Year 4 Maths Distance Teaching and Learning

Week beginning: 13th July 2020

Lesson 1		
Learning Intention: WALT: use equal parts to find fractions of quantities	**Key Vocabulary:** Denominator Numerator Bar model	**What you will need:** A computer, tablet or phone for the starter Maths book Pencil and ruler Video: Year 4 Maths – S2 Week 7 - lesson 1

Starter
Log into Times Table Rock Stars and complete a gig if it is available. If not, complete a studio session.

Main Teaching

Today, we are going to be calculating fractions of quantities by dividing the quantity into equal parts.

Remember:

The denominator The amount of equal parts that the whole is split into.	$\dfrac{3}{5}$	**The numerator** The amount of equal parts that we want

Example 1

There are 18 buttons in a box. Alex wants to use $\dfrac{2}{3}$ of them on his school project. How many buttons will he need?

To start solving this problem we need to find what the value of one equal part is. The denominator will help us here.

If we divide 18 into 3 equal parts we will find out how many buttons are in one part:

$$18 \div 3 = 6$$

We need $\underline{2}$ of 18 so we have to take **two** of the equal parts: 2 x 6 = 12
     3

Alex needs 12 buttons for his school project.

Example 2

There are 12 eggs in a box. $\underline{5}$ of them have been used. How many eggs have been used?   6

First, we need to find the value of one equal part. To do this, we divide the quantity by the denominator.

12 ÷ 6 = 2

We can show this on a bar model

12 eggs					
2 eggs	2 eggs	2 eggs	2 eggs	2 eggs	2 eggs

If $\underline{5}$ of the eggs were used we need to shade in 5 parts on our bar model
   6

12 eggs					
2 eggs	2 eggs	2 eggs	2 eggs	2 eggs	2 eggs

5 x 2 = 10   So, 10 eggs were used

Example 3

In a class of 32 children, $\underline{3}$ are girls. How many boys are there?
                8

First, we need to find the value of one equal part. To do this, we divide the quantity by the denominator:
32 ÷ 8 = 4

We can show this on a bar model

32							
4	4	4	4	4	4	4	4

The fraction of girls in the class is $\underline{3}$ so we need to shade in 3 parts for the girls.
                          8

32							
4	4	4	4	4	4	4	4

3 x 4 = 12   So, there are 12 girls in the class.

The fraction of boys is what is left. We can see this is 5 equal parts (or $\frac{5}{8}$)

32							
4	4	4	4	4	4	4	4

5 x 4 = 20   So, there are 20 boys in the class.

Independent Tasks

Please complete 1 or 2 challenges. If you are finding a challenge too tricky or too easy after 3 questions, you should switch challenges. After you have completed your challenge, check your answers against the mark scheme. If you got an answer wrong, look carefully and identify where you made a mistake.

Challenge 1

1) There are 20 chocolates in a box. I have eaten $\frac{2}{5}$ of them. How many have I eaten?

2) There are 30 children in a class. $\frac{2}{3}$ of them are girls. How many are girls?

3) There are 16 pencils in a pot. $\frac{3}{8}$ of them are blue. How many are blue?

4) A dormitory has 25 beds. $\frac{4}{5}$ of the beds are occupied. How many are occupied?

5) A bus is carrying 24 people. $\frac{4}{6}$ are sitting upstairs. How many people are upstairs?

6) There are 28 children at a party. $\frac{3}{7}$ drink lemonade. How many drink lemonade?

7) There are 24 hours in a day. I sleep for $\frac{3}{8}$ of it. How many hours do I sleep?

8) An orchard has 48 trees. $\frac{5}{8}$ are in bud. How many trees are in bud?

Challenge 2

1) There are 27 children in a class. $\frac{8}{9}$ are at school. How many are at school?

2) Pet hamsters cost £36 each in my local store. The shopkeeper says if I buy one I can buy another for only 7⁄9 of the normal price. How much would a second hamster cost?

3) My journey is 49km. I stop at a service station after $\frac{5}{7}$ of the journey. How far have I travelled?

4) A packet of ham weighs 200g. One fifth is eaten. How much is left?

5) There are sixty flowers in a display. One third are marigolds. How many are not marigolds?

6) A bus is carrying 56 people. $\frac{3}{8}$ are sitting upstairs. How many people are upstairs?

7) There are 180 spaces in a car park. Nine tenths are taken. How many cars are in the car park?

8) There are 48 chocolates in Sam's box and 36 in Deliah's box. Sam eats half of his and Deliah eats ¾ of hers. Who eats the most?

Challenge X
A roll of wrapping paper is 4m long. $\frac{3}{5}$ is used. How much is left?

Mark Scheme – Lesson 1

Independent Tasks
Challenge 1

1) 8 chocolates
2) 20 girls
3) 6 blue pencils
4) 20 beds
5) 16 people
6) 12 drink lemonade
7) 9 hours
8) 30 trees

Challenge 2

1) 24 children at school
2) £28
3) 35km
4) 160g left
5) 40 not marigolds
6) 21 people upstairs
7) 162 cars
8) Sam eats 24 chocolates. Deliah eats 27 chocolates. Deliah eats the most.

Challenge X

Remember: 4m = 400cm

400 ÷ 5 = 80cm
80 x 3 = 240 cm is used.

400cm – 240cm = 160cm left

Lesson 2		
Learning Intention: WALT: use fractional reasoning to solve unknown problems	Key Vocabulary:	What you will need: A computer, tablet or phone for the starter Maths book Pencil and ruler Video: Year 4 Maths – S2 Week 7 - lesson 2

Starter

Log into Times Table Rock Stars and complete a gig if it is available. If not, complete a sound check session.

Main Teaching

Today, we are going to be using bar models to helps us work backwards to solve problems

Example 1

Sally buys four fifths of the shop's apples. She bought 20 apples. How many apples are left in the shop?

We can start by making a bar model. We know that our part model is going to be split into 5 equal parts because that is what our denominator is.
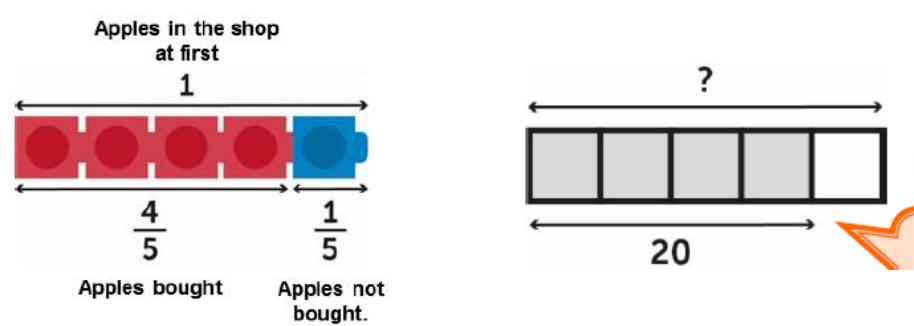
$\frac{4}{5} = 20$

To find out the value of one equal part we can divide 20 by our numerator which is 4.

$20 \div 4 = 5$ So, $\frac{1}{5} = 5$.

We know there is one fifth of the apples left in the shop so there are 5 apples left.

We can also see that there must have been 25 apples in the shop to start with

$5 \times 5 = 25$

Example 2

James had some football cards. He gave two fifths away. He now has 24 cards. How many did he have to start with? How many did he give away?

We can represent the problem by drawing a bar model like this:
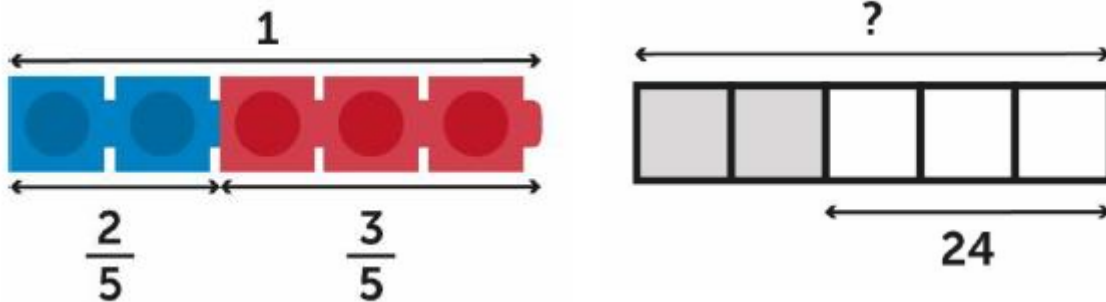
We know James has $\frac{3}{5}$ of the cards left which is 24 cards.

To find the value of $\frac{1}{5}$ we need to divide 24 by 3. $24 \div 3 = 8$ cards

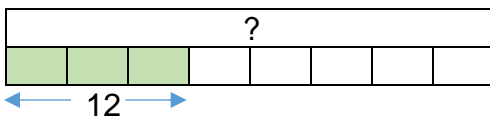If we show this on a bar model we can solve the problem

8	8	8	8	8
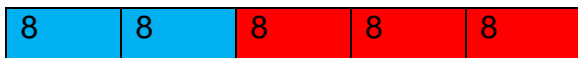
To start with James had 8 x 5 = 40 cards

He gave away 2 x 8 = 16 cards

Example 3

$\frac{3}{8}$ is 12. What is $\frac{8}{8}$?

To solve this problem we need to draw a bar model and add the information we know.

$\frac{3}{8}$ = 12 so to find the value of $\frac{1}{8}$ we need to divide 12 by 3. $12 \div 3 = 4$

The value of $\frac{8}{8}$ is 8 x 4 = 32

Independent Tasks

Please complete 1 or 2 challenges. If you are finding a challenge too tricky or too easy after 3 questions, you should switch challenges. After you have completed your challenge, check your answers against the mark scheme. If you got an answer wrong, look carefully and identify where you made a mistake.

Challenge 1

Use a bar model to represent and solve the following problems:

1) $\frac{3}{4}$ is 36 what is $\frac{4}{4}$?
2) $\frac{2}{3}$ is 28 what is $\frac{3}{3}$?
3) $\frac{5}{6}$ is 30 what is $\frac{6}{6}$?
4) $\frac{7}{10}$ is 14 what is $\frac{10}{10}$?
5) $\frac{5}{8}$ is 25 what is $\frac{8}{8}$?
6) $\frac{8}{9}$ is 16 what is $\frac{9}{9}$?

Challenge 2

Use a bar model to represent and solve the following problems:

1) $\frac{3}{4}$ is 36 what is $\frac{4}{4}$?
2) Ned is 140cm tall which is 7/8 as tall as Tom. How tall is Tom?
3) One eighth smaller than a bar of chocolate leaves 21 pieces. How many pieces does the bar of chocolate have?
4) 5/6 of a piece of ribbon is 3m long. How long is the whole ribbon?
5) 0.8 of a class of children have a pet. Four pupils don't have a pet. How many pupils have pets.
6) Lily reads 4/6 of her book by Tuesday. She had 18 pages left to read. How many pages were there in Lily's book?

Challenge X

Use a bar model to represent and solve the following problem:

4 🏁

What is the cost of a full price t-shirt?

T-shirt Offer

Buy 1, buy another for ¾ of the original price.

1st T-shirt Full Price

2nd T-shirt £9.00

Mark Scheme – Lesson 2

Independent Tasks

Challenge 1

1)

12	12	12	12

36 ÷ 3 = 12. 12 x 4 = 48

2)

14	14	14

28 ÷ 2 = 14. 14 x 3 = 42

3)

6	6	6	6	6	6

30 ÷ 5 = 6.   6 x 6 = 36

4)

7	7	7	7	7	7	7	7	7	7

14 ÷ 2 = 7.   7 x 10 = 70

5)

5	5	5	5	5	5	5	5

25 ÷ 5 = 5.   5 x 8 = 40

6)

2	2	2	2	2	2	2	2	2

16 ÷ 8 = 2.   2 x 9 = 18

Challenge 2

1)

12	12	12	12

36 ÷ 3 = 12. 12 x 4 = 48

2)

Tom							
20	20	20	20	20	20	20	20

← Ned = 140cm →

140 ÷ 7 = 20 cm.   20 x 8 = 160cm

3)

?							
3	3	3	3	3	3	3	3

← 21 pieces →

21 ÷ 7 = 3 pieces. 3 x 8 = 24 pieces

4)

?					
60cm	60cm	60cm	60cm	60cm	60cm

← 3m →

300cm ÷ 5 = 60cm.   60 x 6 = 360 cm

5)

?								4	
2	2	2	2	2	2	2	2	2	2

If 8/10 of pupils have pets, 2/10 don't have pets
2/10 = 4
4 ÷ 2 = 2. 2 x 8 = 16 children have pets

6)

?					
read				18 pages left	
9	9	9	9	9	9

If 4/6 have been read, 2/6 are still left to read.
2/6 = 18
18 ÷ 2 = 9. 9 x 6 = 54 pages in the whole book.

Challenge X

?			
£3	£3	£3	£3

$\frac{3}{4}$ = £9 so $\frac{1}{4}$ = £3

The whole full price t-shirt = $\frac{4}{4}$

£3 x 4 = £12

The full price t-shirt costs £12.
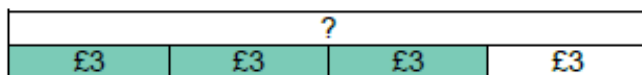
Lesson 3		
<u>Learning Intention:</u> WALT: calculate the perimeter of shapes	<u>Key Vocabulary:</u> Perimeter Length Rectangle Square Equilateral triangle Isosceles triangle	<u>What you will need:</u> A computer, tablet or phone for the starter Maths book Pencil and ruler Video: Year 4 Maths – S2 Week 7 - lesson 3

<u>Starter</u>

Log into Times Table Rock Stars and complete a gig if it is available. If not, complete a garage session.

<u>Main Teaching</u>

Today, we are going to be calculating the perimeter of shapes and using our knowledge of rectangles to calculate the perimeter when one measurement is missing.

The **perimeter** of a shape is the measurement all the way around the outside of a shape. It is usually measured in mm, cm, m or km.

This shape is made with sticks. The perimeter is 14 sticks.
There are 5 sticks on each of its long sides = 10 sticks
There are 2 sticks on each of its short sides = 4 sticks

Example 1
Calculate the perimeter of this shape
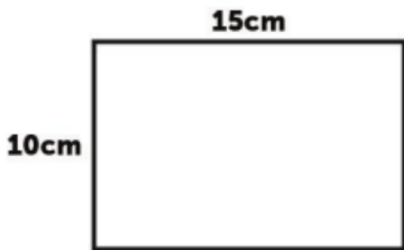
We know that the opposite sides of a rectangle are the same length. So, if we have the length of a long and a short side we can calculate the perimeter.

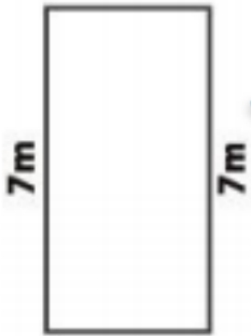The perimeter of this rectangle could be calculated as follows

15cm + 15cm + 10cm + 10cm = 50cm

Or

(15cm x 2) + (10cm x 2) = 50cm
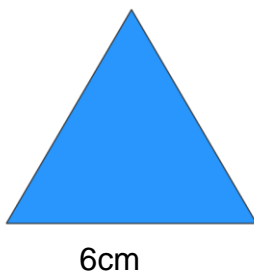
Example 2
Calculate the perimeter of this rectangle

We cannot calculate the perimeter of this shape as we don't
Know the length of the short side

Example 3

What is the perimeter?

6cm

The sides of an equilateral triangle are all the same length. So if we know the length of one sides we can calculate the perimeter.

6cm x 3 = 18 cm

Independent Tasks

Please complete 1 or 2 challenges. If you are finding a challenge too tricky or too easy after 3 questions, you should switch challenges. After you have completed your challenge, check your answers against the mark scheme. If you got an answer wrong, look carefully and identify where you made a mistake.

Calculate the perimeter of the following shapes. Pay careful attention to the units of measure and make sure your answer includes the correct unit of measure:

1.

3m

4m

2.

10cm

6 cm

3.

2cm

7cm

4.

5m   (This shape is a square)

5.

4mm   (This shape is an equilateral triangle)

6.   7cm   (This shape is an isosceles triangle)

3cm
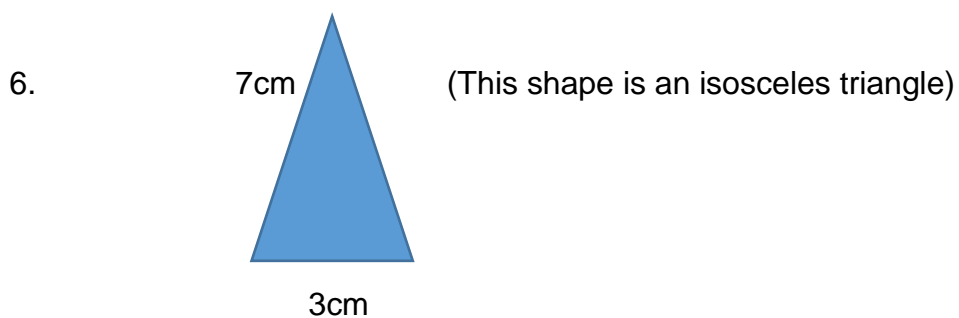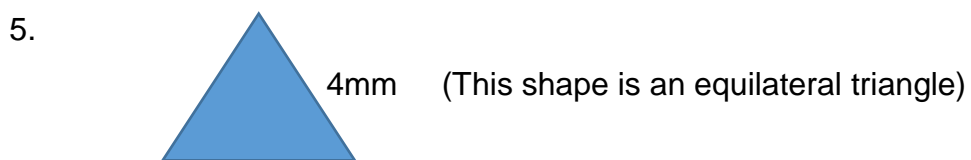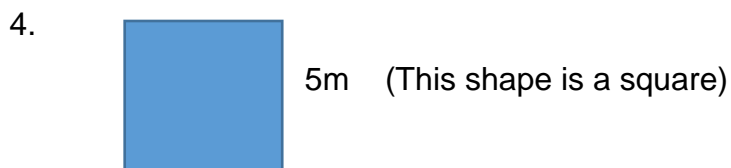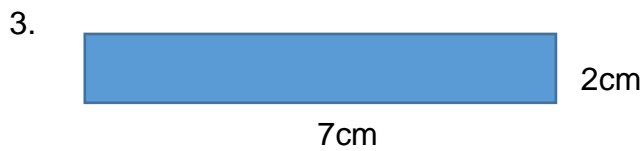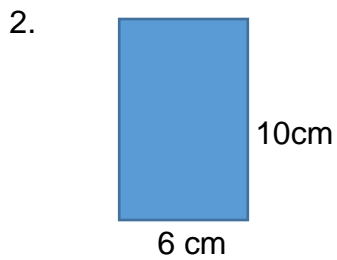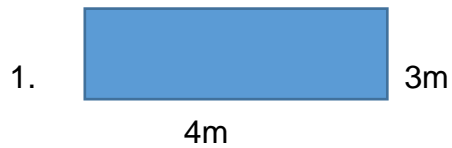
Challenge 2

Calculate the perimeter of the following shapes. Pay careful attention to the units of measure and make sure your answer includes the correct unit of measure:

1.

7cm

9cm

2.

16m

3m

3.

4.5cm

11cm

4.

6.5 m   (This shape is a square)

5.   12mm   (This shape is an equilateral triangle)

6.

(This shape is an isosceles triangle)

13.5m

8cm
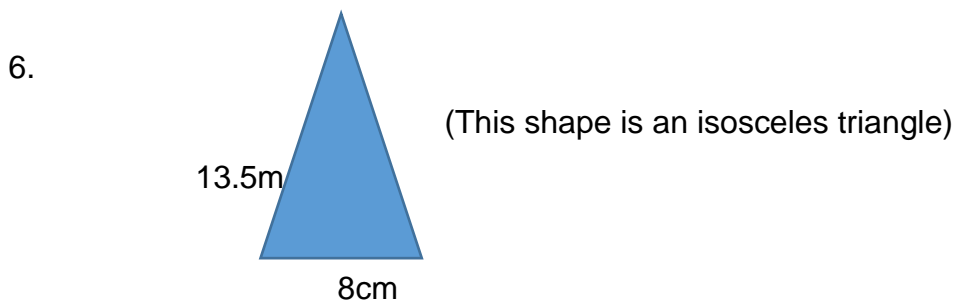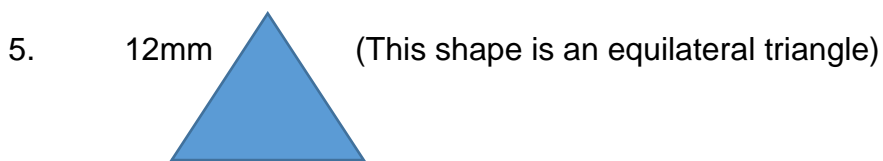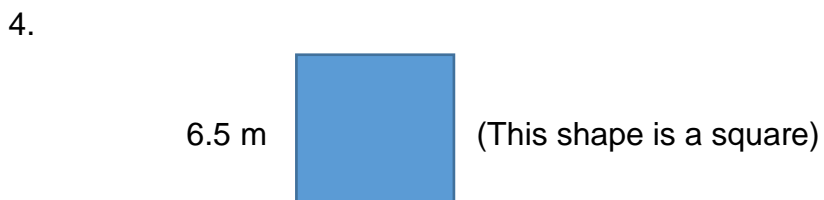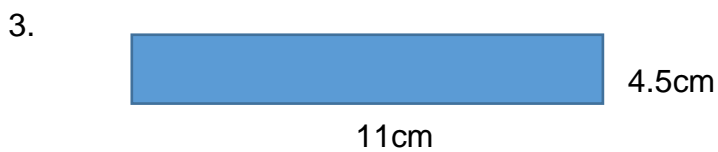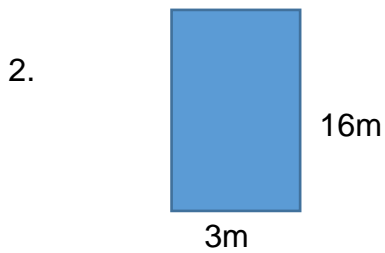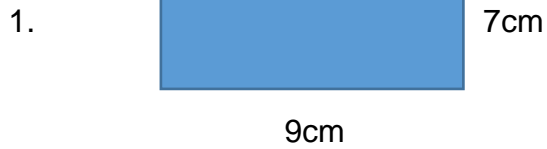
Challenge X

The perimeter of a rectangle is 40cm. The length of one side is 12cm. What is the length of the other side in centimetres?

Independent Tasks
Challenge 1
1. 14m 2. 32cm 3. 18cm 4. 20cm 5. 12mm 6. 17cm
Challenge 2
1. 32cm 2. 38m 3. 31cm 4. 26m 5. 36mm 6. 35cm
Challenge X
12cm + 12cm = 24cm 40cm – 24cm = 16cm 16cm ÷ 2cm = 8cm The length of the other side is 8cm

Lesson 4		
Learning Intention: WALT: solve problems involving perimeter of rectilinear shapes with missing information.	Key Vocabulary: Rectilinear	What you will need: A computer, tablet or phone for the starter Maths book Pencil and ruler Video: Year 4 Maths – S2 Week 7 - lesson 4

Starter
Log into Times Table Rock Stars and complete a gig if it is available. If not, challenge someone to a rock slam!

Main Teaching

Today, we are going to solve perimeter problems where a value maybe unknown. The shapes will be rectilinear which means they are rectangular or made up of rectangles

To find the perimeter of a rectangle we need to find the total length of all its sides.

Perimeter = a + a = b + b
Or
Perimeter = (a x 2) + (b x 2)

Example 1

Isabel has made a rectangular wire photo frame from a length of wire 28cm long. The width of the photo frame is 5cm. What is the length of the photo frame?

We can start to solve this problem by drawing a rectangle and adding the information we know:
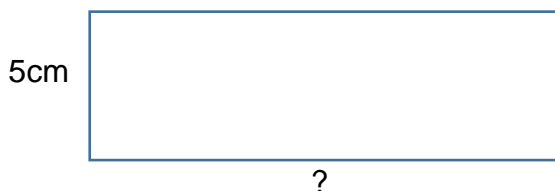
We know that two of the sides are 5cm. 5 x 2 = 10cm
We need to take 10cm away from 28cm. 28 – 10 = 18cm

Now we have 18cm left which must be shared equally between the two lengths.
18 ÷ 2 = 9cm
So, the length of Isabel's rectangle is 9cm.

We can check this by adding up all the sides:

5cm + 5cm + 9cm + 9cm = 28cm

Example 2

Amber has put a trimming of ribbon around the edge of her rectangular basket. The width of the basket is 7cm. She has used 50cm of ribbon. What is the length of her basket?

Again we start by drawing a rectangle to represent the problem:

7cm
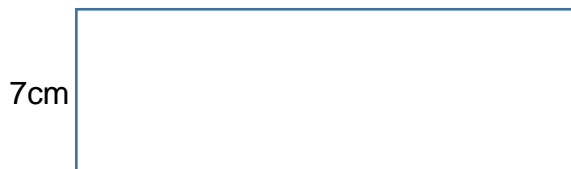
7cm x 2 = 14cm

50cm – 14cm = 36cm

36 ÷ 2 = 18cm.   The length of the basket is 18cm

Example 3
A square has a perimeter of 36cm. what is the length of one of its sides?
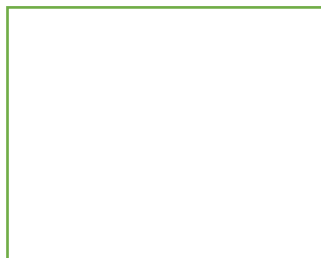
Remember, all 4 sides of a square are the same length. So, to find the length of one side we divide the perimeter by 4:

36cm ÷ 4 = 9cm. The length of one side is 9cm

Independent Tasks
Please complete 1 or 2 challenges. If you are finding a challenge too tricky or too easy after 3 questions, you should switch challenges. After you have completed your challenge, check your answers against the mark scheme. If you got an answer wrong, look carefully and identify where you made a mistake.

Challenge 1
1. The perimeter of a rectangular photo frame is 28cm. I know one of the sides is 6cm long. How long is the other side? 2. The length of my rectangle is 9cm. What would the width be if the perimeter were 20cm? 3. My rectangular whiteboard has a width of 7cm. What is the length if the perimeter is 34cm? 4. A square has a perimeter of 24cm. What is the length of each side? 5. The perimeter of my rectangle is 16cm. My length is 6cm. Kate says my width must be 3cm. Is she right or wrong? How do you know?

Challenge 2
1. Our playground is a rectangle shape. The perimeter is 48m. The length of the longest side is 14m. What is the length of the shortest side? 2. The perimeter of my square is 64 cm. what is the length of one side? 3. The width of my rug is 150cm and the perimeter is 700cm. What is the length of my rug? 4. Sarah's bathroom mirror is 42cm long and the perimeter is 140cm. How wide is her bathroom mirror? 5. The perimeter of George's exercise book is 81cm. The length of his book is 24cm. what is the width of his book?

Challenge X
A square has sides that are whole centimetres in length. Spot the perimeters that can't be true. 8cm, 18cm, 20cm, 24cm, 25cm, 28cm. Prove your answer

Mark Scheme – Lesson 4

Independent Tasks
Challenge 1

1. The perimeter of a rectangular photo frame is 28cm. I know one of the sides is 6cm long. How long is the other side? 8cm

2. The length of my rectangle is 9cm. What would the width be if the perimeter were 20cm? 1cm

3. My rectangular whiteboard has a width of 7cm. What is the length if the perimeter is 34cm? 10cm

4. A square has a perimeter of 24cm. What is the length of each side? 6cm

5. The perimeter of my rectangle is 16cm. My length is 6cm. Kate says my width must be 3cm. Is she right or wrong? How do you know? She is wrong because the answer should be 2cm:

   6cm x 2 = 12cm

   16cm – 12cm = 4 cm

   4cm ÷ 2 = 2cm

Challenge 2

1. Our playground is a rectangle shape. The perimeter is 48m. The length of the longest side is 14m. What is the length of the shortest side? 10m

2. The perimeter of my square is 64 cm. what is the length of one side? 8cm

3. The width of my rug is 150cm and the perimeter is 700cm. What is the length of my rug? 200cm

4. Sarah's bathroom mirror is 42cm long and the perimeter is 140cm. How wide is her bathroom mirror? 28cm

5. The perimeter of George's exercise book is 81cm. The length of his book is 24cm. what is the width of his book? 16.5cm

Challenge X

Possible response:
A square has sides which all measure the same length so you must be able to divide the perimeters by 4.
8cm ÷ 4 = 2cm 18 ÷ 4 = 4 r2 20 ÷ 4 = 5cm 24 ÷ 4 = 6cm
25cm ÷ 4 = 6 r1 28 ÷ 4 = 7cm
25cm and 18cm cannot be true.

Lesson 5		
Learning Intention: WALT: solve correspondence problems involving perimeter of rectilinear shapes	Key Vocabulary: Correspondence	What you will need: A computer, tablet or phone for the starter Maths book Pencil and ruler Video: Year 4 Maths – S2 Week 7 - lesson 5

Log into Times Table Rock Stars and complete a gig if it is available. If not, challenge someone to a rock slam! Complete a studio session.

Main Teaching

Today, we are going to be solving problems where one measurement corresponds to another. Correspond means to relate to or be connected to something else.

Example 1

The length of a rectangle is twice its width. The length is 16cm. What is the width? What is the perimeter of the rectangle?

We can represent this problem as a bar model:
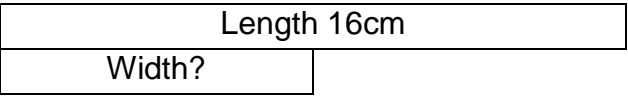
Length 16cm
Width?

So if the length is twice the width. The width must be half the length. Therefore if we divide the length by 2 we will get the width

16cm ÷ 2 = 8cm   The width of the rectangle is 8cm

Now we know the width and the length we can calculate the perimeter:

16cm

8cm

Perimeter = (8 x 2) + (16 x 2)
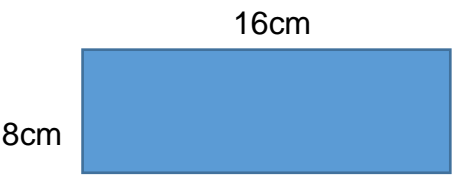
                    = 16 + 32

                    = 48cm

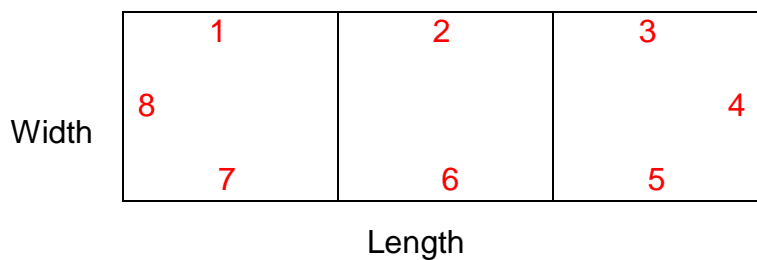**Example 2**

The perimeter of a rectangle football pitch is 96m. The length of the pitch is three times the width.
Find the length and width of the football pitch.

To solve a problem like this we can first draw the rectangle:

Width

Length

We can see that the length is 3 times the width.
The perimeter is a measurement all the way round the outside of the rectangle and in this case is 96cm.

We don't know what the width is but if we count up the number of widths around the rectangle there are 8.

So, if we divide 96m by 8 we will get the measurement for the width:

96m ÷ 8 = 12m.   The width of the football pitch is 12m.

Our problem tells us that the length of the pitch is three times the width. To get the measurement of the length we now need to multiply the width by 3:

12m x 3 = 36m.   The length of the football pitch is 36m.

We can check this by calculating the perimeter with these measurements:

Perimeter = (12 x 2) + (36 x 2)

                    =   24 + 72

                    =   96m   (which is the perimeter we were given in the problem)

Independent Tasks

Please complete 1 or 2 challenges. If you are finding a challenge too tricky or too easy after 3 questions, you should switch challenges. After you have completed your challenge, check your answers against the mark scheme. If you got an answer wrong, look carefully and identify where you made a mistake.

Challenge 1

1) The width of a rectangle is half its length. The length is 18cm. What is its width?

2) The length of a rectangle is three times its width. The length is 12cm. What is its width?

3) The width of a rectangle patio is 4m. Its length is 4 times its width. What is its width?

4) The length of a rectangle is three times its width. The length is 18cm.
   a) What it its width?
   b) What is its perimeter?

5) The width of a rectangle is 7cm. Its length is three times as long.
   a) What is its length?
   b) What is its perimeter?

Challenge 2

1) The length of a rectangle is twice its width. The length is 36cm. What is its width?

2) The width of a rectangle garden is 15m. Its length is 4 times its width. What is its length?

3) The perimeter of a rectangle must be 30cm because the length is 20cm and the width is 20cm. True or false? Explain how you know.

4) The length of a rectangle is three times its width. The length is 36cm.
   a) What it its width?
   b) What is its perimeter?

5) The perimeter of a rectangular dining hall is 64m. The length of the hall is three times the width. Find the length and width of the dining hall.

Challenge X

A rectangle is twice as long as it is wide. If one side is 10cm in length then the perimeter would be 30cm long. Draw a diagram to check if this is true or false.

Independent Tasks
Challenge 1

1) The width of a rectangle is half its length. The length is 18cm. What is its width?
9cm

2) The length of a rectangle is three times its width. The length is 12cm. What is its width? 4cm

3) The width of a rectangle patio is 4m. Its length is 4 times its width. What is its width? 16m

4) The length of a rectangle is three times its width. The length is 18cm.
   c) What it its width? 6cm
   d) What is its perimeter? 48cm

5) The width of a rectangle is 7cm. Its length is three times as long.
   c) What is its length? 21cm
   d) What is its perimeter? 56cm

Challenge 2

1) The length of a rectangle is twice its width. The length is 36cm. What is its width?
18cm

2) The width of a rectangle garden is 15m. Its length is 4 times its width. What is its length? 60m

3) The perimeter of a rectangle must be 30cm because the length is 20cm and the width is 20cm. True or false? Explain how you know.
False, because:
Perimeter = (20 x 2) + (20 x 2)
         = 40 + 40
         = 80cm

4) The length of a rectangle is three times its width. The length is 36cm.
   c) What it its width? 12 cm
   d) What is its perimeter? 96cm

5) The perimeter of a rectangular dining hall is 64m. The length of the hall is three times the width. Find the length and width of the dining hall.
Width = 8m
Length = 24m

Possible response:

20cm

10cm   10cm

20cm

10cm

5cm   5cm
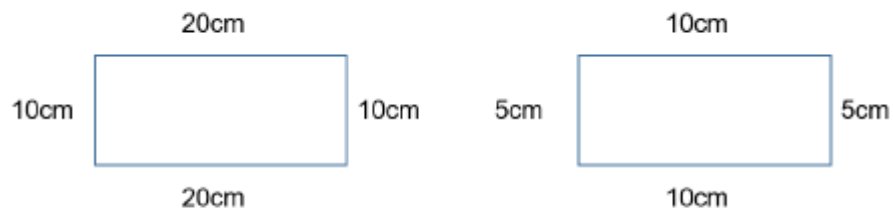
10cm

If the longer side is 10cm then the perimeter will be 30cm.

If the shorter side is 10cm then the perimeter will be greater than 30cm.