

Year 6

Summer Term Week 8

(w/c 15th June)

Lesson 1

Solve 2-step equations <https://vimeo.com/428002477>

Lesson 2

Find pairs of values <https://vimeo.com/428002579>

Lesson 3

Convert metric measures <https://vimeo.com/428002669>

Lesson 4

Miles and kilometres <https://vimeo.com/428002822>

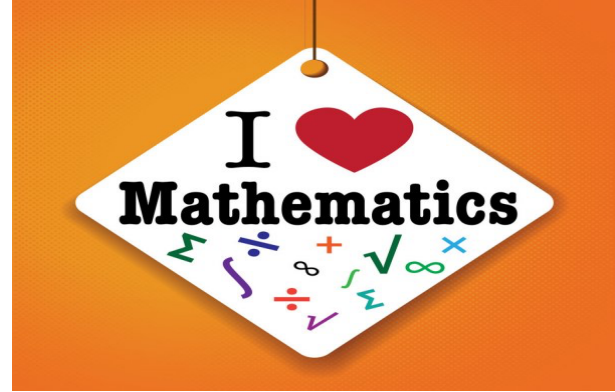
Lesson 5

Challenge

Lesson 1

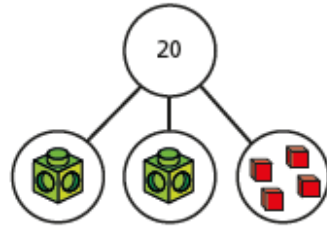
Solve 2-step equations <https://vimeo.com/428002477>

Answer questions on next few slides.





Solve two-step equations

1 Here is a part-whole model.

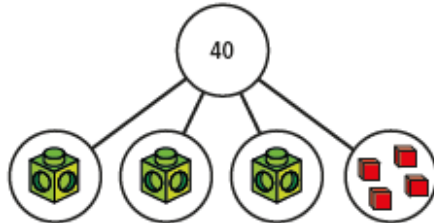


a) Write an equation for the part-whole model.

b) Solve the equation to work out the value of 

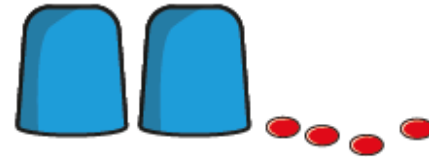
 =

2 If each multilink cube represents x , form and solve an equation to find the value x .



$x =$

3 There is the same number of counters under each cup.
There are 16 counters in total.



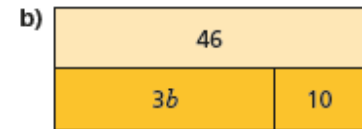
a) Use y to represent the number of counters under each cup.
Write an equation in terms of y .

b) Solve the equation to find the value of y .

$y =$

c) How many counters are under each cup?

4 Write an algebraic equation to represent each bar model.
Find the values of a and b .



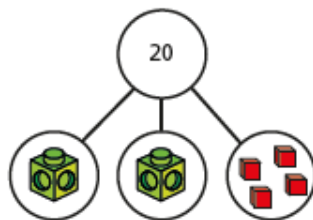
$a =$

$b =$




Solve two-step equations


1 Here is a part-whole model.



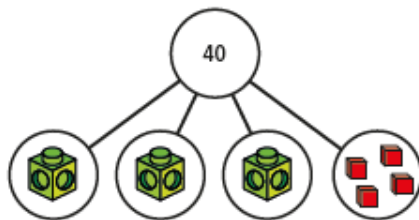
a) Write an equation for the part-whole model.

$2a + 4 = 20$

b) Solve the equation to work out the value of 

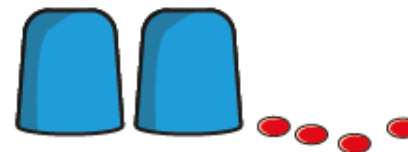
 = 8

2 If each multilink cube represents x , form and solve an equation to find the value x .



$x = 12$

3 There is the same number of counters under each cup. There are 16 counters in total.



a) Use y to represent the number of counters under each cup. Write an equation in terms of y .

$2y + 4 = 16$

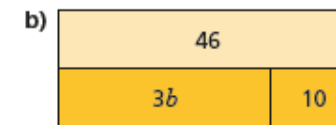
b) Solve the equation to find the value of y .

$y = 6$

c) How many counters are under each cup?

6

4 Write an algebraic equation to represent each bar model. Find the values of a and b .



$a = 6$

$b = 12$

5 Solve the equations.

a) $5x + 1 = 31$

$x =$

b) $3x - 3 = 9$

$x =$

c) $4p - 11 = 3$

$p =$

d) $9 = 2y + 8$

$y =$

e) $10g - 2 = 46$

$g =$

f) $4 + 3y = 28$

$y =$

6 Dani thinks of a number.

She doubles it and adds 3

She gets the answer 15

a) Write an equation to represent Dani's problem.

b) Solve the equation to find her number.



7 Alex is y years old.

Her friend Brett is 3 years older.

The total of their ages is 25

How old are Alex and Brett?

Alex is

Brett is

8



a) Work out the cost of one banana and one orange.

One banana costs

One orange costs

b) Compare methods with a partner.

CHALLENGE QUESTIONS



5 Solve the equations.

a) $5x + 1 = 31$

$x = 6$

b) $3x - 3 = 9$

$x = 4$

c) $4p - 11 = 3$

$p = 3.5$

d) $9 = 2y + 8$

$y = 0.5$

e) $10g - 2 = 46$

$g = 4.8$

f) $4 + 3y = 28$

$y = 8$

6 Dani thinks of a number.

She doubles it and adds 3

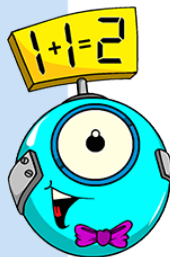
She gets the answer 15

a) Write an equation to represent Dani's problem.

$2x + 3 = 15$

b) Solve the equation to find her number.

6



7 Alex is y years old.

Her friend Brett is 3 years older.

The total of their ages is 25

How old are Alex and Brett?

Alex is 11

Brett is 14

8



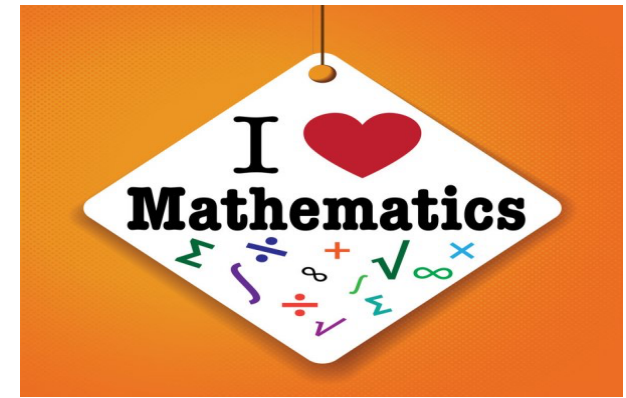
a) Work out the cost of one banana and one orange.

One banana costs $32p$

One orange costs $28p$

b) Compare methods with a partner.

CHALLENGE ANSWERS



Lesson 2

Find pairs of values <https://vimeo.com/428002579>

Answer questions on next few slides.

Find pairs of values (2)

1 Class 6 are trying to solve a number puzzle.

$$\triangle + \triangle + \bigcirc = 10$$

a)



Dexter

The triangle could be 3 and the circle could be 4

Do you agree with Dexter? _____

Explain why.

b)

The triangle is worth 4



Dora

What is the value of the circle in Dora's number puzzle?

$$\bigcirc = \square$$

c) Find other pairs of values that the triangle and circle could equal.

Find three pairs.

$$\triangle = \square \quad \bigcirc = \square$$

$$\triangle = \square \quad \bigcirc = \square$$

$$\triangle = \square \quad \bigcirc = \square$$

2 a and b are whole numbers.

$$2a + b = 14$$

Complete the table to show different possible values for a and b .

a	0	1	2	3	4	5	6	7
$2a$	0	2						
b	14							
$2a + b$	14	14	14	14				

3 c and d are both integers less than 15 but greater than zero.

$$3c - d = 2$$

Complete the table to show different possible values for c and d .

c	1	2	3	4	5
$3c$	3				
d	1				
$3c - d$	2	2	2		

b) Explain why there are no other possible values for c and d .

Find pairs of values (2)

1 Class 6 are trying to solve a number puzzle.

$$\triangle + \triangle + \bigcirc = 10$$

a)



Dexter

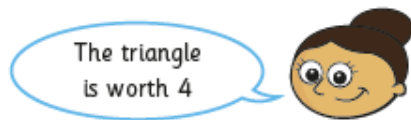
The triangle could be 3 and the circle could be 4

Do you agree with Dexter? yes

Explain why.

$3 + 3 + 4 = 10$

b)



Dora

The triangle is worth 4

What is the value of the circle in Dora's number puzzle?

$$\bigcirc = \boxed{2}$$

c) Find other pairs of values that the triangle and circle could equal.

Find three pairs.

$$\triangle = \boxed{1} \quad \bigcirc = \boxed{8}$$

$$\triangle = \boxed{5} \quad \bigcirc = \boxed{0}$$

$$\triangle = \boxed{2} \quad \bigcirc = \boxed{6}$$

2 a and b are whole numbers.

$$2a + b = 14$$

Complete the table to show different possible values for a and b .

a	0	1	2	3	4	5	6	7
$2a$	0	2	4	6	8	10	12	14
b	14	12	10	8	6	4	2	0
$2a + b$	14	14	14	14	14	14	14	14

3 c and d are both integers less than 15 but greater than zero.

$$3c - d = 2$$

Complete the table to show different possible values for c and d .

c	1	2	3	4	5
$3c$	3	6	9	12	15
d	1	4	7	10	13
$3c - d$	2	2	2	2	2

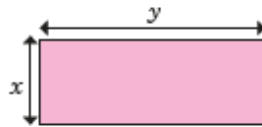
b) Explain why there are no other possible values for c and d .

If c was 16 d would be greater than 15

- 4 x and y are both multiples of 5 less than 100
If $2x = y$, circle the possible values of x and y .

$x = 20, y = 20$
 $x = 10, y = 20$
 $x = 20, y = 10$
 $x = 35, y = 70$
 $y = 90, x = 45$

- 5 Here is a rectangle.
 x and y are both integers.



The rectangle has a perimeter of 28 cm.

- a) Write an equation to represent the perimeter of the rectangle.

- b) List all the possible pairs of values for x and y .

Compare answers with a partner. How do you know you have found all the possible values?



- 6 Aisha is buying some stationery for school.
She spends exactly £1
List the possible combinations of pencils and pens that Aisha could have bought.



- 7 Ron has four digit cards.
- Two of the cards have the same value.
 - All of the cards are less than 10 but greater than zero.
 - All of the cards are odd.
 - The sum of the four cards is 24

Find two possible sets of cards.

Set 1

Set 2

8

$2ab = 48$

- a) Find a pair of possible values for a and b .

$a =$ $b =$

- b) Work with a partner to find as many pairs of values as you can.

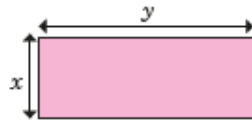
CHALLENGE QUESTIONS



- 4 x and y are both multiples of 5 less than 100
If $2x = y$, circle the possible values of x and y .

$x = 20, y = 20$
 $x = 10, y = 20$
 $x = 20, y = 10$
 $x = 35, y = 70$
 $y = 90, x = 45$

- 5 Here is a rectangle.
 x and y are both integers.



The rectangle has a perimeter of 28 cm.

- a) Write an equation to represent the perimeter of the rectangle.

$2x + 2y = 28$

- b) List all the possible pairs of values for x and y .

$x = 1 \quad y = 13 \quad x = 5 \quad y = 9$

$x = 2 \quad y = 12 \quad x = 6 \quad y = 8$

$x = 3 \quad y = 11$

$x = 4 \quad y = 10$

Compare answers with a partner. How do you know you have found all the possible values?



CHALLENGE ANSWERS

- 6 Aisha is buying some stationery for school.
She spends exactly £1
List the possible combinations of pencils and pens that Aisha could have bought.



10 pencils
 $6 \text{ pens \& 1 pencil}$
 $2 \text{ pens \& 7 pencils}$
 $4 \text{ pens \& 4 pencils}$

- 7 Ron has four digit cards.
- Two of the cards have the same value.
 - All of the cards are less than 10 but greater than zero.
 - All of the cards are odd.
 - The sum of the four cards is 24

Find two possible sets of cards.

Set 1	1	5	9	9
Set 2	1	7	7	9

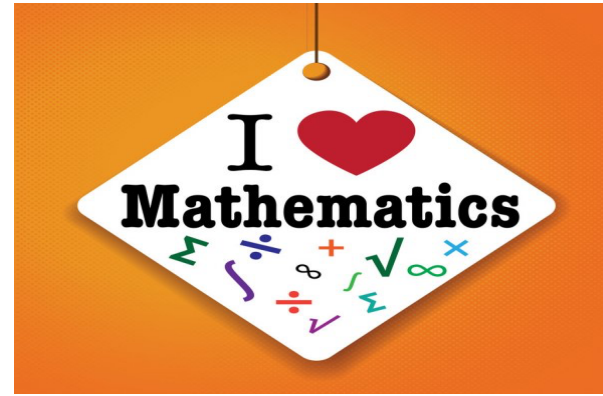
8

$2ab = 48$

- a) Find a pair of possible values for a and b .

e.g. $a = 6 \quad b = 4$

- b) Work with a partner to find as many pairs of values as you can.



Lesson 3

Convert metric measures <https://vimeo.com/428002669>

Answer questions on next few slides.

Convert metric measures

1 How many centimetre cubes can you fit along a metre stick?



What does this tell you?

2 Complete the sentences.

a) There are grams in 1 kilogram.

There are kilograms in one tonne.

b) There are millilitres in 1 litre.

c) There are millimetres in 1 centimetre

There are centimetres in 1 metre.

There are metres in 1 kilometre.



3 Complete the bar models.

a)

1 km	1 km	1 km	1 km
1,000 m	1,000 m		

There are m in 4 km.

b)

1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	$\frac{1}{2}$ kg
1,000 g	1,000 g	1,000 g				

There are g in $6\frac{1}{2}$ kg.

4 Complete the conversions.

a) 2 kg = g

5 kg = g

10 kg = g

12 kg = g

b) 1 l = ml

5 l = ml

11 l = ml

5 A bag of dog food weighs 2.5 kg.

Write this weight in grams.



Convert metric measures

1 How many centimetre cubes can you fit along a metre stick?



100

What does this tell you?

2 Complete the sentences.

a) There are grams in 1 kilogram.

There are kilograms in one tonne.

b) There are millilitres in 1 litre.

c) There are millimetres in 1 centimetre

There are centimetres in 1 metre.

There are metres in 1 kilometre.



3 Complete the bar models.

1 km	1 km	1 km	1 km
1,000 m	1,000 m	1,000 m	1,000 m

There are m in 4 km.

b)

1 kg	1 kg	1 kg	1 kg	1 kg	1 kg	$\frac{1}{2}$ kg
1,000 g	1,000 g	1,000 g	1,000 g	1,000 g	1,000 g	500g

There are g in $6\frac{1}{2}$ kg.

4 Complete the conversions.

a) 2 kg = g

b) 1 l = ml

5 kg = g

5 l = ml

10 kg = g

11 l = ml

12kg = g

5 A bag of dog food weighs 2.5 kg.
Write this weight in grams.



- 6 What measurements are the arrows pointing to?
Label them on the number line.



- 7 Complete the conversions.

a) $10 \text{ mm} = \square \text{ cm}$ $\square \text{ mm} = 1.1 \text{ cm}$

$11 \text{ mm} = \square \text{ cm}$ $\square \text{ mm} = 10.1 \text{ cm}$

$\square \text{ mm} = 11 \text{ cm}$

b) $2.1 \text{ km} = \square \text{ m}$ $2.01 \text{ km} = \square \text{ m}$

$2.001 \text{ km} = \square \text{ m}$ $2.011 \text{ km} = \square \text{ m}$

- 8 Write $>$, $<$ or $=$ to complete the statements.

a) $100 \text{ m} \bigcirc 1 \text{ km}$ b) $5.1 \text{ l} \bigcirc 5,100 \text{ ml}$

$10 \text{ m} \bigcirc 10 \text{ cm}$ $607 \text{ l} \bigcirc 0.607 \text{ ml}$

$10.1 \text{ mm} \bigcirc 101 \text{ cm}$ $0.05 \text{ l} \bigcirc 5 \text{ ml}$



- 9 Dora and Amir are trying to convert 1.05 metres into millimetres.



Dora

You can multiply 1.05 by 100 to convert it into centimetres, then multiply the product by 10 to convert it into millimetres.

Amir

You can just multiply 1.05 by 1,000!



Who do you agree with? _____
Explain your thinking.

- 10 What is the mass of one of the boxes?
Give your answer in grams.



- 11 There are 1,000 kg in one tonne.

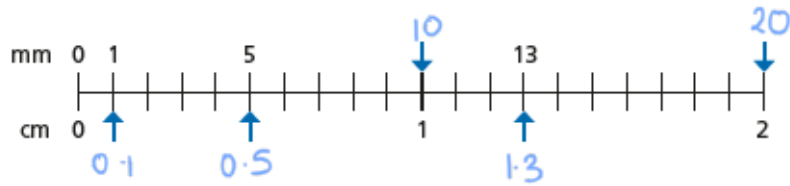
a) How many grams are there in one tonne?

b) A car weighs 1.3 tonnes.

Write the weight of the car in grams.

CHALLENGE QUESTIONS

- 6 What measurements are the arrows pointing to?
Label them on the number line.



- 7 Complete the conversions.

a) $10 \text{ mm} = 1 \text{ cm}$ $11 \text{ mm} = 1.1 \text{ cm}$

$11 \text{ mm} = 1.1 \text{ cm}$ $101 \text{ mm} = 10.1 \text{ cm}$

$110 \text{ mm} = 11 \text{ cm}$

b) $2.1 \text{ km} = 2,100 \text{ m}$ $2.01 \text{ km} = 2,010 \text{ m}$

$2.001 \text{ km} = 2,001 \text{ m}$ $2.011 \text{ km} = 2,011 \text{ m}$

- 8 Write $>$, $<$ or $=$ to complete the statements.

a) $100 \text{ m} < 1 \text{ km}$ b) $5.1 \text{ l} = 5,100 \text{ ml}$

$10 \text{ m} > 10 \text{ cm}$ $607 \text{ l} > 0.607 \text{ ml}$

$10.1 \text{ mm} < 101 \text{ cm}$ $0.05 \text{ l} > 5 \text{ ml}$



- 9 Dora and Amir are trying to convert 1.05 metres into millimetres.



Dora

You can multiply 1.05 by 100 to convert it into centimetres, then multiply the product by 10 to convert it into millimetres.

Amir

You can just multiply 1.05 by 1,000!



Who do you agree with? Both
Explain your thinking.

- 10 What is the mass of one of the boxes?
Give your answer in grams.



250g

- 11 There are 1,000 kg in one tonne.

a) How many grams are there in one tonne?

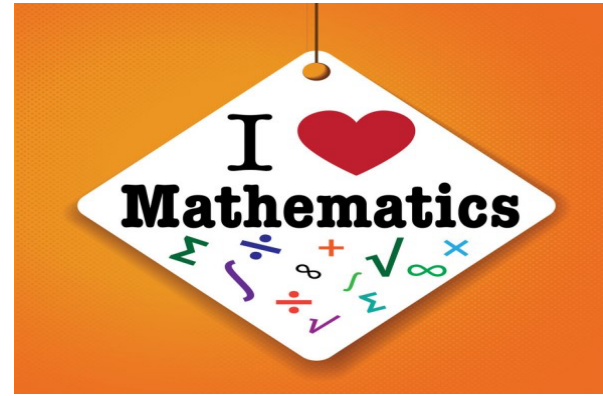
1,000,000g

b) A car weighs 1.3 tonnes.

Write the weight of the car in grams.

1,300,000g

CHALLENGE ANSWERS



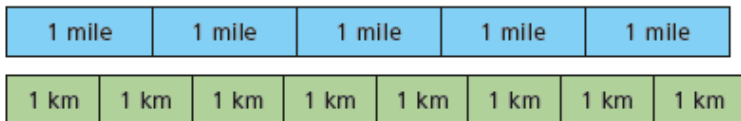
Lesson 4

Miles and kilometres <https://vimeo.com/428002822>

Answer questions on next few slides

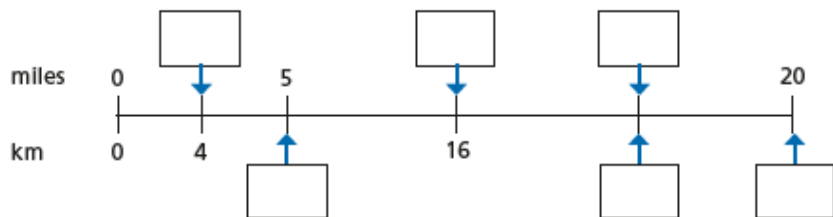
1 Tick the statements that are true.

Use the bar model to help you.



- a) 5 miles is approximately equal to 8 kilometres.
- b) 1 mile is longer than 1 kilometre.
- c) 2 kilometres is longer than 1 mile.
- d) 2 kilometres is longer than 2 miles.

2 Fill in the missing numbers on the number line.



3 Complete the conversions.

- a) 5 miles = kilometres
- 10 miles = kilometres
- 15 miles = kilometres
- b) miles = 16 kilometres
- mile = 1.6 kilometres
- miles = 0.8 kilometres

4 Complete the conversions.

- a) miles = 160 km
- b) 45 miles = km
- c) = 640 km
- d) 95 miles = km
- e) 7.5 miles = km
- f) 2 miles = km

5



If 5 miles is approximately 8 kilometres, then 10 miles is approximately 13 kilometres.

Here is Whitney's working out.

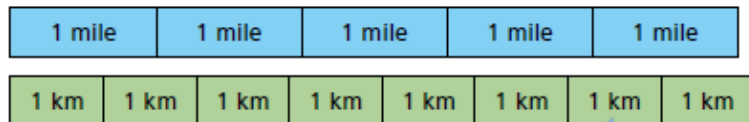
$$\begin{array}{c}
 +5 \quad \left\{ \begin{array}{l} 5 \text{ miles} \approx 8 \text{ km} \\ 10 \text{ miles} \approx 13 \text{ km} \end{array} \right. \quad +5
 \end{array}$$

Explain Whitney's mistake.

Miles and kilometres

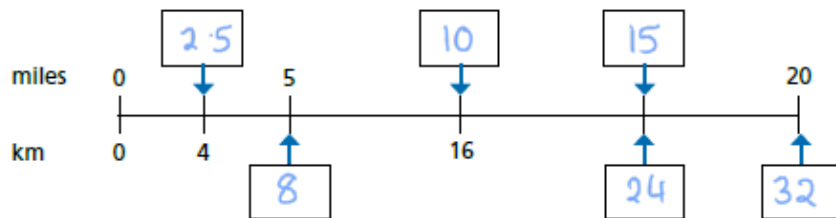
- 1 Tick the statements that are true.

Use the bar model to help you.



- a) 5 miles is approximately equal to 8 kilometres.
- b) 1 mile is longer than 1 kilometre.
- c) 2 kilometres is longer than 1 mile.
- d) 2 kilometres is longer than 2 miles.

- 2 Fill in the missing numbers on the number line.



- 3 Complete the conversions.

- a) 5 miles = kilometres b) miles = 16 kilometres
- 10 miles = kilometres mile = 1.6 kilometres
- 15 miles = kilometres miles = 0.8 kilometres

- 4 Complete the conversions.

- a) miles = 160 km d) 95 miles = km
- b) 45 miles = km e) 7.5 miles = km
- c) = 640 km f) 2 miles = km

- 5



If 5 miles is approximately 8 kilometres, then 10 miles is approximately 13 kilometres.

Here is Whitney's working out.

$$\begin{array}{c}
 + 5 \quad \leftarrow 5 \text{ miles} \approx 8 \text{ km} \\
 \quad \quad \quad \leftarrow 10 \text{ miles} \approx 13 \text{ km} \quad \leftarrow + 5
 \end{array}$$

Explain Whitney's mistake.

- 6 A marathon is approximately 26.2 miles.
How far is this in kilometres?

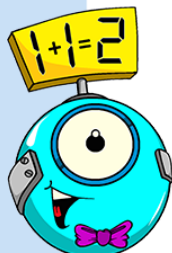
- 7 The maximum speed limit on residential roads in the UK is 30 miles per hour.



In France, the maximum speed limit on residential roads is 50 kilometres per hour.

- a) Which country has the higher speed limit for these roads?

- b) What is the difference between the speed limits in miles per hour?



CHALLENGE QUESTIONS



- 8 Esther cycles 70 miles over 4 days.
On day 1 she cycles 14 miles.
On day 2 she cycles 32 km.
On day 4 she cycles twice as far as she does on day 3.
How far does she cycle on day 4?
Give units with your answer.

- 9 Use a map of your local area.
Find something that is approximately:
a) 1 mile away from your school

- b) 1 km away from your school

- c) 5 miles away from your school

- d) 5 km away from your school

Compare answers with a partner.



- 6 A marathon is approximately 26.2 miles.
How far is this in kilometres?

41.92km

- 7 The maximum speed limit on residential roads in the UK is 30 miles per hour.



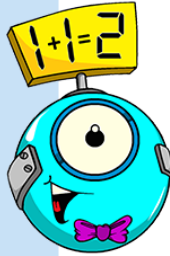
In France, the maximum speed limit on residential roads is 50 kilometres per hour.

- a) Which country has the higher speed limit for these roads?

France

- b) What is the difference between the speed limits in miles per hour?

1.25mph



- 8 Esther cycles 70 miles over 4 days.
On day 1 she cycles 14 miles.
On day 2 she cycles 32 km.
On day 4 she cycles twice as far as she does on day 3
How far does she cycle on day 4?
Give units with your answer.

24 miles

- 9 Use a map of your local area. *Various answers.*
Find something that is approximately:
a) 1 mile away from your school

- b) 1 km away from your school

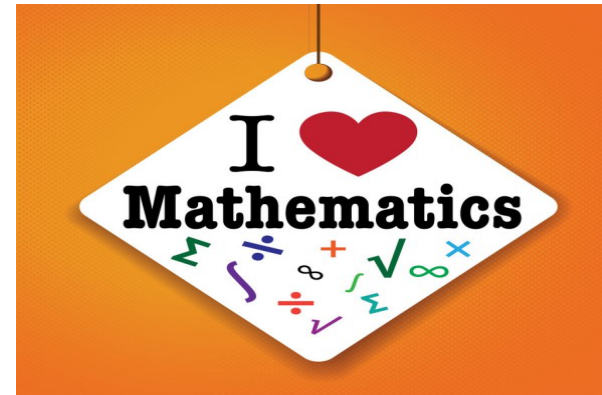
- c) 5 miles away from your school

- d) 5 km away from your school

Compare answers with a partner.



CHALLENGE ANSWERS



Lesson 5

Challenge

Attempt the following problems.

Remember to use RUCSAC

R	U	C	S	A	C
Read Read the question. What is the important information?	Understand Understand the question. What do you need to find out?	Choose Choose the correct method of calculation and operation(s).			
Solve Solve the problem. Make sure you follow the steps.	Answer Answer the question. What were you meant to find out?	Check Check your answer. Use the inverse to check your working out.			

ink saving Eco

Challenge 1

Rani has 38p.

**I have 10p more
than Rani.**



**I have 20p less
than Eva.**

How much money does Eva have?

Challenge 2

If

$$\triangle \times \triangle = 25$$

and

$$\circ \times \circ = 100$$

Work out the value of

$$\triangle \times \circ$$

Challenge 3

A sequence is made up of three 2-digit numbers.

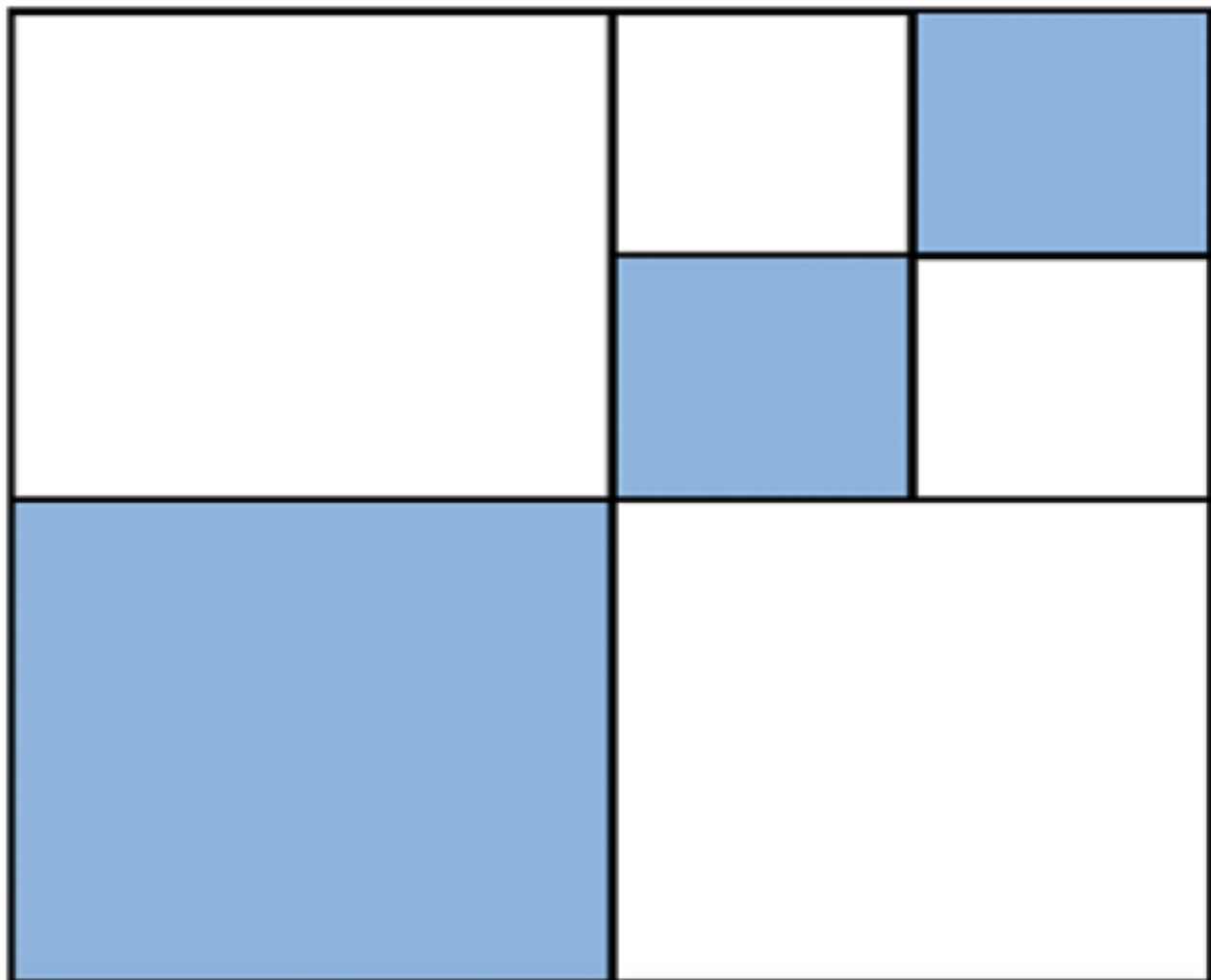
The sequence increases by eight each time. These are the digits that make up the three numbers.



Work out the numbers in the sequence.

Challenge 4

A square is divided into smaller squares.



What fraction of the square is shaded?

Challenge 5

The mass of an empty jar is 470 g.



6 marbles are placed in the jar.

6 marbles are placed in the jar.



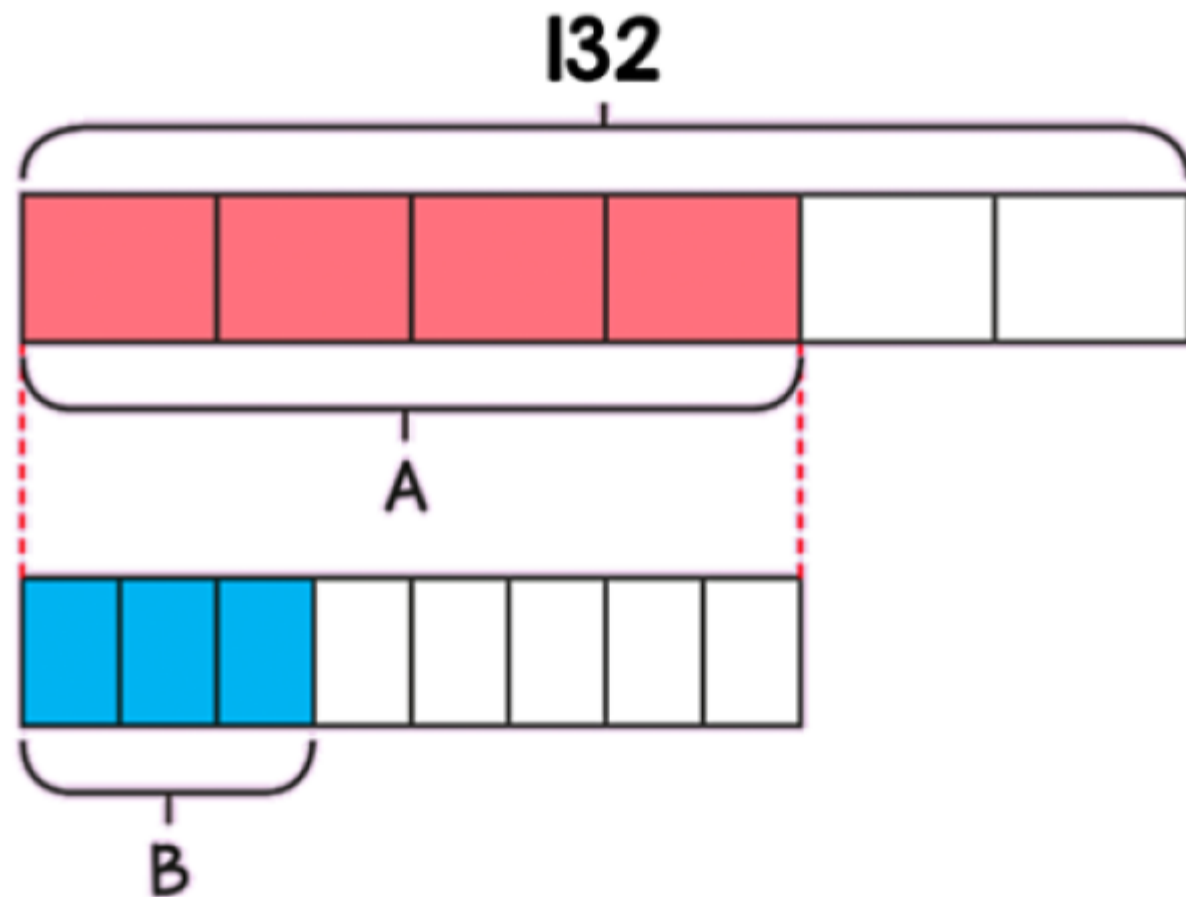
The total mass of the jar and marbles is now 1.1 kg.

Two of the marbles are removed.

What is the mass of the jar and marbles now?

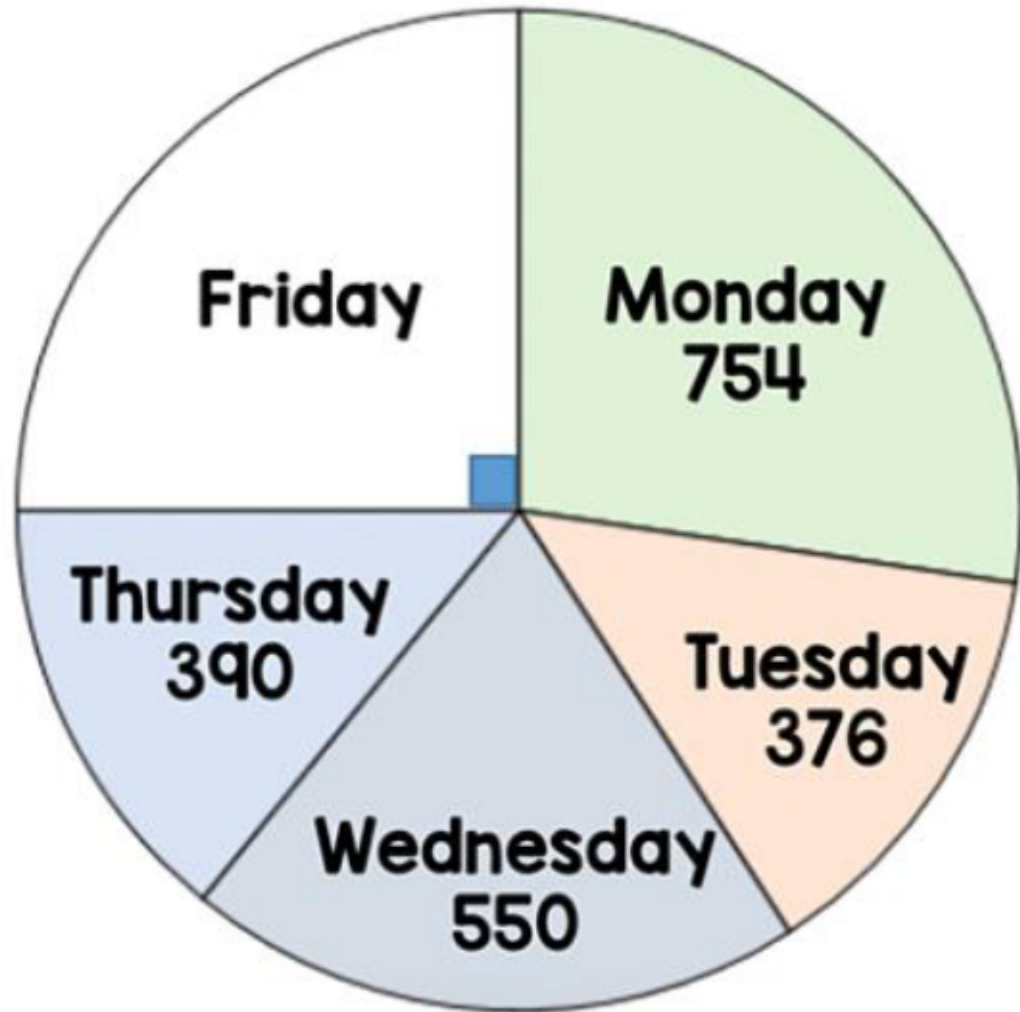
Challenge 6

Work out the value of B.



Challenge 7

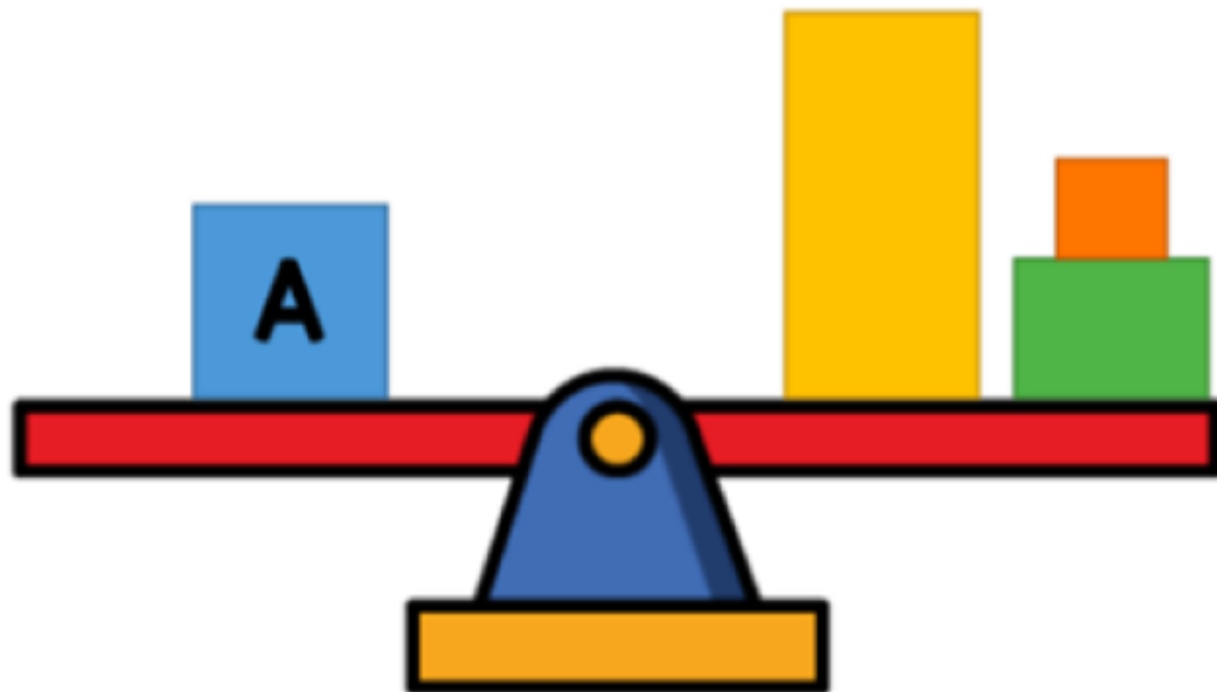
The pie chart shows the number of visitors to a museum each day.



How many people visited on Friday?

Challenge 8

Four blocks are balanced on a scale.



The mass of A is 220 g.

What is the mean mass of all the blocks?

Challenge 9

Here is rectangle A.



Rectangle B is $\frac{1}{3}$ longer than A



Rectangle C is $\frac{1}{3}$ longer than B



The total length of all three rectangles is 133 cm.

How much longer is rectangle C than B?

Challenge 10

At 12pm there are 855 people in the zoo.

By 5pm $\frac{4}{5}$ of the children have left and $\frac{3}{4}$ of the adults have left.

There are now 36 more children than adults in the zoo.

How many adults were in the zoo at 12pm?

Answers

Challenge 1 - 68p

Challenge 2 - 50

Challenge 3 - 34, 42, 50

Challenge 4 - $6/16 = 3/8$

Challenge 5 - 890 g

Challenge 6 - 33

Challenge 7 - 690 people

Challenge 8 - 110 g

Challenge 9 - 14 cm

Challenge 10 - 300 adults