Unit 10: Fractions

Introducing whole and parts

➜ pages 113–115

1. Children should have matched: cat ➜ whiskers, house ➜ chimney, bus ➜ wheel, tree ➜ leaf

2. The truck is the whole (in both instances). Children could have completed the other statements with: wheel, light, bumper or window.

3. Children could have completed the sentences using different parts, e.g.
a) The cake is the whole and the sugar is a part.
b) The flour is a part and the cake is the whole.

4. Children could have completed the sentences in different ways, e.g.
a) The flower is the whole. The petal is a part.
b) The swings are the whole. The seat is a part.

5. Children could have suggested different answers, e.g.

The house is the whole. The school is the whole. The wall is the whole.

Reflect

Children could have chosen many different items, e.g.

The cupboard is the whole. The drawer is a part.

The computer is the whole. The screen is a part.

Making equal parts

➜ pages 116–118

1. a) 2
b) 3
c) 4

2. a) equal
b) unequal
c) equal (although some children might say that the parts are unequal because they are different shapes)

3. Children should have drawn lines to descriptions as follows (from top to bottom):
Equal parts
Unequal parts
Equal parts
Equal parts
Equal parts
Unequal parts

4. Children should have drawn 3 biscuits on each plate.

5. Children could have folded one sheet into equal parts in many different ways, e.g. using a horizontal fold, vertical fold or diagonal fold. The fold should pass through the centre of the paper.

Children could have folded the other sheet into unequal parts in many different ways.

Reflect

Children should have recognised that the loaf has not been cut into 2 equal parts. They could have explained how they know in different ways, e.g. The part on the left is longer than the part on the right.

Recognising a half ($\frac{1}{2}$)

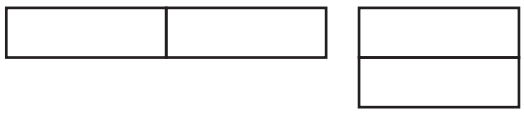
➜ pages 119–121

1. Children should have ticked shapes a, c and d.

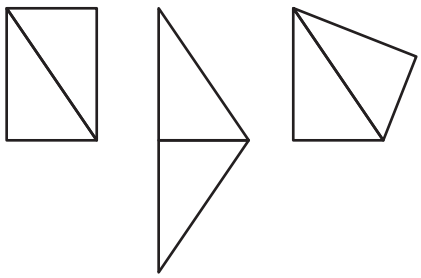
2. Children should have shaded:
a) one of the drawn halves
b) any half of the square
c) two of the quarters
d) any half of the rectangle

3. Children could have completed the whole in different ways, probably by drawing the image of the given shape in one of its sides, e.g.

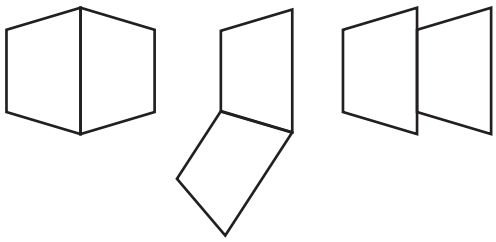
a)



b)



c)



4. No, Tom is not correct. Children could have explained their reasoning in different ways, e.g.
The part on the right is bigger than the part on the left; The parts of the log are not equal.

5. The first diagram shows $\frac{1}{2}$ shaded, the others do not. Children could have explained their reasoning in different ways, e.g.

The first diagram shows $\frac{1}{2}$ shaded because the shaded part is the same size as the unshaded part.

None of the second shape is shaded. It is divided into halves, though, because it is divided into 2 equal parts.

The third shape does not have half shaded. 2 squares are shaded but 4 squares are not shaded. So, the shaded and unshaded parts are not equal.

Reflect

The hexagon and circle can be split into two equal parts. Children could have explained their reasoning in different ways, e.g.

If you draw a horizontal line through the middle of the hexagon and one through the middle of the circle, this will divide these shapes into two equal parts.

The sides of the final shape are not the same length so it is not simple to split this shape into two equal parts.

Finding a half

➜ pages 122–124

1. a) 4
b) 6

2. Children should have shaded squares and completed the number sentences as follows:
a) 5 squares, $\frac{1}{2}$ of 10 is 5.
b) 10 squares, $\frac{1}{2}$ of 20 is 10.

3. Children should have circled images and completed the number sentences as follows:
a) 12 stars, $\frac{1}{2}$ of 24 is 12.
b) 9 balls, $\frac{1}{2}$ of 18 is 9.

4. Children should have matched the fractions as follows:

$\frac{1}{2}$ of 28 ➜ 14

$\frac{1}{2}$ of 22 ➜ 11

$\frac{1}{2}$ of 30 ➜ 15

$\frac{1}{2}$ of 26 ➜ 13

5. Most children are likely to have suggested that Tom and Mo cannot share the sweets equally because there are 9 sweets and 9 is an odd number. Some children might have said the sweets can be shared because one of the sweets could be cut in half.

6. a) 14
b) 14

Reflect

Children could have suggested different methods, e.g.

I can find $\frac{1}{2}$ of 16 by taking 16 counters and sharing them equally into two sets.

I can find $\frac{1}{2}$ of 16 using my 2 times-tables. I know that $2 \times 8 = 16$ so $\frac{1}{2}$ of 16 = 8.

Recognising a quarter ($\frac{1}{4}$)

➜ pages 125–127

1. Children should have drawn lines to descriptions as follows (from top to bottom):

Shows $\frac{1}{4}$

Shows $\frac{1}{4}$

Does not show $\frac{1}{4}$

Shows $\frac{1}{4}$

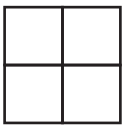
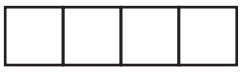
Does not show $\frac{1}{4}$

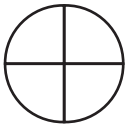
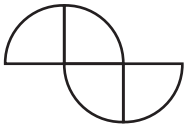
Does not show $\frac{1}{4}$

Shows $\frac{1}{4}$

2. Children should have shaded shapes as follows:
Top row, first shape: any one of the drawn quarters
Top row, second shape: any one of the drawn quarters
Top row, third shape: any two of the drawn eighths
Bottom row, first shape: children should have drawn two diameters that cross at right-angles and shaded one of the quarters
Bottom row, second shape: any one of the drawn quarters
Bottom row, third shape: any one of the drawn parts (quarters)

3. Children could have drawn the full shape in different ways, e.g.

a)  or 

b)  or 

4. Joe is not correct. Children could have explained in different ways, e.g. Joe has split the stick into two equal parts so the parts are halves not quarters.

5. Children could have shaded any 1 of the quarters in each diagram in the top row. Children could have split the squares in the bottom row into quarters in different ways, e.g. by drawing in the two diagonals and shading one of the quarters produced.

Reflect

Children should have ticked the cross and the circle. They could have explained their reasoning in different ways, e.g.

The cross and circle can easily be split into four equal parts with a horizontal line through the middle and a vertical line through the middle. The other shapes do not easily split into four equal parts.

Finding a quarter

➜ pages 128–130

1. 2

2. Children should have drawn 5 flowers in each vase and completed the sentences: $\frac{1}{4}$ of 20 = 5. There are 5 flowers in each vase.

3. Children should have shaded the following items and completed the number sentences:
a) 3 squares, $\frac{1}{4}$ of 12 = 3
b) 10 stars, $\frac{1}{4}$ of 40 = 10

4. $\frac{1}{4}$ of 24 = 6

5. 3

6. 16, 16

Reflect

Children should have been able to complete number sentences when they had chosen numbers that were multiples of 4, e.g.

$\frac{1}{4}$ of 20 = 5, $\frac{1}{4}$ of 4 = 1, $\frac{1}{4}$ of 28 = 7

Unit fractions

➜ pages 131–133

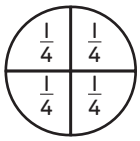
1. a) 2, 1, $\frac{1}{2}$
b) 3, 1, $\frac{1}{3}$

2. Children should have ticked the 1st and 2nd shapes.

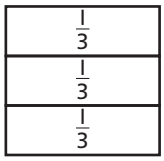
3. Children should have ticked the 1st, 2nd, 3rd and 5th shapes.

4. Children should have shaded 1 part of the shape.

5. Children could have completed the shape in different ways, using 4 quarter-circles altogether for the first shape and 3 rectangles altogether for the second shape. The most likely answers are:
a)



b)



6. 4

7. Children should have matched the fractions as follows: $\frac{1}{2}$ ➜ 6, $\frac{1}{3}$ ➜ 4, $\frac{1}{4}$ ➜ 3.

Reflect

Children should have drawn a flag that is split into equal parts with one part shaded yellow.

They could have explained their method in different ways, e.g.

I know that the fraction shaded yellow is a unit fraction because I split the flag into equal parts and have shaded one part.

I know that the fraction shaded yellow is a unit fraction because I split the flag into quarters and have shaded one quarter.

Understanding other fractions

➜ pages 134–136

1. 3, 3, 2, 2, $\frac{2}{3}$

2. Children should have matched shapes as follows:

Top shape ➜ $\frac{2}{3}$

Middle shape ➜ $\frac{3}{4}$

Bottom shape ➜ $\frac{2}{4}$

3. Children should have shaded:
a) 2 balloons
b) 2 bottles

4. a) Children should have disagreed with Sam. They could have explained their answer in different ways, e.g. There are 4 counters. 3 counters are shaded so this is $\frac{3}{4}$ of the counters.
b) $\frac{3}{4}$ because 3 out of 4 counters are shaded. $\frac{1}{4}$ because 1 out of 4 counters is not shaded.

5. a) $\frac{3}{4}$, $\frac{1}{4}$
b) $\frac{3}{4}$, $\frac{1}{4}$

Reflect

Children should have circled the following fractions: $\frac{2}{3}$, $\frac{3}{3}$, $\frac{2}{4}$, $\frac{3}{4}$.

Children could have drawn any of these fractions and explained why it is a non-unit fraction in different ways, e.g.

My drawing is a non-unit fraction because I have drawn 4 counters and shaded 3 of them so I have shaded $\frac{3}{4}$. This is not a unit fraction because I have shaded more than 1 part.

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

➜ pages 137–139

1. Children should have ticked the 2nd and 4th images.
2. Children should have shaded 2 cubes in each picture and noticed that $\frac{2}{4}$ is the same amount as $\frac{1}{2}$.
3. Children should have completed the fraction and matched to the descriptions as follows:

   $\frac{2}{4}$ ➜ Equal to $\frac{1}{2}$

   $\frac{1}{3}$ ➜ Less than $\frac{1}{2}$

   $\frac{3}{4}$ ➜ Greater than $\frac{1}{2}$
4. 10, the same (or equal or equivalent).
5. Children should have written multiples of 4 in the left-hand box and numbers which are not multiples of 4 in the right-hand box.

Reflect

Children could have explained their methods in different ways, e.g.

I used paper. I showed that $\frac{1}{2}$ is equal to $\frac{2}{4}$ by taking two identical pieces of paper and folding one in half and the other into quarters. I could see that $\frac{1}{2}$ was the same size as $\frac{2}{4}$.

I used cubes. I took 8 cubes and noticed that $\frac{1}{2}$ was 4 cubes and that $\frac{2}{4}$ was also 4 cubes.

Finding $\frac{3}{4}$

➜ pages 140–142

1. Children should have shaded:
   a) 3 triangles
   b) 6 squares
2. a) 3
   b) 9
3. a) Children should have drawn 4 brushes in each pot and completed the number sentences:
   $\frac{3}{4}$ of 16 = 12. Jack puts 4 brushes in each pot.
   b) 4
4. 15
5. Children should have drawn 3 counters into the empty box.
   a) 3
   b) 12

Reflect

Children might have answered the questions in different ways, e.g.

What is the same about the fractions? They have the same denominator. They both involve quarters.

What is different? They have different numerators. One of the fractions is a unit fraction but the other is a non-unit fraction.

Understanding a whole

➜ pages 143–145

1. $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$
2. Children should have circled: 1st shape (rectangle), 4th shape (octagon), $\frac{2}{2}$, $\frac{4}{4}$
3. Children should have matched the drawings that show the following fractions:

   $\frac{1}{4}$ ➜ $\frac{3}{4}$

   $\frac{1}{2}$ ➜ $\frac{1}{2}$

   $\frac{1}{3}$ ➜ $\frac{2}{3}$
4. a) $\frac{3}{4} + \frac{1}{4} = \frac{4}{4} = 1$ (or $\frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1$)
   b) $\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$ (or $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$)
5. a) $\frac{1}{3}$
   b) $\frac{1}{4}$
   c) $\frac{2}{4}$ or $\frac{1}{2}$
6. Children could have explained this in different ways, e.g.

   The slices Jack ate could have been bigger than the slices that Jemima ate.

   If Jemima ate 3 thirds of a cake and Sam ate 2 halves of a cake, they would both have eaten the same amount (a whole cake).

Reflect

Children should have circled the statement 'always true'.

They could have written any fraction where the numerator and denominator are the same. They could have drawn their fraction using a shape (splitting it into the appropriate number of parts and shading all parts) or a set of objects (organising them into the appropriate number of sets and shading all sets).

Understanding whole and parts

→ pages 146–148

1. a) $6\frac{1}{4}$

b) $3\frac{3}{4}$

2. Missing numbers in part-whole diagrams from left to right: $\frac{1}{2}$, $8\frac{2}{4}$ or $8\frac{1}{2}$, 2 and $\frac{1}{3}$.

3. Children should have circled the oranges, apples and chocolate bars.

4. a) $2\frac{1}{3}$

b) $2\frac{2}{3}$

5. $1\frac{1}{4}$

6. $6\frac{2}{4}$ or $6\frac{1}{2}$

Reflect

Answers will vary. Children should have been able to explain how many wholes and what fractional part they have drawn. Children should have been able to write their partner's fraction accurately using mixed numbers.

Counting in halves

→ pages 149–151

1. a) This shows 1 whole and 1 half.

This is $1\frac{1}{2}$.

2 (circled)

b) This shows 3 wholes and 0 halves (or 0 wholes and 6 halves).

This is 3 (or $\frac{6}{2}$).

$3\frac{1}{2}$ (circled)

2. Missing numbers:

a) $2\frac{1}{2}$, 3, $3\frac{1}{2}$

b) 4, $4\frac{1}{2}$, 5

c) $8\frac{1}{2}$, 9, $9\frac{1}{2}$

3. Children should have completed the table as follows:

Top row: 1st cell – blank, 4th cell – $1\frac{1}{2}$ sweets (drawn)

Bottom row: 3rd cell – 1, 5th cell – 2

4. Missing numbers: 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5

5. Children could have explained the mistakes in different ways, e.g.

a) Maya has missed out $2\frac{1}{2}$ and 3.

b) Bob has missed out $5\frac{1}{2}$.

Reflect

Children could have explained their reasoning in different ways, e.g.

I know the next number is $2\frac{1}{2}$ because the sequence is going up in halves.

I know the next number is $2\frac{1}{2}$ because if you add $\frac{1}{2}$ to 2 that gives $2\frac{1}{2}$.

Counting in quarters

→ pages 152–154

1. 5

2. Missing numbers from left to right:

a) $\frac{3}{4}$, 1, $1\frac{1}{4}$ (alternatively, some children might continue the count in quarters i.e. $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$)

b) $3\frac{2}{4}$ (or $3\frac{1}{2}$), $3\frac{3}{4}$, $4\frac{1}{4}$

c) $1\frac{1}{4}$, 1, $\frac{3}{4}$

3. Missing numbers from left to right:

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

b) $7\frac{2}{4}$ (or $7\frac{1}{2}$), 8, $8\frac{1}{4}$

4. Both counts are both correct. Children could have explained this in different ways, e.g.

$\frac{2}{4}$ is the same as $\frac{1}{2}$.

5. $2\frac{1}{2}$ or $2\frac{2}{4}$

Reflect

Children might have explained their reasoning in different ways, e.g.

I know the next number is $1\frac{2}{4}$ because when you add a quarter to $1\frac{1}{4}$ you get $1\frac{2}{4}$.

I know the next number is $1\frac{1}{2}$ because $1\frac{1}{4}$ add $\frac{1}{4}$ gives $1\frac{1}{2}$.

End of unit check

→ pages 155–156

My journal

Children could have sorted the fractions in various ways, e.g.

All of the denominators are the same/different.

These fractions all make the same/a different amount.