}$ etc.



PUPIL TEXTBOOK 3C PAGE 14



PUPIL TEXTBOOK 3C PAGE 15

Practice

WAYS OF WORKING Independent thinking

IN FOCUS These questions will help children to secure their understanding of identifying equivalent fractions using diagrams. They use number lines to find the missing numerator and/or denominator from the given equivalent fractions.

STRENGTHEN If children are struggling, use paper fraction strips, so that they can see a concrete representation of the question. In question 1, ask: *What is $\frac{1}{2}$ equal to (think of the example in the lesson)? How can you use the number lines to find equivalent fractions? What are you looking for? What does 'equivalent fraction' mean?*

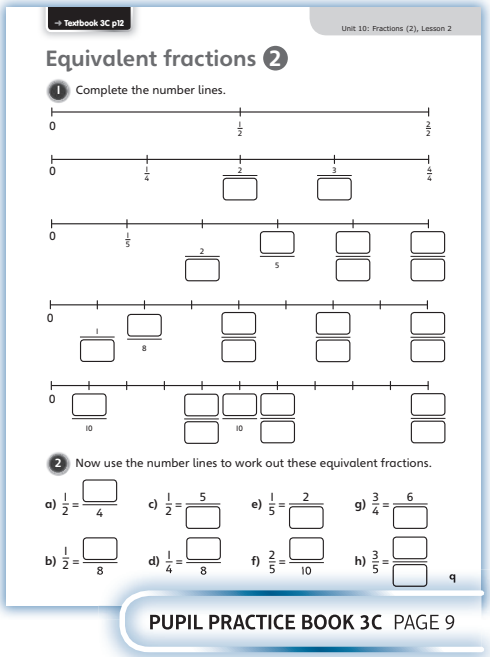
DEEPEN Deepen children's understanding in question 4 by asking them: *How big is the interval from $\frac{1}{4}$ to $\frac{1}{2}$? How big is the interval from $\frac{1}{8}$ to $\frac{1}{2}$?* Ask them to demonstrate how they know they are correct.

Children could also explore the concept presented in question 6 in more depth. When discussing the fractions in the question, children need to think about how different parts of the whole are joined together to make one. Ask: *What does a whole look like in a diagram? How can it be represented as a fraction? What other equivalent fractions can you find?*

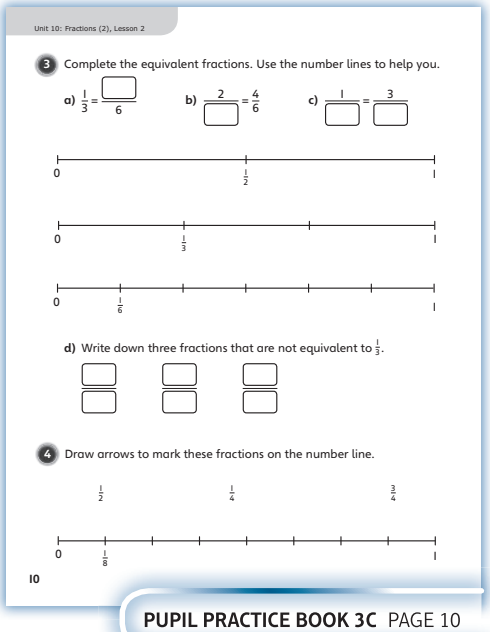
THINK DIFFERENTLY Question 5 encourages children to think differently by identifying the fractions that are not equivalent.

ASSESSMENT CHECKPOINT Children should be confident in identifying and showing equivalent fractions using diagrams. They can explain how number lines can be used to find equivalent fractions, using the correct mathematical language.

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



PUPIL PRACTICE BOOK 3C PAGE 9



PUPIL PRACTICE BOOK 3C PAGE 10

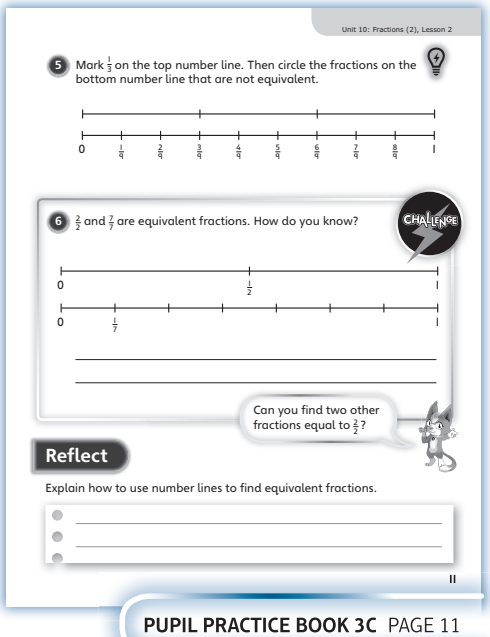
Reflect

WAYS OF WORKING Pair work

IN FOCUS Start by giving children time to discuss with a partner how to use number lines to find equivalent fractions. Once children have discussed their methods, give them time to write their explanations. Challenge them to make a missing number question for their partner.

ASSESSMENT CHECKPOINT Look for clarity in children's explanations. They should make reference to the fact that equivalent fractions are the same size, but can be split into a different number of equal parts.

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



PUPIL PRACTICE BOOK 3C PAGE 11

After the lesson

- Can children show equivalent fractions using number lines and use number lines to help them find equivalent fractions?
- Were children able to use diagrams to support their findings?
- Were children able to explain their reasoning?

Equivalent fractions 3

Learning focus

In this lesson, children will continue to develop their ability to find equivalent fractions using proportional reasoning. Diagrams are used to build children's understanding of pattern and numerical reasoning.

Small steps

- Previous step: Equivalent fractions (2)
- **This step: Equivalent fractions (3)**
- Next step: Comparing fractions

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

- Recognise and show, using diagrams, equivalent fractions with small denominators.
- Solve problems that involve [equivalent fractions with small denominators].

ASSESSING MASTERY

Children can use proportional reasoning to understand equivalent fractions and pairs of fractions, through the relationship between the numerator and denominator of each fraction.

COMMON MISCONCEPTIONS

Some children will use methods that do not apply to all scenarios. For example, if you double the fraction to find families of equivalent fractions, this will work for $\frac{1}{3} = \frac{2}{6} = \frac{4}{12}$, but not for finding $\frac{5}{15}$ or $\frac{6}{18}$. Children need to understand the meaning of the digits in a fraction, rather than relying on rules they cannot explain. Ask:

- *What are the numerator and denominator in $\frac{2}{4}$ showing us? What is the relationship between them? Can you think of an equivalent fraction that uses different numbers, but shows the same thing?*

STRENGTHENING UNDERSTANDING

Show children concrete representations of $\frac{1}{3}$, such as $\frac{1}{3}$ of a chocolate bar. Split each third into 3 equal parts. Children establish that $\frac{1}{3} = \frac{3}{9}$. Move from concrete to pictorial representation, by asking children to find $\frac{1}{3}$ on a fraction wall or number line.

GOING DEEPER

Ask children to look at the relationship between the numerator and denominator of $\frac{1}{3}$. 1 is a third of 3, or 3 is three times greater than 1. Now ask children to look at $\frac{3}{9}$. Ask: *What relationship is there between the numerator and denominator of $\frac{3}{9}$?* Give children opportunities to develop their proportional reasoning when considering the relationship between the numerator and denominator in a fraction.

KEY LANGUAGE

In lesson: numerator, denominator, equivalent fraction, pattern, multiply by, divide by

Other language to be used by the teacher: proportional reasoning, missing fraction, relationship, unit fraction, whole

STRUCTURES AND REPRESENTATIONS

fraction strip model, number line, fraction wall

RESOURCES

Mandatory: fraction cards, number lines, fraction strips, paper strips

Optional: number cards

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

Before you teach

- Are children confident in showing equivalent fractions?
- Are children confident using number lines and fraction strips?
- What resources will you provide beyond the number lines and fraction strips so that the lesson is as hands-on as possible?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What are equivalent fractions? What fraction does Reena need to find an equivalent to? What is the relationship between the numerator and denominator in $\frac{1}{2}$?*
- Question 1 b): *What fractions can you make with the numbers shown?*

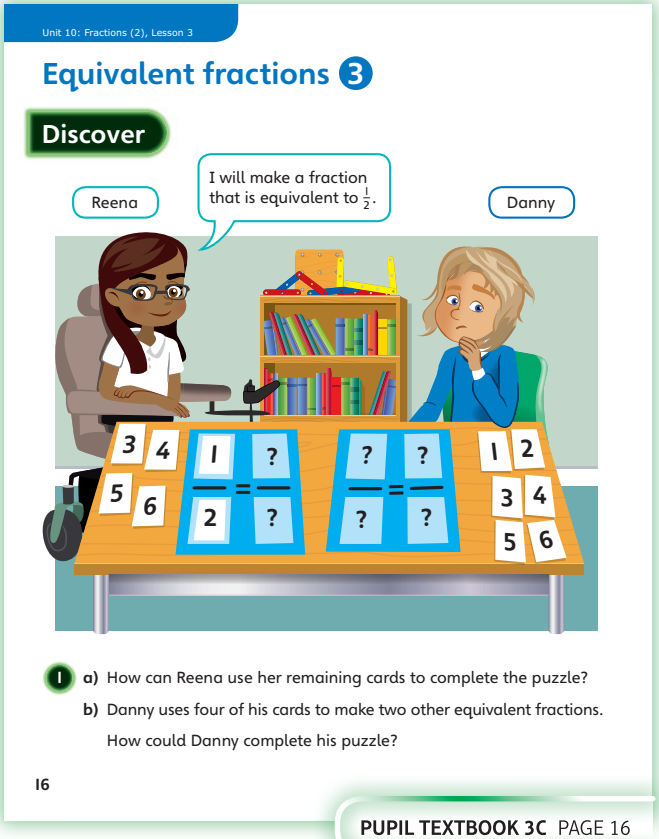
IN FOCUS Use this task to encourage children to use the visual diagrams they have seen in previous lessons to find other fractions that are equal to $\frac{1}{2}$. This is an opportunity to recap and briefly assess children's current understanding of the numerator and denominator in a fraction. In question 1 a), encourage children to realise that they can use any of the four available number cards, but only some combinations will make an equivalent for $\frac{1}{2}$. In question 1 b) they have the numbers 1 to 6 available. Ask: *Can you think of a pair of equivalent fractions, or suggest a fraction to start with?*

PRACTICAL TIPS Make sure each pair or group has five paper strips folded into halves, thirds, quarters, fifths and sixths. Remind children that they are looking to make $\frac{1}{2}$. Children could test for themselves how many $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ or $\frac{1}{6}$ they need to make $\frac{1}{2}$ (if any).

ANSWERS

Question 1 a): $\frac{1}{2} = \frac{3}{6}$

Question 1 b): Various possible answers: $\frac{1}{2} = \frac{3}{6}$; $\frac{2}{3} = \frac{4}{6}$; $\frac{1}{3} = \frac{2}{6}$; $\frac{4}{6} = \frac{2}{3}$; $\frac{3}{6} = \frac{1}{2}$; $\frac{2}{6} = \frac{1}{3}$



PUPIL TEXTBOOK 3C PAGE 16

Share

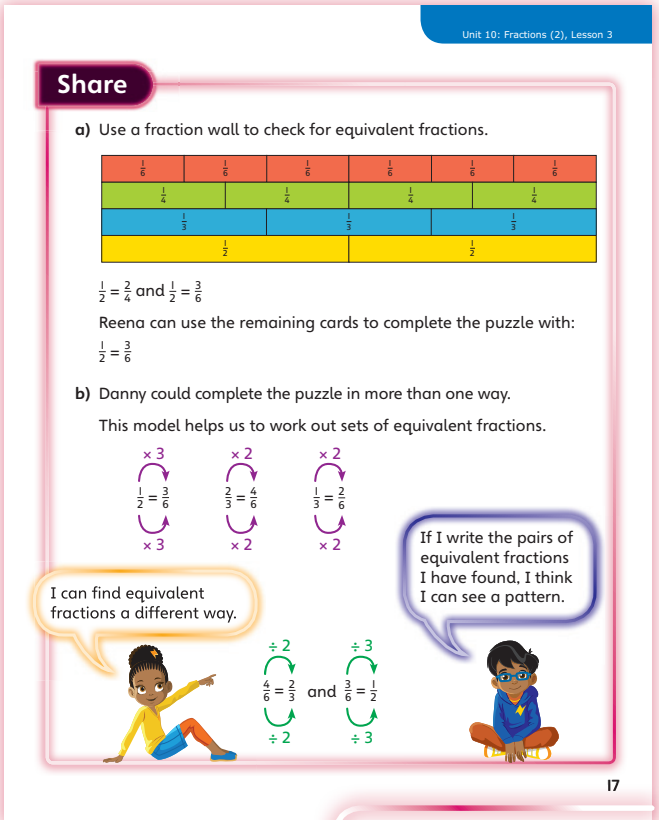
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *Tell me a fraction that is equivalent to $\frac{1}{2}$. What cards does Reena have? Can you make the equivalent of $\frac{1}{2}$ a different way, using the remaining cards? How do you know without checking the diagram?*
- Question 1 b): *Can you make another fraction? Can you find an equivalent fraction to that? Are there any other pairs of equivalent fractions you could make?*

IN FOCUS Children can show their understanding of equivalent fractions in these activities. Ask: *Can you explain why these fractions are equal? Are there other fractions equal to them?* Watch for, and discuss, any potential misconceptions children may have.

STRENGTHEN This is a good opportunity to reinforce the relationship that may exist between the numerator and denominator. For example, children could be looking for fractions where the numerator is two times or three times less than the denominator (or where the denominator is two times, or three times greater).



PUPIL TEXTBOOK 3C PAGE 17

Think together

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

ASK

- Question 1 a): *What are equivalent fractions? How can you use number lines to find equivalent fractions?*
- Question 2 : *What does each numerator show? What does each denominator show? How can you use this information to find the missing numerators and denominators?*

IN FOCUS Questions 1 and 2 will help scaffold the children's use of diagrams. Ask children to match the number lines with the fractions they are making.

STRENGTHEN In question 1, ask children to describe the pattern in each pair of fractions they make. Ask: *How many times bigger is the denominator than the numerator?* In question 2, look for the pattern that exists between both fractions. Ask: *How many times bigger is one denominator than the other? Will you multiply or divide to find the missing number?*

DEEPEN Challenge children in question 3 by asking them to think about different ways in which the question can be answered. Not only will they practise finding equivalent fractions, but they will also have an opportunity to reason which method they prefer and why. To deepen their understanding even further, ask them to draw diagrams to support their answers.

ASSESSMENT CHECKPOINT At this point in the lesson, children should be more confident in finding equivalent fractions using proportional reasoning. Visual diagrams are used to build their understanding of pattern and numerical reasoning.

They are becoming increasingly fluent in keeping the same relationship between numerator and denominator in all equivalent fractions.

ANSWERS

Question 1 a): $\frac{1}{2} = \frac{5}{10}$ or $\frac{1}{5} = \frac{2}{10}$

Question 1 b): $\frac{1}{5} = \frac{2}{10}$ or $\frac{1}{2} = \frac{5}{10}$

Question 2 a): $\frac{2}{5} = \frac{4}{10}$

Question 2 b): $\frac{3}{10} = \frac{6}{20}$

Question 2 c): $\frac{8}{10} = \frac{4}{5}$

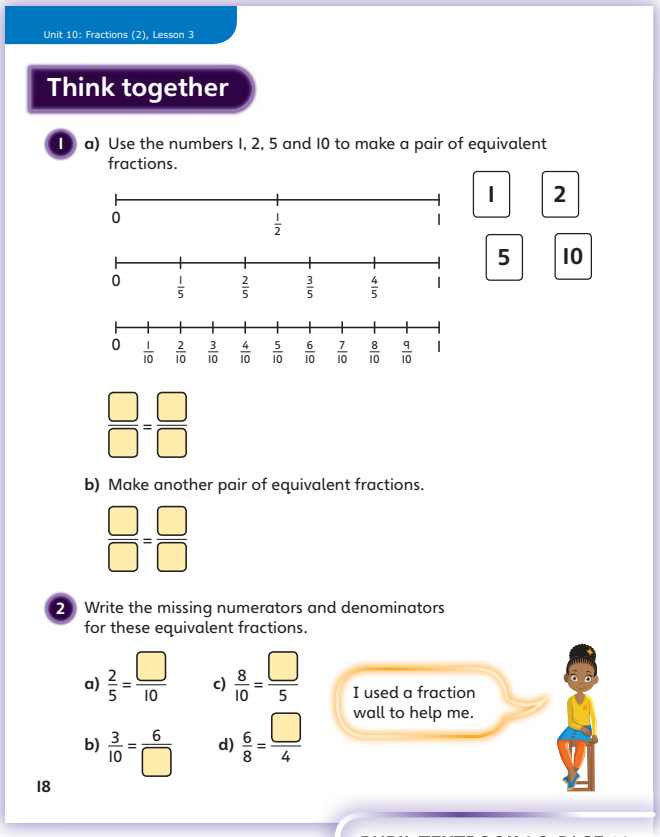
Question 2 d): $\frac{6}{8} = \frac{3}{4}$

Question 3 a): $\frac{1}{5} = \frac{4}{20}$

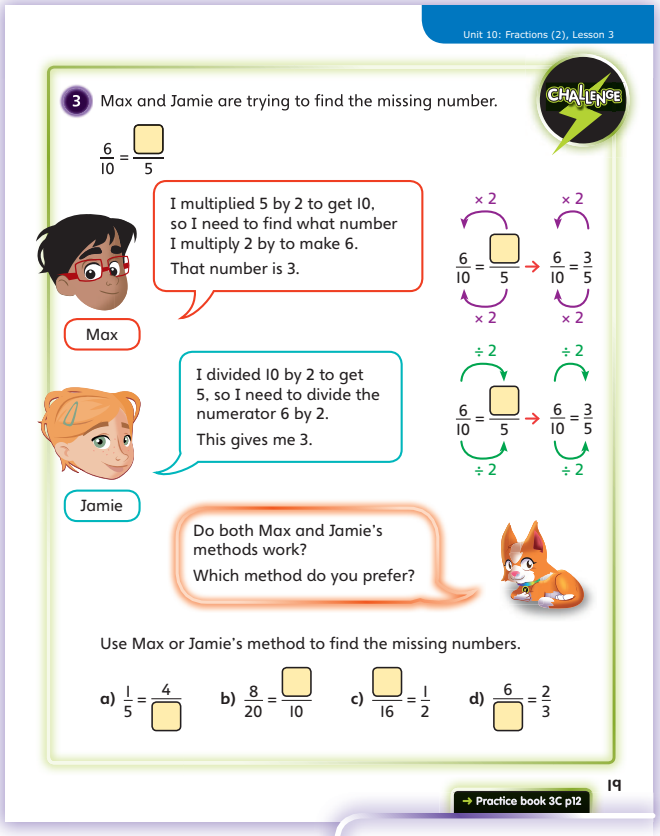
Question 3 b): $\frac{8}{20} = \frac{4}{10}$

Question 3 c): $\frac{8}{16} = \frac{1}{2}$

Question 3 d): $\frac{6}{9} = \frac{2}{3}$



PUPIL TEXTBOOK 3C PAGE 18



PUPIL TEXTBOOK 3C PAGE 19

Practice

WAYS OF WORKING Independent thinking

IN FOCUS Question 1 scaffolds children's understanding of using diagrams to find equivalent fractions. Shading representations of the fractions is very beneficial in giving children an opportunity to develop their fluency in finding missing numerators.

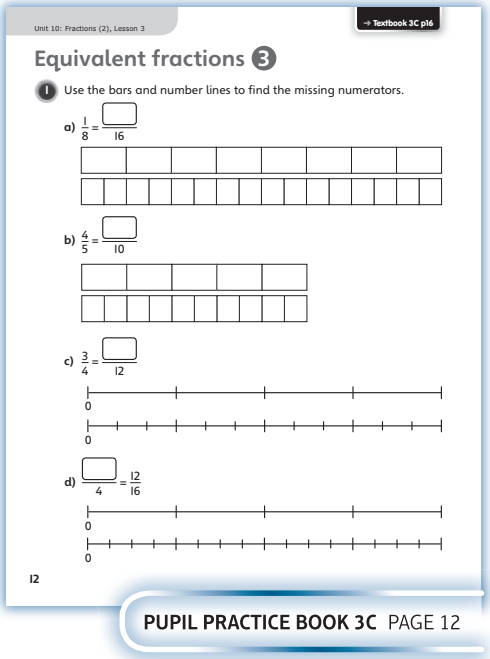
STRENGTHEN If children need support with question 2, it may be helpful to use number lines and fraction strips to make each of the fractions presented in the question. Ask: *How do you know you are right?* Once they have a clear visual representation in their heads, help them develop their proportional reasoning. Ask: *What can you divide 12 by to get 3? What can you multiply 2 by to get 8?*

DEEPEN Use question 5 to deepen their explanation and reasoning skills. Ask: *What part of the lesson did Emma not understand? How will you explain the mistake? What should the answer have been? Can you draw a diagram to show your answer?*

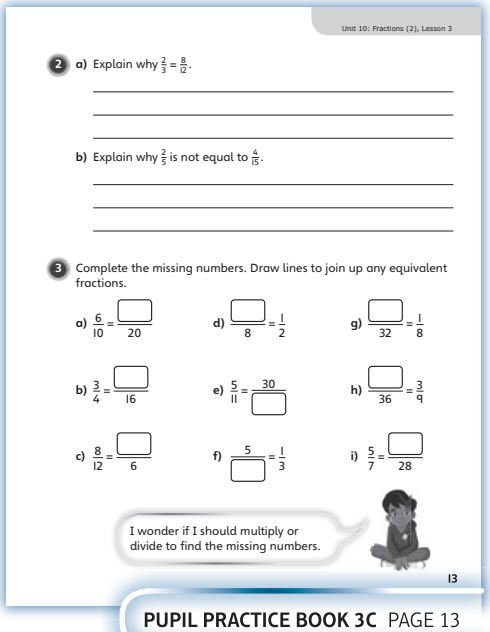
THINK DIFFERENTLY Question 4 offers children an opportunity to problem solve and think independently. Children have to work systematically to find the answer. Ask: *Can you find another answer? Can you explain your answer in two ways?* This is a good opportunity to clarify any misconceptions that children may have. Ask: *What clues did you use to find the answer? Can you use a number line to support your answer?*

ASSESSMENT CHECKPOINT At this point in the lesson, children should be able to confidently use their understanding of pattern and numerical reasoning to find equivalent fractions.

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



PUPIL PRACTICE BOOK 3C PAGE 12



PUPIL PRACTICE BOOK 3C PAGE 13

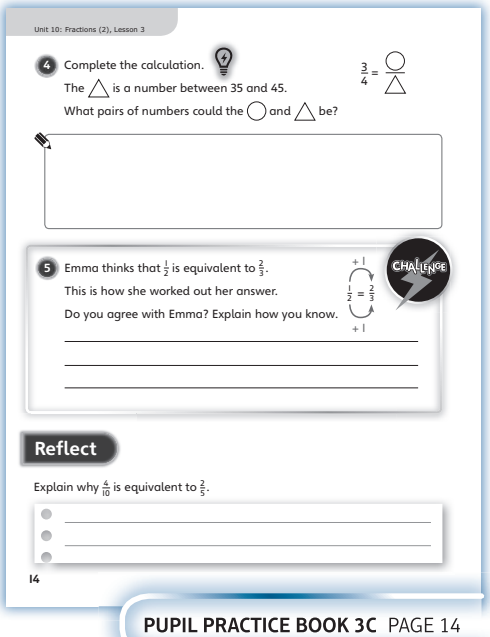
Reflect

WAYS OF WORKING Independent thinking

IN FOCUS This question offers a good opportunity to observe children's reasoning. Pay particular attention to their thinking about the relationship between the numerator and denominator of a single fraction, or the proportional relationship between the numerators and denominators in a pair of fractions.

ASSESSMENT CHECKPOINT Look for children who are able to clearly explain their reasoning. They can use a concrete representation or picture to justify their answer, rather than reverting to a preferred rule or shortcut to try to find the answer.

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



PUPIL PRACTICE BOOK 3C PAGE 14

After the lesson

- Have children recognised the links between the concepts explored in the past three lessons?
- How will you reinforce these links?

Comparing fractions

Learning focus

In this lesson, children will compare two fractions using a fraction wall and use the <, > or = signs.

Small steps

- Previous step: Equivalent fractions (3)
- **This step: Comparing fractions**
- Next step: Comparing and ordering fractions

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

- Recognise and show, using diagrams, equivalent fractions with small denominators.
- Compare and order unit fractions, and fractions with the same denominators.

ASSESSING MASTERY

Children can compare and order unit fractions and fractions with the same denominator. Children can use a fraction wall to help them compare and order fractions with different denominators.

COMMON MISCONCEPTIONS

Children may think that when comparing fractions they must compare both the numerator and the denominator, for example, that $\frac{2}{8} > \frac{1}{2}$ since 2 > 1 and 8 > 2. Provide fraction strips showing $\frac{1}{8}$s and $\frac{1}{2}$s. Use fraction strips to represent the fractions. Ask:

- *Which fraction is bigger? How do you know? What does the denominator of each fraction show? Does the number of parts matter when comparing fractions?*

STRENGTHENING UNDERSTANDING

Make sure children are familiar with how to use a fraction wall, and what each bar represents. Ask: *What is the biggest unit fraction you can see? What is the smallest?*

GOING DEEPER

Help children to create their own fraction wall using folded paper strips glued onto a piece of cardboard. This resource will help children to understand the parts of the fraction wall, and become fluent in using it to compare fractions..

KEY LANGUAGE

In lesson: **inequality statement**, fraction wall, numerator, denominator, inequality, compare, greater than (>), less than (<)

Other language to be used by the teacher: partition, unit fraction, whole

STRUCTURES AND REPRESENTATIONS

fraction strip, number line, fraction wall

RESOURCES

Mandatory: fraction wall

Optional: coloured paper to make fraction strips

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

Before you teach

- Can children recognise and use unit and non-unit fractions?
- Is your classroom set up to allow children to compare fractions easily and regularly?
- Do children have access to different fraction representations to develop their fluency?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *Which turtle is closer to the sea, the top one or the bottom one? Can you estimate which turtle will arrive at the sea first? How do you know? What do the signs <, > and = mean?*
- Question 1 b): *Look at the fraction wall in the picture. Can you find $\frac{2}{3}$? What does the denominator 4 mean? Which lines in the fraction wall do we need to find and compare?*

IN FOCUS Use the picture to recap and briefly assess children's current understanding of unit fractions. Begin by making sure they understand the meaning of the digits in a fraction. Children may need to be reminded of what the comparison signs <, > and = mean.

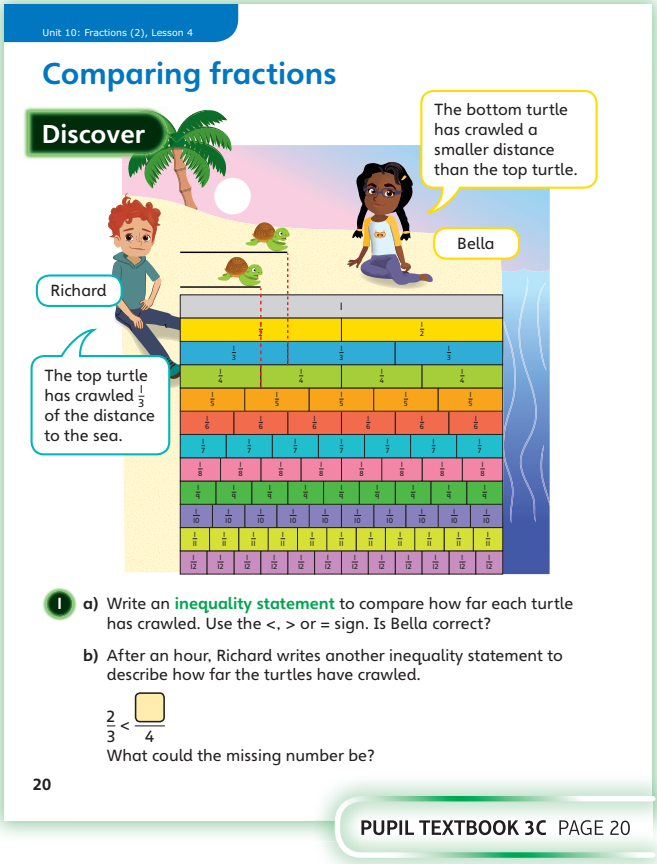
For question 1 a), ask children to focus on finding $\frac{1}{3}$ and $\frac{1}{4}$ on the fraction wall. Ask: *Which fraction is greater?*

PRACTICAL TIPS Ask children to use the fraction wall they have made or the one in the **Discover** picture. Encourage children to identify a fraction that is less than $\frac{1}{2}$ and another one greater than $\frac{1}{2}$. Repeat for $\frac{2}{3}$ and so on.

ANSWERS

Question 1 a): $\frac{1}{4} < \frac{1}{3}$ so Bella is correct.

Question 1 b): $\frac{2}{3} < \frac{3}{4}$ or $\frac{2}{3} < \frac{4}{4}$



PUPIL TEXTBOOK 3C PAGE 20

Share

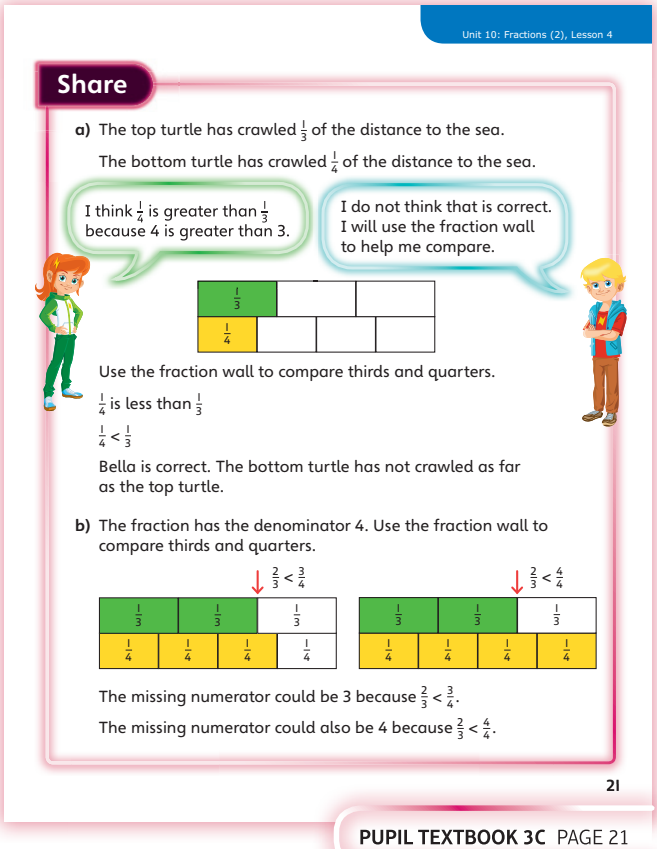
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *Look at the fraction each bar represents. Which one is longer? Which one is shorter? Do you agree with Astrid? How could you help her learn from her mistake?*
- Question 1 b): *What fraction strip will you compare $\frac{2}{3}$ with? What does the denominator of 4 in the second fraction show? Where in the line will $\frac{2}{3}$ be? Will the other fraction be placed on the left or on the right of $\frac{2}{3}$ on the line? How do you know?*

IN FOCUS Use this opportunity to make sure children are confident comparing fractions. Use question 1 b) to make sure children know that they are comparing the total length of the bar, rather than the number of bars each fraction represents.

STRENGTHEN It is important to make sure that children are confident in writing their own comparison statements. Ask: *Is $\frac{2}{3}$ greater or less than $\frac{1}{4}$? How do you know? Is $\frac{2}{3}$ greater or less than $\frac{2}{4}$?* Children can use the fraction strips to compare fractions and explain their answers.



PUPIL TEXTBOOK 3C PAGE 21

Think together

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

ASK

- Question 1 a): *What fraction does the first strip represent?*
- Question 1 b): *Find $\frac{1}{2}$ on the relevant number line. Find $\frac{3}{4}$. Is $\frac{3}{4}$ more or less than $\frac{1}{2}$?*
- Question 2 a): *What does a denominator of 3 show? What does a denominator of 9 show?*
- Question 2 b): *Which fraction strips are you comparing? How can you record your findings?*

IN FOCUS Questions 1 and 2 give an opportunity to compare unit fractions, and fractions with small denominators. Children use their knowledge of locating fractions on a number line, and compare the fractions based on their location. Ask: *How far is each fraction from 0? Which fraction is further from 0?*

STRENGTHEN For all the questions in this section of the lesson, ask children to use the fraction wall to compare fractions. Children can use their knowledge of equivalent fractions when justifying their answers, for instance $\frac{3}{4} = \frac{9}{12}$ and $\frac{9}{12} > \frac{7}{12}$, hence $\frac{3}{4} > \frac{7}{12}$.

DEEPEN Deepen children's conceptual understanding of comparing fractions. Ask: *When comparing unit fractions, does a bigger denominator mean the fraction is bigger? Explain your answer. Would it make a difference if all the fractions had the same numerator of 2? What about 3?*

Listen for children who can generalise, and encourage them to use the correct mathematical vocabulary when explaining their findings.

ASSESSMENT CHECKPOINT Children should now be confident in using the fraction wall to discuss the position of fractions and compare them accordingly. Listen to their reasoning when working through question 2. They should be able to record their findings using the signs <, > and =, and be able to justify their thinking.

ANSWERS

Question 1 a): $\frac{1}{5} > \frac{1}{6}$

Question 1 b): $\frac{1}{2} < \frac{3}{4}$

Question 2 a): $\frac{1}{3} > \frac{1}{9}$

Question 2 b): $\frac{1}{8} < \frac{2}{9}$

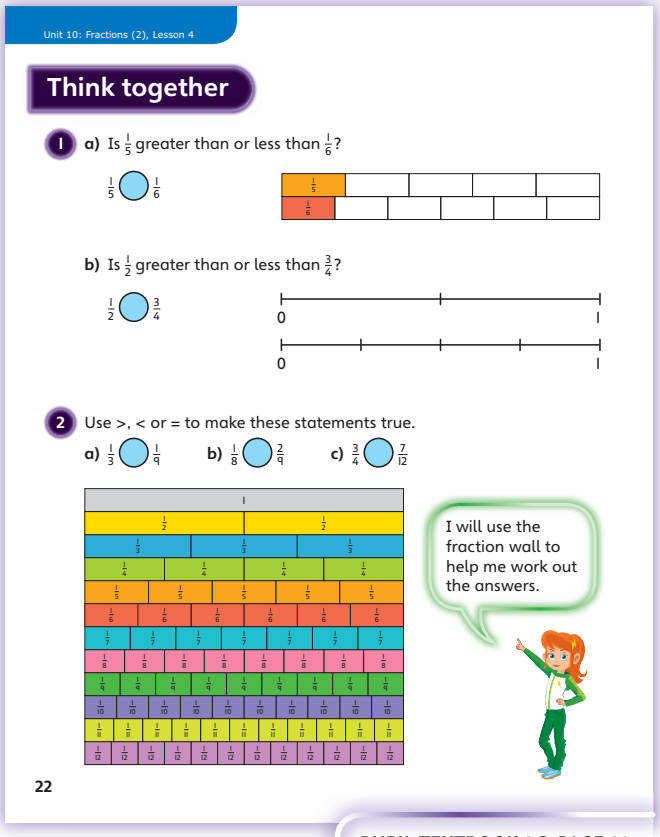
Question 2 c): $\frac{3}{4} > \frac{7}{12}$

Question 3 a): Various possible correct answers, including $\frac{1}{8} > \frac{1}{10} > \frac{1}{12}$

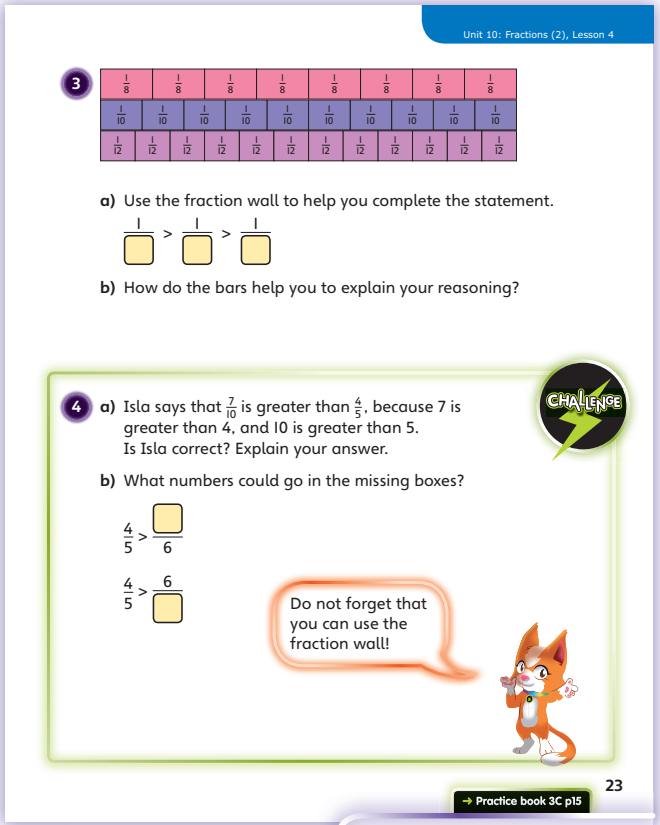
Question 3 b): Various possible explanations. For example, the bars offer a visual representation of the size of the parts, so it can be seen that $\frac{1}{8}$ is a bigger bar than $\frac{1}{10}$.

Question 4 a): No, Isla is not correct. $\frac{7}{10} < \frac{4}{5}$ because $\frac{4}{5}$ is equivalent to $\frac{8}{10}$ and $\frac{7}{10} < \frac{8}{10}$.

Question 4 b): Various possible answers, such as $\frac{4}{5} > \frac{3}{6}$ and $\frac{4}{5} > \frac{6}{9}$



PUPIL TEXTBOOK 3C PAGE 22



PUPIL TEXTBOOK 3C PAGE 23

Practice

WAYS OF WORKING Independent thinking

IN FOCUS In question 1, fractions are illustrated in different ways. This will deepen children's conceptual understanding and help them to see the fractions in new, and sometimes non-linear, representations.

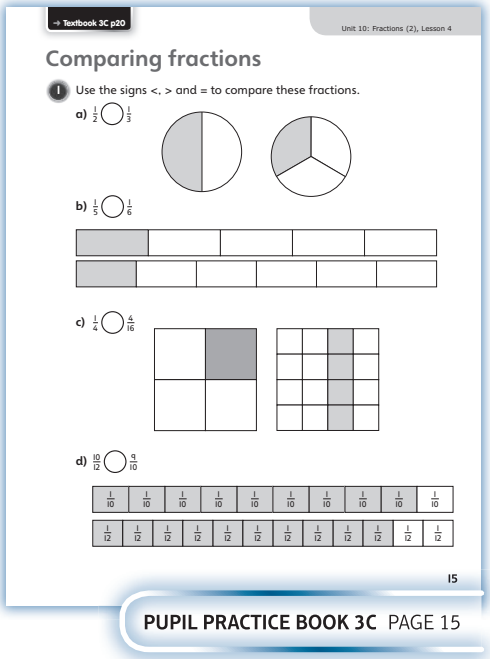
STRENGTHEN Children should continue to use the fraction wall to find the missing numbers in questions 3, 4, and 5. For these questions, provide children with copies of the fraction wall, which they may colour in to help them with the comparisons. Add fraction scaffolds to encourage children to complete the questions independently.

DEEPEN Ask children to use the fraction wall to come up with their own questions similar to question 6, to ask each other. For example, ask: *Which fraction might I be thinking of, if it is greater than $\frac{1}{3}$ but less than $\frac{3}{5}$? Are there any other possible answers?*

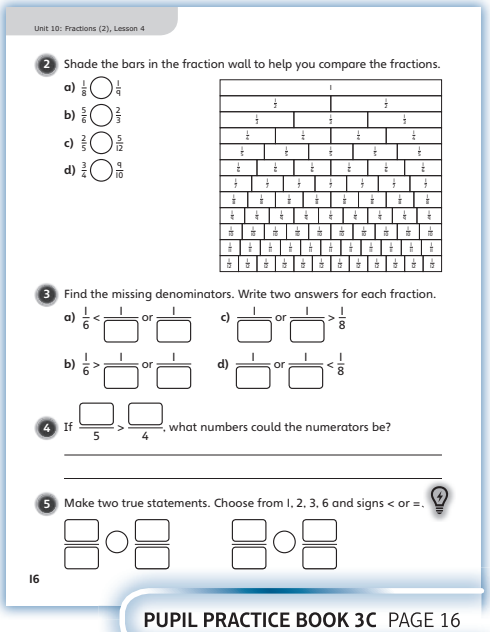
THINK DIFFERENTLY Question 5 provides a good opportunity for children to work systematically to compare fractions, while also identifying fractions that are equivalent. Encourage children to explain the reasoning behind their choices, using the appropriate vocabulary.

ASSESSMENT CHECKPOINT Children should be confident in comparing fractions. They should recognise equivalent fractions, and use their knowledge to compare unit fractions and fractions with small denominators.

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



PUPIL PRACTICE BOOK 3C PAGE 15



PUPIL PRACTICE BOOK 3C PAGE 16

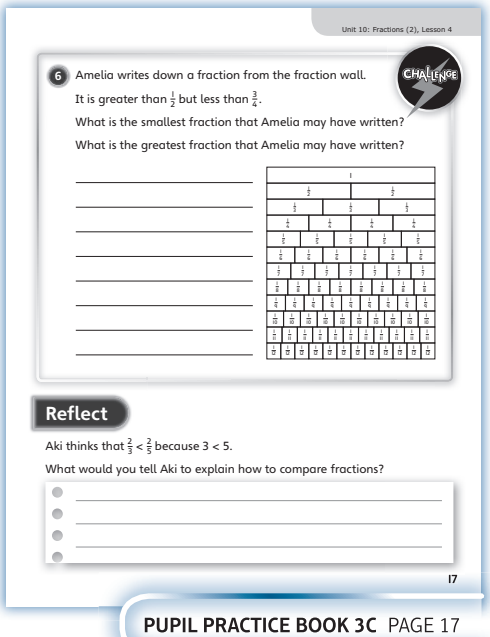
Reflect

WAYS OF WORKING Pair work

IN FOCUS Give children the opportunity to share their ideas with their partner. If they have answered the question differently, can they explain each other's method?

ASSESSMENT CHECKPOINT Children should be comfortable using a variety of concrete and pictorial manipulatives, as well as appropriate vocabulary to explain their ideas.

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



PUPIL PRACTICE BOOK 3C PAGE 17

After the lesson

- Are children able to use a fraction wall to compare fractions?
- What are the main areas that children need more practice with before moving on to the next lesson?

Comparing and ordering fractions

Learning focus

In this lesson, children will learn to compare two fractions using fraction strips and to order a set of fractions on a number line.

Small steps

- Previous step: Comparing fractions
- **This step: Comparing and ordering fractions**
- Next step: Adding fractions

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

Compare and order unit fractions, and fractions with the same denominators.

ASSESSING MASTERY

Children understand that fractions are numbers in their own right. They can compare and order fractions using a number line.

COMMON MISCONCEPTIONS

Some children will only put fractions with the same denominator on the same number line. Remind them that denominators locate a fraction on a number line. Ask:

- *Is the fraction less than $\frac{1}{2}$? Is it bigger than $\frac{1}{2}$?*

Use fraction strips to help secure children's understanding of how to compare different pairs of fractions.

STRENGTHENING UNDERSTANDING

Provide plenty of visual representations to compare fractions and help children to place them on the number line. Rather than just using the traditional 'pizza' representation, provide children with fraction strips, which they can place above one another when comparing fractions. Ask: *What do you notice about the fraction strips for thirds and sixths? How do these fractions compare with quarters?*

GOING DEEPER

Placing a number line above a fraction strip is helpful. This will help children to see where the fractions fit on the number line. Ask: *What do you notice? Which fraction comes first on the number line?*

KEY LANGUAGE

In lesson: equivalent fraction, numerator, denominator, fraction, order, less than (<), greater than (>)

Other language to be used by the teacher: unit fraction, fraction wall, compare, partition

STRUCTURES AND REPRESENTATIONS

bar model, number line, fraction wall

RESOURCES

Mandatory: fraction strips, number lines

Optional: fraction walls, paper strips

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

Before you teach

- Are children confident using the denominator to determine the number of equal parts in the whole?
- Can children order fractions with the same denominator?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *Can you count in quarters? What comes before $\frac{3}{4}$? And after? Can you make $\frac{2}{4}$ or $\frac{1}{4}$ with the number cards you have available?*
- Question 1 b): *Do the fractions have different denominators? How can you work out which is bigger?*

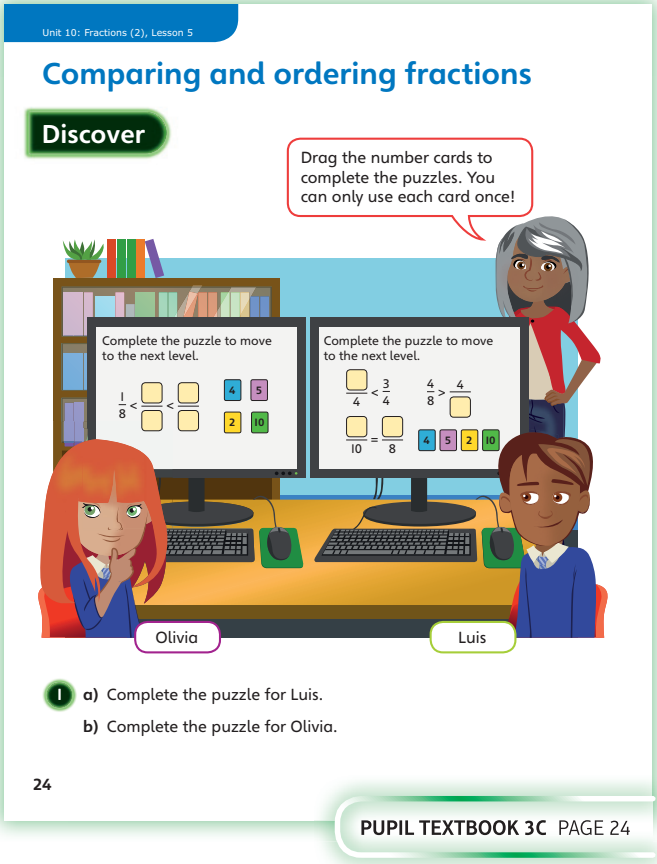
IN FOCUS Children can decide what resources or representations to use, and work out the answer methodically. They need to have a firm understanding of what the denominator and numerator represent. Watch for any misconceptions, such as: 'the larger the denominator, the larger the fraction'.

PRACTICAL TIPS Provide children with paper strips and number lines labelled from 0 to 1. The more opportunity children have to use fractions, the stronger their understanding will be. Ask them to fold the strips of paper into quarters, eighths, fifths, tenths and halves, to support them in finding solutions to the questions.

ANSWERS

Question 1 a): $\frac{2}{4} < \frac{3}{4}$; $\frac{4}{8} > \frac{4}{10}$; $\frac{5}{10} = \frac{4}{8}$

Question 1 b): $\frac{1}{8} < \frac{2}{10} < \frac{4}{5}$



PUPIL TEXTBOOK 3C PAGE 24

Share

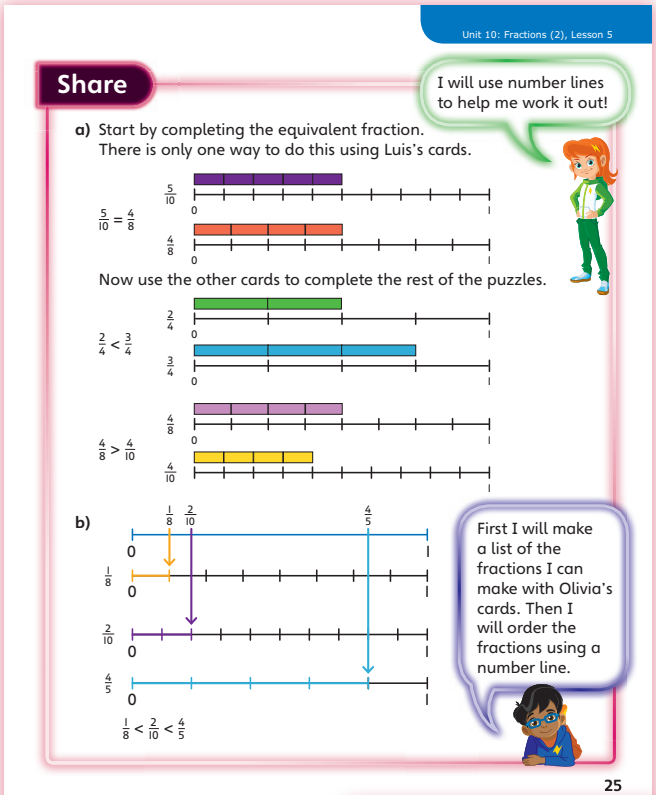
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *How can you use number lines to compare fractions?*
- Question 1 a): *What do you notice about comparing fractions that have the same denominator? Is this different to comparing fractions with the same numerator?*
- Question 1 a): *What do you notice about the equivalent fractions?*

IN FOCUS In question 1 a), children need to pay attention to both the given and the missing numbers. The first two fractions have denominators of 4; hence both number lines are split into 4 equal parts. The second two fractions have equal numerators (both 4); hence the smaller the denominator, the bigger the fraction will be. The third two fractions are equal. Ask: *How do you know that the two fractions in this puzzle are equal? Did you notice the 'equal to' sign?* They should use number lines that go up in $\frac{1}{10}$s and $\frac{1}{8}$s to identify equal fractions.

STRENGTHEN In question 1 b), encourage children to place the fractions they are comparing on a single number line labelled 0 to 1. Ask: *Would this fraction be closer to 0 or 1? How do you know? Has it passed the half-way line? What do you notice?*



PUPIL TEXTBOOK 3C PAGE 25

Think together

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

ASK

- Question 1 b): *How does Ash know that $\frac{5}{6}$ is less than one whole? How can one whole be represented?*
- Question 2 : *How many parts has each number line been split into? Which is the smallest of the fractions?*

IN FOCUS Question 1 a) requires children to compare fractions with the same denominator, while question 1 b) requires children to compare fractions with the same numerator. Ask: *Will your approach be different? What could the missing number be? What do you notice about the size of the fraction and the denominator? What do you notice about the size of the fraction and the numerator?*

For all questions in this section, encourage children to use number lines to check the missing number answers. Ask: *Can you think of another number that the numerator can be? Can the denominator be different?* Questions 1, 2 and 3 all provide opportunities for children to order fractions on a number line.

DEEPEN Ask children to organise the fractions from the lesson so far into two groups: 'less than $\frac{1}{2}$' and 'greater than $\frac{1}{2}$'. Ask: *In which group will this fraction go? How do you know you have organised the fractions correctly?*

To extend this further, ask children to place all the fractions on a single number line. Ask children whether they could use the fraction wall to check each fraction is in the correct position.

ASSESSMENT CHECKPOINT Children should be able to compare fractions with the same denominator. They can place fractions with small denominators on a number line and compare them with each other.

ANSWERS

Question 1 a): $\frac{3}{5} > \frac{2}{5}$ or $\frac{1}{5}$

Question 1 b): $\frac{5}{6} < \frac{5}{5}$

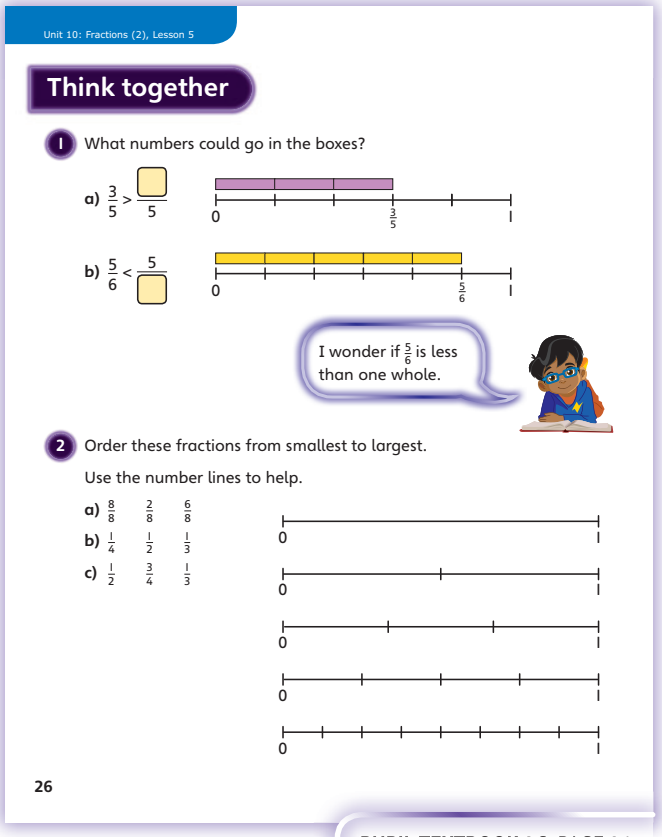
Question 2 a): $\frac{2}{8}, \frac{6}{8}, \frac{8}{8}$

Question 2 b): $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$

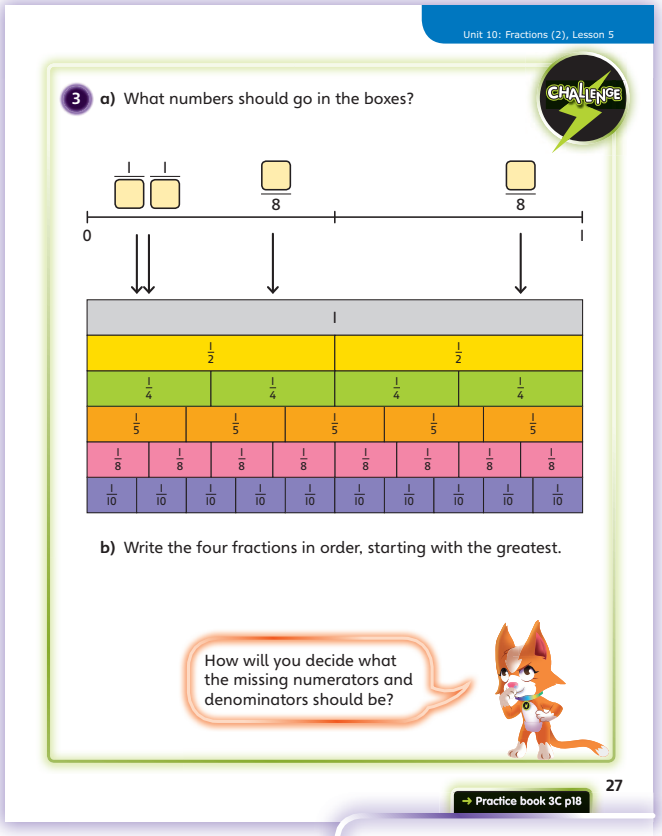
Question 2 c): $\frac{1}{3}, \frac{1}{2}, \frac{3}{4}$

Question 3 a): $\frac{1}{10}, \frac{1}{8}, \frac{3}{8}, \frac{7}{8}$

Question 3 b): $\frac{7}{8} > \frac{3}{8} > \frac{1}{8} > \frac{1}{10}$



PUPIL TEXTBOOK 3C PAGE 26



PUPIL TEXTBOOK 3C PAGE 27

Practice

WAYS OF WORKING Independent thinking

IN FOCUS Questions 1 and 2 help children to develop fluency with fractions, identifying them using a fraction wall and a number line. To find the missing numbers, children build on their knowledge of unit fractions, equivalent fractions and using fractions as numbers.

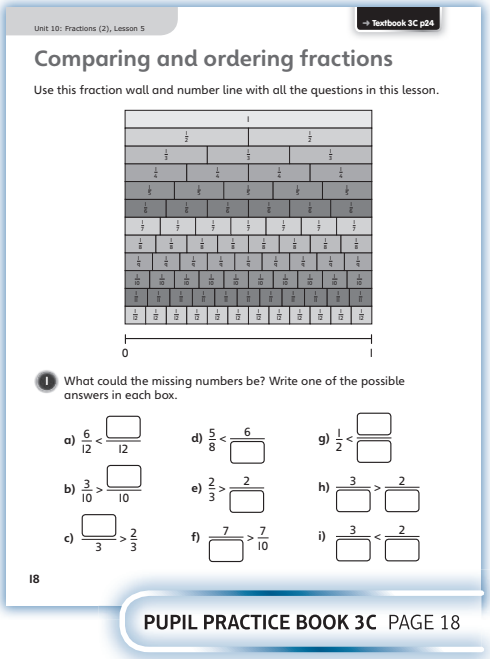
In question 5, children first need to work out what the numerator and denominator of each fraction could be, and then check that the numbers add up to 10. They can then place their fractions on the number line. Encourage children to justify their reasoning clearly.

STRENGTHEN If children are having trouble finding the mistake in question 3, provide a number line labelled from 0 to 1. Ask children to position the fractions $\frac{1}{10}$, $\frac{1}{2}$, $\frac{1}{5}$ and $\frac{9}{10}$ on the number line. Can they establish which fraction is in the wrong place?

DEEPEN Use question 4 to deepen children's reasoning and explanation skills. Ask: *What resource will you use to explain your findings? How many different answers can you find?*

ASSESSMENT CHECKPOINT At this point in the lesson, children should be able to confidently recognise and order fractions on a number line. Their answers to question 3 should demonstrate their ability to do this. They can record their findings using the signs <, >, = and fluently describe their findings. Question 4 should offer a good indication of their current level of understanding.

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


Unit 10: Fractions (2), Lesson 5

→ Textbook 3C p24

Comparing and ordering fractions

Use this fraction wall and number line with all the questions in this lesson.

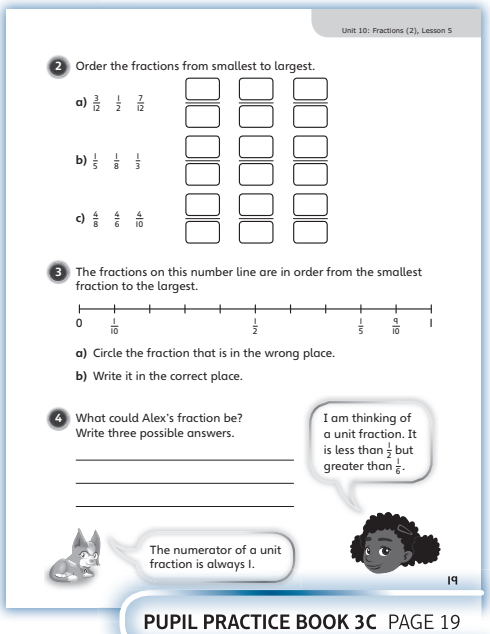
0 1

1 What could the missing numbers be? Write one of the possible answers in each box.

a) $\frac{6}{12} < \frac{\square}{12}$ b) $\frac{3}{10} > \frac{\square}{10}$ c) $\frac{\square}{3} > \frac{2}{3}$ d) $\frac{5}{8} < \frac{6}{\square}$ e) $\frac{2}{3} > \frac{2}{\square}$ f) $\frac{7}{\square} > \frac{7}{10}$ g) $\frac{1}{2} < \frac{\square}{\square}$ h) $\frac{3}{\square} > \frac{2}{\square}$ i) $\frac{3}{\square} < \frac{2}{\square}$

18

PUPIL PRACTICE BOOK 3C PAGE 18


Unit 10: Fractions (2), Lesson 5

2 Order the fractions from smallest to largest.

a) $\frac{3}{12}$ $\frac{1}{2}$ $\frac{7}{12}$

b) $\frac{1}{5}$ $\frac{1}{8}$ $\frac{1}{3}$

c) $\frac{4}{8}$ $\frac{4}{6}$ $\frac{4}{10}$

3 The fractions on this number line are in order from the smallest fraction to the largest.

0 $\frac{1}{10}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{9}{10}$ 1

a) Circle the fraction that is in the wrong place.

b) Write it in the correct place.

4 What could Alex's fraction be? Write three possible answers.

I am thinking of a unit fraction. It is less than $\frac{1}{3}$ but greater than $\frac{1}{6}$.

The numerator of a unit fraction is always 1.

19

PUPIL PRACTICE BOOK 3C PAGE 19

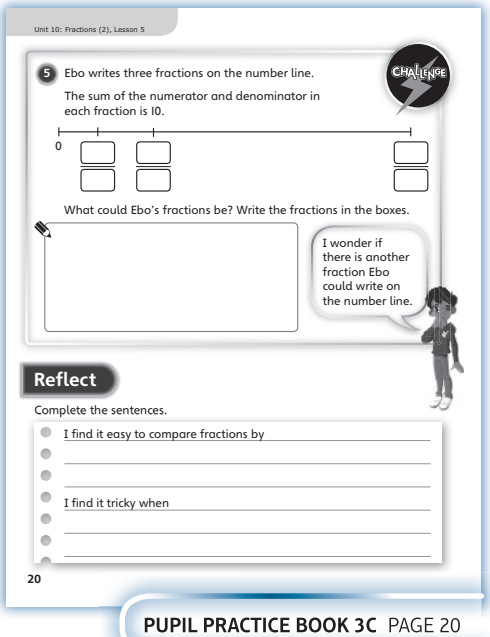
Reflect

WAYS OF WORKING Independent thinking

IN FOCUS Give children an opportunity to develop their own line of thinking. They should be able to link vocabulary they have learnt in past lessons to justify their thinking in this lesson.

ASSESSMENT CHECKPOINT Children should be comfortable using different methods to compare fractions. They should be able to explain confidently the importance of using different resources.

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


Unit 10: Fractions (2), Lesson 5

5 Ebo writes three fractions on the number line.

The sum of the numerator and denominator in each fraction is 10.

CHALLENGE

0

What could Ebo's fractions be? Write the fractions in the boxes.

I wonder if there is another fraction Ebo could write on the number line.

Reflect

Complete the sentences.

I find it easy to compare fractions by

I find it tricky when

20

PUPIL PRACTICE BOOK 3C PAGE 20

After the lesson

- Are children able to compare fractions confidently?
- Are children able to order fractions on a number line?
- How will you build in more opportunities to practise these skills?

Adding fractions

Learning focus

In this lesson, children will add two or more fractions with the same denominator.

Small steps

- Previous step: Comparing and ordering fractions
- **This step: Adding fractions**
- Next step: Subtracting fractions

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$].

ASSESSING MASTERY

Children will count fraction steps of a constant size, using their understanding of fractions as numbers. This will help them to make sense of adding fractions with the same denominator. They can find pairs of fractions that total one.

COMMON MISCONCEPTIONS

Children may try to add fractions by adding both the numerators and the denominators (for example, $\frac{2}{5} + \frac{1}{5} = \frac{3}{10}$). Ask:

- *How many parts has the whole been split into? If we start with $\frac{2}{5}$ and count on another $\frac{1}{5}$, how many do we have now? Has the denominator stayed the same size?*

Children may be confused by a whole being made of different fractions. Show them a 'whole', and then split it into fractions. Ask:

- *What does the whole look like? How many equal pieces has it been split into? If the whole has been split into 6 equal pieces, it is represented as $\frac{6}{6}$ – what if it is split into 5 pieces instead?*

STRENGTHENING UNDERSTANDING

Show fifths on a number line or fraction wall. Practise counting in fifths up to one whole. Provide children with a fraction strip split into 5 equal parts. Ask them to count along in fifths. Practise addition calculations, such as: 'start at $\frac{2}{5}$ and count on one more fifth'. Explain that this is written as $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$.

GOING DEEPER

Ask questions that require children to count fractions within the whole. Ask: *I started at $\frac{3}{8}$ and counted on $\frac{2}{8}$. Where did I land? I started at $\frac{1}{8}$ and landed at $\frac{6}{8}$. How many eighths have I counted? I counted on $\frac{5}{8}$ and landed at $\frac{6}{8}$. Where did I start?* Show how this is adding fractions, by recording as $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$ or $\frac{1}{8} + \frac{5}{8} = \frac{6}{8}$.

Provide different images of a 'whole'. For instance, when the denominator is 2, a whole can be represented as $\frac{2}{2}$. When the denominator is 5, a whole can be represented as $\frac{5}{5}$.

KEY LANGUAGE

In lesson: fraction, add, fraction strip, number line, calculation

Other language to be used by the teacher: numerator, denominator, unit fraction, non-unit fraction, whole, subtract

STRUCTURES AND REPRESENTATIONS

bar model, number line, fraction 'pizza'

RESOURCES

Mandatory: fraction strips, number lines

Optional: paper circles (paper plates), interlocking cubes

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

Before you teach

- Are children confident about what the numerator and denominator in a fraction show?
- Are children confident in describing one whole as a fraction?
- Are children confident with counting in different fraction steps?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *How many parts has each pizza been cut into? How many parts of each pizza are left?*
- Question 1 a): *What fraction of the pizza is left in the first box? And in the second box?*
- Question 1 a): *What does 'altogether' mean? How can you show this on a number line?*

IN FOCUS This picture shows fractions in a real-life context. Recap the misconception of adding the denominators, by asking children: *How many parts has each pizza been cut into? Does that number change if you eat a slice of the pizza?*

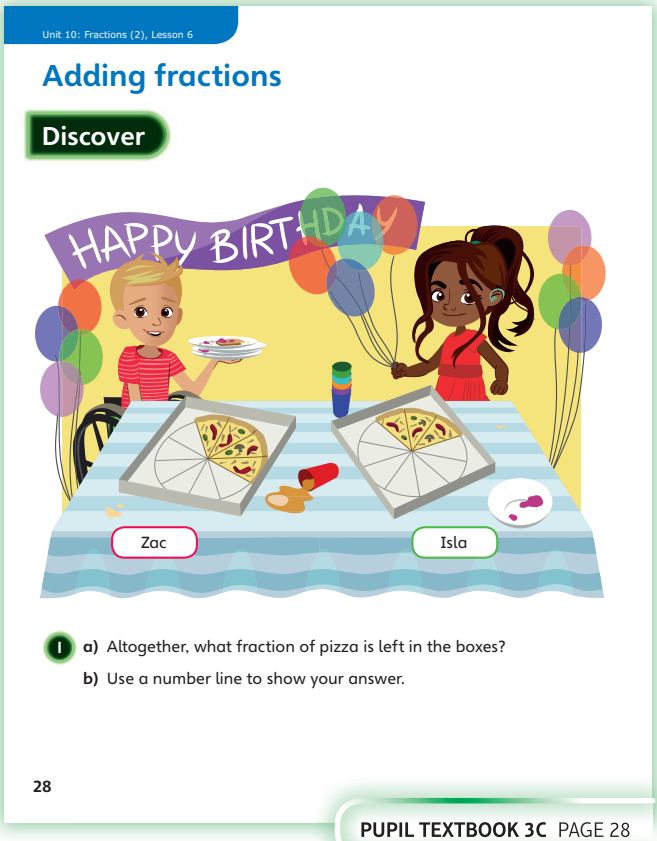
PRACTICAL TIPS On each table, provide a fraction strip split into 10 equal parts. This will help children to visualise one whole made up of 10 parts. It will also provide them with an opportunity to count along the strip in tenths.

Alternatively, offer a practical example. Make 'pizzas' out of paper plates divided into 10 equal pieces. Put 4 slices of pizza out. Discuss what fraction is being represented. Add 3 more slices of pizza and ask: *How many pieces do we have now? What fraction is this?*

ANSWERS

Question 1 a): $\frac{4}{10} + \frac{3}{10} = \frac{7}{10}$ There is $\frac{7}{10}$ left over altogether.

Question 1 b): Check children's number lines.



PUPIL TEXTBOOK 3C PAGE 28

Share

WAYS OF WORKING Whole class teacher led

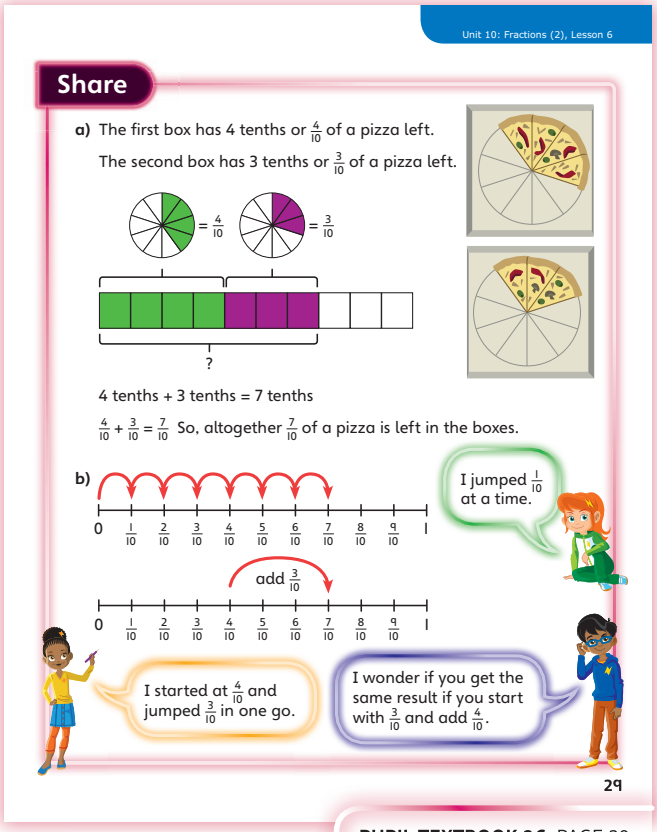
ASK

- Question 1 a): *What fraction of the pizza is left in each box?*
- Question 1 a): *Why did you decide to add the two fractions?*
- Question 1 a): *Why has the numerator changed? Why is the denominator still 10?*
- Question 1 b): *Look at Astrid and Flo's methods of adding using a number line. Which do you prefer? Why?*

IN FOCUS It is important to give children opportunities to add different fractions with the same numerator. Establish that we can show calculations with fractions on a number line, just as we can show calculations with whole numbers. You could also use fraction strips to show counting on, before helping children to transition to using a number line. Ask: *What mistakes might happen when adding fractions?* Clarify any misconceptions.

STRENGTHEN To support children with question 1 b), ask them to look at the fraction strip or the number line. Ask: *How many more tenths must we count to complete the whole? How can you show this as a fraction?*

Ask children to investigate Ash's comment. Ask: *Would your answer be different if you added* $\frac{3}{10} + \frac{4}{10}$*? Can you explain your answer using a diagram?*



PUPIL TEXTBOOK 3C PAGE 29

Think together

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

ASK

- Question 1: *What fractions are shown in each diagram?*
- Question 1: *Will the numerator change? Will the denominator stay the same? How do you know?*
- Question 2: *What diagrams can you use to check your answers?*

IN FOCUS Questions 1 and 2 provide children with practice in adding fractions with the same denominator. Ask them to explain what they are doing as they progress through the questions. Ensure children really understand what happens to the fractions when they are added. Ask: *Why does the denominator not change? What happens if you add the denominators? In your diagram, where are the fractions you are adding? Where is the answer?*

STRENGTHEN In question 3 b), strengthen the link between fractions being numbers, and adding fractions with the same denominator. Encourage children to use number bonds to think of different ways to make a fraction that is less than $\frac{11}{11}$. Ask: *Does the order in which we add the fractions matter?*

DEEPEN Encourage children to find different solutions to question 3 b). Ask: *What two numbers make less than 1?* Being confident with number bonds will help children to think of all the possible solutions. Ask children to investigate Ash's question. Ask: *How many answers can you find? How will you record your answers?* Encourage children to work systematically.

ASSESSMENT CHECKPOINT At this point in the lesson, children should be more confident adding fractions with the same denominator. They understand that fractions are numbers and are exploring their properties.

ANSWERS

Question 1 a): $\frac{5}{8}$

Question 1 b): $\frac{6}{9}$

Question 1 c): $\frac{6}{6}$

Question 2 a): $\frac{4}{5}$

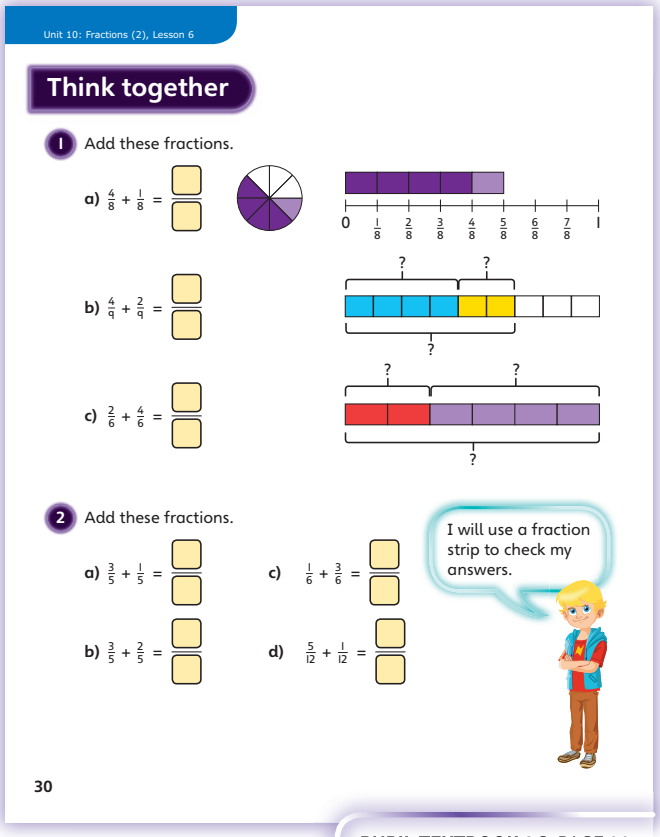
Question 2 b): $\frac{5}{5}$

Question 2 c): $\frac{4}{6}$

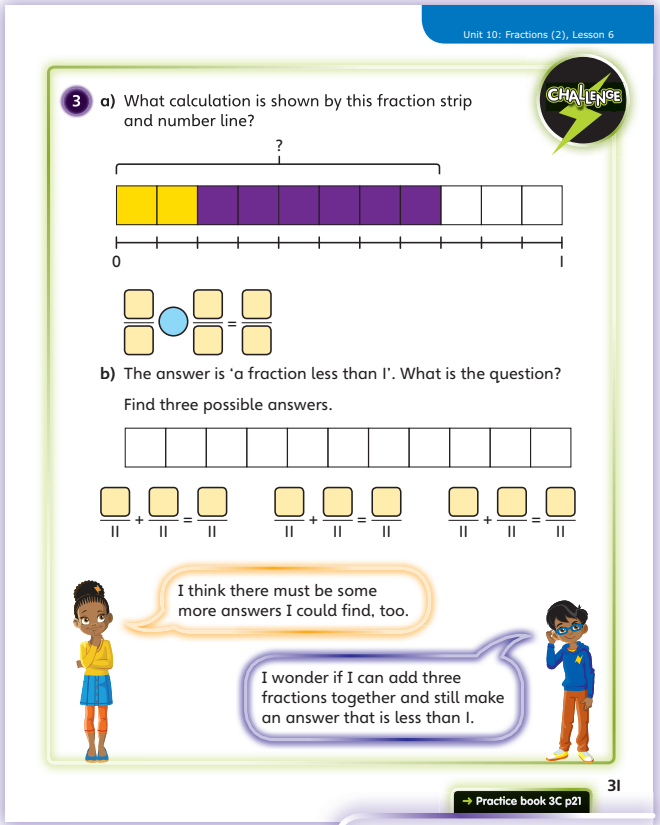
Question 2 d): $\frac{6}{12}$

Question 3 a): $\frac{2}{11} + \frac{6}{11} = \frac{8}{11}$

Question 3 b): Various possible answers that should total less than $\frac{11}{11}$. For example, $\frac{1}{11} + \frac{9}{11} = \frac{10}{11}$, $\frac{2}{11} + \frac{8}{11} = \frac{10}{11}$, $\frac{3}{11} + \frac{7}{11} = \frac{10}{11}$ etc. Three fractions could also offer various answers; for example, $\frac{1}{11} + \frac{2}{11} + \frac{3}{11} = \frac{6}{11}$, $\frac{2}{11} + \frac{3}{11} + \frac{4}{11} = \frac{9}{11}$ and so on.



PUPIL TEXTBOOK 3C PAGE 30



PUPIL TEXTBOOK 3C PAGE 31

Practice

WAYS OF WORKING Independent thinking

IN FOCUS Questions 1 and 2 provide children with visual images of fractions and require them to complete the additions. Do children understand how they can colour the shapes to help them find the answers?

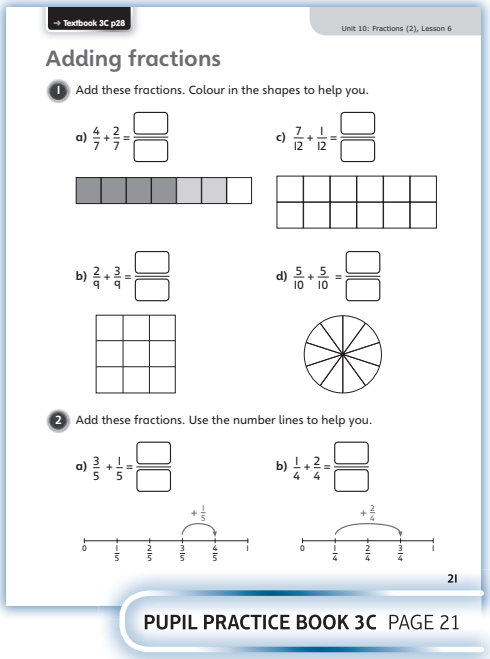
Question 6 requires children to have a secure understanding of what a 'whole' is. Children use number bonds and visual representations to explore pairs of fractions that total 1. If the children know that 5 + 3 = 8, this will help them to recognise that $\frac{5}{8} + \frac{3}{8} = \frac{8}{8}$.

STRENGTHEN Question 4 requires children to add fractions with the same denominator, without the support of a visual representation. Encourage them to explain their answers. Ask: *What can you do to check your answer?* Allow children to use fraction strips or number lines as support, if needed.

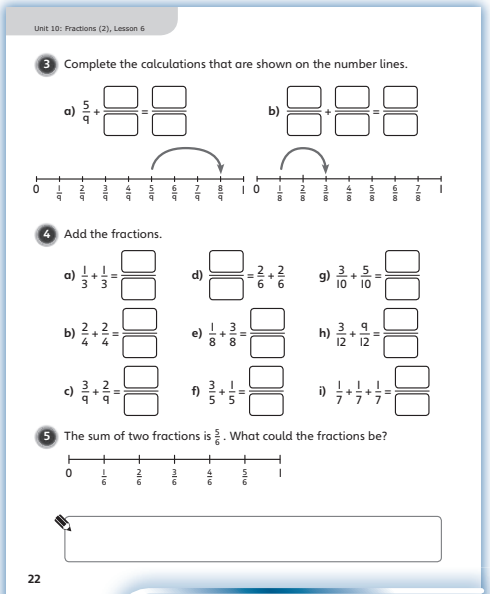
DEEPEN You could deepen question 5 by asking children to prove their ideas using diagrams. Ask: *How many ways can you demonstrate the answer? Explain how you know you have found them all.*

ASSESSMENT CHECKPOINT Children should be confident in understanding how to add fractions. They should understand that they can show calculations with fractions on a number line, in the same way they do with whole numbers.

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



PUPIL PRACTICE BOOK 3C PAGE 21



PUPIL PRACTICE BOOK 3C PAGE 22

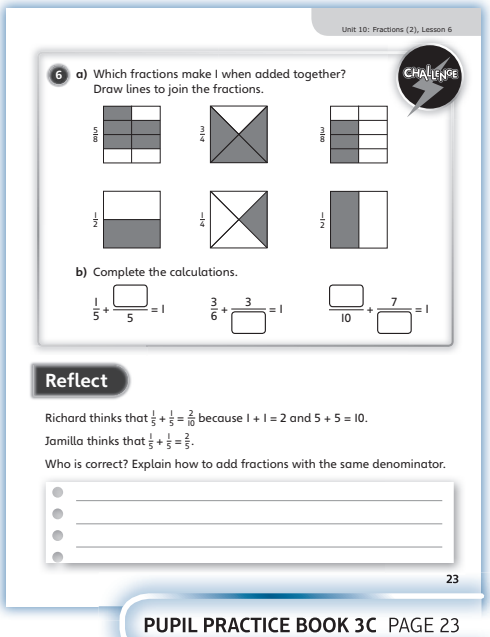
Reflect

WAYS OF WORKING Independent thinking

IN FOCUS Give children time to explain who they think is correct and why. Once they have recorded their thinking, ask them to share their ideas with their partner. Encourage them to use diagrams to support their thinking. Ask: *Can they explain to Richard how to add fractions with the same denominator?*

ASSESSMENT CHECKPOINT Look for clarity in children's explanations. Rather than learning a rule or short-cut to find the answers, children must know what is happening to the fractions when they are added and why.

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



PUPIL PRACTICE BOOK 3C PAGE 23

After the lesson

- Are children able to confidently explain how to add fractions with the same denominator within one whole?
- Do they fully understand what they are doing and why, or are they relying on a rule to answer questions?
- Can children confidently explain how to use number lines and fraction strips to support their answers?
- How will you build in more opportunities to practise adding fractions throughout the school day?

Subtracting fractions

Learning focus

In this lesson, children will learn to subtract fractions with the same denominator.

Small steps

- Previous step: Adding fractions
- **This step: Subtracting fractions**
- Next step: Problem solving – adding and subtracting fractions

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$].

ASSESSING MASTERY

Children will draw on their understanding of fractions as numbers and of counting in fraction steps of a constant size. This will help them make sense of subtracting fractions with the same denominator. They can find the difference between two fractions with the same denominator.

COMMON MISCONCEPTIONS

When subtracting fractions, children may subtract the numerators and the denominators separately. For example, they may think that $\frac{3}{5} - \frac{2}{5} = 1$, because 3 – 2 = 1 and 5 – 5 = 0. Ask:

- *If you do $\frac{3}{5} - \frac{2}{5}$, how many parts are in the whole? How many of these parts do you have to start with? How many of them are you subtracting? What do you have left?*

Children may think that whole numbers have the same denominator as the fraction subtracted, for example $1 - \frac{3}{8} = \frac{1}{8} - \frac{3}{8} = \frac{2}{8}$. With this misconception, children will often move the numerators around before subtracting. Ask:

- *If you are working in eighths and you do $1 - \frac{3}{8}$, how many eighths make up the 1 (the whole)? If you calculate $\frac{8}{8} - \frac{3}{8}$ what answer do you get?*

STRENGTHENING UNDERSTANDING

Present children with a real-life problem. Show them an orange and say: *If you have $\frac{3}{5}$ of this orange left and you give your friend 2 of the parts, what fraction of the original orange will you have left? If you had a whole orange and split it into 8 equal parts, what fraction of the orange would be left if you ate 3 of the parts?*

GOING DEEPER

When subtracting with fractions on a number line, children should work in the same way as with whole numbers. Encourage them to use a fraction strip and number line, and practise counting on and back in different fraction steps. Ask questions that require counting fractions within the whole, for instance: *I started at $\frac{7}{12}$ and counted back $\frac{2}{12}$. Where did I land? I started on $\frac{7}{12}$ and landed on $\frac{2}{12}$. How many twelfths have I counted?* Relate the counting to subtracting fractions and record it as $\frac{7}{12} - \frac{2}{12} = \frac{5}{12}$.

KEY LANGUAGE

In lesson: subtract, difference, fraction, whole, calculate

Other language to be used by the teacher: numerator, denominator, unit fraction, non-unit fraction, add, fraction strips

STRUCTURES AND REPRESENTATIONS

bar model, number line

RESOURCES

Mandatory: fraction strips, number lines

Optional: paper circles, interlocking cubes

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

Before you teach

- Do children understand what the numerator and denominator show in a fraction?
- Are they confident describing a whole as a fraction?
- Are they comfortable counting back in different fraction steps?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What fraction of the fuel is there to start with? How do you know?*
- Question 1 a): *What fraction of the fuel will be used on the journey? How much will there be left?*
- Question 1 b): *What is the question asking? Can you use a fraction strip to show the question?*

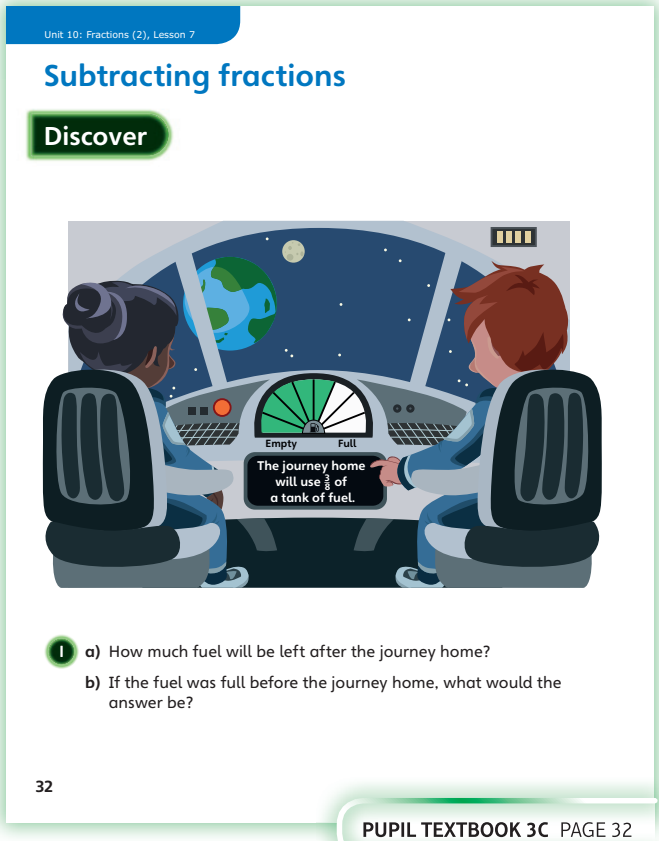
IN FOCUS Using a concrete pictorial approach, children will see how a real-life situation can be translated on paper using fraction strips and number lines. In order to calculate the fraction of fuel left, it is important they think of the fractions as numbers. Ask: *What would you do if the question said: 'There are 5 litres of fuel, 3 litres are used. How many litres are left?'*

PRACTICAL TIPS A fraction strip split into 8 equal parts will help children to visualise a whole made up of 8 parts. It will also allow children to count along the strip if needed. Provide a fraction bar for each table.

ANSWERS

Question 1 a): There will be $\frac{2}{8}$ left after the journey.

Question 1 b): If the fuel was full at the start, there would be $\frac{5}{8}$ left after the journey.



PUPIL TEXTBOOK 3C PAGE 32

Share

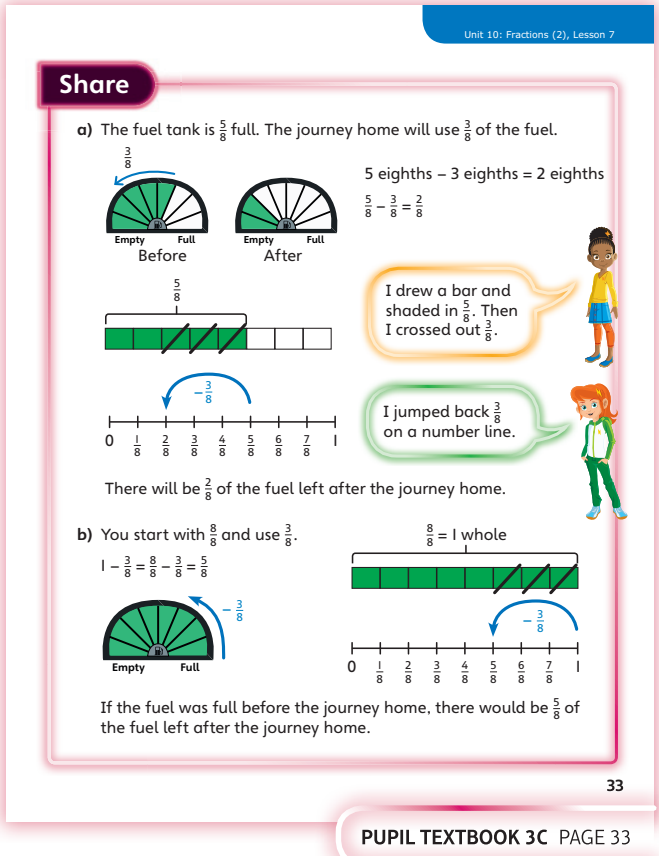
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *What does the coloured area on the fraction strip show?*
- Question 1 a): *Why has the numerator changed?*
- Question 1 b): *Why is the denominator still 8? Can you explain your answer using the diagrams?*

IN FOCUS It is important to give children opportunities to subtract different fractions with the same denominator. Establish that we can show calculations with fractions on a number line in the same way as we do with whole numbers. Fraction strips can be used to support counting back and the transition to using a number line. Some children may try to simplify $\frac{2}{8}$ to $\frac{1}{4}$. Avoid deliberately simplifying at this stage, as equivalent fractions should be encountered (with the support of a representation such as a fraction wall).

STRENGTHEN Relate the counting they have been doing with the subtraction of fractions, for example, record $\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$. Ask children to quickly practise $\frac{3}{8} - \frac{2}{8}$, $\frac{7}{8} - \frac{2}{8}$ and so on. Clarify any misconceptions. To strengthen the idea of 'whole', ask children to calculate what fraction of the whole tank is empty.



PUPIL TEXTBOOK 3C PAGE 33

Think together

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

ASK

- Question 1: *What fractions are shown in each diagram?*
- Question 1: *Will the numerators change? Will the denominators stay the same? How do you know?*
- Question 2 b): *What fraction can be used to represent 1 in this question? Why?*

IN FOCUS Questions 1 and 2 provide children with different visual representations of subtracting fractions with the same denominator. Ask children to explain their working to ensure they really understand what happens to the fractions when they are subtracted. Ask: *Why is the denominator not changing? What happens if you subtract the denominators? Would the answer be different?*

STRENGTHEN For question 3, strengthen the link between fractions being numbers and subtracting fractions with the same denominator. Use simple calculations, such as $7 - 4 = 3$, to show that finding the difference is another model of subtraction.

DEEPEN For question 3 b), draw two fraction strips or number lines, one above the other. Ask: *If the difference between the fractions is $\frac{3}{10}$, what will the fractions be? How can you show a difference of $\frac{3}{10}$ in the diagram?* Ask children to investigate Sparks' question. *How will you find all the answers? How can you record your answer?*

ASSESSMENT CHECKPOINT At this point in the lesson, children should be more confident in subtracting fractions with the same denominator. They are able to use a number line to count back.

ANSWERS

Question 1 a): $\frac{2}{8}$

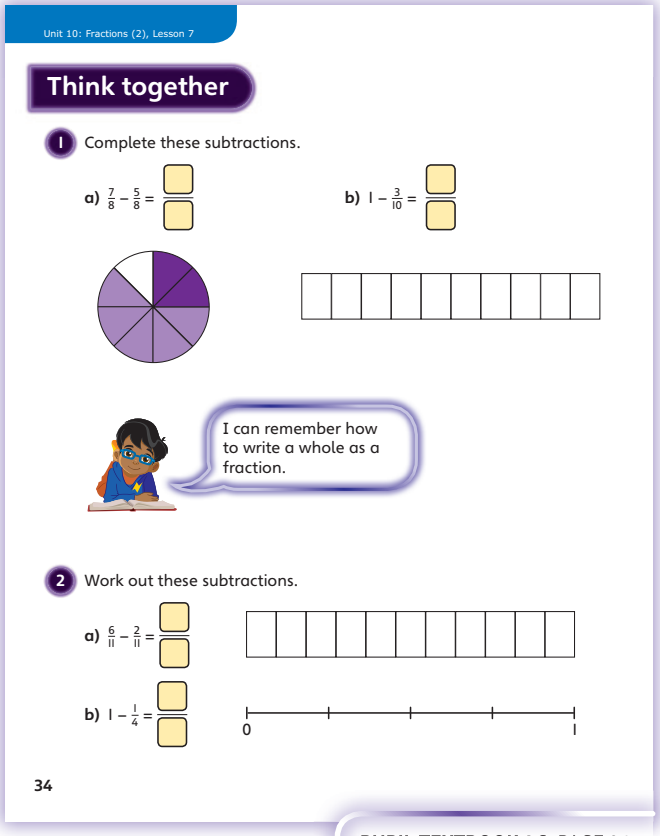
Question 1 b): $\frac{7}{10}$

Question 2 a): $\frac{4}{11}$

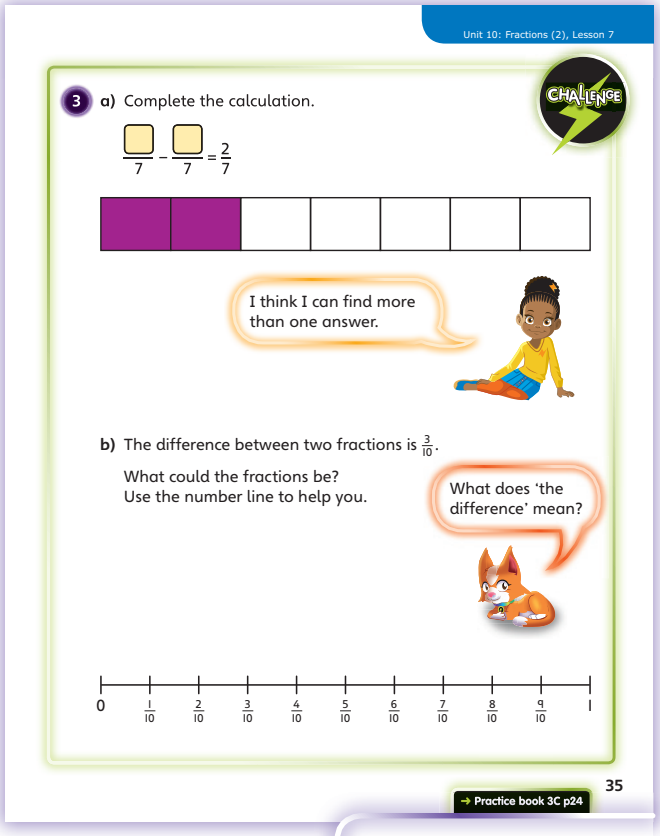
Question 2 b): $\frac{3}{4}$

Question 3 a): $\frac{7}{7} - \frac{5}{7} = \frac{2}{7}$; $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$; $\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$; $\frac{4}{7} - \frac{2}{7} = \frac{2}{7}$; $\frac{3}{7} - \frac{1}{7} = \frac{2}{7}$

Question 3 b): $\frac{4}{10}$ and $\frac{1}{10}$; $\frac{5}{10}$ and $\frac{2}{10}$; $\frac{6}{10}$ and $\frac{3}{10}$; $\frac{7}{10}$ and $\frac{4}{10}$; $\frac{8}{10}$ and $\frac{5}{10}$; $\frac{9}{10}$ and $\frac{6}{10}$; $\frac{10}{10}$ and $\frac{7}{10}$



PUPIL TEXTBOOK 3C PAGE 34



PUPIL TEXTBOOK 3C PAGE 35

Practice

WAYS OF WORKING Independent thinking

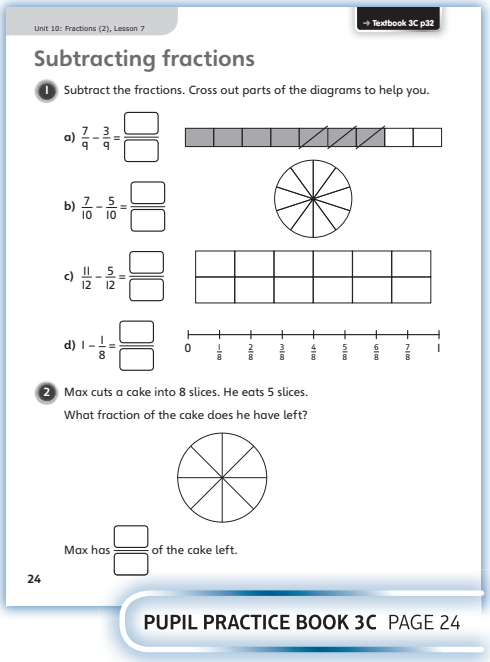
IN FOCUS Questions 1 and 2 provide children with visual images of fractions and require them to complete the subtractions.

STRENGTHEN Question 4 requires children to subtract fractions with the same denominator, without a visual representation. Encourage children to explain their answers. Ask: *How can you be sure you are correct? What can you do to check your answer?* Address any misconceptions around working with whole numbers. Discuss how number lines might be useful.
Question 6 requires children to have a secure understanding of using number lines to subtract. Encourage children to use number lines in question 7 to check their answers.

DEEPEN You could extend question 6 by asking children to check their answer to the subtraction by using addition. Ask: *What happens if you add* $\frac{2}{10} + \frac{7}{10}$*?* Encourage them to write alternative subtractions using the same number line. In question 7, explore what happens when adding and subtracting fractions at the same time. Ask: *Would the answer be different if you changed the order of calculations?*

ASSESSMENT CHECKPOINT Children should have a good understanding of how to subtract fractions. They can show calculations with fractions on a number line in the same way as they do with whole numbers.

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


Unit 10: Fractions (2), Lesson 7

→ Textbook 3C p32

Subtracting fractions

1 Subtract the fractions. Cross out parts of the diagrams to help you.

a) $\frac{7}{9} - \frac{3}{9} = \square$

b) $\frac{7}{10} - \frac{5}{10} = \square$

c) $\frac{11}{12} - \frac{5}{12} = \square$

d) $1 - \frac{1}{8} = \square$

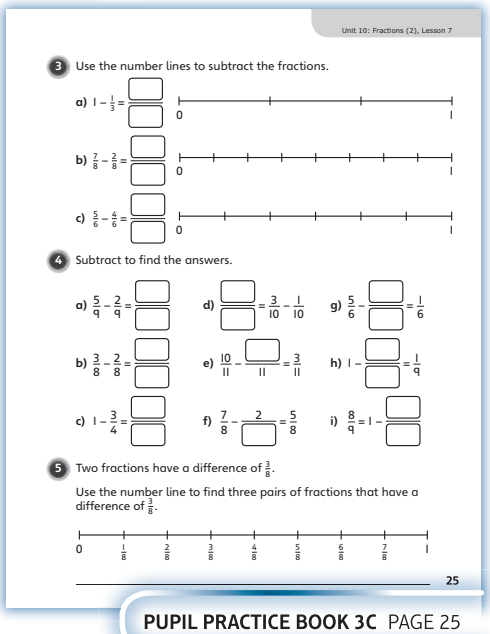
0 $\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ 1

2 Max cuts a cake into 8 slices. He eats 5 slices.
What fraction of the cake does he have left?

Max has $\frac{\square}{\square}$ of the cake left.

24

PUPIL PRACTICE BOOK 3C PAGE 24


Unit 10: Fractions (2), Lesson 7

3 Use the number lines to subtract the fractions.

a) $1 - \frac{1}{3} = \square$

b) $\frac{7}{8} - \frac{2}{8} = \square$

c) $\frac{5}{6} - \frac{4}{6} = \square$

0 1

4 Subtract to find the answers.

a) $\frac{5}{9} - \frac{2}{9} = \square$

b) $\frac{3}{8} - \frac{2}{8} = \square$

c) $1 - \frac{3}{4} = \square$

d) $\square = \frac{3}{10} - \frac{1}{10}$

e) $\frac{10}{11} - \square = \frac{3}{11}$

f) $\frac{7}{8} - \square = \frac{5}{8}$

g) $\frac{5}{6} - \square = \frac{1}{6}$

h) $1 - \square = \frac{1}{9}$

i) $\frac{8}{9} = 1 - \square$

5 Two fractions have a difference of $\frac{3}{8}$.
Use the number line to find three pairs of fractions that have a difference of $\frac{3}{8}$.

0 $\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ 1

25

PUPIL PRACTICE BOOK 3C PAGE 25

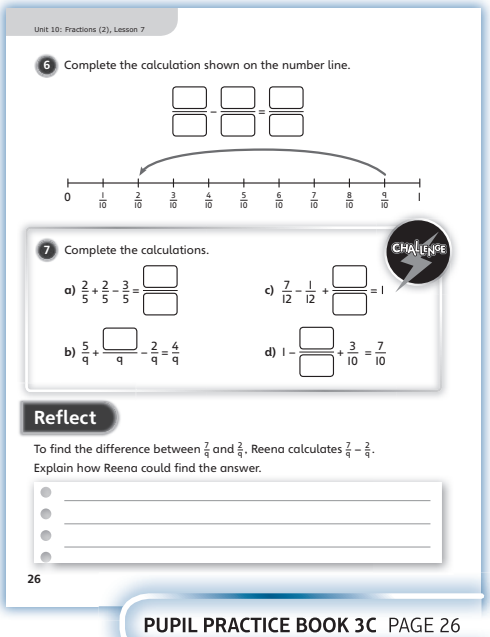
Reflect

WAYS OF WORKING Pair work

IN FOCUS Once they have recorded their thinking, give children an opportunity to share their ideas with their partner. Encourage them to use diagrams to support their thinking. Can they explain how Reena could find the difference between the fractions?

ASSESSMENT CHECKPOINT Look for clarity in children's explanations. Children should know that when finding the difference between two fractions they need to subtract them, as they would with two whole numbers. They can use fraction strips or number lines to support their answers.

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


Unit 10: Fractions (2), Lesson 7

6 Complete the calculation shown on the number line.

$\square - \square = \square$

0 $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ 1

7 Complete the calculations.

CHALLENGE

a) $\frac{2}{5} + \frac{2}{5} - \frac{3}{5} = \square$

b) $\frac{5}{9} + \square - \frac{2}{9} = \frac{4}{9}$

c) $\frac{7}{12} - \frac{1}{12} + \square = 1$

d) $1 - \square + \frac{3}{10} = \frac{7}{10}$

Reflect

To find the difference between $\frac{7}{9}$ and $\frac{2}{9}$, Reena calculates $\frac{7}{9} - \frac{2}{9}$.
Explain how Reena could find the answer.

26

PUPIL PRACTICE BOOK 3C PAGE 26

After the lesson

- Can children confidently explain how to subtract fractions with the same denominator within one whole?
- Can they explain how to use number lines and fraction strips to support their answers?
- Are children confident that they need to subtract to find the difference between two fractions?

Problem solving – adding and subtracting fractions

Learning focus

In this lesson, children will learn to reason mathematically and solve problems by adding and subtracting fractions.

Small steps

- Previous step: Subtracting fractions
- **This step: Problem solving – adding and subtracting fractions**
- Next step: Problem solving – fractions of measures

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

- Solve problems that involve addition and subtraction of fractions.
- Add and subtract fractions with the same denominator, within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$].

ASSESSING MASTERY

Children can recognise the operation needed to answer a word problem. They can write the necessary calculation to answer the problem and successfully find and write the correct answer.

COMMON MISCONCEPTIONS

In previous units, children have added and subtracted fractions, using images such as a number line, following explicit instructions. In this unit, they decide which operation to use. Children may find it difficult to identify exactly what the question is asking. Instead of applying their knowledge of fractions, this uncertainty can lead them to guess at the answer. Ask:

- *Can you draw a picture or a diagram that describes the problem?*

STRENGTHENING UNDERSTANDING

Resources such as fraction strips should be available. Encourage children to make sense of any problem before attempting to solve it, and show them how to organise their thinking. Ask: *What is it about? Can you describe it?* If they are unsure, ask them to read the question again. Ask: *Have you used all the information given?*

GOING DEEPER

Challenge children to find different ways to find the answer to the same question. Sometimes, children who work out the answer more quickly, are less inclined to look for different ways to answer the question, moving on as soon as they have found an answer. Remind them that the route to finding the answer can be more important than the answer itself.

KEY LANGUAGE

In lesson: fraction, more, add, subtract

Other language to be used by the teacher: calculate, word problem, less, greatest, addition, subtraction

STRUCTURES AND REPRESENTATIONS

bar model, number line

RESOURCES

Optional: bar models, counters, coloured rods, part-whole models

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

Before you teach

- Which resources will children find the most useful to represent the given information?
- How will you ensure that children are able to interpret the different types of question they will encounter?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *What fraction of the food was used on Monday? And on Tuesday? How can you work out how much food was used in total?*
- Question 1 b): *If $\frac{4}{10}$ of the food has been used, how much is left? Has more been used or is there more left?*

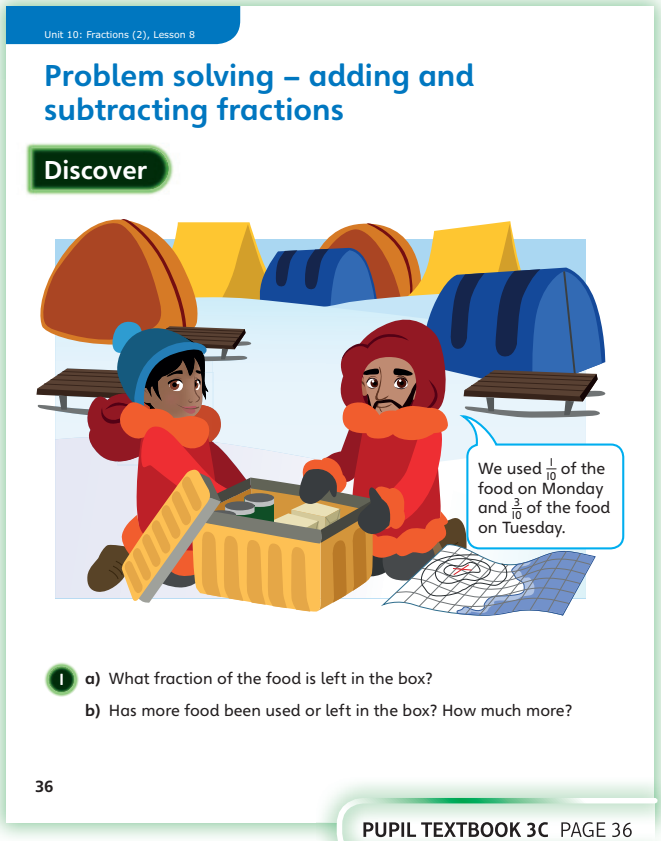
IN FOCUS Use these pictures to discuss the food that children use at home. Ask: *If you know how much food is used each day of the week, how can you work out how much food is used in the whole week?*

PRACTICAL TIPS Use fraction strips with 10 equal parts to help children visualise the question. It might be useful to revisit how the number line can be used to add and subtract fractions within one whole.

ANSWERS

Question 1 a): $\frac{6}{10}$ of the food is left in the box.

Question 1 b): More of the food is left than has been used. $\frac{2}{10}$ more of the food is left than has been used.



PUPIL TEXTBOOK 3C PAGE 36

Share

WAYS OF WORKING Whole class teacher led

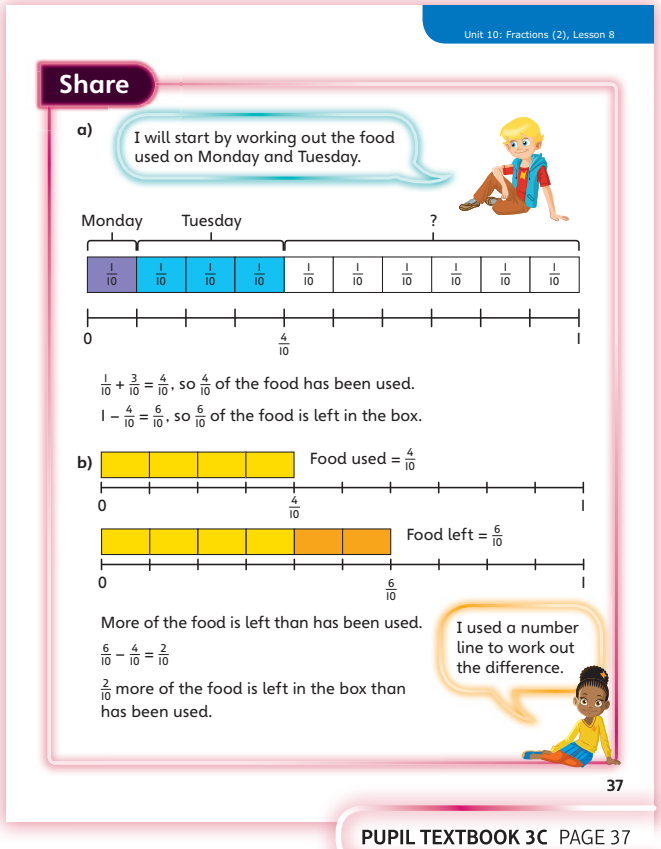
ASK

Question 1 a): *To work out the fraction of food left, what information do you need to know? What fraction of food was there to start with? What fraction of food has been used in total?*

Question 1 b): *Is there more food left than has been used? How can you work out how much more food is left?*

IN FOCUS In this section, children must interpret the questions accurately in order to solve the problems. They also need to be confident in adding and subtracting fractions within a whole.

STRENGTHEN Set up two fraction strips at the front of the class or on the whiteboard. Next to the first fraction strip write: Monday $1 - \frac{1}{10} = \frac{9}{10}$. Next to the second fraction strip write: Tuesday $\frac{9}{10} - \frac{3}{10} = \frac{6}{10}$. Ask: *Is this answer correct? How can you explain it? What does each step represent?*



PUPIL TEXTBOOK 3C PAGE 37

Think together

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

ASK

- Question 1: *What fraction of the journey did Sofia and Amal walk? What fraction of the journey did they ski?*
- Question 2 a): *What fraction of the tents are blue? And red? How can you find the fraction that are yellow?*
- Question 2 b): *What is the question asking? What clues are given? Can you solve it a different way?*

IN FOCUS Questions 1 and 2 are two-step problems. First, children need to find the total amount; then they need to subtract the answer from 1. Questions 2 b) and 3 progress from comparing fractions, to finding the difference between two fractions.

STRENGTHEN Some children may find it difficult to answer question 3. Discuss Astrid's suggestion that children find the fraction Max ate first. Some children may misinterpret this information and assume that Max ate $\frac{1}{5}$ of the packet. Ask them to read the question carefully. Discuss how they can check if their answer is correct.

DEEPEN In question 3, use a fraction strip split into 5 equal parts. The fraction strips should be accessible for all children. Concrete visual resources are a powerful tool to help deepen children's understanding of fractions. Challenge children to think of fraction word problems, swap them with a partner and draw or use representations to model the answers.

ASSESSMENT CHECKPOINT At this point in the lesson, children should be able to understand and interpret the questions and identify the operations required to solve the question. They should also be able to explain any manipulatives they have chosen to use.

ANSWERS

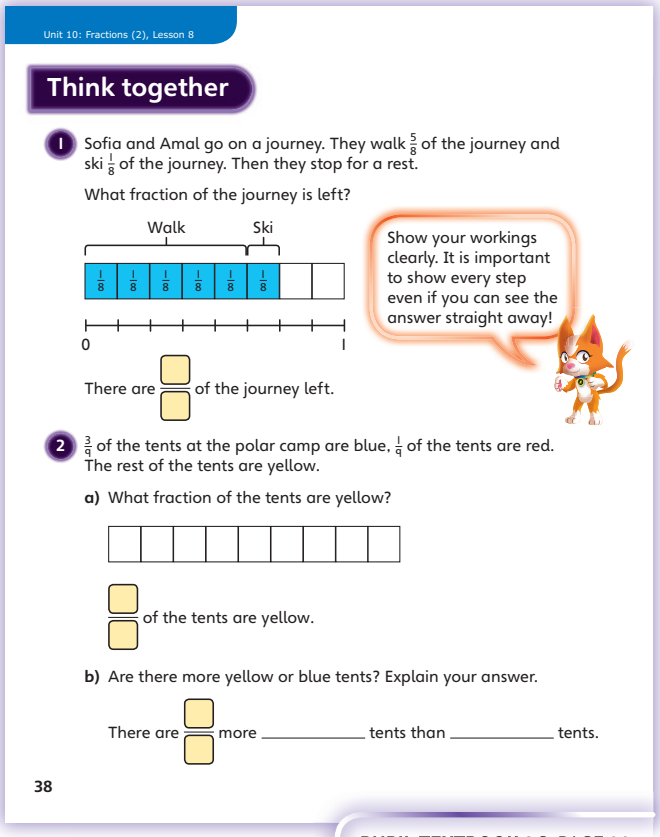
Question 1: There are $\frac{2}{8}$ of the journey left.

Question 2 a): $\frac{5}{9}$ of the tents are yellow.

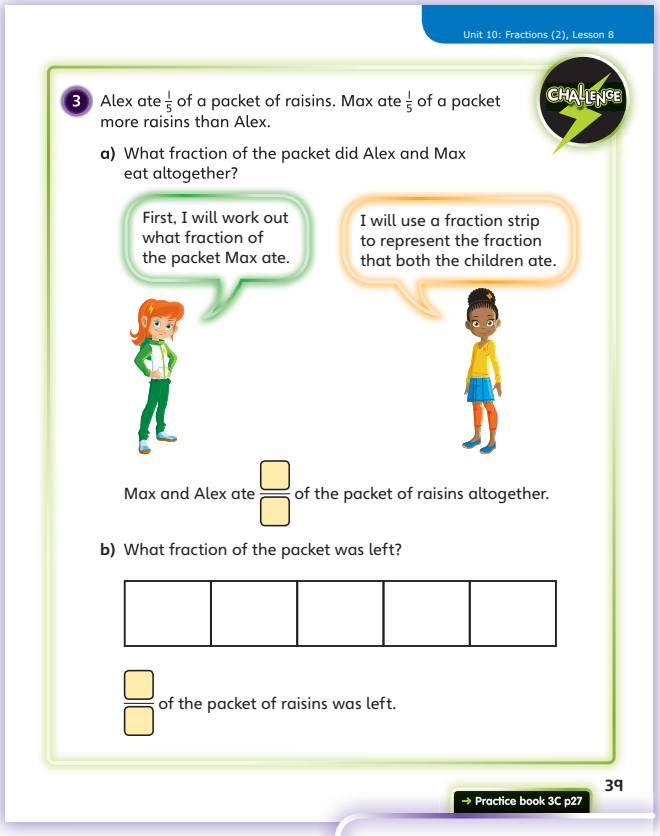
Question 2 b): There are $\frac{2}{9}$ more yellow tents than blue tents.

Question 3 a): Max and Alex ate $\frac{3}{5}$ of the packet of raisins altogether.

Question 3 b): $\frac{2}{5}$ of the packet of raisins was left.



PUPIL TEXTBOOK 3C PAGE 38



PUPIL TEXTBOOK 3C PAGE 39

Practice

WAYS OF WORKING Independent thinking

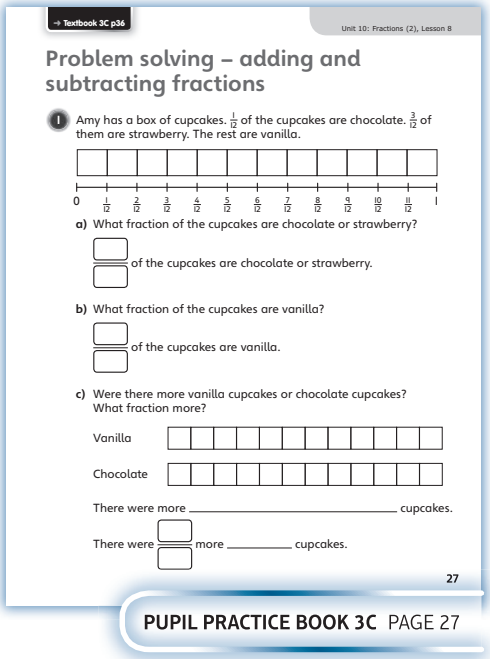
IN FOCUS Question 3 challenges children to create six different questions that all have the same answer. Children need to use a systematic approach when solving this problem in order to organise their thinking and results.

STRENGTHEN Encourage any children who are finding question 4 difficult to use a fraction strip, number line or both. Remind them to read the question slowly and record their findings step-by-step. Encourage children to label their findings for each step, so they can share their thinking through the stages, and check their answer at the end.

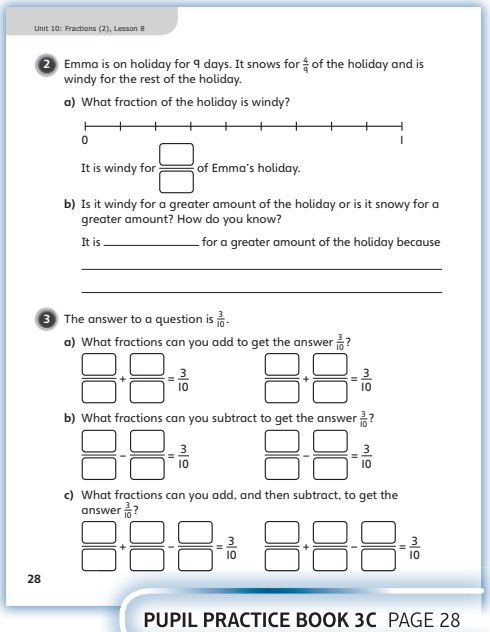
DEEPEN Question 5 will challenge children's ability to solve problems. The question replicates a common mistake – rushing through the question and answering what they think is being asked, rather than the actual question. Ask them to consider: *What information is given? What is the answer to this calculation?*

ASSESSMENT CHECKPOINT By this point in the lesson, children should be showing confidence in solving problems. They should be able to use representations to demonstrate a question visually, and use a systematic approach to solve it.

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



PUPIL PRACTICE BOOK 3C PAGE 27



PUPIL PRACTICE BOOK 3C PAGE 28

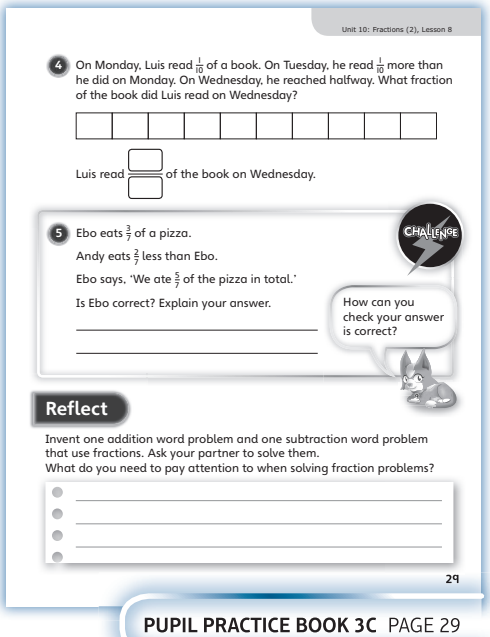
Reflect

WAYS OF WORKING Independent thinking

IN FOCUS Give children an opportunity to develop their own fraction problems independently. Can they answer the questions themselves? What method do they prefer to use to answer their own questions? Ask them to swap problems with a partner. They should compare the methods they used. Ask: *Whose method is more efficient?*

ASSESSMENT CHECKPOINT Children should be using different representations fluently to solve fraction problems. Assess their written explanation of what they think they should pay attention to when solving fraction problems. Look and listen for children's reasoning, clarify any misconceptions and ensure children are learning to anticipate these.

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



PUPIL PRACTICE BOOK 3C PAGE 29

After the lesson

- Can children confidently work in different ways to solve a problem?
- Are they confident in choosing different types of representation to solve problems independently?
- What opportunities will you provide for them to practise solving multi-step problems outside the lesson?

Problem solving – fractions of measures

Learning focus

In this lesson, children will learn to reason mathematically, and solve problems involving fractions and money by adding and subtracting fractions.

Small steps

- Previous step: Problem solving – adding and subtracting fractions
- **This step: Problem solving – fractions of measures**
- Next step: Months and years

NATIONAL CURRICULUM LINKS

Year 3 Number – Fractions

- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
- Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.
- Solve problems that involve all of the above.

ASSESSING MASTERY

Children can recognise the operation needed to answer a word problem. They write the necessary calculation to answer the problem and find the correct solution.

COMMON MISCONCEPTIONS

Some children will overgeneralise and assume that, for example 'all quarters' are the same. They do not understand that the size of the whole determines the size of the fractional part. Ask:

- *Which is bigger, $\frac{1}{4}$ of a 2 litre bottle or $\frac{1}{4}$ of a 500 ml bottle?*

Some children misunderstand the idea that 'the bigger the denominator the smaller the part' and ignore the numerators when comparing fractions. For instance, they may think that $\frac{1}{4} > \frac{3}{5}$ because quarters are bigger than fifths. Ask:

- *Which is greater, $\frac{1}{4}$ or $\frac{3}{5}$? How do you know? What information have you looked at to decide?*

STRENGTHENING UNDERSTANDING

Provide containers that differ in shape, but still hold the same amount, such as 1 litre. Appearances can be misleading, so ask children to estimate amounts held by containers in a range of shapes and heights. Recall that 1 litre = 1,000 ml. Give two children one measuring jug each. One of the jugs holds 1 litre, the other 2 litres. Ask each child to $\frac{1}{2}$ fill their jug with water. Ask: *Who has more water? How do you know?* Repeat for different fractions, for instance $\frac{1}{4}$ or $\frac{1}{3}$. Encourage children to make sense of each problem before they start to solve it. Ask: *What is it about? Can you describe it? What resources can you use to check your answer?*

GOING DEEPER

The more hands-on experience children gain, the deeper their understanding will be. Provide real-life examples of fractions of measurements, for instance a cake recipe which includes fractions of different amounts. Give children time to discuss and compare the different amounts and encourage them to refer to a fraction wall to check their answers.

KEY LANGUAGE

In lesson: fraction, amount, subtract, method

Other language to be used by the teacher: word problem, mass, capacity, scales, litre (l), add, calculate, measure, greater

STRUCTURES AND REPRESENTATIONS

bar model

RESOURCES

Optional: bar models, capacity measuring equipment, coloured rods, part-whole models

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

Before you teach

- What resources will you be using in the lesson? Which resources will children find most useful?
- Can children use division to find fractions of an amount and consider what is left?
- What previous opportunities have children had to find measurements?

Discover

WAYS OF WORKING Pair work

ASK

- Question 1 a): *How much money do the children have? What fraction of the money have they allocated for juice? And for fruit? How can you work out the total fraction of money they have allocated for juice and fruit?*
- Question 1 a): *Would the fraction change if the children had £15 to spend in total?*

IN FOCUS In this section, children must interpret the question correctly in order to understand how to solve it. They will use skills from previous lessons to establish how to use the information and interpret what the question requires.

PRACTICAL TIPS Ask children to imagine they have £10 to £20 to spend on a picnic with friends. Ask: *How would you spend the money? What fraction would you spend on drinks? What about on different food items?* Do not give children an exact amount; this will keep the focus on making sense of the fractions rather than calculating actual values.

ANSWERS

Question 1 a): Lee and Amelia spend $\frac{4}{10}$ of £20 on sandwiches.

Question 1 b): They will have £8 left to spend on sandwiches.

PUPIL TEXTBOOK 3C PAGE 40

Share

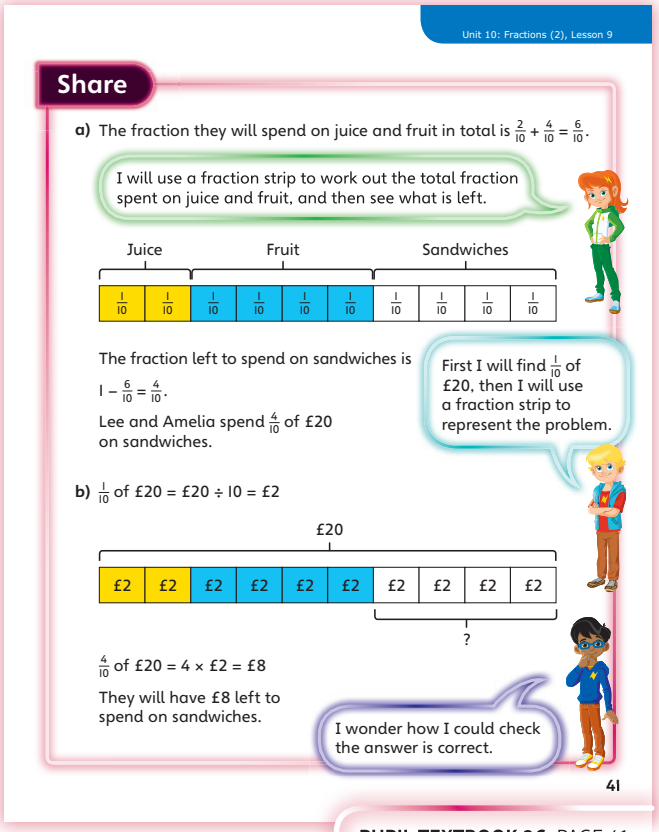
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 b): *To work out the fraction of the money that is left, what information do we need to know?*
- Question 1 b): *Each $\frac{1}{10}$ of £20 is £2. If $\frac{4}{10}$ is left for sandwiches, how much money is this? How much has been spent on juice and fruit? How do you know? How can you check your answer?*

IN FOCUS To solve the question, children need to be confident in adding and subtracting fractions within a whole. For question 1 a), discuss Astrid's suggestion. Explore how they can use a fraction strip to find the answer.

STRENGTHEN Set up two fraction strips at the front of the class. Divide both strips into ten equal parts. Cross out two of the bars on the first fraction strip and write: 'Juice: $1 - \frac{2}{10} = \frac{8}{10}$'. Cross out four of the bars on the second fraction strip and write: 'Fruit: $\frac{8}{10} - \frac{4}{10} = \frac{4}{10}$'. Answer: $\frac{4}{10}$ of the money is left to spend on sandwiches.' Ask: *Is this answer correct? How can you explain it? What does each step represent?*



PUPIL TEXTBOOK 3C PAGE 41

Think together

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

ASK

- Question 1 a): *How can you find the fraction of the oranges left?*
- Question 2 : *What is the question asking? What clues will help you to solve the question? Have you used all the information given? How can you check your answer?*
- Question 2 : *Do you have to find the actual amounts to be able to compare them?*

IN FOCUS Question 3 a) is a two-step question. First, children need to find the total amount, and then they need to subtract the answer from 1. Question 3 b) encourages children to consider alternative ways of solving the same problem, and to assess which method they prefer.

STRENGTHEN Discuss Astrid and Flo's suggestions in question 3 . Ask: *Can you recognise a difference between the methods? What answer does each method give? Can you give the answer in a different way?* For support, children may wish to use a bar model and colour in the fractions already walked, to give a visual indication of the distance left to go.

DEEPEN Encourage children to model question 3 by drawing their own representations, such as a number line, bar model or other appropriate image. Ask: *Which method do you prefer?* Listen for clear explanations and a systematic approach to solving the task.

ASSESSMENT CHECKPOINT Children should understand the questions and explain what is required. They should be able to explain the operations used to solve the question and demonstrate using manipulatives.

ANSWERS

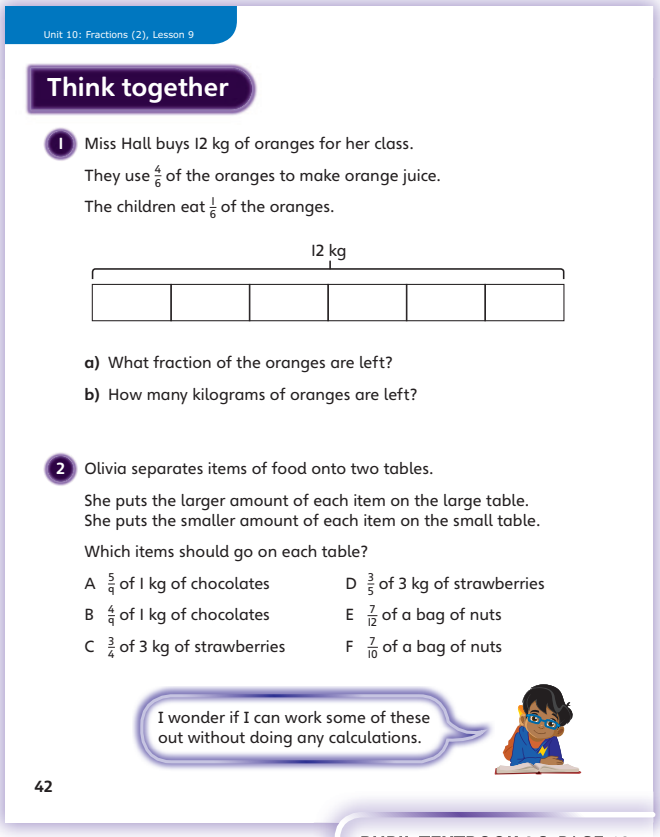
Question 1 a): $\frac{1}{6}$ of the oranges are left.

Question 1 b): 2 kg of oranges are left.

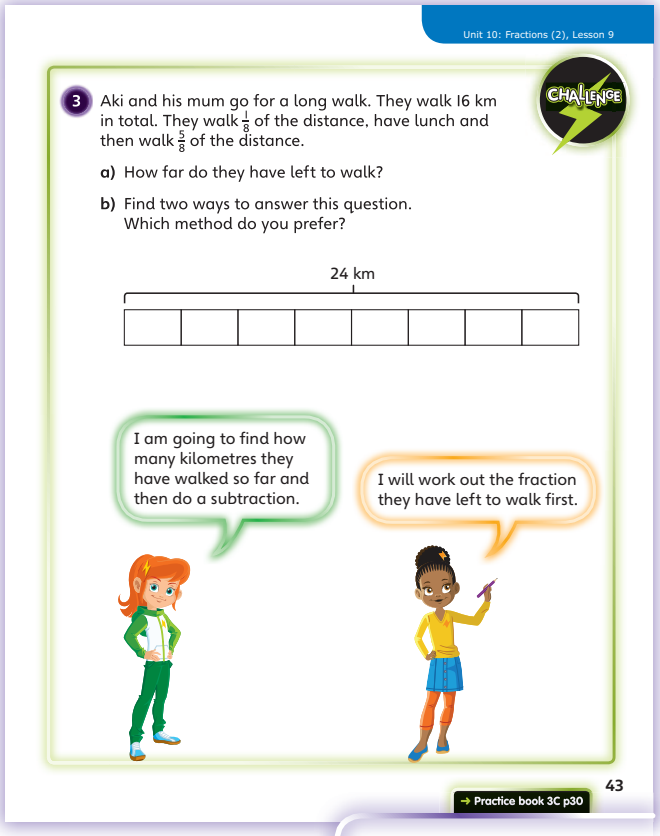
Question 2 A, C and F on the large table; B, D and E on the small table.

Question 3 a): They have $\frac{2}{8}$ of the journey left to walk. They have 4 km left to walk.

Question 3 b): Children's answers will vary.



PUPIL TEXTBOOK 3C PAGE 42



PUPIL TEXTBOOK 3C PAGE 43

Practice

WAYS OF WORKING Independent thinking

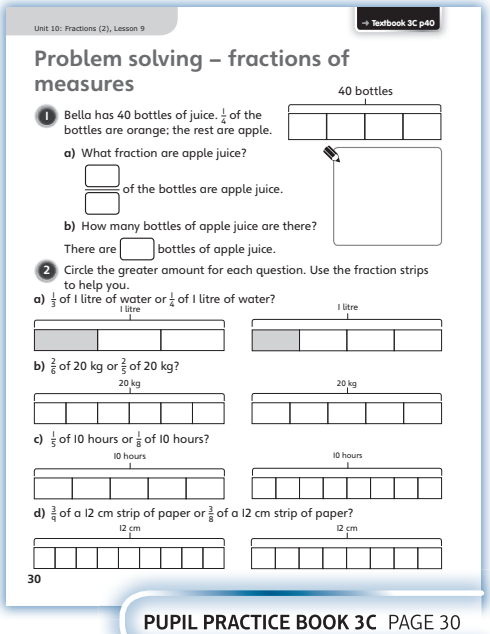
IN FOCUS Question 2 offers the opportunity to work with fractions of measurements, without finding the actual amounts. The amounts stay the same, so children need to pay attention to the fractions compared in each case.

STRENGTHEN For questions 3 and 4, encourage children to use a fraction strip, number line, or both, to work through the steps of the problem. Remind them to read the question carefully and record their findings. Encourage children to label their findings, so they can follow their work and check the answer at the end.

DEEPEN Question 5 challenges children's ability to solve problems. They will need to be systematic, and organise their thinking and results. Deepen their understanding by asking them to represent the problem pictorially. Draw the original sunflower and label its height as 12 cm. Repeat for week 1 and week 2, labelling each flower with both its height in cm, and the fractional amount it has grown.

ASSESSMENT CHECKPOINT At this point, children should be confident in problem solving with fractions of measurements. They should be able to use multiple representations for a question and follow a systematic approach to solve problems.

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


Unit 10: Fractions (2), Lesson 9

→ Textbook 3C p40

Problem solving – fractions of measures

1 Bella has 40 bottles of juice. $\frac{1}{4}$ of the bottles are orange; the rest are apple.

40 bottles

a) What fraction are apple juice?

of the bottles are apple juice.

b) How many bottles of apple juice are there?

There are bottles of apple juice.

2 Circle the greater amount for each question. Use the fraction strips to help you.

a) $\frac{1}{3}$ of 1 litre of water or $\frac{1}{4}$ of 1 litre of water?

1 litre

1 litre

b) $\frac{2}{5}$ of 20 kg or $\frac{3}{5}$ of 20 kg?

20 kg

20 kg

c) $\frac{1}{5}$ of 10 hours or $\frac{1}{8}$ of 10 hours?

10 hours

10 hours

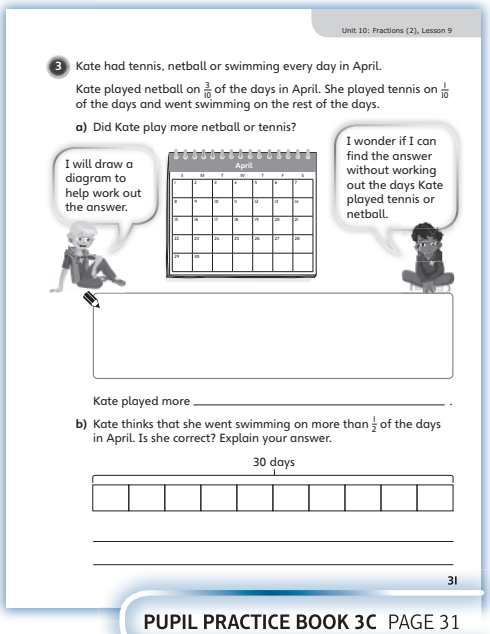
d) $\frac{3}{4}$ of a 12 cm strip of paper or $\frac{3}{8}$ of a 12 cm strip of paper?

12 cm

12 cm

30

PUPIL PRACTICE BOOK 3C PAGE 30


Unit 10: Fractions (2), Lesson 9

3 Kate had tennis, netball or swimming every day in April.

Kate played netball on $\frac{3}{10}$ of the days in April. She played tennis on $\frac{1}{10}$ of the days and went swimming on the rest of the days.

a) Did Kate play more netball or tennis?

I will draw a diagram to help work out the answer.

April

I wonder if I can find the answer without working out the days Kate played tennis or netball.

Kate played more _____.

b) Kate thinks that she went swimming on more than $\frac{1}{2}$ of the days in April. Is she correct? Explain your answer.

30 days

31

PUPIL PRACTICE BOOK 3C PAGE 31

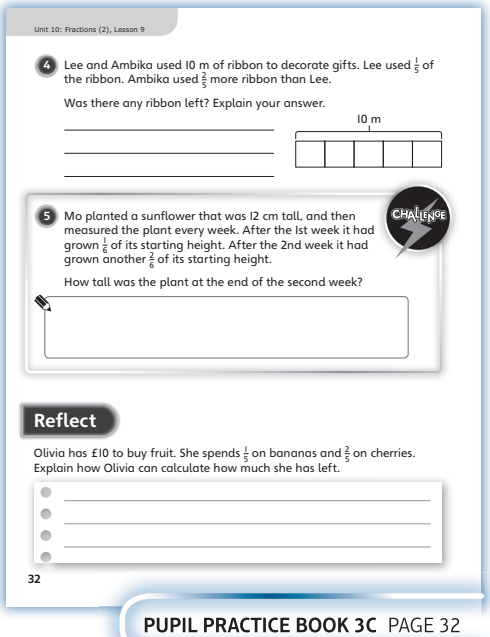
Reflect

WAYS OF WORKING Independent thinking

IN FOCUS Give children an opportunity to independently develop their reasoning. Ask: *What advice can you give Olivia? What method would you use? Why*? Encourage children to compare their method with their partner. Whose method is the more efficient?

ASSESSMENT CHECKPOINT Children should be increasingly confident in solving different types of problem independently. They first make sense of the problem, and then use the information given to identify what is required. Children are confident using different types of representation to solve fraction problems.

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


Unit 10: Fractions (2), Lesson 9

4 Lee and Ambika used 10 m of ribbon to decorate gifts. Lee used $\frac{1}{5}$ of the ribbon. Ambika used $\frac{2}{5}$ more ribbon than Lee.

Was there any ribbon left? Explain your answer.

10 m

5 Mo planted a sunflower that was 12 cm tall, and then measured the plant every week. After the 1st week it had grown $\frac{1}{6}$ of its starting height. After the 2nd week it had grown another $\frac{2}{6}$ of its starting height.

How tall was the plant at the end of the second week?

CHALLENGE

Reflect

Olivia has £10 to buy fruit. She spends $\frac{1}{5}$ on bananas and $\frac{2}{5}$ on cherries. Explain how Olivia can calculate how much she has left.

32

PUPIL PRACTICE BOOK 3C PAGE 32

After the lesson

- What opportunities will children have to compare fractions of measures outside this lesson?
- What opportunities will children have to problem-solve independently?
- Are they confident in choosing different types of representation to solve problems?

End of unit check

Don't forget the *Power Maths* unit assessment grid on p26.

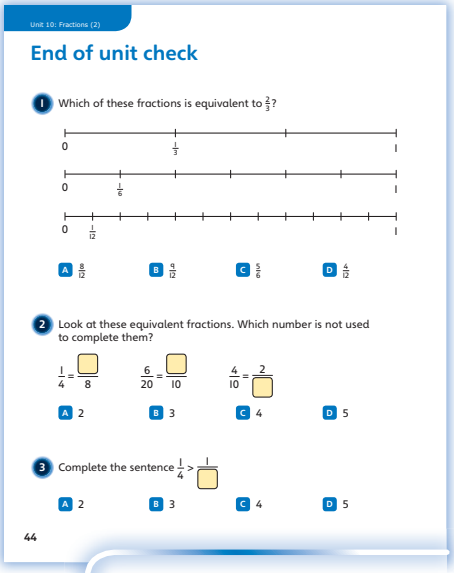
WAYS OF WORKING Group work adult led

IN FOCUS

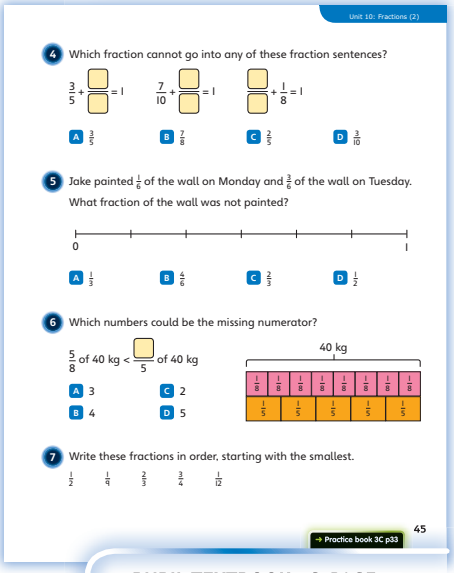
- Question 1 assesses children's ability to recognise equivalent fractions to $\frac{2}{3}$. Ask: *How can you use the number line to check your answer?*
- Question 2 assesses children's ability to find the missing numerator or denominator of equivalent fractions. Ask: *What representations can you use to help you with this question?*
- Question 3 assesses children's ability to compare unit fractions. Ask: *Can you explain how you found the answer? How do you compare unit fractions?*
- Question 4 assesses children's ability to add and subtract fractions to make 1. Ask: *For each of these calculations, how can 1 be represented as a fraction? Why?*
- Question 5 assesses children's ability to solve a problem by adding and subtracting fractions. Ask: *Can you solve the question in two ways?*
- Question 6 assesses children's ability to find fractions of measures. Ask: *Can you find two answers?*
- Question 7 is a SATS-style question and assesses children's ability to order non-unit fractions based on their size. Ask: *Which is the smallest fraction? How do you know?*

ANSWERS AND COMMENTARY

Children will demonstrate mastery by finding equivalent fractions and comparing fractions. They can use bar models and number lines to support their answers. Children can add and subtract fractions with confidence and can solve fraction problems including solving problems of fractions of measures.



PUPIL TEXTBOOK 3C PAGE 44



PUPIL TEXTBOOK 3C PAGE 45

Q	A	WRONG ANSWERS AND MISCONCEPTIONS	STRENGTHENING UNDERSTANDING
1	A	Choosing B or D may indicate a lack of understanding about using number lines.	To help children gain fluency in their understanding of fractions: • Make sure they have access to a fraction wall throughout the day. • Ensure all the representations of number lines are labelled clearly. • Give children access to fraction rods throughout the day. • Ensure children have access to unit fractions made of different numbers of equal parts.
2	C	Choosing A, B or D may indicate a lack of understanding about identifying equivalent fractions.	
3	D	Choosing A or B may indicate a lack of understanding about how to compare unit fractions. Choosing C may indicate that children misread the question.	
4	A	Choosing B, C or D may indicate that children lack experience in adding and subtracting fractions to make one whole.	
5	A	Choosing B may indicate children misread the question. Choosing C or D may indicate a lack of understanding of how to subtract fractions and identify equivalent fractions.	
6	B, D	Choosing A or C may indicate that children lack an understanding of comparing fractions of measures.	
7	$\frac{1}{12}, \frac{1}{9}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}$	Check children have looked at both the numerator and denominator.	

My journal

WAYS OF WORKING Independent thinking

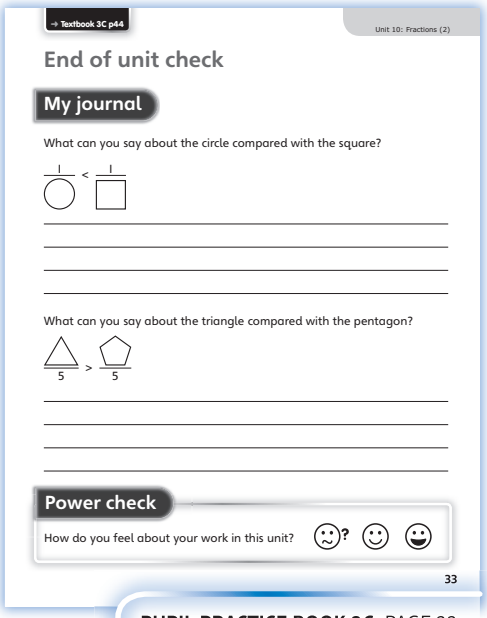
ANSWERS AND COMMENTARY

Children may record answers such as those shown below.

When comparing the circle to the square:
- They are unit fractions and the first fraction is smaller than the second.
- The more parts a unit is divided into, the smaller the size of each part.
- Looking at a fraction wall, the bigger the denominator, the smaller the size of the bar. Some children may prove this using real examples and show that, for example $\frac{1}{3} < \frac{1}{2}$ or $\frac{1}{10} < \frac{1}{8}$.

When comparing the triangle with the pentagon:
- The denominators are the same so the greater the numerator, the greater the fraction.
- If I look at a fraction strip split into 5 equal parts, the more parts I have, the bigger the fraction is.
- Some children may prove this by using real examples and show that, for example, $\frac{4}{5} > \frac{2}{5}$.

If children are finding it difficult to give reasons for their answers, ask: *What does the numerator show? What does the denominator show? Show me the fractions in the number line. Which one is bigger?*

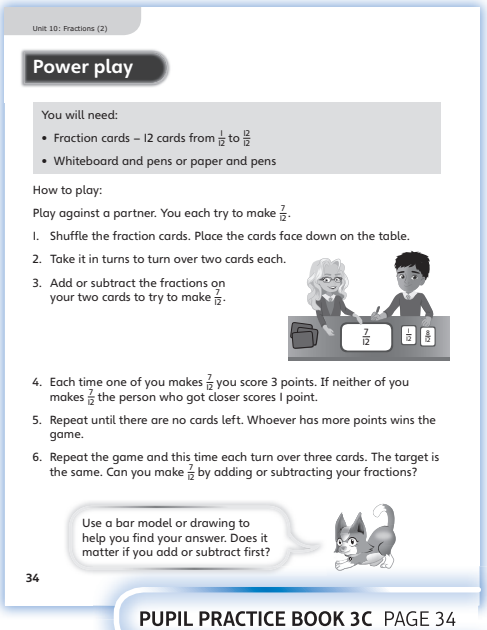


PUPIL PRACTICE BOOK 3C PAGE 33

Power check

WAYS OF WORKING Independent thinking

ASK
- *What did you know about adding and subtracting fractions before you started this unit? What new things have you learnt?*
- *How confident do you feel about adding and subtracting fractions? How does it differ from adding and subtracting with whole numbers?*
- *What do you feel you could improve on in this unit? What do you need more help or practice with?*



PUPIL PRACTICE BOOK 3C PAGE 34

Power puzzle

WAYS OF WORKING Pair work

IN FOCUS This game will assess children's ability to add and subtract fractions with the same denominator. Children can use a bar model or number line to support their answers and show their calculations clearly.

ANSWERS AND COMMENTARY When using three cards, some children are not sure whether to add or subtract first. Provide more opportunities to practise counting on and back on a number line using fraction steps. Encourage children to pay attention to the result. Does it change depending on which calculation they do first?

After the unit

- Is your classroom a 'fraction-rich' environment? How many opportunities are there for children to engage with fractions around the school environment? Are the fraction representatives visible and available for all children to use?

Strengthen and **Deepen** activities for this unit can be found in the *Power Maths* online subscription.