

# Contents

## Week 1 – Fractions

- Simplifying fractions 4
- Comparing and ordering fractions 8
- Adding and subtracting fractions (1) 12
- Adding and subtracting fractions (2) 16

## Week 2 – Fractions cont.

- Multiplying a fraction by a whole number 20
- Multiplying a fraction by a fraction 24
- Dividing a fraction by a whole number 28
- Calculating fractions of amounts 32

## Week 3 – Decimals

- Multiplying by 10, 100 and 1,000 36
- Multiplying decimals 40
- Dividing decimals 44
- Decimals as fractions 48

## Week 4 – Percentages

- Converting fractions to percentages 52
- Equivalent fractions, decimals and percentages (1) 56
- Equivalent fractions, decimals and percentages (2) 60
- Percentage of 64

## Week 5 – Algebra

- Finding a rule 68
- Using a rule (1) 72
- Using a rule (2) 76
- Solving equations (1) 80

4

4

8

12

16

20

20

24

28

32

36

36

40

44

48

52

52

56

60

64

68

68

72

76

80

This tells you which page you need.



## Week 6 – Algebra cont.

- Solving equations (2) 84
- Solving equations (3) 88
- Measure – imperial and metric measures** 92
- Converting metric measures 92
- Miles and km 96

## Week 7 – Measure – perimeter, area and volume

- Area and perimeter 100
- Area of a triangle 104
- Area of a parallelogram 108
- Volume of a cuboid 112

## Week 8 – Ratio and proportion

- Ratio (1) 116
- Ratio (2) 120
- Similar shapes 124
- Solving problems involving ratio and proportion 128

## Week 9 – Geometry – properties of shapes

- Vertically opposite angles 132
- Angles in triangles 136
- Angles in polygons (1) 140
- Angles in polygons (2) 144

## Week 10 – Geometry – properties of shapes cont.

- Nets 148
- Parts of a circle 152
- Statistics** 156
- Introducing pie charts 156
- The mean 160

- Answers to Practice questions 164

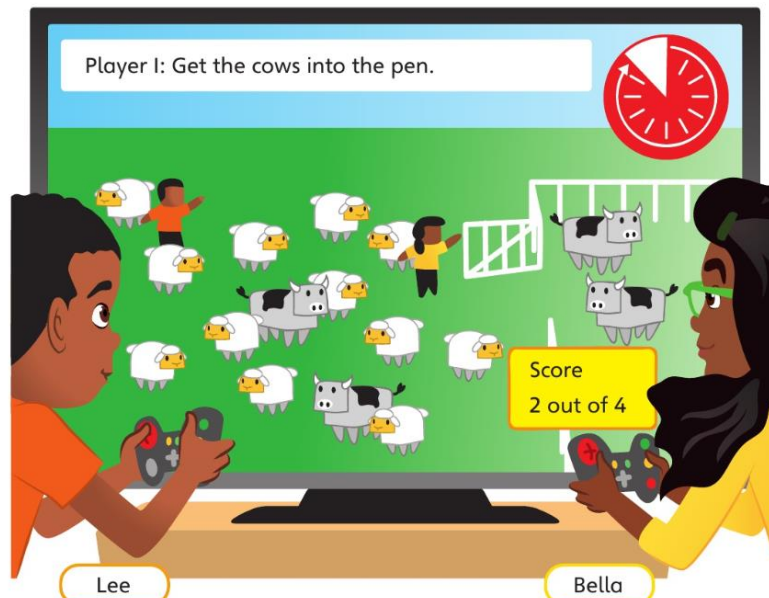
The first page of a lesson is a maths problem. Don't look at the next page until you have had a go! The third and fourth pages give you practice, so you can check your understanding.



# Lesson 1

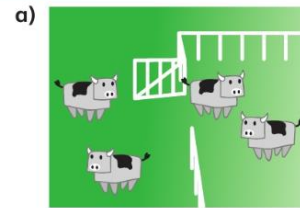
## Simplifying fractions

### Discover



- 1 a) Bella gets 2 cows into the pen before the time runs out.  
What is her score? Give your answer as a fraction in its simplest form.
- b) Lee gets 9 of the 12 sheep into the pen.  
What is his score? Give your answer as a fraction in its simplest form.

### Share



To find a fraction's simplest form we divide the numerator and the denominator by a **common factor**.



Bella's score is 2 out of 4.

We can write this fraction as  $\frac{2}{4}$ .



$$\begin{array}{c} \div 2 \\ \updownarrow \\ \frac{2}{4} = \frac{1}{2} \\ \updownarrow \\ \div 2 \end{array}$$

$\frac{2}{4}$  can be simplified to  $\frac{1}{2}$ . Bella's score is  $\frac{1}{2}$ .

I divided the numerator and denominator by 2 because 2 is a common factor of 2 and 4.



- b) Lee gets  $\frac{9}{12}$  of the sheep in the pen.



We can divide the numerator and the denominator by 3 because 3 is a common factor of 9 and 12.

$$\begin{array}{c} \div 3 \\ \updownarrow \\ \frac{9}{12} = \frac{3}{4} \\ \updownarrow \\ \div 3 \end{array}$$



Lee's score is  $\frac{3}{4}$ .


These fractions represent the same amount, but one is written in its simplest form.



# Lesson 1

## Simplifying fractions

1 Write in the missing numbers to simplify the fractions.

a)   
 $\frac{3}{12} = \frac{1}{\square}$   
 $\div 3$   
 $\div 3$

b)  $\frac{35}{42} = \frac{\square}{\square}$   
 $\div 7$   
 $\div \square$

c)  $\frac{25}{35} = \frac{\square}{\square}$   
 $\div \square$   
 $\div \square$

2 Simplify these fractions.

a)  $\frac{14}{24} = \frac{\square}{\square}$

c)  $\frac{20}{45} = \frac{\square}{\square}$

e)  $\frac{72}{\square} = \frac{9}{10}$

b)  $\frac{6}{15} = \frac{\square}{\square}$

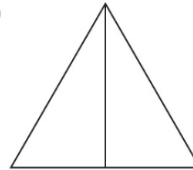
d)  $\frac{12}{16} = \frac{\square}{\square}$


f)  $\frac{\square}{24} = \frac{3}{4}$

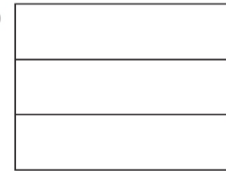
3 Write in the missing numbers.

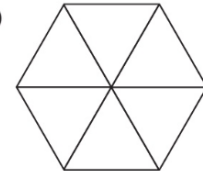
$\frac{90}{120} = \frac{\square}{60} = \frac{15}{\square} = \frac{\square}{4}$

4 Shade in the shapes to show the fractions.

a)   $\frac{10}{20}$

c)   $\frac{20}{25}$

b)   $\frac{6}{9}$

d)   $\frac{45}{54}$

5 Ebo thinks  $\frac{4}{6}$  in its simplest form is  $\frac{1}{1.5}$ .

Is Ebo correct? Explain how you know.

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6 Circle the fraction that is **not** equivalent to the other fractions.

a)  $\frac{5}{15}$     $\frac{15}{45}$     $\frac{10}{20}$     $\frac{20}{60}$

b)  $\frac{12}{18}$     $\frac{120}{180}$     $\frac{18}{24}$     $\frac{24}{36}$

## Lesson 2

### Comparing and ordering fractions

#### Discover



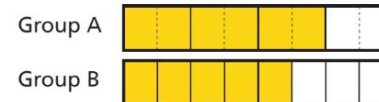
Group A

Group B

- 1** a) Which group has a bigger fraction of people wearing glasses?  
 b) Some more people are in Group C.  $\frac{2}{3}$  of the people in Group C are wearing glasses.  
 Which group now has the biggest fraction of people wearing glasses?

#### Share

- a) We need to compare  $\frac{3}{4}$  and  $\frac{5}{8}$ .



$$\frac{3}{4} \text{ is equivalent to } \frac{6}{8}$$

$$\begin{array}{c} \times 2 \\ \frac{3}{4} = \frac{6}{8} \\ \times 2 \end{array}$$

I found equivalent fractions for Group A so that I could compare  $\frac{1}{8}$ s.



$\frac{6}{8}$  is greater than  $\frac{5}{8}$  so  $\frac{3}{4}$  is greater than  $\frac{5}{8}$ .

Group A has a bigger fraction of people wearing glasses.

- b) Now we need to compare  $\frac{3}{4}$  and  $\frac{2}{3}$ .



Multiples of 4 are 4, 8, **12**.

Multiples of 3 are 3, 6, 9, **12**.

The lowest common multiple of 4 and 3 is 12 so we can find equivalent fractions with a denominator of 12.

$$\frac{3}{4} = \frac{9}{12}$$

$$\begin{array}{c} \times 3 \\ \frac{3}{4} = \frac{9}{12} \\ \times 3 \end{array}$$

$$\frac{2}{3} = \frac{8}{12}$$

$$\begin{array}{c} \times 4 \\ \frac{2}{3} = \frac{8}{12} \\ \times 4 \end{array}$$

I needed to find equivalent fractions for both groups. To get the same denominator I found the **lowest common multiple (LCM)** of 4 and 3.



$$\frac{9}{12} > \frac{8}{12} \text{ so } \frac{3}{4} > \frac{2}{3}$$

Group A has the biggest fraction of people wearing glasses.

# Lesson 2

## Comparing and ordering fractions

- 1 a) Compare the fractions  $\frac{1}{2}$  and  $\frac{3}{4}$ .



The LCM of 2 and 4 is .

$$\frac{1}{2} = \frac{\boxed{\phantom{00}}}{4}$$

$$\text{So } \frac{1}{2} \bigcirc \frac{3}{4}.$$

- b) Compare the fractions  $\frac{3}{5}$  and  $\frac{7}{10}$ .



The LCM of 5 and 10 is .

$$\frac{3}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$\text{So } \frac{3}{5} \bigcirc \frac{7}{10}.$$

- c) Compare the fractions  $\frac{3}{8}$  and  $\frac{2}{3}$ . The LCM of 8 and  is .

$$\frac{3}{8} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$\frac{2}{3} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$\text{So } \frac{3}{8} \bigcirc \frac{2}{3}.$$

- d) Compare the fractions  $\frac{3}{5}$  and  $\frac{4}{7}$ . The LCM of  and  is .

$$\frac{3}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$\frac{4}{7} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$\text{So } \frac{3}{5} \bigcirc \frac{4}{7}.$$

- 2 Here are some fractions.

$$\frac{4}{5}$$

$$\frac{7}{10}$$

$$\frac{3}{4}$$

- a) What is the LCM of 5, 10 and 4? Explain how you know.

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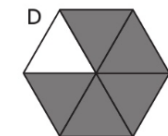
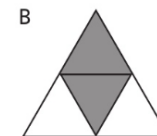
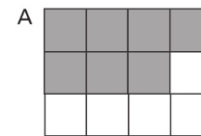
- b) Which is the biggest fraction? How do you know?

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- 3 A fraction of each shape is shaded.



Put the shapes in order of the fraction shaded. Start with the shape with the biggest fraction shaded.

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- 4 Put these fractions in order from biggest to smallest.

a)  $\frac{11}{15}, \frac{2}{3}, \frac{7}{10}, \frac{1}{2}$

b)  $\frac{1}{6}, \frac{3}{3}, \frac{7}{8}, \frac{3}{4}$

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# Lesson 3

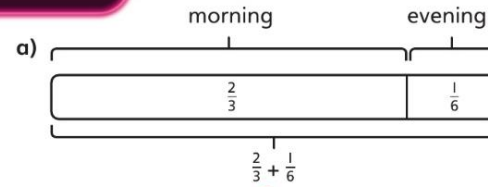
## Adding and subtracting fractions 1

### Discover



- 1 a) What fraction of a bale of hay does Hattie eat in a day?  
 b) Molly eats  $\frac{1}{4}$  of a bale of hay less than Hattie per day.  
 What fraction of a bale of hay does Molly eat in a day?

### Share



When adding or subtracting fractions, we need to find a common denominator.



Multiples of 3 are 3, **6**.

A multiple of 6 is **6**.

The lowest common multiple of 3 and 6 is 6.

I will find an equivalent fraction with a denominator of 6.



$$\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$$

$$\frac{2}{3} = \frac{4}{6}$$

× 2

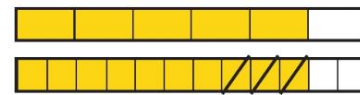
Hattie eats  $\frac{5}{6}$  of a bale of hay in a day.

- b) Molly eats  $\frac{1}{4}$  of a bale less than Hattie.

Use the LCM of 6 and 4 to find a common denominator.

Multiples of 6 are 6, **12**

Multiples of 4 are 4, 8, **12** The LCM is 12.



$$\frac{5}{6} - \frac{1}{4} = \frac{10}{12} - \frac{3}{12} = \frac{7}{12}$$

$$\frac{5}{6} = \frac{10}{12}$$

× 2

$$\frac{1}{4} = \frac{3}{12}$$

× 3

Molly eats  $\frac{7}{12}$  of a bale of hay in a day.

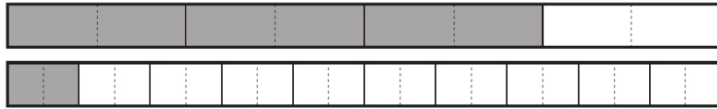
I need to subtract.



# Lesson 3

## Adding and subtracting fractions 1

1 a) Work out  $\frac{3}{4} + \frac{1}{10}$ .



The LCM of 4 and 10 is .

$$\frac{3}{4} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{1}{10} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} + \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

So  $\frac{3}{4} + \frac{1}{10} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

b) Work out  $\frac{7}{8} - \frac{5}{12}$ .

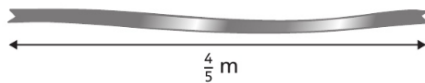


The LCM of  and  is .

$$\frac{7}{8} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{5}{12} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

So  $\frac{7}{8} - \frac{5}{12} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

2  $\frac{3}{4}$  of a metre is cut off this ribbon.  
What length of ribbon remains?





3 What mistake has Ambika made when adding the two fractions?  
Explain the correct way to complete the problem.

$$\frac{3}{10} + \frac{1}{5} = \frac{4}{15}$$

4 Complete these additions and subtractions.

a)  $\frac{2}{5} + \frac{7}{15} =$



c)  $\frac{3}{4} - \frac{2}{3} =$



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



d)  $\frac{9}{10} - \frac{1}{4} =$



5 Andy thinks of a fraction.

He subtracts  $\frac{2}{3}$  from it and his answer is  $\frac{4}{21}$ .

What fraction was he thinking of?



I wrote it out like this

$$\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{2}{3} = \frac{4}{21}$$

Then I thought about what I needed to do with  $\frac{4}{21}$  and  $\frac{2}{3}$ .



## Lesson 4

### Adding and subtracting fractions 2

#### Discover



- 1** a) On Saturday, Amelia cycles  $3\frac{2}{5}$  kilometres with her dad.  
On Sunday, she cycles  $1\frac{1}{3}$  kilometres.  
How many kilometres does Amelia cycle in total?
- b) How many more kilometres does Amelia cycle on Saturday than on Sunday?

#### Share

- a) Saturday   
Sunday 

Add the wholes: 

$$3 + 1 = 4$$

Add the parts:

$$\frac{2}{5} + \frac{1}{3}$$

Multiples of 5 are 5, 10, **15**

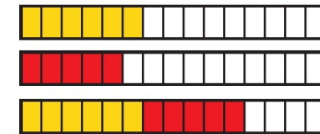
Multiples of 3 are 3, 6, 9, 12, **15**

The lowest common multiple is 15.

So

$$\frac{2}{5} + \frac{1}{3} = \frac{6}{15} + \frac{5}{15} = \frac{11}{15}$$

Amelia cycles  $4 + \frac{11}{15} = 4\frac{11}{15}$  in total.



- b) We need to subtract to find the difference.

$$3\frac{2}{5} - 1\frac{1}{3}$$

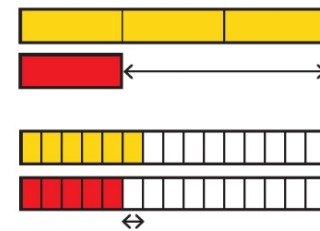
First subtract the wholes.

$$3 - 1 = 2$$

Then subtract the parts.

$$\frac{2}{5} - \frac{1}{3} = \frac{6}{15} - \frac{5}{15} = \frac{1}{15}$$

So Amelia cycles  $2\frac{1}{15}$  more km on Saturday than on Sunday.





# Lesson 4

## Adding and subtracting fractions 2

1 a) Work out  $4\frac{2}{3} + 1\frac{1}{6}$ .



Add the wholes:  $4 + 1 =$

Add the parts:  $\frac{2}{3} = \frac{\quad}{6}$

$\frac{2}{3} + \frac{1}{6} = \frac{\quad}{6} + \frac{1}{6} = \frac{\quad}{6}$

So  $4\frac{2}{3} + 1\frac{1}{6} =$

b) Work out  $3\frac{3}{4} - 1\frac{1}{6}$ .

Subtract the wholes:  -  =

Subtract the parts:  $\frac{3}{4} = \frac{\quad}{6}$       $\frac{1}{6} = \frac{\quad}{6}$

$\frac{3}{4} - \frac{1}{6} = \frac{\quad}{6} - \frac{\quad}{6} = \frac{\quad}{6}$

So  $3\frac{3}{4} - 1\frac{1}{6} =$

Remember you need to find the lowest common multiple of 4 and 6. Think of the first number in the 4 and 6 times-tables.



2 Work out these additions and subtractions.

a)  $2\frac{2}{5} + 1\frac{1}{3}$

c)  $3\frac{7}{10} + 1\frac{1}{4}$

b)  $3\frac{4}{9} + 2\frac{1}{3}$

d)  $8\frac{3}{4} - \frac{3}{5}$

3 A bucket contains  $12\frac{1}{2}$  litres of water. There is a hole in the bucket.

Each minute  $1\frac{1}{5}$  litres of water leak out of the bucket.

a) How much water will leak out in 2 minutes?

b) How much water is left in the bucket after 2 minutes?