Summer Block 1

Fractions

Small steps

Step 1	Introduction to parts and whole

Step 2	Equal and unequal parts

Step 3	Recognise a half

Step 4	Find a half

Step 5	Recognise a quarter

Step 6	Find a quarter

Step 7	Recognise a third

Step 8	Find a third

Small steps

Step 9	Find the whole
Step 10	Unit fractions
Step 11	Non-unit fractions
Step 12	Recognise the equivalence of a half and two-quarters
Step 13	Recognise three-quarters
Step 14	Find three-quarters
Step 15	Count in fractions up to a whole

Introduction to parts and whole

Notes and guidance

This small step is the first time that children encounter fractions this year. They begin by learning about parts and wholes.

Children are introduced to a variety of examples showing parts and wholes. It is important that they are secure in identifying the whole and parts of the whole. They can use everyday objects such as bicycles and flowers to identify the whole and parts of the whole. Using an interactive map is a good tool to identify the parts and whole, then zooming in to redefine the parts and whole before comparing.

Children should also consider how many ways they can identify parts and wholes from pictures. They should begin to consider if the part is a large or small part of the whole. This learning will be built upon over the block, as children identify equal parts and begin to formally recognise and find fractions.

Key questions

- What is a part? What is a whole?
- What is the difference between a "hole" and a "whole"?
- Which is larger, the part or the whole?
- If _____ is the whole, what could be part of the whole?
- Is this part a large or a small part of the whole? How do you know?
- How many parts of the whole can you find?

Possible sentence stems

- If the _____ is the whole, _____ is part of the whole.
- If _____ is the whole, _____ is not part of the whole.

Things to look out for

- Children may mix up a part and the whole.
- Children may not realise that a whole can be made up of many parts.

National Curriculum links

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

Introduction to parts and whole

Key learning

Tell children to make a simple model using bricks. Ask them to identify the parts and the whole.

- Complete the sentence for each picture.

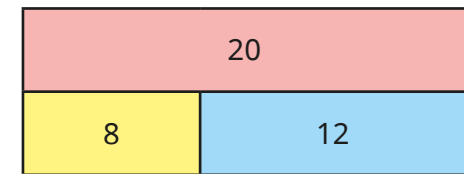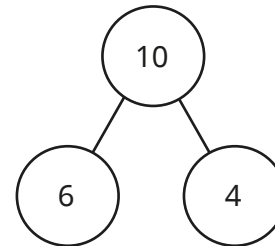If the _____ is the whole, _____ is part of the whole.

As a class, use Google Earth to look at an image of Earth. Identify the whole, then identify different parts of the whole. Zoom in and redefine the whole. Ask children to name parts of the whole now.
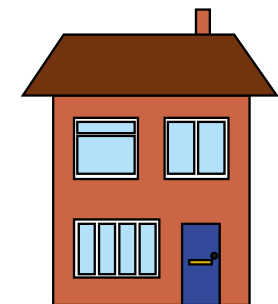
Continue zooming in and redefining the whole and parts of the whole.

Discuss the relative sizes of the parts and the whole and whether they change as you zoom in.

- Look at each picture.

  What is the whole?

  What are the parts?

  10
  6   4

20	
8	12

- Here is a picture.

  ▶ What is the whole?

  ▶ What is a part of the whole?

  ▶ Find a large part of the whole.

  ▶ Find a small part of the whole.

  Complete the sentence.

  If _____ is the whole, _____ is **not** part of the whole.

  How many ways can you complete the sentence?

Introduction to parts and whole

Reasoning and problem solving

Are the statements always true, sometimes true or never true?
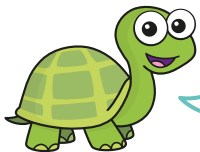
> Small things are always a part of a whole.

> Big things are always a whole.

sometimes true

sometimes true

Discuss examples as a class.

Tiny is thinking about parts and wholes.

> If Class 2 is the whole, White Rose Primary School is a part of the whole.

Explain Tiny's mistake.

Make up some statements about wholes and parts in your school.

Tiny has mixed up parts and wholes.

Here is a tower made of red, yellow and green cubes.

How many different ways can you describe the parts?

The _____ cubes are a small part of the whole.

The _____ cubes are a large part of the whole.

Build your own tower and describe the parts.

red or yellow

green

Equal and unequal parts

Notes and guidance

In this small step, children explore equal and unequal parts.

It is important that children have a secure understanding of the whole and parts before moving on to this step. They will already have used many skills required for this step in the multiplication and division block when identifying equal and unequal groups, so it may be useful to recap this.

Children identify whether a shape has been split into equal or unequal parts. This is crucial learning, as it is used throughout the block to identify fractions. They first look at shapes where the equal parts look the same, but are then challenged to prove a shape has been split into equal parts where the parts do not look the same. At this stage, children do not need to describe the parts as fractions of the whole.

Things to look out for

- Children may not know what equal groups/parts mean.
- Children may know how to split a shape into equal parts, but may find it difficult to draw accurately.
- Children may think that all equal parts must be identical.
- Children may think that they can only make equal parts using straight lines.

Key questions

- What does "equal" mean? What does "unequal" mean?
- Which picture shows equal groups? How is this similar to equal parts?
- How do you know that the shape has been split into equal parts?
- How could you split the shape into equal parts?
- Is there more than one way to show equal parts? How do you know?
- Do equal parts always need to look the same?
- Is it possible to make equal parts using curved lines?

Possible sentence stems

- There are _____ equal parts.
- I know the shape has been split into equal/unequal parts because …

National Curriculum links

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

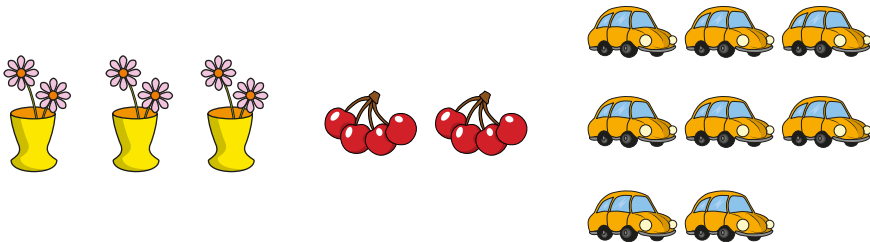# Equal and unequal parts

Key learning

As a class, create definitions of equal and unequal.

Ask children to draw examples of things that are equal and things that are unequal.

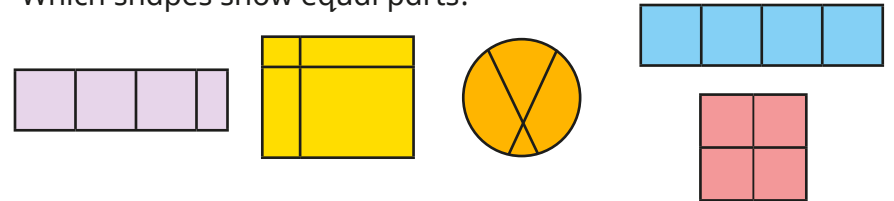- Which pictures show equal groups?
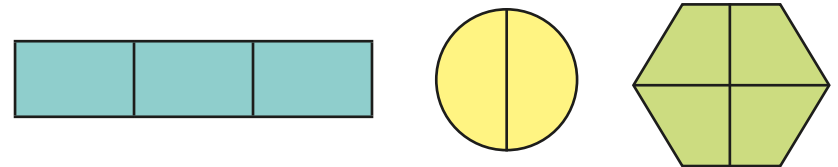
  Which picture shows an unequal group?

Give children a paper shape. Ask them to cut it into four parts and then put it back together again. What do they notice? Are the parts equal or unequal?

Compare shapes as a class and challenge children to sort shapes into those that have equal or unequal parts.

- Which shapes show equal parts?

- Complete the sentence for each shape.

  There are _____ equal parts.

  How can you tell that they are equal parts?

- Split the shapes so that they show equal parts.
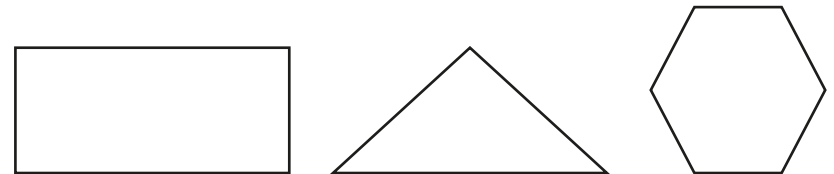
  Split the shapes so that they show unequal parts.

Equal and unequal parts

Reasoning and problem solving

Tiny is finding equal and unequal parts.

This shape has not been split into equal parts.
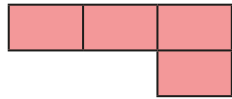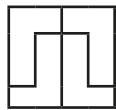
Do you agree with Tiny?
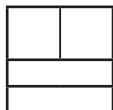
Explain your answer.
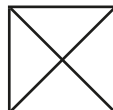
No

Ben, Tom and Fay each split a square into parts.

Ben **Tom** **Fay**

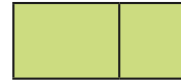Who has split the square into equal parts?

Explain your answer.

They have all split the square into equal parts.

Kay and Dan each have a strip of paper.

Kay splits her paper into four equal parts.

Dan splits his paper into two equal parts.

Kay

Dan

Whose strip of paper is longer?

How do you know?

Kay's

Recognise a half

Notes and guidance

Children now begin to focus on specific fractions, starting with a half.

Children were taught this in Year 1 and may be familiar with the word or concept of a half from everyday life. It could be useful to discuss this and identify any misconceptions, such as "the bigger half". Once confident with their understanding of a half, they are introduced to the formal notation for fractions for the first time, in this case $\frac{1}{2}$. It is important to spend time considering what each digit represents to support understanding, not only in this step, but for understanding of fractions moving forwards. Children are also introduced to the terms "numerator" and "denominator" for the first time.

Children need to identify half of a shape, but they should also look at length and sets of objects. In the next step, they will work out half of a number.

Things to look out for

- Children may not recognise that the halves must be equal.
- Children may think that it is impossible to represent $\frac{1}{2}$ when there are more than two parts.
- Children may mix up the numerator and denominator.

Key questions

- What is a half?
- When have you used the word "half" before?
- How do you know that a half is shaded?
- Has the shape been split into equal parts? How do you know?
- How many equal parts is the shape split into?
- How else can you write one half? What does each number represent?
- What does the fraction bar represent?

Possible sentence stems

- The whole has been split into _____ equal parts.

  Each part is worth one _____

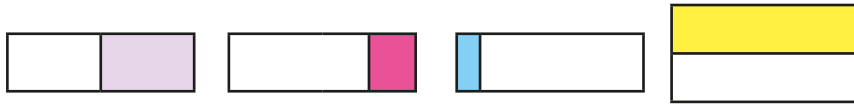 This can be written as $\frac{\square}{\square}$

National Curriculum links

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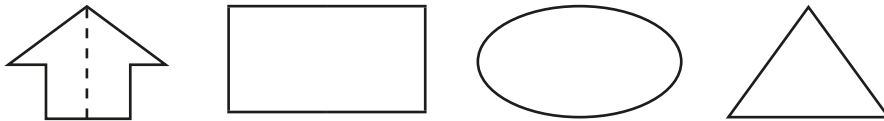
Recognise a half

Key learning

- Which shapes show a half?

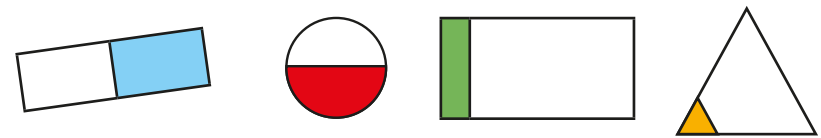- Colour half of each shape.

  Is there more than one way to show a half?

Discuss how Kay remembers how to write $\frac{1}{2}$

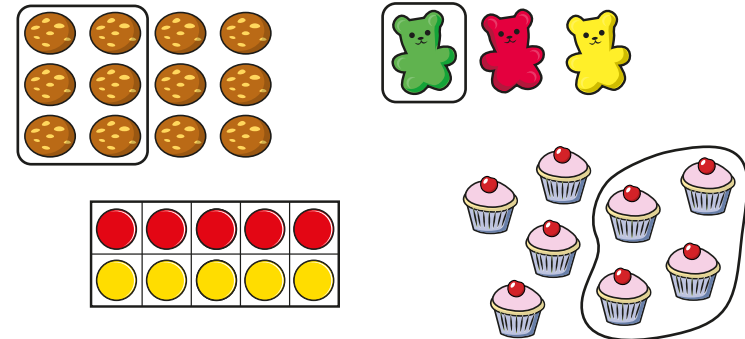|			
	The whole has been divided	Write the fraction bar.	$—$
	into 2 equal parts.	Write the denominator.	$\overline{2}$
	1 part is shaded.	Write the numerator.	$\frac{1}{2}$

What do children notice?

What does each number represent?
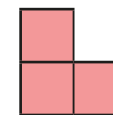
- Which pictures show $\frac{1}{2}$?

  How could you change the other pictures so that they show $\frac{1}{2}$?

- Which pictures show $\frac{1}{2}$?

- Here is $\frac{1}{2}$ of a shape.

  What could the whole shape be?

Recognise a half

Reasoning and problem solving

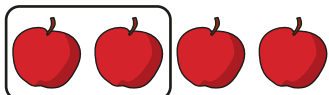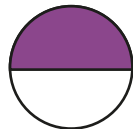Jo tries to write one half.

$$\frac{2}{1}$$

Do you agree with Jo?

Explain your answer.
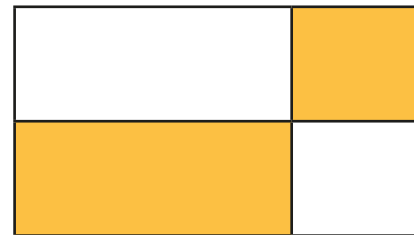
No

Which is the odd one out?

$$\frac{1}{2}$$

one half

Explain your answer.

rectangle

Max is finding half of a shape.

The coloured part of the shape does not show a half, because there are four parts, not two equal parts.

No

Do you agree with Max?

Explain your answer.

Find a half

Notes and guidance

In this small step, children use their understanding of $\frac{1}{2}$ to find half of a quantity.

This step should focus on using concrete resources and pictorial representations to support understanding. It may also be useful to recap division skills. Children could start by sharing bean bags or counters into two equal groups. Guide them to make the link that when they find $\frac{1}{2}$ of a number, they need to divide the number by 2, the denominator of the fraction. Children could also use related facts to help them find $\frac{1}{2}$ of greater numbers, for example using $\frac{1}{2}$ of 4 to work out $\frac{1}{2}$ of 40

Things to look out for

- Children may need support splitting objects into two equal groups if they cannot physically share them.

- Children may not make the link between finding $\frac{1}{2}$ and dividing by 2

- Children may not understand why they cannot find $\frac{1}{2}$ of an odd number using counters.

Key questions

- What is a half?

- How can you find half of the number?

- How can you use counters/bar models to help you?

- How is finding half of a number similar to dividing by 2? Why?

- Why can you not split an odd number of counters into two equal groups?

- If you know half of 6, how can you find half of 60?

Possible sentence stems

- The objects have been shared equally between _____ groups. There are _____ in each group.
  $\frac{1}{2}$ of _____ is equal to _____

- To find half of a number, I need to divide the number by _____

National Curriculum links

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

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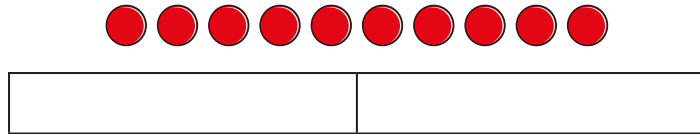
Find a half

Key learning

As a class, share 20 bean bags equally between two containers. Then complete the sentences.

The whole is _____   Half of _____ is _____

Repeat with other even numbers of bean bags.

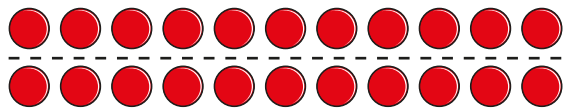- Share 10 counters between the two groups.

Complete the sentences.

The counters have been shared equally between _____ groups.

There are _____ in each group.

$\frac{1}{2}$ of 10 is equal to _____

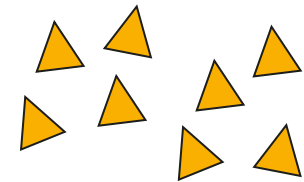- Ann uses an array to find $\frac{1}{2}$ of 22
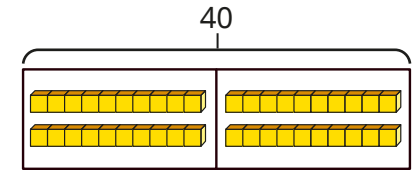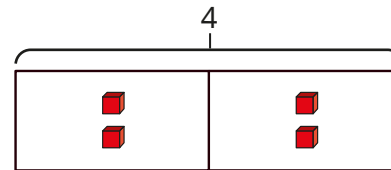
$\frac{1}{2}$ of 22 is equal to 11

Use Ann's method to find $\frac{1}{2}$ of each number.

▸ 12   ▸ 18   ▸ 24

- Find $\frac{1}{2}$ of each set of objects.

- Use base 10 and bar models to work out the calculations.

4

40

▸ $\frac{1}{2}$ of 4 = _____ $\frac{1}{2}$ of 40 = _____

▸ $\frac{1}{2}$ of 6 = _____ $\frac{1}{2}$ of 60 = _____

▸ $\frac{1}{2}$ of 8 = _____ $\frac{1}{2}$ of 80 = _____

What do you notice?

- Dan is running a 100 m race.

How far will he have run when he has completed $\frac{1}{2}$ of the race?

Find a half

Reasoning and problem solving

Kim is finding $\frac{1}{2}$ of different numbers.

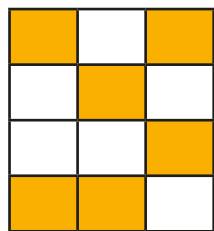> If I know how to divide by 2, I can find $\frac{1}{2}$ of a number.

Do you agree with Kim?

Explain your answer.

Yes

Tiny is finding $\frac{1}{2}$ of 10

$$\frac{1}{2} \text{ of } 10 = 8$$

Explain Tiny's mistake.

Tiny has subtracted 2 from 10, instead of dividing 10 by 2

Ben is asked to colour half of a shape.

This is his answer.

Is Ben correct?

Explain your answer.

Yes

Fay is thinking of a number.

Half of her number is more than 10 but less than 15

What could her number be?

How many answers can you find?

22, 24, 26, 28

Recognise a quarter

Notes and guidance

Building on their learning in Year 1, children spend the next two steps deepening their understanding of a quarter. In this small step, they recognise a quarter, focusing mainly on shapes but also considering length and sets of objects.

Children should be able to identify if a shape has been split into equal parts and if each part represents a quarter. They can compare the written notation for $\frac{1}{2}$ and $\frac{1}{4}$ and identify what the digits represent.

Children should see $\frac{1}{4}$ represented in multiple ways and not be limited to just standard examples. They may also begin to compare $\frac{1}{2}$ and $\frac{1}{4}$ in relation to the same object or amount and think about which is greater.

Things to look out for

- Children may think that they must colour the "first" box, not recognising that all parts are worth $\frac{1}{4}$

- Children may think that $\frac{1}{4}$ should be represented by one part shaded/selected and four parts unshaded/unselected.

Key questions

- What is a quarter?

- How do you know that a quarter is shown?

- Has the shape been split into equal parts?

- What is the denominator? How do you know?

- How is the denominator of $\frac{1}{4}$ different from the denominator of $\frac{1}{2}$? Why?

- Does it matter which part you colour/circle?

- What does each digit in the fraction represent? What does the fraction bar represent?

Possible sentence stems

- The whole has been split into _____ equal parts.

  One of the _____ equal parts is called a _____

  This can be written as $\frac{\square}{\square}$

National Curriculum links

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

Recognise a quarter

Key learning

- Use a rectangular piece of paper.

  ▶ Fold the piece of paper in half.

    What fraction is shown?

  ▶ Fold the piece of paper in half again.

    How many equal parts do you have now?

    What fraction can you see?
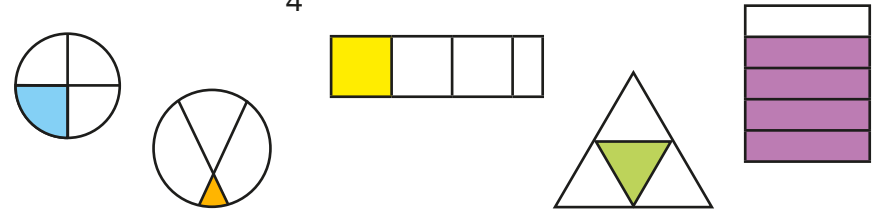
- Which shapes show a quarter?
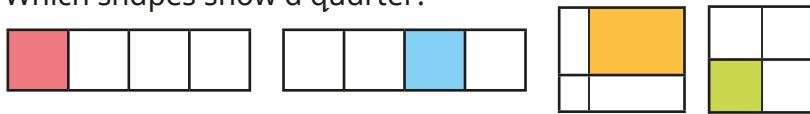
Discuss how Tom remembers how to write $\frac{1}{4}$

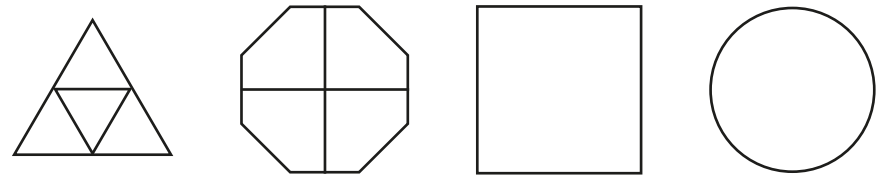|			
	The circle has been divided	Write the fraction bar.	—
	into 4 equal parts.	Write the denominator.	$\overline{4}$
	1 part is shaded.	Write the numerator.	$\frac{1}{4}$

What do children notice?

What does each number represent?
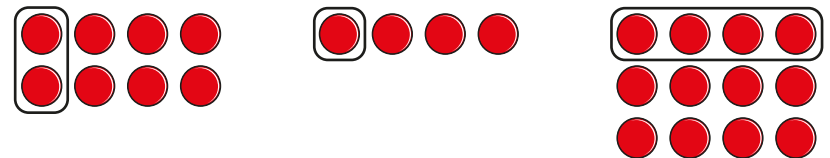
- Which shapes show $\frac{1}{4}$?

Explain why the others do not show $\frac{1}{4}$

- Colour $\frac{1}{4}$ of each shape.
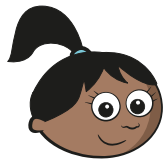
Is there more than one way to colour $\frac{1}{4}$?

- Which pictures show $\frac{1}{4}$?

Recognise a quarter

Reasoning and problem solving

Sam folds two identical paper strips.

I think that $\frac{1}{4}$ of one strip will be greater than $\frac{1}{2}$ of the other strip, because 4 is greater than 2

Do you agree with Sam?

Explain your answer.

No

Here is a triangle with a fraction shaded.
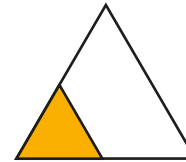
Is the statement true or false?

$\frac{1}{4}$ of the shape is shaded.

Explain your answer.

True

Ron draws a bar model to show $\frac{1}{4}$

Do you agree with Ron?

Explain your answer.

No

Here is $\frac{1}{4}$ of a shape.

What could the whole shape be?

Compare answers as a class.

Find a quarter

Notes and guidance

In this small step, children use their understanding of a quarter to find $\frac{1}{4}$ of an amount.

As with Step 4, the focus here should be on using concrete and pictorial resources to support understanding. One of the difficulties with this step is that children are not yet familiar with dividing by 4, so modelling of sharing into four equal groups will be required. They could also approach finding a quarter by recognising that it is half of a half or divide by 2 twice. Encourage children to attempt both strategies and decide which they find more efficient.

Things to look out for

- Children may find it difficult to split pictures into four equal groups.
- Children may not recognise the relationship between finding $\frac{1}{2}$ and $\frac{1}{4}$ of a number.
- Children may confuse finding a quarter of a set of objects with finding four of the objects.

Key questions

- How do you find half of a number? How do you find a quarter of a number? What is the same? What is different?
- How can you use counters/bar models to help?
- How many equal groups do you need to make?
- How many ways can you find a quarter?
- How many quarters are there in a half?
- If you know half of an amount, how can you find a quarter?

Possible sentence stems

- The objects have been shared equally between _____ groups.
  There are _____ in each group.
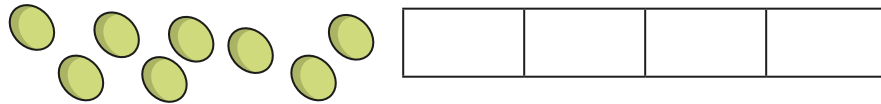 $\frac{1}{4}$ of _____ is equal to _____

National Curriculum links

- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- Write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

Find a quarter

Key learning

- Use the bar model to help share the 8 grapes equally between four people.
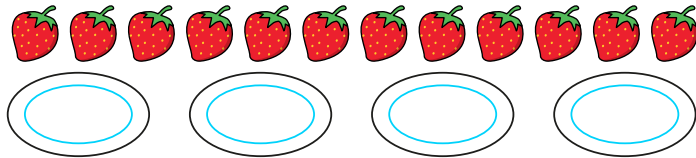
  The grapes are split into _____ equal parts.
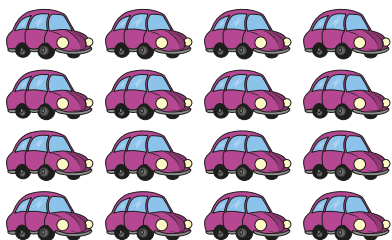
  Each part is worth a _____

  $\frac{1}{4}$ of 8 is equal to _____

- Share the 12 strawberries into four equal groups.

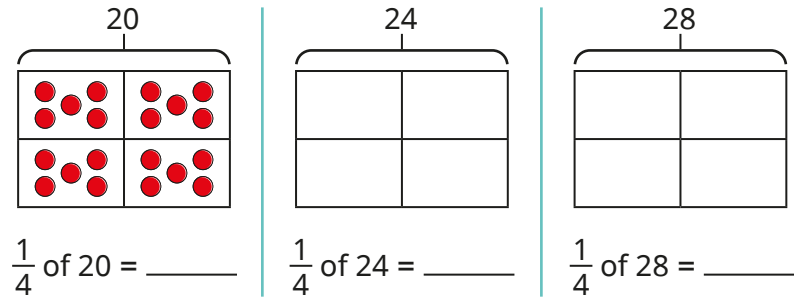 $\frac{1}{4}$ of 12 = _____

- Circle $\frac{1}{4}$ of the cars.

  One quarter of _____ is _____

  _____ is $\frac{1}{4}$ of _____

- Use bar models to find $\frac{1}{4}$ of each number.

  20   24   28

  $\frac{1}{4}$ of 20 = _____ | $\frac{1}{4}$ of 24 = _____ | $\frac{1}{4}$ of 28 = _____

  What do you notice?

- Complete the number sentences.

  ▶ $\frac{1}{2}$ of 8 = _____   ▶ $\frac{1}{4}$ of 8 = _____

  ▶ $\frac{1}{2}$ of 16 = _____   ▶ $\frac{1}{4}$ of 16 = _____

  ▶ $\frac{1}{2}$ of 20 = _____   ▶ $\frac{1}{4}$ of 20 = _____
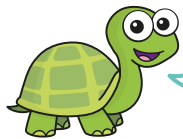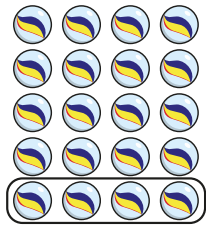
  What do you notice?

- Kay knows that half of 44 is 22

  How can Kay use this fact to work out $\frac{1}{4}$ of 44?

  What is $\frac{1}{4}$ of 44?

Find a quarter

Reasoning and problem solving

Tiny is finding a quarter.

I have circled $\frac{1}{4}$, because I have four marbles.

Do you agree with Tiny?

Explain your answer.

No

Jo has $\frac{1}{4}$ of £40

Max has $\frac{1}{2}$ of £20

Who has the most money?

They have the same amount.
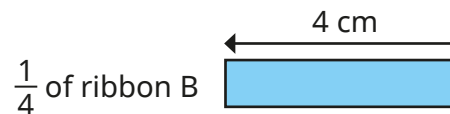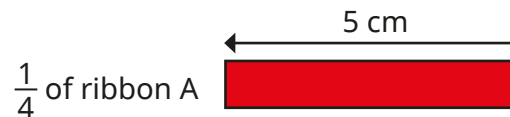
Ron has two ribbons.

He cuts $\frac{1}{4}$ from each ribbon.

Here are the pieces of ribbon that Ron has cut.

5 cm

$\frac{1}{4}$ of ribbon A

4 cm

$\frac{1}{4}$ of ribbon B

How long were Ron's whole pieces of ribbon?

Which ribbon was longer?

How much longer was it?

A 20 cm

B 16 cm

A

4 cm longer

Recognise a third

Notes and guidance

In this small step, children are introduced to the fraction $\frac{1}{3}$ for the first time.

It is important that time is taken to consider what is the same and what is different about $\frac{1}{3}$ and the other fractions children have learnt. They should recognise that 1 is still the numerator (the importance of which will be covered in more detail in Step 10), but the denominator is 3, so the whole is split into three equal parts. Again, children should consider what each digit represents in the written notation to support understanding.

Children identify a third of a shape, a length and a set of objects and need to consider if they have been split into three equal parts. At this stage, they could also begin to compare $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ to support and deepen understanding.

Things to look out for

- Children may think that a shape split into three unequal parts shows $\frac{1}{3}$
- Children may think that they can only find $\frac{1}{3}$ when they have exactly three parts.

Key questions

- Has the shape been split into equal parts?
- How many equal parts has the shape been split into?
- What is a third? How is it similar to a half and a quarter? How is it different?
- What does the numerator/denominator represent?
- How can you show $\frac{1}{3}$?
- Why do these shapes not show $\frac{1}{3}$?

Possible sentence stems

- The whole has been split into _____ equal parts.
  Each part is worth a _____
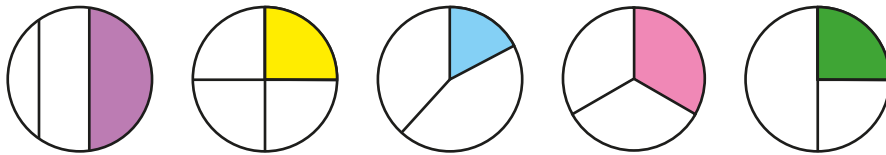 This is the same as $\frac{\square}{\square}$

National Curriculum links

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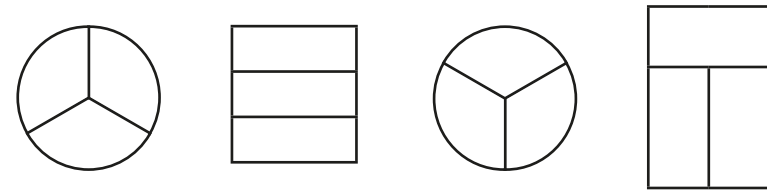
Recognise a third

Key learning

- Which circle shows a third?

Explain why the other circles do not show a third.

Discuss how Fay remembers how to write $\frac{1}{3}$

	The circle has been divided	Write the fraction bar.	$-$
	into 3 equal parts.	Write the denominator.	$\overline{3}$
	1 part is shaded	Write the numerator.	$\frac{1}{3}$

What do children notice?

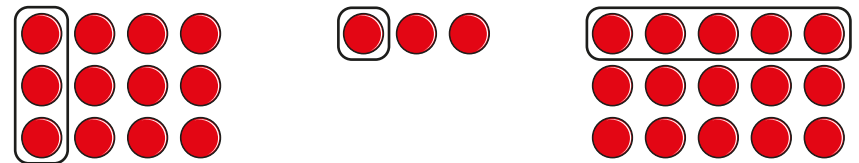What does each number represent?

- Colour $\frac{1}{3}$ of each shape.

Compare answers with a partner.

Do your shapes look the same?

- Which pictures show $\frac{1}{3}$?

- Estimate where Ron will be when he has run $\frac{1}{3}$ of the race.

Which is easiest to estimate, $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{3}$? Why?

Recognise a third

Reasoning and problem solving
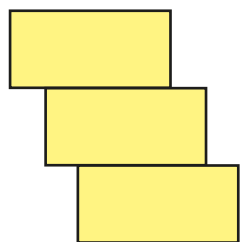
Max is eating pizza.

Max eats $\frac{1}{3}$ of the pizza, because he eats one slice and there are three slices left.

Do you agree with Tiny?

Explain your answer.

No

Has the shape been split into thirds?

Explain your answer.

Yes

Tom, Sam and Ben each show a piece of ribbon.

Tom shows $\frac{1}{2}$ of his whole ribbon.

Sam shows $\frac{1}{4}$ of her whole ribbon.

Ben shows $\frac{1}{3}$ of his whole ribbon.

Whose whole piece of ribbon is the longest?

Whose is the shortest?

Explain your answers.

Sam's

Tom's

Find a third

Notes and guidance

In this small step, children use their understanding of a third to find $\frac{1}{3}$ of an amount.

As with previous steps, the focus should be on the use of concrete and pictorial representations to support understanding alongside the abstract calculations. Children should use their understanding of the denominator to realise that they need to share the objects into three equal groups and eventually understand that they need to divide by 3

Children begin to think about the similarities and differences between finding $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ of a number. They may recognise that finding $\frac{1}{3}$ of a number will result in a greater amount than $\frac{1}{4}$, but a smaller amount than $\frac{1}{2}$

Things to look out for

- Children may think that they can use $\frac{1}{2}$ of a number to find $\frac{1}{3}$ of the number, as they could when finding $\frac{1}{4}$ of a number.

- Children may think that a third of a number is always 3

Key questions

- How do you find $\frac{1}{2}$ / $\frac{1}{4}$ of a number? How do you find $\frac{1}{3}$ of a number? What is the same? What is different?

- How can you use counters/bar models to help?

- How many equal groups do you need to make?

- Why do you need to make three equal groups?

- Is $\frac{1}{3}$ greater than or less than $\frac{1}{2}$ / $\frac{1}{4}$? Why?

Possible sentence stems

- The whole has been split into _____ equal groups.

  There are _____ in each group.

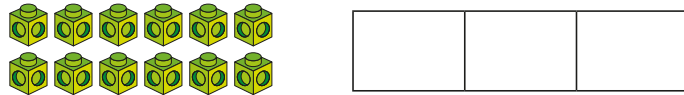 $\frac{1}{3}$ of _____ is equal to _____

National Curriculum links

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

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

Find a third

Key learning

- Use the cubes to make three equal groups.

  There are _____ cubes altogether.

  A third of _____ is _____

  $\dfrac{\square}{\square}$ of _____ is _____

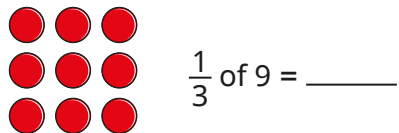- Kay, Jo and Ron share six sweets equally.

  Draw circles to show how they share them.

  The whole has been split into _____ equal groups.

  There are _____ in each group. $\dfrac{1}{3}$ of 6 = _____

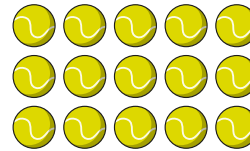- Circle $\dfrac{1}{3}$ of the counters. $\dfrac{1}{3}$ of 9 = _____

  Is there more than one way to circle $\dfrac{1}{3}$?

  Why? Will this always work?

- Find $\dfrac{1}{3}$ of each set of objects.

  $\dfrac{1}{3}$ of 15 = _____ $\dfrac{1}{3}$ of 18 = _____ $\dfrac{1}{3}$ of 21 = _____

  What do you notice about your answers?

- Use bar models to help you complete the number sentences.

  ▸ $\dfrac{1}{3}$ of 30 = _____   ▸ $\dfrac{1}{3}$ of 27 = _____

  ▸ $\dfrac{1}{3}$ of 33 = _____   ▸ $\dfrac{1}{3}$ of 36 = _____

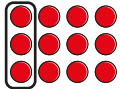# Find a third

Reasoning and problem solving

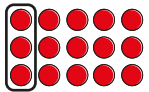Tiny uses counters to find a third of some numbers.

Here are Tiny's workings.

$\frac{1}{3}$ of 9 = 3

$\frac{1}{3}$ of 12 = 3

$\frac{1}{3}$ of 15 = 3

Explain Tiny's mistake.

Work out the correct answers.

3

4

5

Tom is thinking of a number.

$\frac{1}{3}$ of his number is greater than 8, but less than 12

What could Tom's number be?

27, 30, 33

Dan, Max and Ann each have a fraction of £12

- Dan has $\frac{1}{2}$ of £12
- Max has $\frac{1}{4}$ of £12
- Ann has $\frac{1}{3}$ of £12

Who has the most money?

Who has the least money?

Explain your answer.

Dan

Max

Kim has a piece of ribbon.

She cuts it into three equal parts.

$\frac{1}{3}$ of the ribbon is 6 cm long.

How long is $\frac{1}{2}$ of the ribbon?

9 cm

Find the whole

Notes and guidance

In this small step, children use the skills that they have learnt in previous steps to use a fraction of an amount to find the whole. Although this has been explored briefly in previous steps, children now formalise this understanding and start to make comparisons between fractions.

Children may find this difficult to visualise at first, so encourage them to use diagrams and practical resources to ensure accuracy and understanding. Bar models are particularly useful. Encourage children to identify the part and to use the fact that all the parts must be equal to find the whole.

Give children opportunities to use this skill in a range of contexts, including length.

Things to look out for

- Children may find a fraction of the given amount rather than finding the whole.
- Children may not be able to visualise the whole without drawing a diagram.
- Children may know what one part of the diagram should be, but be unsure of the other parts.

Key questions

- Do you know a part or the whole?
- How many equal parts are there?
- If there are _____ in one of the parts, how many need to be in the other parts?
- How can you find the whole?
- If you know what $\frac{1}{2}$ / $\frac{1}{3}$ / $\frac{1}{4}$ is, how can you find the whole?

Possible sentence stems

- The whole has been split into _____ equal parts.

  One part is _____ , so the other parts must also be _____
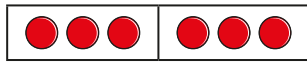
  The whole is _____

National Curriculum links

- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- Write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

Find the whole

Key learning

- Use the bar model to help you complete the sentences.

▸ $\frac{1}{2}$ of 6 = _____   ▸ $\frac{1}{2}$ of _____ = 3

What do you notice?

Which did you find easier to work out?
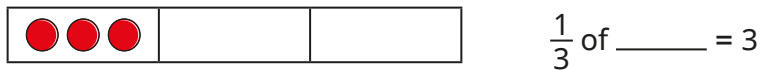
- Complete the sentences for each bar model.

The whole has been split into _____ equal parts.

One part is _____ , so the other part(s) must be _____

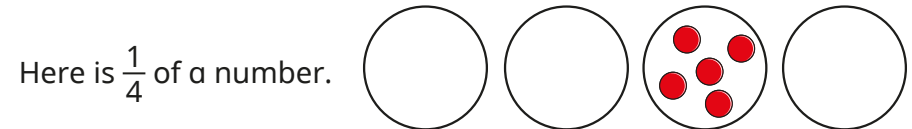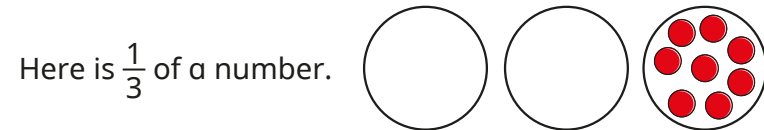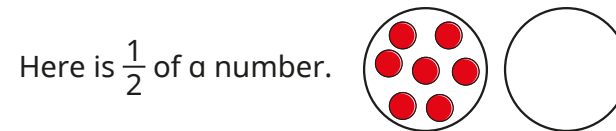The whole is _____

- Complete the bar model to find the whole.

     $\frac{1}{3}$ of _____ = 3

Use this method to find each whole.

▸ $\frac{1}{3}$ of _____ = 6   ▸ $\frac{1}{2}$ of _____ = 6   ▸ $\frac{1}{4}$ of _____ = 6

- Find the whole for each picture.

Here is $\frac{1}{2}$ of a number.

Here is $\frac{1}{3}$ of a number.

Here is $\frac{1}{4}$ of a number.

- Find the wholes.

▸ $\frac{1}{2}$ of _____ = 5   ▸ $\frac{1}{3}$ of _____ = 5   ▸ $\frac{1}{4}$ of _____ = 5

▸ $\frac{1}{2}$ of _____ = 10   ▸ $\frac{1}{3}$ of _____ = 10   ▸ $\frac{1}{4}$ of _____ = 10

What patterns can you spot?

- Kay has run 20 m in a race.

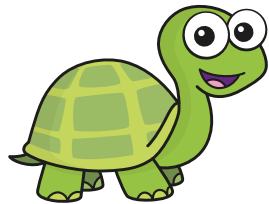She is $\frac{1}{4}$ of the way through the race.

How long is the race?

Find the whole

Reasoning and problem solving

Tiny is trying to find the whole.

$$\frac{1}{2} \text{ of } \boxed{} = 8$$

The answer must be 4

Do you agree with Tiny?

Explain your answer.

No

Which is the greatest total amount of money?

A $\frac{1}{4}$ of _____ = £7
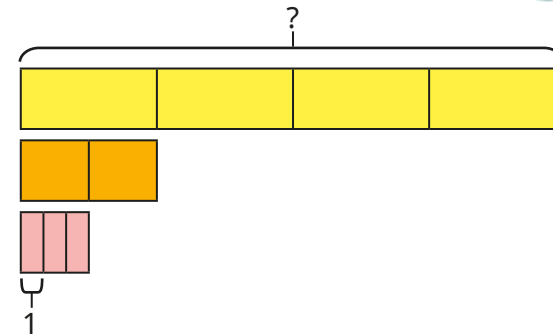
B $\frac{1}{2}$ of _____ = £7

C $\frac{1}{3}$ of _____ = £7

Did you need to work out each whole to decide?

A

Work out the missing number.

?

1

24

Unit fractions

Notes and guidance

In this small step, children bring together the learning so far in this block to understand the concept of unit fractions. They are already familiar with the fractions $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ and will now use the term "unit fraction" to describe them.

Children should recognise that a unit fraction is one in which the whole has been split into equal parts and one of those parts is shaded or highlighted. They should consider how unit fractions are written in fraction notation, and this will clarify the role of the numerator and denominator. They can begin to generalise that a unit fraction is any fraction with a numerator of 1

Children begin by looking at unit fractions where one equal part of a shape or object is shaded/circled, before exploring unit fractions of a set of objects.

Things to look out for

- Children may think that a unit fraction is always represented by the first box or top left box being shaded.
- Children may struggle to see how a unit fraction can also apply to a set of objects rather than a single object.

Key questions

- What is the same and what is different about the fractions $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$?
- What is a unit fraction?
- What do all unit fractions have in common?
- Has the shape been split into equal parts? How many parts are shaded?
- How can you colour this shape to show a unit fraction?
- Is it possible to show a unit fraction if more than one object is circled?

Possible sentence stems

- There are _____ equal parts.

  There is _____ part shaded.

  $\frac{\square}{\square}$ is shaded.

  This is a _____ fraction.

National Curriculum links

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

© White Rose Maths 2022

Unit fractions

Key learning

- Complete the sentences for each bar model.

There are _____ equal parts.

There is _____ part shaded.

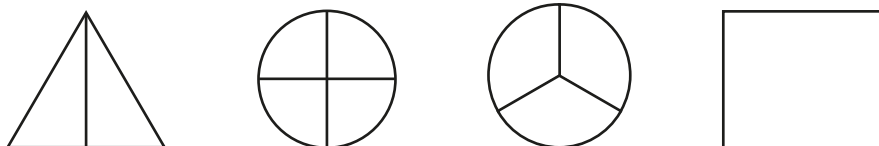$\frac{\square}{\square}$ is shaded.

What is the same and what is different about the bar models?

-
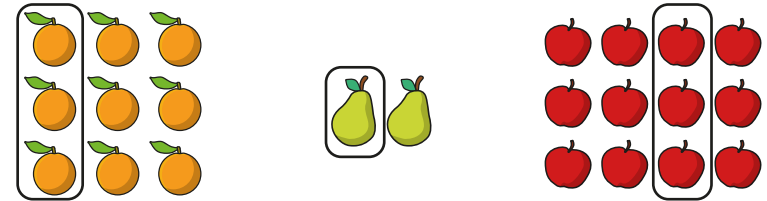A unit fraction is always one equal part of a whole.

Which shapes show unit fractions?

- Colour the shapes so that they show unit fractions.

- Match the pictures to the unit fractions.

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

- What fractions are shown?

Which fraction is the greatest?

Which fraction is the smallest?

What do you notice about their denominators?

- Ron has circled some pencils to show a unit fraction.
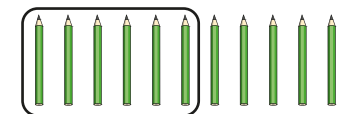
What unit fraction has Ron shown?

What other unit fractions could you show using Ron's pencils?

Unit fractions

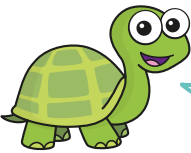## Reasoning and problem solving

Is the statement always true, sometimes true or never true?

To show a unit fraction, you need to colour one part.
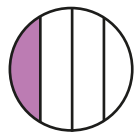
Explain your answer.

sometimes true

Tiny shows a unit fraction.

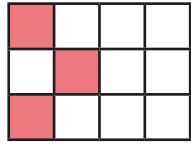This is a unit fraction, because I have coloured one of the parts.
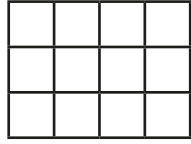
Do you agree with Tiny?

Explain your answer.

No

This shows $\frac{1}{4}$

Colour some squares to show $\frac{1}{3}$

Is there more than one answer?

any four squares coloured

Fay thinks of a number.

$\frac{1}{3}$ of her number is 8

Which will be greater, $\frac{1}{2}$ or $\frac{1}{4}$ of Fay's number?

Explain your answer.

$\frac{1}{2}$

Non-unit fractions

Notes and guidance

In this small step, children learn about non-unit fractions.

Reference should be made to the previous step, and unit fractions should be constantly used within questioning to ensure that children can differentiate between the two types of fraction. They recognise that a non-unit fraction is a fraction where the numerator is greater than 1. They identify $\frac{2}{3}$, $\frac{2}{4}$ and $\frac{3}{4}$ and also begin to look at fractions equivalent to 1 whole. It may be useful to identify non-unit fractions as an amount of unit fractions, for example $\frac{2}{3}$ = 2 lots of $\frac{1}{3}$

Children begin to compare unit and non-unit fractions by using diagrams or contexts and are introduced to the concept of equivalence through fractions that are equivalent to a whole.

Things to look out for

- Children may not realise that $\frac{3}{4}$ is made up of 3 lots of $\frac{1}{4}$

- Children may not recognise when a fraction is equal to 1 whole.

- Children may not recognise the equivalence of $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$

Key questions

- What is a unit fraction? What is a non-unit fraction?

- What is the difference between a unit fraction and a non-unit fraction?

- How many _____ s are there in _____ ? (for example, $\frac{1}{4}$ s in $\frac{3}{4}$) How many _____ s are there in 1 whole?

- How can you tell if this fraction is the same as 1 whole?

- Will a unit fraction always be smaller than a non-unit fraction? Why?

Possible sentence stems

- There are _____ equal parts.

  There are _____ parts shaded.

  $\frac{\square}{\square}$ is shaded.

- The numerator is greater than _____ , so this is a _____ fraction.

National Curriculum links

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

Non-unit fractions
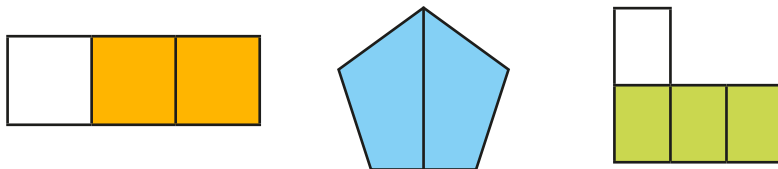
Key learning

- Here are two bar models showing fractions.

  What is the same? What is different?

  Which bar model shows a unit fraction? How do you know?

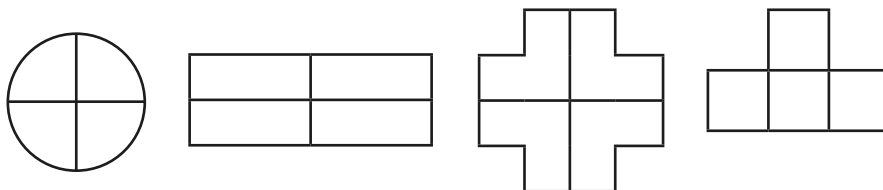- Complete the sentences for each picture.

  There are _____ equal parts.
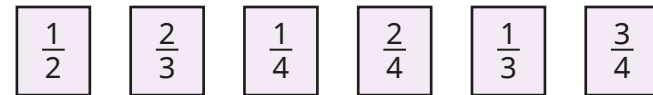
  There are _____ parts shaded.

  $\dfrac{\square}{\square}$ is shaded.

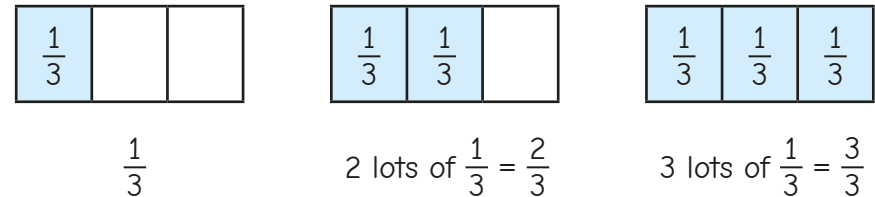 Are these unit fractions or non-unit fractions?

- Shade a non-unit fraction of each shape.

- Sort the fractions into unit fractions and non-unit fractions.

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

- Dan labels each part to help find the fractions.

  $\dfrac{1}{3}$

  2 lots of $\dfrac{1}{3} = \dfrac{2}{3}$

  3 lots of $\dfrac{1}{3} = \dfrac{3}{3}$

  Use Dan's method to find the fractions.

  What do you notice?

- Match the pictures to the non-unit fractions.

  $\dfrac{2}{3}$ $\dfrac{4}{4}$ $\dfrac{3}{4}$
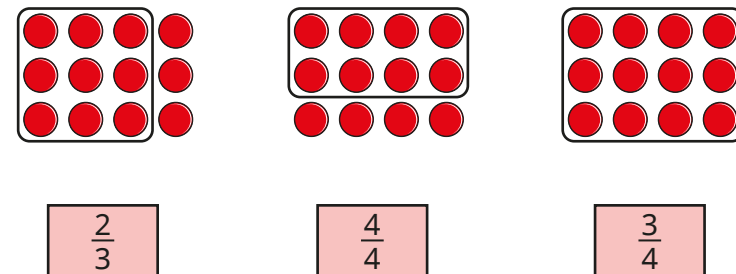
Non-unit fractions

Reasoning and problem solving

Tiny is colouring non-unit fractions.
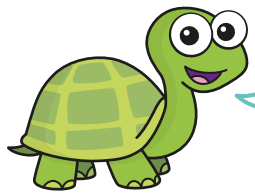
I have coloured $\frac{2}{2}$ of the shape.
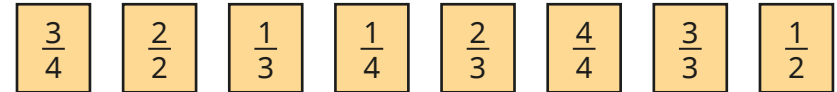
Do you agree with Tiny?

Explain your answer.

No

Which is greater, $\frac{1}{4}$ or $\frac{3}{4}$?

Explain your answer.

$\frac{3}{4}$

Sort the fractions into the table.

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

	Fractions equal to 1 whole	Fractions less than 1 whole
Unit fractions		
Non-unit fractions		

What do you notice?

Are any boxes in the table empty?

Can you add another fraction to each part of the table?

top right: $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$

bottom left: $\frac{2}{2}$, $\frac{4}{4}$, $\frac{3}{3}$

bottom right: $\frac{3}{4}$, $\frac{2}{3}$

top left: $\frac{1}{1}$

Recognise the equivalence of a half and two-quarters

Notes and guidance

Children may have thought about equivalence in the previous step, but they now look in detail at $\frac{1}{2}$ and $\frac{2}{4}$ and recognise their equivalence. It is important to discuss the language of equivalence.

Children need to approach this step with practical and pictorial resources to support understanding. When finding a fraction of a shape, they should see that $\frac{1}{2}$ and $\frac{2}{4}$ take up the same amount of space, as long as the wholes are equal in size.

Although finding non-unit fractions of amounts has not been covered yet, this may be explored with support as another way to show the equivalence between $\frac{1}{2}$ and $\frac{2}{4}$

Things to look out for

- Children may find the word "equivalent" difficult.

- Children may not realise that they can use $\frac{1}{2}$ and $\frac{2}{4}$ interchangeably to suit the question.

- If diagrams are not equal in size, children may not be able to see that $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent.

Key questions

- What does "equivalent" mean?

- What do you notice when you colour $\frac{1}{2}$ and $\frac{2}{4}$ of the same shape?

- How can you show that $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent?

- Why do you think some people might think that $\frac{1}{2}$ and $\frac{2}{4}$ are not equivalent?

- How can you colour $\frac{2}{4}$ of a shape if you cannot easily split it into four equal parts?

Possible sentence stems

- $\frac{1}{2}$ is _____ to $\frac{2}{4}$

- $\frac{1}{2} = \dfrac{\square}{4}$ $\dfrac{1}{\square} = \frac{2}{4}$

National Curriculum links

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

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

Recognise the equivalence of a half and two-quarters

Key learning

- Take two identical strips of paper.

  Fold one strip into two equal pieces.

  Fold the other strip into four equal pieces.

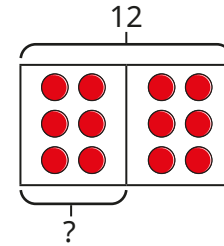 Compare one of the two equal pieces with two of the four equal pieces.

  What do you notice?

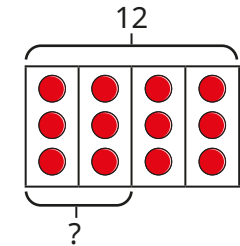- Colour $\frac{1}{2}$ and $\frac{2}{4}$ of each shape.

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

What do you notice about the coloured parts of similar shapes?

- Use the bar models to find $\frac{1}{2}$ of 12 and $\frac{2}{4}$ of 12

  12

  ?

  $\frac{1}{2}$ of 12 = _____

  12

  ?

  $\frac{2}{4}$ of 12 = _____

  Complete the sentence.

  $\frac{\Box}{\Box}$ of 12 is equal to $\frac{\Box}{\Box}$ of 12

- Sam and Max are finding $\frac{2}{4}$ of 20 sweets.

  I will split my sweets into four equal groups. Then I will count two of the groups.

  I will split my sweets into two equal groups. Then I will count one group.
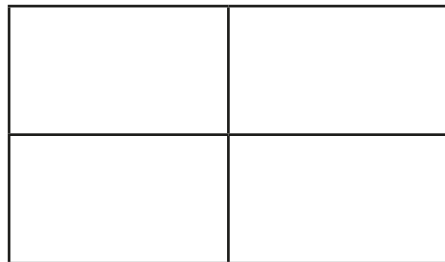
  Why does each method work?

  Choose one of the methods to find $\frac{2}{4}$ of 20

Recognise the equivalence of a half and two-quarters

Reasoning and problem solving
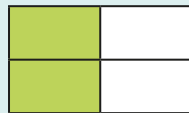
Ron wants to colour $\frac{1}{2}$ of the shape.

> I cannot colour half because the shape has not been split into two parts.

multiple possible answers, e.g.

Explain why Ron can colour $\frac{1}{2}$

Colour half of the shape.

Jo colours part of a shape.

> I have coloured $\frac{1}{3}$ of my shape.
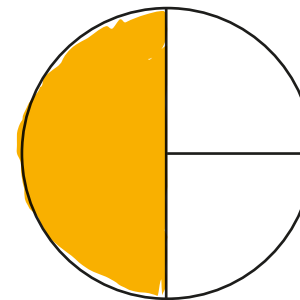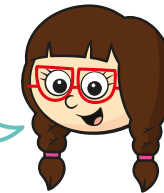
$\frac{1}{2}$ or $\frac{2}{4}$

What mistake has Jo made?

What fraction has she coloured?

Recognise three-quarters

Notes and guidance

Children have already begun to explore non-unit fractions in the last two steps, and in this small step they focus on recognising $\frac{3}{4}$

Children first look at $\frac{1}{4}$ and $\frac{3}{4}$ and identify the relationship between them, recognising that $\frac{3}{4}$ is made up of 3 lots of $\frac{1}{4}$. They should also be able to identify that $\frac{3}{4}$ represents the whole being split into four equal parts and having three of the equal parts.

Children recognise and represent $\frac{3}{4}$ in a variety of ways, including with shapes, length and sets of objects. They should also be able to recognise $\frac{3}{4}$ when there are more than four equal parts (for example, a set of 20 pencils), using sharing to support this.

Things to look out for

- Children may mix up the role of the numerator and the denominator.

- Children may find it more difficult to recognise $\frac{3}{4}$ when looking at a set of objects, rather than just part of a shape.

- Children may need support to identify the relationship between $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$

Key questions

- How are $\frac{1}{4}$ and $\frac{3}{4}$ similar? How are they different?

- How many quarters are there in three-quarters?

- How can you show three-quarters of this shape?

- How can you show $\frac{3}{4}$ if there are more than four equal parts?

- How do you know that this does not show three-quarters? What would you change?

- Is $\frac{3}{4}$ always greater than $\frac{1}{4}$?

Possible sentence stems

- There are _____ equal parts.

  _____ of the equal parts are shaded.

  This can be written as $\frac{\square}{\square}$

- There are _____ lots of $\frac{1}{4}$ in $\frac{3}{4}$

National Curriculum links

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

Recognise three-quarters

Key learning

- Colour the shapes to match the sentences.

  ▶ There are four equal parts.

    One of the parts is shaded.

  ▶ There are four equal parts.

    Two of the parts are shaded.

  ▶ There are four equal parts.
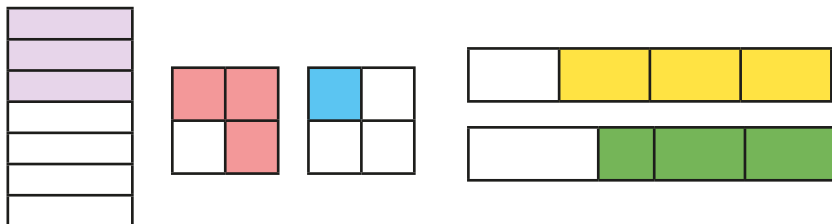
    Three of the parts are shaded.

  Write each of these as a fraction.

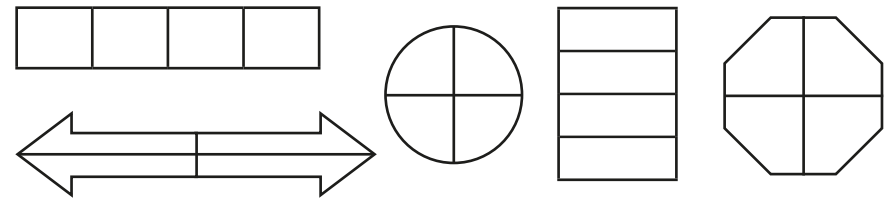- Here is a fraction.

  $\frac{3}{4}$ What does the 3 represent?
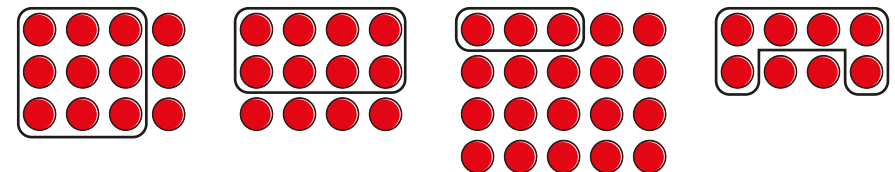
    What does the 4 represent?

- Which shapes show $\frac{3}{4}$?

  Explain why some of the shapes do **not** show $\frac{3}{4}$

- Colour the shapes to show $\frac{3}{4}$

- Which pictures show $\frac{3}{4}$?

- Which shapes have $\frac{3}{4}$ shaded?
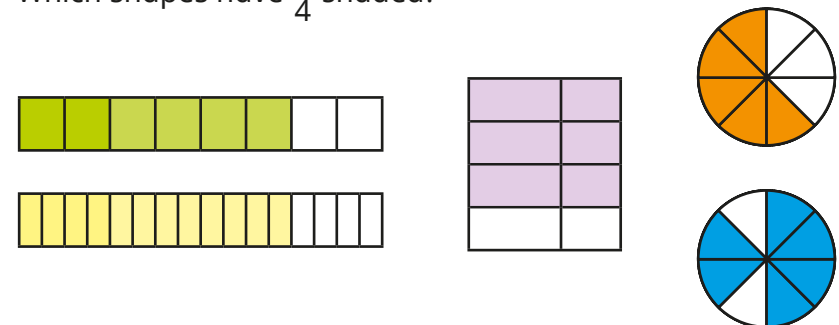
Recognise three-quarters

Reasoning and problem solving

Tiny is learning about $\frac{3}{4}$
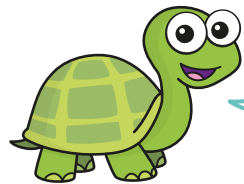
To show $\frac{3}{4}$, I just need to show three parts.

Is Tiny correct?

Explain your answer.

sometimes correct

Is the statement always true, sometimes true or never true?

$\frac{3}{4}$ is greater than $\frac{1}{4}$

Explain your answer.

sometimes true
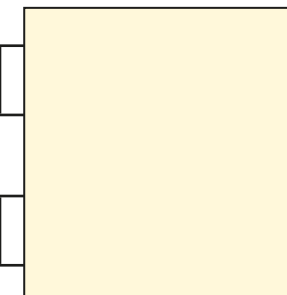
Ann and Kay each have a piece of ribbon.

Part of each ribbon is hidden.

- $\frac{1}{4}$ of Ann's ribbon is shown.
- $\frac{3}{4}$ of Kay's ribbon is shown.

Ann

Kay

Who has the longer piece of ribbon?

How do you know?

Draw estimates of the full ribbons.

Ann

© White Rose Maths 2022

Find three-quarters

Notes and guidance

In this small step, children find three-quarters of a set of objects or a number.

Children may find this step challenging, as it can involve dividing by 4 and will generally involve more than one step. Use concrete and pictorial resources to support understanding and develop confidence. Some children may need to use these resources throughout the step.

Children start by finding $\frac{1}{4}$ of a set of objects, then explore and discuss methods to find $\frac{3}{4}$. They could consider the suitability and efficiency of these methods. Guide children to identify patterns when finding $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ and $\frac{4}{4}$ of a number. Encourage them to consider which is greater, $\frac{1}{2}$ or $\frac{3}{4}$ of the same number.

Things to look out for

- Children may find it difficult to split pictures into four equal parts.
- Children may find $\frac{1}{4}$ rather than $\frac{3}{4}$
- Children may think that $\frac{3}{4}$ of a number is always 3

Key questions

- How do you find $\frac{1}{4}$ of a number? How could you use this to find $\frac{3}{4}$ of a number?
- How can you use counters/bar models to help?
- How many equal groups do you need to make?
- How many of the equal groups do you need to count to find $\frac{3}{4}$?
- How many ways can you find $\frac{3}{4}$?
- If you know $\frac{1}{4}$ of a number, how can you find $\frac{3}{4}$ of the number?

Possible sentence stems

- The whole is _____

  $\frac{1}{4}$ of _____ is _____

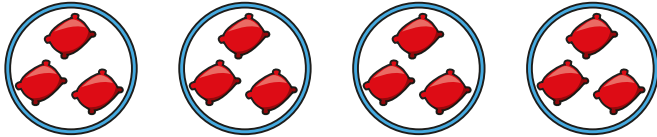 $\frac{3}{4}$ of _____ is _____

National Curriculum links

- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
- Write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

Find three-quarters

Key learning

- Dan shares 12 bean bags into 4 equal groups.

  Use the picture to complete the sentences.
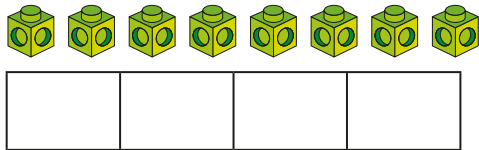

  One-quarter of 12 is equal to _____

  Two-quarters of 12 is equal to _____

  Three-quarters of 12 is equal to _____

  Four-quarters of 12 is equal to _____

- There are 8 cubes.

  ▶ Use the bar model to share the cubes into 4 equal groups.

  ▶ Complete the sentences.

  There are _____ in each group.

  To find $\frac{3}{4}$ I need to count _____ groups.

  $\frac{3}{4}$ of 8 is _____

  ▶ Use the same method to help you find $\frac{3}{4}$ of 16 and $\frac{3}{4}$ of 20

- Circle $\frac{1}{4}$ of the marbles. Use a different colour to circle $\frac{3}{4}$

  What is the same? What is different?

- Circle $\frac{3}{4}$ of each set of objects.
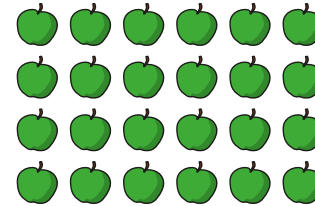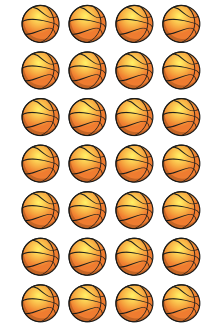
  $\frac{3}{4}$ of 24 = _____ $\frac{3}{4}$ of 28 = _____

- Use counters, cubes or bar models to help you find the fractions.

  ▶ $\frac{1}{4}$ of 32 = _____   ▶ $\frac{1}{4}$ of 36 = _____   ▶ $\frac{1}{4}$ of 40 = _____

  $\frac{2}{4}$ of 32 = _____ $\frac{2}{4}$ of 36 = _____ $\frac{2}{4}$ of 40 = _____

  $\frac{3}{4}$ of 32 = _____ $\frac{3}{4}$ of 36 = _____ $\frac{3}{4}$ of 40 = _____
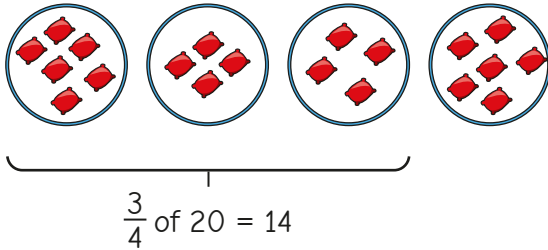
  $\frac{4}{4}$ of 32 = _____ $\frac{4}{4}$ of 36 = _____ $\frac{4}{4}$ of 40 = _____

  What do you notice?

Find three-quarters

Reasoning and problem solving

Tiny uses bean bags and hoops to find $\frac{3}{4}$ of 20

$\frac{3}{4}$ of 20 = 14

What mistake has Tiny made?

What is the correct answer?

15

Tom eats three-quarters of his sweets.

He eats these sweets.

How many sweets does Tom have left?

2

Write < , > or = to compare the amounts.

$\frac{3}{4}$ of 40 ◯ $\frac{1}{4}$ of 40

$\frac{1}{2}$ of 32 ◯ $\frac{3}{4}$ of 32

>

<

Tiny wants to find $\frac{3}{4}$ of 40

I could find $\frac{1}{4}$ and subtract it from the whole.

Do you agree with Tiny?

Explain your answer.

Find $\frac{3}{4}$ of 40

Yes

_____

30

Count in fractions up to a whole

Notes and guidance

In this small step, children use their knowledge of unit fractions and non-unit fractions to count in fractions up to a whole, focusing on halves, thirds and quarters. This step is pictorially based and does not include number lines, which will be introduced in Year 3

Encourage children to recognise and represent fractions, as well as spotting patterns when counting. They should come to realise that the numerator increases, but the denominator stays the same. They should also be aware of examples in which a fraction is equivalent to 1 whole.

Children do not need to count beyond 1 at this stage, but it may be useful to discuss that fractions do not stop at 1 whole.

Things to look out for

- Children may increase the denominator instead of the numerator (for example, $\frac{1}{3}$, $\frac{1}{4}$ ...) or increase both (for example, $\frac{1}{3}$, $\frac{2}{4}$ ...).
- Children may not recognise fractions that are equivalent to 1 whole.
- Children may think that it is impossible to count beyond $\frac{4}{4}$, for example.

Key questions

- What comes next in the pattern?
- How many parts do you need to colour for the next fraction in the pattern?
- What comes after $\frac{\square}{\square}$?
- What do you notice happens to the numerator? What happens to the denominator?
- How do you know when a fraction is equivalent to 1 whole?
- How is counting in fractions similar to counting in ones? How is it different?

Possible sentence stems

- $\frac{\square}{\square}$ comes after $\frac{\square}{\square}$
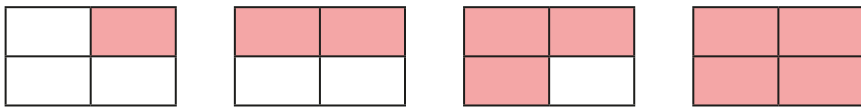- $\frac{\square}{\square}$ is equivalent to 1 whole.

National Curriculum links

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

Count in fractions up to a whole
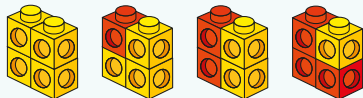
Key learning

- What fractions are shown?

What do you notice?

Show children this pattern and ask what the next lot of cubes will look like.

Ask children to write the fraction of red cubes in each picture. Can they tell you what the first picture represents?
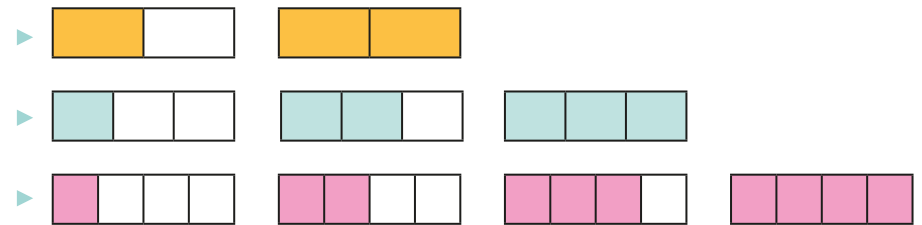
Now ask them to write the fraction of yellow cubes. What is the same? What is different?
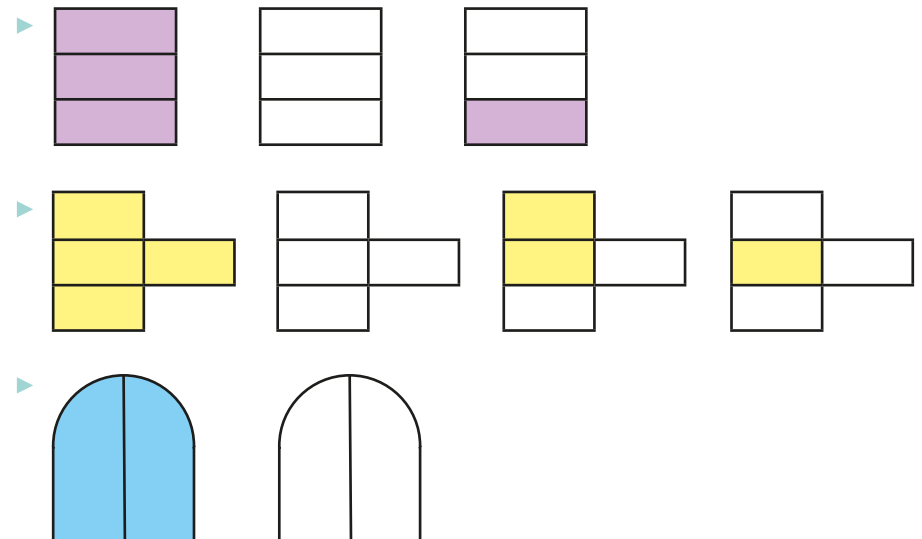
- Jo colours part of a shape.

  ▸ What fraction has Jo shown?

  ▸ Colour another part of the shape. What fraction is shown now?

  ▸ Colour another part of the shape. What fraction is shown now?

- Use the bar models to count in fractions up to 1 whole.

Compare the patterns. What do you notice?

- Colour the blank pictures and write the fractions to count back from 1 whole.

Count in fractions up to a whole

Reasoning and problem solving

Ron and Kim are counting in quarters.

Ron: One-quarter, two-quarters, three-quarters, four-quarters.

Kim: One-quarter, one-half, three-quarters, one whole.

Who is correct?

Explain your answer.

Both children are correct.

Tiny is trying to count in thirds.

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

What mistake has Tiny made?

Tiny has added 1 to the denominator as well as the numerator.

Max is counting in fractions.

Three-quarters …

Is there more than one fraction that Max could say next?

Explain your answer.

Yes

Summer Block 2

Time

White Rose Maths

Small steps

Step 1	O'clock and half past

Step 2	Quarter past and quarter to

Step 3	Tell the time past the hour

Step 4	Tell the time to the hour

Step 5	Tell the time to 5 minutes

Step 6	Minutes in an hour

Step 7	Hours in a day

O'clock and half past

Notes and guidance

In Year 1, children learnt to tell the time to the hour and half past the hour. That learning is revisited in this small step.

Begin by discussing time, finding out what children already know and can remember from Year 1. Recap the two hands of the clock, starting with the minute hand on 12 and the hour hand moving around the clock, showing the different times on the hour. Provide children with clocks and ask them to show a given time, before making a time for a partner to read. Move on to half past the hour, showing the minute hand at 6 and the hour hand halfway between two numbers. Ensure that children know that the time will be half past the last number the hour hand has moved past.

Things to look out for

- Children may keep the hour hand pointing directly at a number for half past an hour, instead of halfway between two numbers.

- Children may confuse the minute and hour hands.

- Children may not use analogue clocks outside school, so this representation may be unfamiliar to them.

Key questions

- Which is the hour hand? Which is the minute hand?

- What is the same and what is different about the hands on a clock?

- What does each hand on a clock show?

- At _____ o'clock, where should the hour/minute hand be?

- What time is shown?

- Where does the hour/minute hand need to be for half past _____?

Possible sentence stems

- When the minute hand points at _____ (12/6), it means that the time is _____ (o'clock/half past).

- The time is _____ o'clock.

- The time is half past _____

National Curriculum links

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clockface to show these times

O'clock and half past

Key learning

Model telling the time to the hour and half past the hour on a large clock.

Make sure that children see that at half past the hour, the hour hand is halfway between two numbers. Move on to giving the children a time for them to show on clocks.
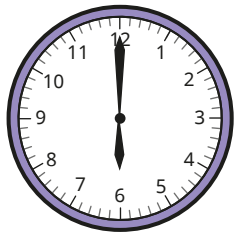
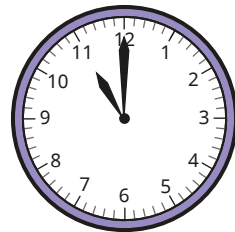- Write the times shown on the clocks.
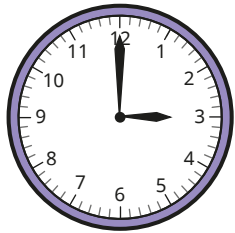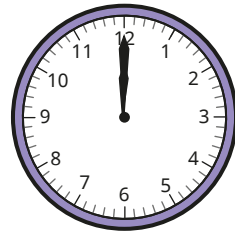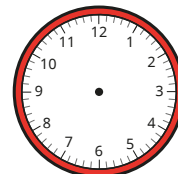
_____ o'clock   _____ o'clock

_____ o'clock   _____ o'clock

- What times are shown on the clocks?

- Complete the sentences.
   ▶ At 5 o'clock, the hour hand points to _____ and the minute hand points to _____
   ▶ At half past 11, the hour hand points between _____ and _____ and the minute hand points to _____

- Draw hands on the clocks to show the times.
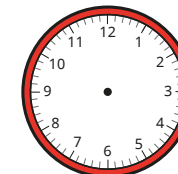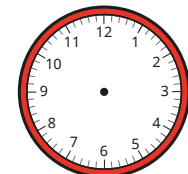
3 o'clock   half past 5   half past 12

O'clock and half past

Reasoning and problem solving
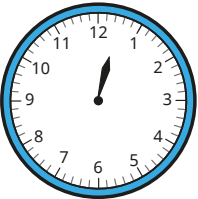
It is half past 11, so the hour hand should point to 11

Is Tiny correct?

Explain your answer.

No

The minute hand has fallen off the classroom clock.

Lunchtime is at 12:00

Are the children late for lunch?

Explain your answer.

Yes

Sam, Max and Jo are telling the time.

The time is half past 6

Sam

The time is half past 3

Max

The time is half past 2

Jo

Jo

Who is correct?

What mistakes have the other children made?

© White Rose Maths 2022

Quarter past and quarter to

Notes and guidance

In this small step, the learning from the previous step is extended to include quarter past and quarter to the hour. This is the first time that children have seen the terms "quarter to" and "quarter past", although they should be familiar with quarters from work on fractions.

Model the four quarters on a clock. Children may see the connection between half past and two quarters past, and it is worth discussing this link. While children will be familiar with the term "past" from the previous step, the term "to" in relation to time is new. Spend some time modelling where the minute hand goes for quarter past and quarter to, as well as where the hour hand needs to be at these times.

Children then read and create times for themselves.

Things to look out for

- Children may confuse "quarter past" and "quarter to".

- Children may keep the hour hand pointing directly at a number for quarter past/to an hour, instead of placing it partway between two numbers.

- Children may confuse the minute and hour hands.

Key questions

- How many quarters are there in one whole?

- How could you show a quarter on a clock?

- What does each hand on a clock represent?

- The minute hand is pointing at 3/9. What do you know about the time?

- Where does the minute hand point for quarter past/to _____?

- What is the same about quarter past _____ and quarter to _____? What is different?

Possible sentence stems

- The time shown is quarter past/to _____

- At quarter past/to _____, the minute hand is pointing to _____ and the hour hand is between the _____ and the _____

National Curriculum links

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clockface to show these times

© White Rose Maths 2022
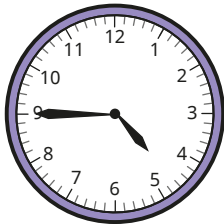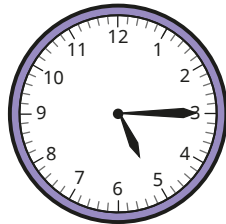
Quarter past and quarter to

Key learning

Model telling the times quarter past and quarter to the hour on a large clock.

Discuss where the hour hand should be in each case. Move on to giving children a time to show on clocks.

- What is the same and what is different about the times?

quarter to 5   quarter past 5

- Match the clocks to the times.

quarter past 3   quarter past 6   quarter past 1
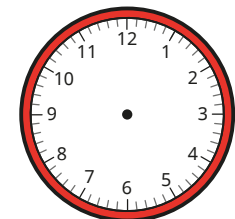
- Match the clocks to the times.

quarter to 3   quarter to 9   quarter to 12

- Complete the sentences.

  ▶ At quarter past 7, the hour hand points to less than halfway between _____ and _____
    The minute hand points to _____

  ▶ At quarter to 5, the hour hand points to over halfway between _____ and _____
    The minute hand points to _____

- Draw hands on a clock to show the times.

  ▶ quarter to 9

  ▶ quarter past 11

  ▶ quarter to 11

Quarter past and quarter to

Reasoning and problem solving

The time is quarter past 2, so the hour hand is closer to the 2 than to the 3

Is Tiny correct?

Explain your answer.

Yes

The hour hand has fallen off the clock.

It was pointing closer to an even number than an odd number.
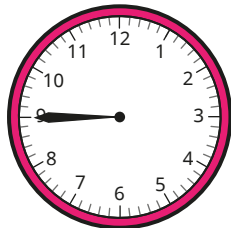
What time could it be?

quarter to any even number of hours, e.g. quarter to 4

How many quarters of an hour are there between quarter past 7 and quarter to 9?

How did you work it out?

6

Put the times in order, from earliest to latest.

quarter past 7
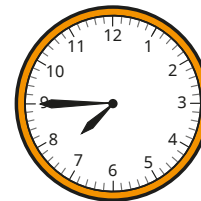
half past 7

quarter past 7

half past 7

quarter to 8 (clock)

Tell the time past the hour

Notes and guidance

Children have already seen the term "past" the hour in relation to half past and quarter past. In this small step, that learning is extended to include intervals of 5 minutes past the hour.

Remind children that there are 60 minutes in an hour, and show that each of the twelve sections of a clock corresponds to a 5-minute interval. Use a large clock and model moving the minute hand around the clock to show 5 minutes, 10 minutes and so on, up to 30 minutes. Then discuss how to read times using the hour hand as well, for example 5 past 9, 10 past 9, quarter past 9 and so on. Children then read and create times for themselves.

Times to the next hour will be covered in the next step.

Things to look out for

- Children may say the number that the minute hand is pointing to, for example "1 minute past" instead of "5 minutes past".

- The break in the pattern going from "5 minutes past" and "10 minutes past" to "quarter past" rather than "15 minutes past" may cause confusion.

Key questions

- How many minutes are there in an hour?

- How many numbers are shown on the clock?

- How many minutes are there between each number shown on the clock? How do you know?

- What does each hand on a clock represent?

- If the minute hand is on _____ , how many minutes past the hour is it?

- How else do we say "15/30 minutes past" an hour?

- When does the minute hand stop being "past the hour"?

Possible sentence stems

- When the minute hand is pointing to _____ , it is _____ minutes past the hour.

- The time shown is _____ minutes past _____

National Curriculum links

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clockface to show these times

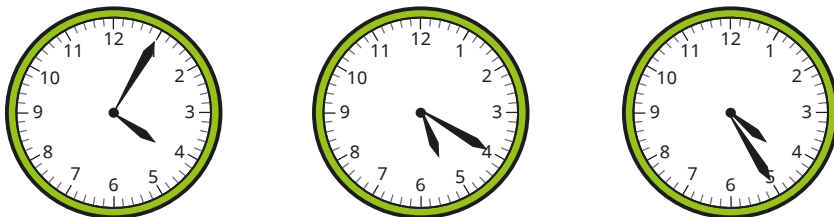# Tell the time past the hour

Key learning

Model telling the times 5 past, 10 past, 20 past and 25 past. Recap quarter and half past and discuss how these also represent 15 minutes and 30 minutes past. Model the movement of the hour hand as well.

- What is the same and what is different about the times?
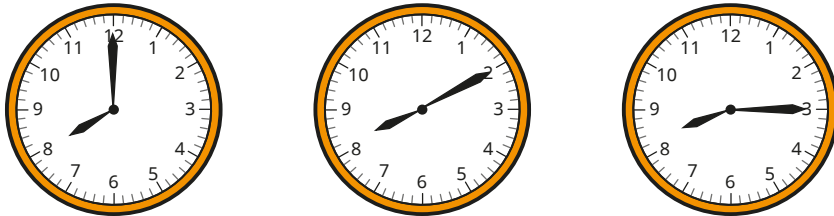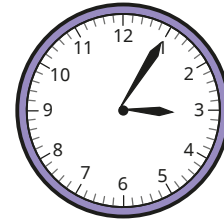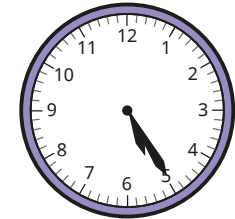
- Match the clocks to the times.

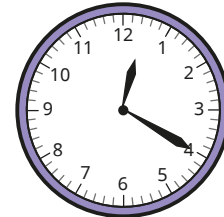| 20 minutes past 5 | 25 minutes past 4 | 5 minutes past 4 |

- Write the times shown on the clocks.

_____ minutes past _____   _____ minutes past _____
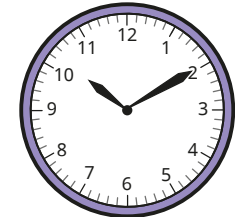
_____ minutes past _____   _____ minutes past _____

- Draw hands on the clocks to show the times.
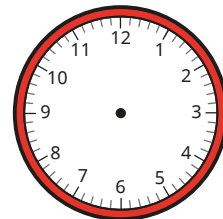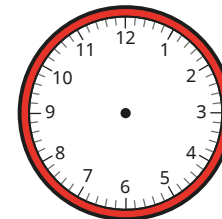
10 minutes past 1   20 minutes past 6   25 minutes past 9
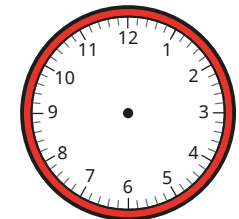
Tell the time past the hour

Reasoning and problem solving

Ron and Sam are telling the time.

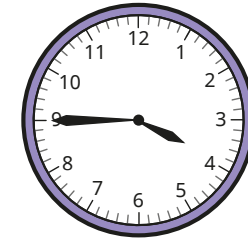

Ron: The time is 15 minutes past 5
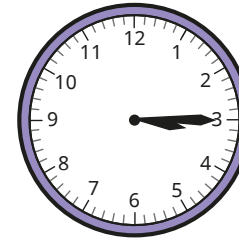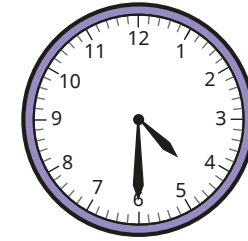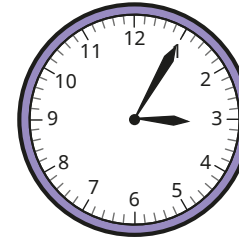
Sam: It is quarter past 5
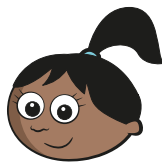
Who do you agree with?

Explain your answer.

Both children are correct.

Which time is the odd one out?

Is there more than one answer?

multiple possible answers, e.g.

quarter to 4: does not include "past"

5 minutes past 3: only time that uses "minutes"

half past 4: not between the hours of 3 and 4

Tell the time to the hour

Notes and guidance

At this stage, children have only seen the term "to" in relation to time when referring to quarter to the hour. In this small step, that learning is extended to include intervals of 5 minutes before the hour.

Explain that half past the hour is only ever said as that, and never as "half to" the hour. Then model the times 25, 20, 10 and 5 minutes to the hour, while also reminding children of quarter to the hour. They see that the hour hand is pointing to before the number that is said in the time. For example, at 10 minutes to 2, the hour hand is pointing slightly before 2. Encourage them to see that times after half past are related to the next hour, so times after half past 6, for example, are "_____ minutes to 7". Children then read and create times for themselves.

Things to look out for

- Children may continue the pattern from the previous step and say 35 minutes past, instead of 25 minutes to.

- Children may confuse the terms "past" and "to".

- Children may use the number of intervals before the hour, or the number the minute hand is pointing to, for example "1 minute to" or "11 minutes to".

Key questions

- How many minutes are there between each pair of numbers on a clock?

- When in an hour do you stop saying "past" and start saying "to"?

- How can you tell by looking at a clock if the time is past or to the hour?

- Where does the minute/hour hand need to be for the time _____ minutes to _____?

- What is the same and what is different about the times _____ minutes past _____ and _____ minutes to _____?

Possible sentence stems

- The time is _____ minutes to _____

- At _____ minutes to _____ , the hour hand is between _____ and _____ and the minute hand is pointing to _____

National Curriculum links

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clockface to show these times
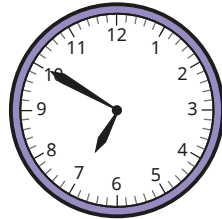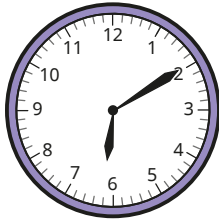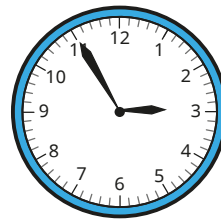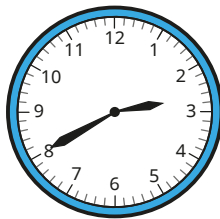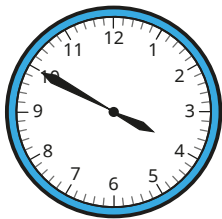
Tell the time to the hour

Key learning

Model telling the time to the hour in 5-minute intervals on a large clock, including quarter to the hour. Draw children's attention to the position of the hour hand, which should be over halfway between the two numbers.

- What is the same and what is different about the times?
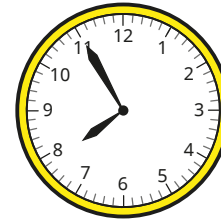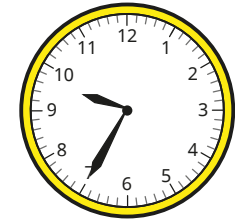
- Match the clocks to the times.

| 5 minutes to 3 | 20 minutes to 3 | 10 minutes to 4 |

- Write the times shown on the clocks.
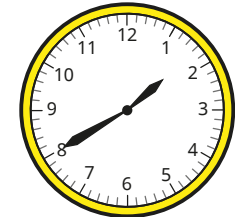
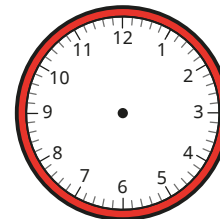_____ minutes to _____   _____ minutes to _____

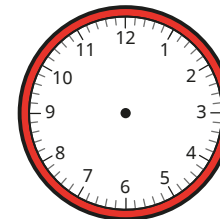_____ minutes to _____   _____ minutes to _____

- Draw hands on the clocks to show the times.

10 minutes to 5   10 minutes to 7   5 minutes to 7

© White Rose Maths 2022
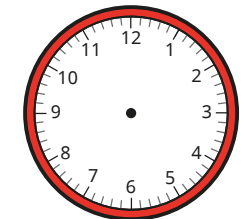
Tell the time to the hour

Reasoning and problem solving

Tiny is telling the time.

The time is 10 minutes to 2

What mistake has Tiny made?

What is the correct time?

10 minutes to 3

Kay is going to the park at 4 o'clock.

How long until Kay goes to the park?

25 minutes

The time is 20 minutes to 5

Are the statements true or false?

The hour hand is closer to the number 4 than to the number 5

The hour hand is closer to the number 6 than the minute hand is.

In 5 minutes, the time will be quarter past 5

False

True

False

Explain your answer.

Tell the time to 5 minutes

Notes and guidance

In this small step, children combine their learning from the previous two steps to tell the time to 5-minute intervals both past and to the hour.

Recap that the right-hand side of a clock shows times that are "past" the hour, while the left-hand side shows times that are "to" the hour. Remind children that when the minute hand is pointing to 6, this always refers to "half past" and never "half to".

Model where the hour hand should be for a given time, discussing which two numbers it should be between and which one of the numbers it should be closer to. For "past" times, the hour hand should be less than halfway between two numbers, and for "to" times it should be over halfway.

Things to look out for

- Children may confuse "past" and "to".

- Children may confuse the 5-minute intervals with the number shown on the clock, for example saying "2 minutes past" instead of "10 minutes past".

- Children may give all times in terms of minutes, instead of using "half past" and "quarter past/to".

Key questions

- How many minutes are there between each pair of numbers on a clock?

- At what time in an hour do you stop saying "past" and start saying "to"?

- Where does the hour hand point for the time _____?

- What is the same and what is different about the times _____ minutes past _____ and _____ minutes to _____?

- How many minutes past/to the hour is it if the minute hand is pointing to _____?

Possible sentence stems

- When the minute hand is pointing to _____, the time is _____ minutes past/to the hour.

- At _____ minutes past/to _____, the minute hand is pointing to _____ and the hour hand is between _____ and _____.

National Curriculum links

- Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clockface to show these times
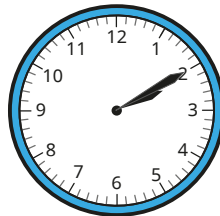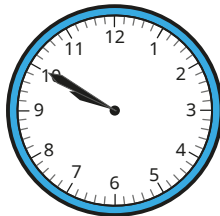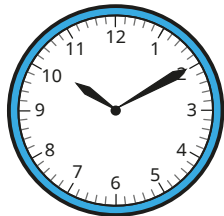
Tell the time to 5 minutes

Key learning

Model telling the time to 5-minute intervals both past and to the hour on a large clock. Then give children a time for them to show on clocks. Make sure that children pay attention to the position of the hour hand for different times.

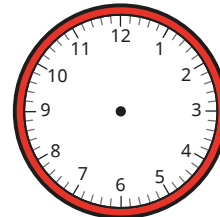- Match the clocks to the times.

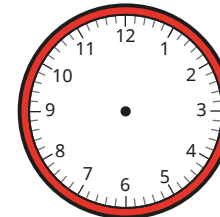| 10 minutes past 2 | 10 minutes to 10 | 10 minutes past 10 |

- Write the times shown on the clocks.
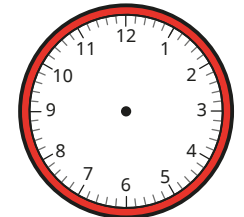
- Draw hands on the clocks to show the times.

10 minutes to 3   5 minutes past 4   25 minutes to 11

- Use the cards to make a time.

5 minutes	10 minutes	quarter
20 minutes	25 minutes	half
past	to	
1	2	3

Ask a partner to make that time on a clock.

How many different times can you make?

Tell the time to 5 minutes

Reasoning and problem solving

Kim, Ron and Mo are telling the time.

Kim: It is 10 minutes to 1
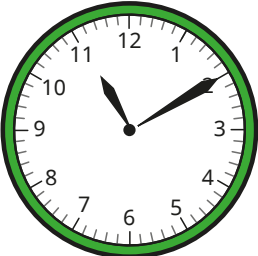
Ron: It is 10 minutes to 2

Mo: It is 10 minutes past 10

Who is correct?

What mistakes have the other children made?

Ron

Sam is wrapping presents for a party.

I will start at 10 minutes past 11

Each present takes Sam 5 minutes to wrap.

She wraps 7 presents.

What time does Sam finish?

Explain how you worked it out.

quarter to 12

Minutes in an hour

Notes and guidance

Children should be familiar with the fact that there are 60 minutes in an hour from earlier in the block. The focus in this step is on using and applying this fact.

Start by exploring half, quarter and three-quarters of an hour and how many minutes each of these refers to. This is a good opportunity to revisit learning from the previous block on fractions.

Children then focus on using the fact that there are 60 minutes in an hour to work out lengths of time greater than 1 hour. For example, 1 hour and 10 minutes is equal to 70 minutes, and 90 minutes is equal to one and a half hours. They can then use this to compare durations of time written in different ways.

As children are yet to explore numbers beyond 100, durations of time beyond 100 minutes are not covered.

Things to look out for

- Children may need to recap working out fractions of amounts.

- If children are not secure in their understanding of addition and subtraction within 100, they may struggle to interpret durations beyond 1 hour.

Key questions

- How many minutes are there in an hour?

- How can you work out $\frac{1}{2}/\frac{1}{4}/\frac{3}{4}$ of 60?

- How many minutes are there in half/quarter/three-quarters of an hour?

- How many minutes are there in 1 hour and _____ minutes?

- How many hours and minutes are there in _____ minutes?

- Which length of time is longer, _____ minutes or 1 hour and _____ minutes?

Possible sentence stems

- There are _____ minutes in 1 hour.

- There are _____ minutes in quarter/half/three-quarters of an hour.

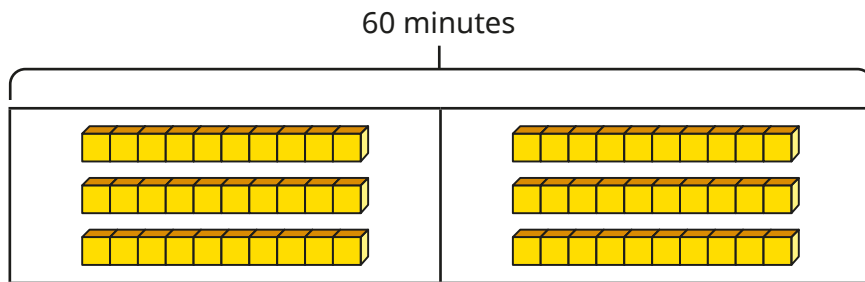- There are _____ minutes in 1 hour and _____ minutes.

National Curriculum links

- Know the number of minutes in an hour and the number of hours in a day

Minutes in an hour

Key learning

- Use the bar model to work out how many minutes there are in half an hour.

60 minutes

Use a bar model to work out how many minutes there are in:

- quarter of an hour
- three-quarters of an hour

- Jo draws a bar model to work out how many minutes there are in 1 hour and 10 minutes.

1 hour and 10 minutes

| 60 minutes | 10 minutes |

There are 70 minutes in 1 hour and 10 minutes.

Jo
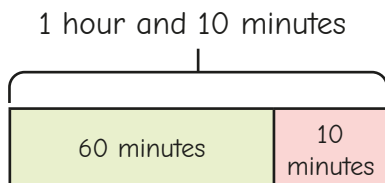
Use Jo's method to work out how many minutes there are in:

- 1 hour and 20 minutes
- 1 hour and 35 minutes
- 1 hour and 5 minutes
- 1 hour and 40 minutes

- Sam works out how many hours and minutes there are in 85 minutes.

> 85 minutes – 60 minutes = 25 minutes
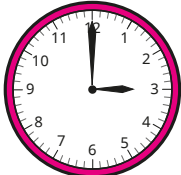>
> So 85 minutes = 1 hour and 25 minutes

Use Sam's method to work out how many hours and minutes there are in:

- 65 minutes
- 95 minutes
- 70 minutes
- 100 minutes

- Write <, > or = to make the statements correct.

half an hour ◯ 40 minutes

1 hour ◯ 100 minutes

50 minutes ◯ 1 hour and 5 minutes

1 hour and 10 minutes ◯ 70 minutes

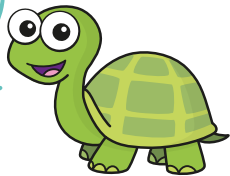90 minutes ◯ three-quarters of an hour

Minutes in an hour

Reasoning and problem solving

The school day ends at half past 3

Here is the time now.

There are 30 minutes until the end of school.

Do you agree with Tiny?

Explain your answer.

Yes

It takes Mo three-quarters of an hour to walk home from school.

It takes Sam 1 hour and 5 minutes.

It takes Kim 70 minutes.

Who takes the longest time to get home?

Who takes the shortest time?

Kim

_____

Mo

Fay is washing cars for charity.

She can wash one car in 10 minutes.

How many cars can she wash in one and a half hours?

9

School starts at 9 o'clock and my maths lesson starts 80 minutes later.

Max

What time does Max's maths lesson start?

20 minutes past 10

Hours in a day

Notes and guidance

This small step extends children's knowledge of the relationships between units of time as they explore the number of hours in a day.

Model how the hour hand moves throughout the day, allowing children to see that each time appears twice in the day, for example 8 o'clock in the morning and 8 o'clock in the evening. Children can then see that there are 24 hours in a day, connecting this to the twelve hours on a clock each happening twice a day. Establish that a full day of 24 hours includes the night-time when they are asleep, as some children may only think of a "day" as the hours in which they are awake.

Discuss the terms midnight and noon, and explain that a new day starts at midnight. Children then solve problems involving time.

The terms "am" and "pm" are not introduced until Year 3

Things to look out for

- Children may be confused by the same numerical time appearing twice in a day.

- Children may think that a new day starts at 1 o'clock rather than 12 midnight.

Key questions

- If the hour hand moves all the way around the clock, how many hours have passed?

  How many times does it do this in one day?

- How many hours are there in a day?

- What time will it be in one hour?

- How many times in a day will it be _____ o'clock?

- What time does a new day start?

- What is the same and what is different about noon and midnight?

Possible sentence stems

- There are _____ hours in a day.

- Each time on a clock happens _____ times every day.

- A new day starts at 12 _____

National Curriculum links

- Know the number of minutes in an hour and the number of hours in a day

Hours in a day

Key learning

Starting with both hands pointing to 12, model how the minute and hour hand move throughout a day. Pause at each hour to tell the time. What happens at 12? How many times does this repeat during a day? Introduce the terms "midnight" and "noon" to describe when the hour hand is pointing to 12

- Complete the sentences.
  - ▶ There are _____ hours in a day
  - ▶ 12 o'clock at night is called _____
  - ▶ 12 o'clock in the middle of the day is called _____
  - ▶ A new day begins at _____

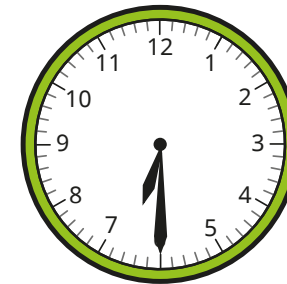- Use the cards to complete the sentences.

  | 8 | 1 | 3 |

  - ▶ Dan is asleep at _____ o'clock in the morning.
  - ▶ Kay eats lunch at _____ o'clock in the afternoon.
  - ▶ Ben walks to school at _____ o'clock in the morning.

- Write some sentences about your day.

  I _____ at _____ o'clock in the morning/in the afternoon.

- Here is a clock.

  - ▶ What time is shown?
  - ▶ What time will it be in 6 hours?
  - ▶ What time will it be in 12 hours?

  What do you notice?

- Complete the sentences.
  - ▶ 1 hour after half past 5, the time is _____
  - ▶ 6 hours after 20 minutes to 1, the time is _____
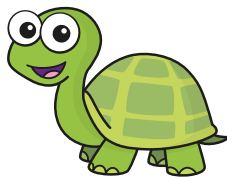 - ▶ _____ hours after 5 minutes to 1, the time is 5 minutes to 4

Hours in a day

Reasoning and problem solving

Here are Tiny's workings for finding out how many hours there are in a day.

12	6	12	6	12
1	7	1	7	
2	8	2	8	
3	9	3	9	
4	10	4	10	
5	11	5	11	

Tiny has counted 12 o'clock three times. The final 12 is the start of the next day.

There are 25 hours in a day.

What mistake has Tiny made?

Sam goes to bed at 8 o'clock every night.

She gets up at 6 o'clock every morning.

How many hours is Sam in bed for?

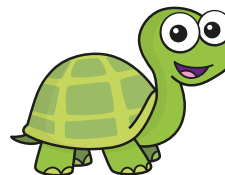How many hours is Sam not in bed for?

How did you work out the answers?

10 hours

14 hours

The time is 20 minutes past 1

It must be light outside because that is just after lunchtime.

Do you agree with Tiny?

Explain your answer.

It depends if it is 20 past 1 in the morning or the afternoon.