Group B – Maths
W/b 25.01.21

Monday - Can I begin to use ratio to share a total amount?

1. On a school trip there is a ratio of 1 adult to 8 children.
   180 people go on the trip in total. How many adults are there?

2. At a zoo, there is a ratio of 4 monkeys to 2 gorillas in an enclosure.
   There are 42 of these animals in the enclosure. How many monkeys are there?

3. In a season of football, the ratio of goals scored to goals missed was 5:3.
   If Chelsea tried 32 times in total,
   How many did they score?
   How many did they miss?

4. The ratio of yellow to red flowers is 4: 6. I plant 70 flowers altogether.
   How many are yellow?
   How many are red?

5. Lucy has a bag of sweets containing with the following ratio. If she has 42 sweets in total, how many sweets are lollies and how many are toffees.

6. In a raffle, there is one blue ticket for every 5 pink tickets sold. If 42 tickets are sold, how many are blue? How many are pink?

7. Sally, Una and Jo share £120 in the ratio 4:6:2.
   How much money does each child get?

Tuesday - Can I solve missing value ratio problems using multiplication and division?

For each of these questions, be sure to show your method.

a) The ratio a:b=2:3 and the ratio a:c=3:4. What is the ratio b:c?

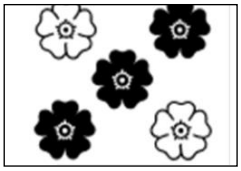
b) There are 25 children in the lunch queue, including Nik.
Nik says, '*There are twice as many children in front of me as there are behind me*'
How many children are **in front** of Nik?

c) Two numbers are in the ratio **4 : 5**
One of the numbers is **60**.
There are two possible values for the other number.
What are the two possible values?

d) White paint costs £2.80 per litre and blue paint costs 70p more than this per litre.
If white paint and blue paint are mixed in the ratio 3:2, what is the cost of 20 litres of the mixture?

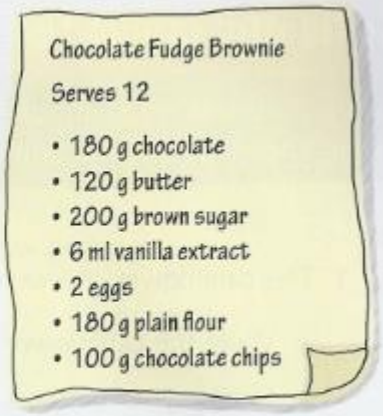
e) Ben changes £800 to euros before he goes on holiday. The exchange rate was £1 to 1.25 euros.
He spent 895 euros. He then changes the Euros he has left bak into pounds, with the new exchange rate of £1 = 1.40 euros.
How many pounds does he get back?

f) Sumita plants flowers in the following pattern.
She says, "I need _____ white flowers for every _____ flowers."
When she has finished planting, she has used 40 white flowers.
How many flowers did she plant in total?



Challenge:

2 Here is a recipe for Chocolate Fudge Brownies.



a Write the following ratios in their simplest form:

i chocolate : butter

ii chocolate : brown sugar

iii chocolate : chocolate chips

iv brown sugar : chocolate chips

b How many servings are there if you use:

i 15 ml vanilla extract? ii a dozen eggs?

iii 1 kg brown sugar? iv 60 g butter?

3 Look at each pair of statements and decide if the second statement is true or false. Explain why, or give the correct answer for any that are false.

a Grey paint is 1 part black paint to 4 parts white paint. In a 2 *l* tin of paint, there is 1·6 *l* of white paint.

b The ratio of boys to girls in a class is 4 : 5. In a class of 27 children, there are 15 girls.

c 200 kg of sand is divided into piles in the ratio 2 : 3. The smaller pile is 80 kg.

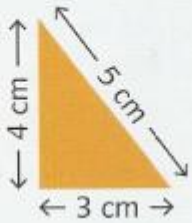
d The approximate ratio of time asleep : time awake for a newborn baby is 2 : 1. A baby is awake for 56 hours in a week.

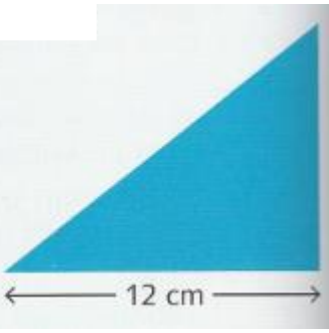
Wednesday - Can I apply my knowledge of ratio to scale factor questions?

3 These two triangles are similar.

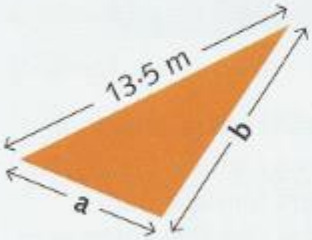
a Find the scale factor.

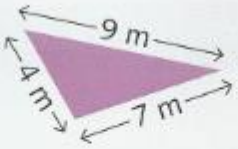
b Calculate the missing lengths of the larger triangle.

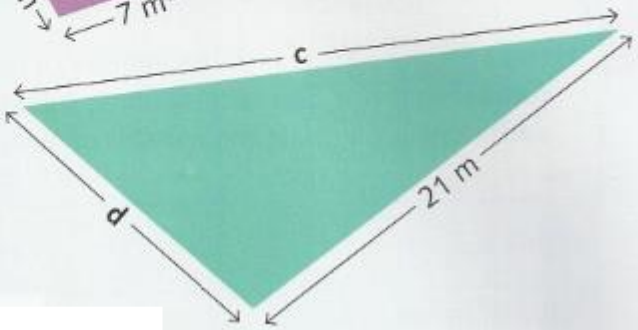




Here are three similar scalene triangles. Find the scale factor for each triangle and calculate the missing lengths.







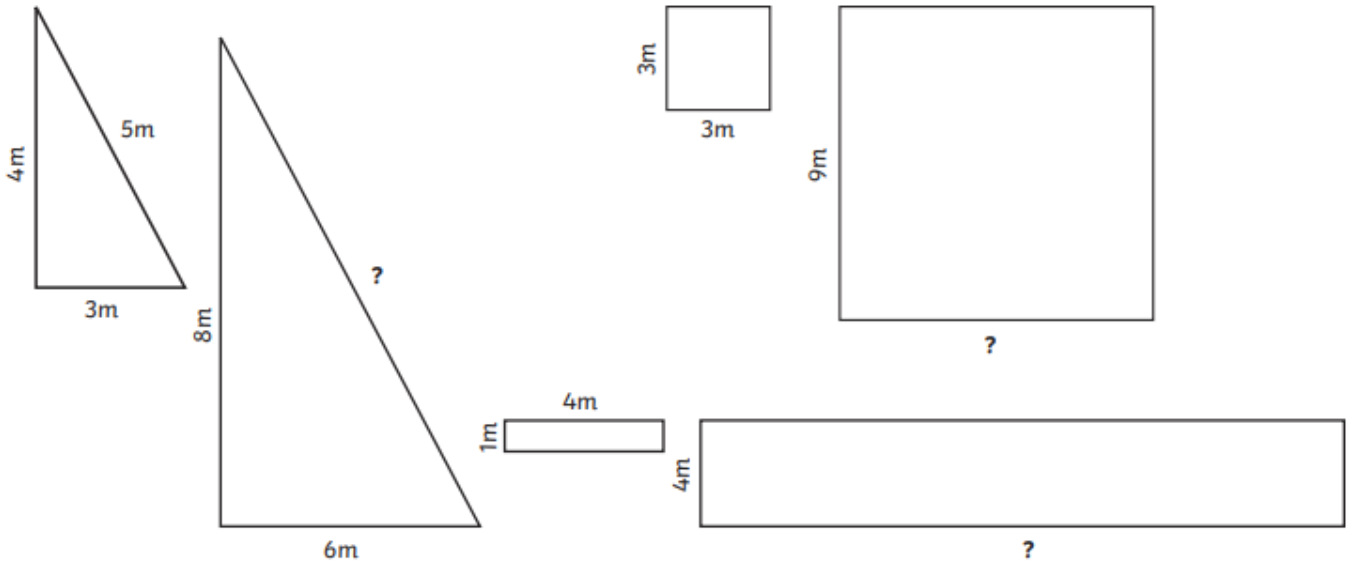
You will need:
- 1 cm squared paper
- ruler

1 Draw each of the shapes described below on 1 cm squared paper and then enlarge each one with a scale factor of 2.

a 2 cm square

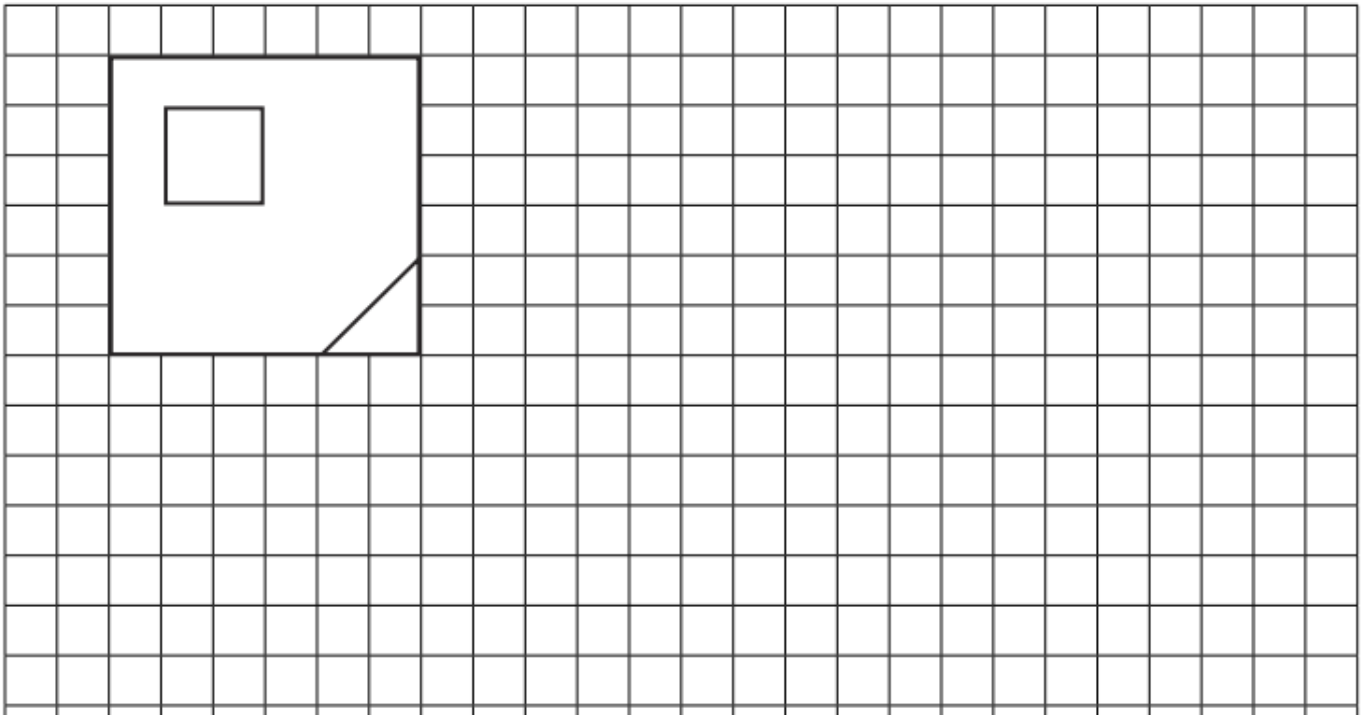
b 1 cm × 4 cm rectangle

c right-angled triangle with the right angle between sides of length 2 cm and 3 cm.



2. In each pair of similar shapes, work out the missing side length and explain how you calculated them:

1. George has produced a logo design for his dad's company. They want to use the design, but have to enlarge it by a scale factor of two. Draw the enlarged shape below and explain how you completed it:



Thursday – Can I further develop my reasoing skills to solve problems involving ratio and scale factor?

Q1. A recipe for fruit squash is

oranges (chopped)	*300 g*
lemonade	*1500 ml*
orange jiuce	*750 ml*
makes enough for 6 people	

Trina wants to make enough squash for **10 people**.

How many millilitres of **lemonade** will she need?

Q2 During a game, players can win and lose counters. At the start of the game Rob, Tim and Luke share the counters in the ratio 5:6:7.
At the end of the game Rob, Tim and Luke share the **same number** of counters in the ratio 7:9:8.
Show that Rob ended the game with more counters than he started with.

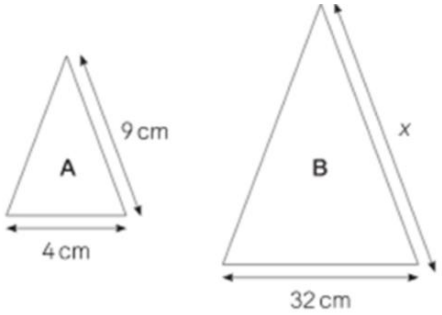
Q3. This photograph shows three Russian dolls.

The real-life height of the **largest** Russian doll is **13.5 cm.**

What is the real-life height of the **smallest** Russian doll?

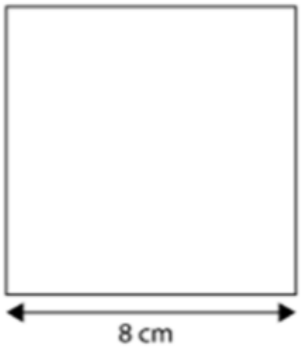
Q.4. Two similar isosceles triangles are drawn.

a) What scale factor has been used from Triangle A to Triangle B?
b) How long is the side marked x?



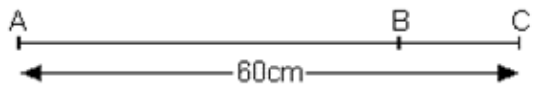
Q.5.

a) A square is drawn. Kira draws a second square with the scale factor of 5. What is the length of the second square?



b) Ola uses the same original square. She draws a second one with the side length of 12cm. What scale factor did she use?

Q.6.



Not drawn to scale

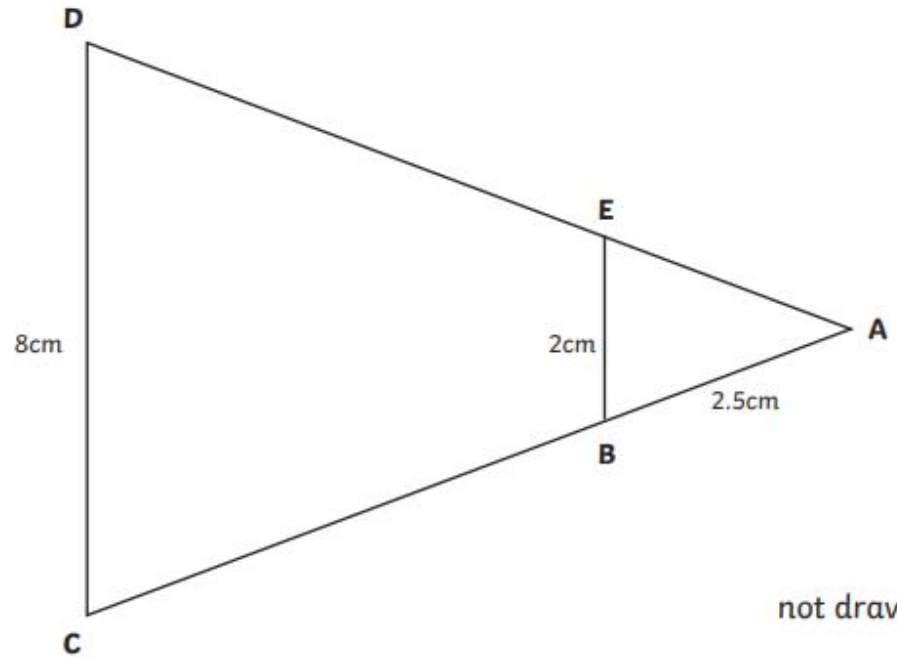
The distance from **A to B** is three times as far as from **B to C**.

The distance from **A to C** is **60 centimetres**.

Calculate the distance from **A to B**.

Q.7.

This picture shows two triangles: triangle ACD and triangle ABE.
They are similar triangles.Calculate the length of side AD. Explain how you worked it out.

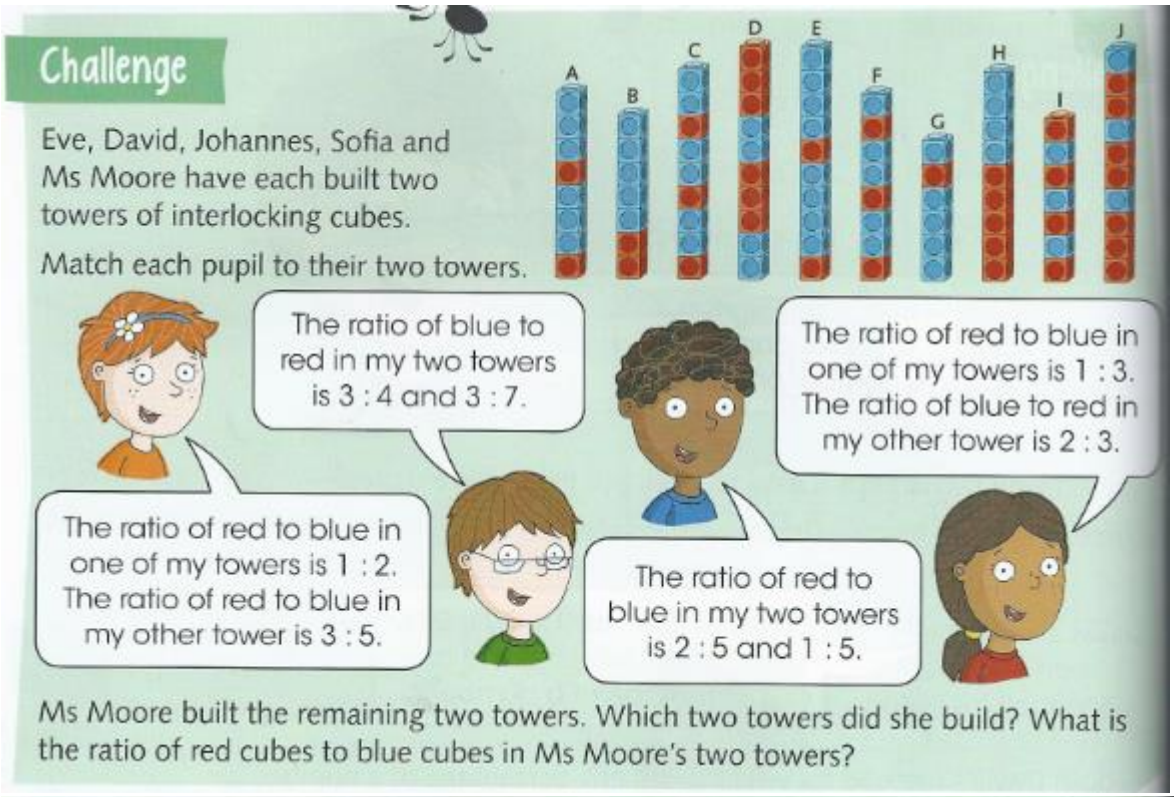


not drawn to scale

Friday – Can I develop my Arithmetic and Reasoning skills?

Before this session, complete the Week 4 arithmetic test, which can be found in the Lockdown Home Learning area of the Valley website – we will go through the answers to this test in the session.

For the session:
Take a look at the reasoning challenge below. We will discuss your ideas on how to approach this question in the session.



OPTIONAL EXTRA CHALLENGES

Peter, the pumpkin eater, wanted to make two pies for a party. His mother, a professional pie maker, had a recipe for him to use. However, she always made 80 pies at a time. She used:

10 dozen eggs
27 litres of condensed milk
480 tablespoons of sugar
100 teaspoons of cinnamon
140 cups of pumpkin

Peter looked in the cupboard and found:

4 cups of pumpkin
2 eggs
$1\frac{1}{2}$ teaspoons of cinnamon
$\frac{2}{3}$ of a litre of condensed milk
15 tablespoons of sugar

Did Peter have enough ingredients to make two pumpkin pies for the party or did he need to buy more?

There are a number of coins on a table.

One quarter of the coins show heads.

If I turn over two coins, then one third show heads.

How many coins are there altogether?

Freddie said:
I got some coins to try out ways to make it work.

Help!

Vasanthi and Francis said:
We noticed that there were more heads after turning over two coins.

Hussam and Suzy said:
First we thought of what number could have a quarter and a third which are whole numbers.

Did you start the problem in the same way as any of these children?
What do you think about each method?

Now continue to work towards a solution to the problem. You could choose to use Freddie's, or Vasanthi and Francis', or Hussam and Suzy's method.

This is a 750 ml bottle of concentrated orange squash.

It is enough to make fifteen 250 ml glasses of diluted orange drink.

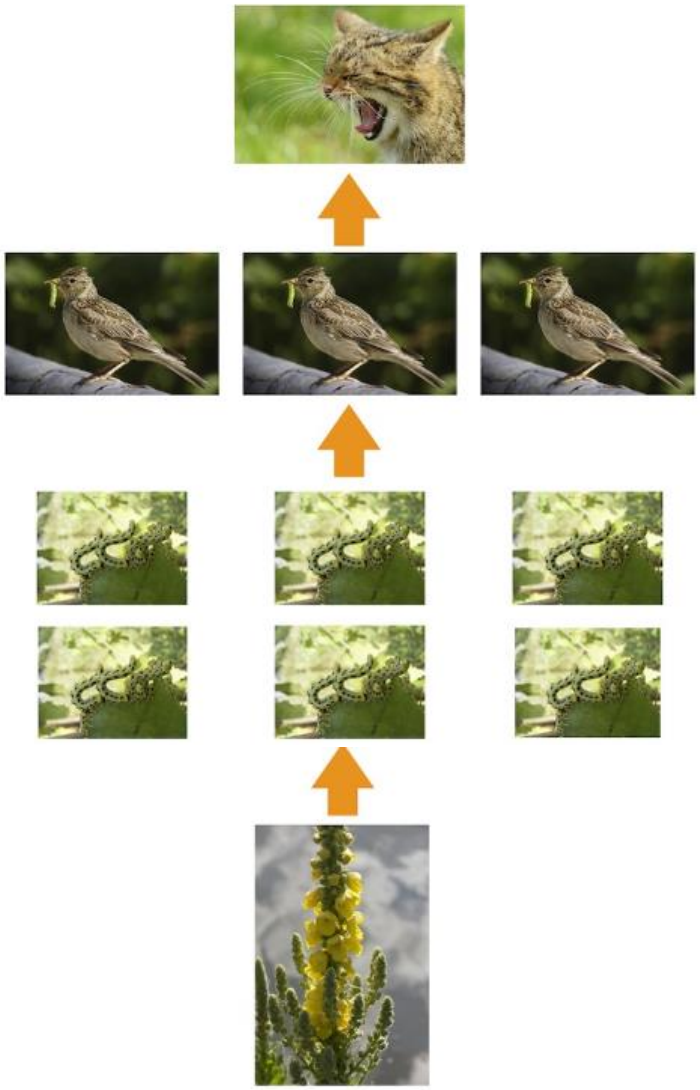
How much water is needed to make 10 litres of this drink?

Key questions

Help!

How much juice is there in each glass of drink?
How much water is there in each glass of drink?
How many glasses of drink are there in a litre? In 10 litres?
What fraction of the made-up drink is water?

Here is a food chain:



A wildcat will eat 3 birds every day. These three birds will eat 10 caterpillars each, every day, totaling 30 caterpillars. The 30 caterpillars will eat one small bush together every day.

a. In the area that these animals live in, the ecosystem can support 500 small bushes being eaten every day. Calculate the numbers of each animal in the food chain.

b. As you go up the food chain, the amount of energy available to the following predator decreases. For this food chain, the amount of energy available decreases by 25% for every level in the chain. Calculate how much more energy the wildcat could obtain from becoming a vegetarian and eating the bush rather than from eating birds.

c. One year, a bacteria kills 5000 caterpillars. What effect will this have on the food chain?

d. Suppose that the wildcats decide to become vegetarians and eat bushes instead of other animals. How many wildcats could 500 bushes support (ignoring the other animals)?

e. If the wildcats became omnivorous (with some of them eating animals and some eating bushes), how many animals would there be if half of the bushes were eaten by caterpillars and the other half were eaten by wildcats?

Answers- Monday-Thurs

MONDAY

1. 20 adults 2. 28 monkeys 3. Scored 20 missed 12 4. 28 yellow 42 red

5. 28 lollies 14 toffees 6. 7 blue 35pink 7. Sally £40 : Una £60 : Jo £20

TUESDAY

a) 3:4 - you need to multiply each ratio so that the a on both is 6

b) 16 – 25 - 1 = 24. 24 ÷ 3 = 8 (2:1 infront/behind) 8x2 = 16 in front

c) 60:75 & 48:60 - 4 x 15 = 60 & 5 x 12 = 60

d) £61.60 - blue paint = 2.80 + 0.70 = 3.50 20l of mixture needs 5x ratio (12:8)
12 x 2.80 = 33.60 8x 3.50 = 28 33.60 + 28 = 61.60

e) £75 - 1:1.25 = 800 x 1.25 = €1000 to start with
1000 – 895 = €105 to exchange back
105 ÷ 1.40 = £75

f) 100 flowers total - 2 white flowers for every 3 black flowers. 2:3 x 20 = 40:60 40+60 = 100

CHALLNEGE:

2. a) i. choc : butter 18:12 = 3:2

ii. Choc : sugar 18:20 = 9:10

iii. choc : choc chips 18:10 = 9:5

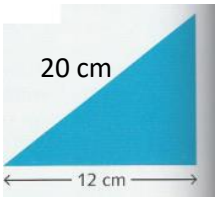
iv. sugar : choc chips 20:10 = 2:1

b) i. 30
ii. 72
iii. 60
iv. 6

3. ALL TRUE

WEDNESDAY

3. a) SF 4 b)



16cm

a) 6m b) 10.5m c) 27m d) 12m

right angle triangle ? = 10 m
Square ? = 9m
Rectangle ? = 16m

THURSDAY

Q1. 2500ml lemonade

Q2.

	R	T	L			
	5	6	7 = 18	x 4 =	72	Ratios x 4 = 20:24:28
	7	9	8 = 24	x 3 =	72	Ratios x 3 = 21:27:24

At the start of the game Rob had 20 counters whereas at the end he had 21 .

Q3. 9.6 cm

Q4. 72cm

Q5. a) 40 com b) SF 1.5

Q6. 45 cm

Q7. 10 cm