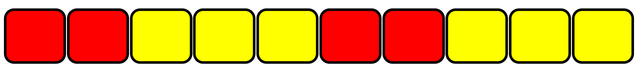
Using Ratio Language

Reasoning and Problem Solving

Whitney lays tiles in the following pattern



If she has 16 red tiles and 20 yellow tiles remaining, can she continue her pattern without there being any tiles left over?

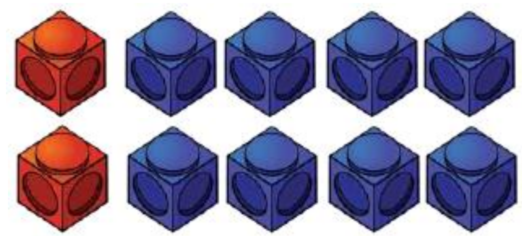
Explain why.

Possible responses:

For every two red tiles there are three yellow tiles. If Whitney continues the pattern she will need 16 red tiles and 24 yellow tiles. She cannot continue the pattern without there being tiles left over.

20 is not a multiple of 3

True or False?



For every red cube there are 8 blue cubes.	False
For every 4 blue cubes there is 1 red cube.	True
For every 3 red cubes there would be 12 blue cubes.	True
For every 16 cubes, 4 would be red and 12 would be blue.	False
For every 20 cubes, 4 would be red and 16 would be blue.	True

Ratio and Fractions

Reasoning and Problem Solving

Ron plants flowers in a flower bed.
For every 2 red roses he plants 5 white roses.

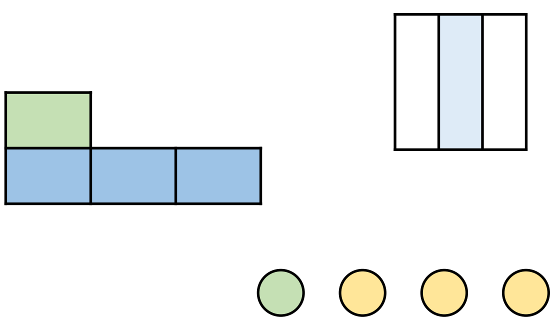
He says,

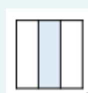
$\frac{2}{5}$ of the roses are red.

Is Ron correct?

Ron is incorrect because $\frac{2}{7}$ of the roses are red. He has mistaken a part with the whole.

Which is the odd one out?
Explain your answer.



 is the odd one out because one part out of three is a different colour. The others are one part out of four.

There are some red and green cubes in a bag. $\frac{2}{5}$ of the cubes are red.

True or False?

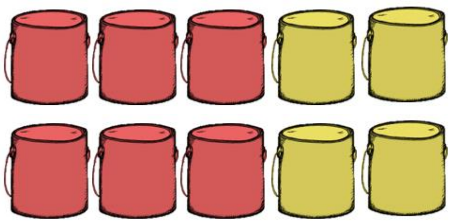
- For every 2 red cubes there are 5 green cubes. — False
- For every 2 red cubes there are 3 green cubes. — True
- For every 3 green cubes there are 2 red cubes. — True
- For every 3 green cubes there are 5 red cubes. — False

Explain your answers.

Introducing the Ratio Symbol

Reasoning and Problem Solving

Tick the correct statements.



- There are two yellow tins for every three red tins.
- There are two red tins for every three yellow tins.
- The ratio of red tins to yellow tins is 2 : 3
- The ratio of yellow tins to red tins is 2 : 3

Explain which statements are incorrect and why.

The first and last statement are correct. The other statements have the ratios the wrong way round.

In a box there are some red, blue and green pens.

The ratio of red pens to green pens is 3 : 5

For every 1 red pen there are two blue pens.

Write down the ratio of red pens to blue pens to green pens.

R : G

3 : 5

R : B

1 : 2 or

3 : 6

R : B : G

3 : 6 : 5

Calculating Ratio

Reasoning and Problem Solving

Teddy has two packets of sweets.

In the first packet, for every one strawberry sweet there are two orange sweets.

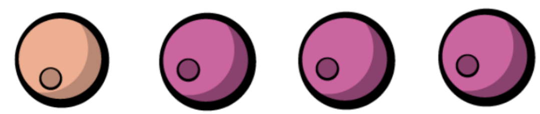
In the second packet, for every three orange sweets there are two strawberry sweets.

Each packet contains 15 sweets in total.

Which packet has more strawberry sweets and by how many?

The first packet has 5 strawberry sweets and 10 orange sweets.
The second packet has 6 strawberry sweets and 9 orange sweets.
The second packet has 1 more strawberry sweet than the first packet.

Annie is making some necklaces to sell.
For every one pink bead, she uses three purple beads.



Each necklace has 32 beads in total.

The cost of the string is £2.80
The cost of a pink bead is 72p.
The cost of a purple bead is 65p.

How much does it cost to make one necklace?

Each necklace has 8 pink beads and 24 purple beads.

The cost of the pink beads is £5.76

The cost of the purple beads is £15.60

The cost of a necklace is £24.16

Using Scale Factors

Reasoning and Problem Solving

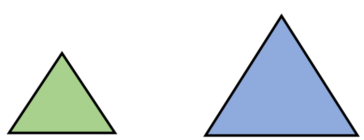
Draw a rectangle 3 cm by 4 cm.

Enlarge your rectangle by scale factor 2.

Compare the perimeter, area and angles of your two rectangles.

The perimeter has doubled, the area is four times as large, the angles have stayed the same.

Here are two equilateral triangles.
The blue triangle is three times larger than the green triangle.



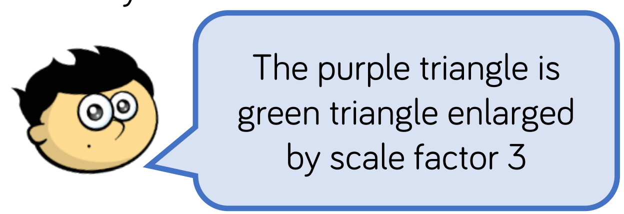
(Not drawn to scale)

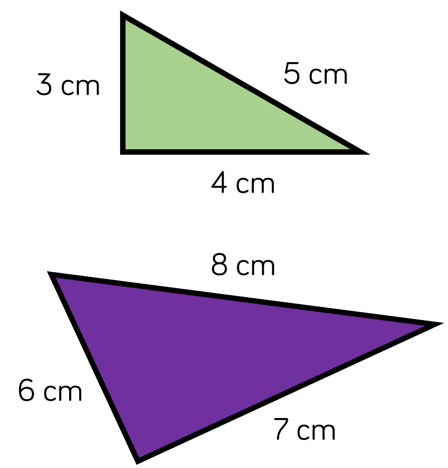
Find the perimeter of both triangles.

The blue triangle has a perimeter of 15 cm.

The green triangle has a perimeter of 5 cm.

Jack says:





Do you agree?
Explain why.

Possible answer
I do not agree because Jack has increased the green shape by adding 3 cm to each side, not increasing it by a scale factor of 3

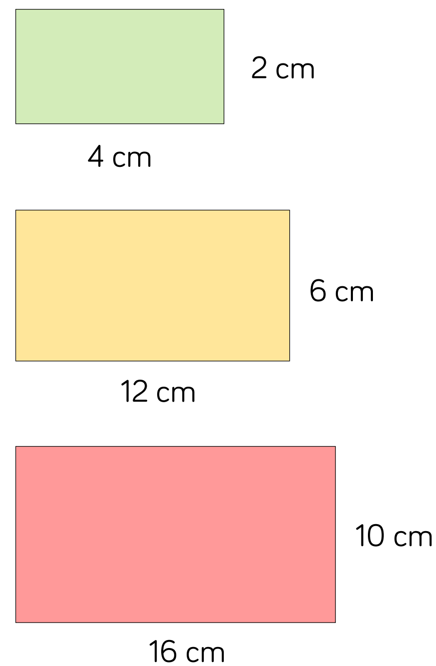
White Rose Maths

Calculating Scale Factors

Reasoning and Problem Solving

A rectangle has a perimeter of 16 cm. An enlargement of this rectangle has a perimeter of 24 cm. The length of the smaller rectangle is 6 cm. Draw both rectangles.	Smaller rectangle: length – 6 cm width – 2 cm Larger rectangle: length – 9 cm width – 3 cm Scale factor: 1.5
Always, sometimes, or never true? To enlarge a shape you just need to do the same thing to each of the sides.	Sometimes. This only works when we are multiplying or dividing the lengths of the sides. It does not work when adding or subtracting.

Ron says that these three rectangles are similar.



Do you agree?
Explain your answer.

Ron is incorrect. The orange rectangle is an enlargement of the green rectangle with scale factor 3. The red rectangle, however, is not similar to the other two as the side lengths are not in the same ratio.

Ratio and Proportion Problems

Reasoning and Problem Solving

This recipe makes 10 flapjacks.

Flapjacks

120 g butter
100 g brown sugar
4 tablespoons golden syrup
250 g oats
40 g sultanas

Amir has 180 g butter.

What is the largest number of flapjacks he can make?

How much of the other ingredients will he need?

He has enough butter to make 15 flapjacks.
He will need 150 g brown soft sugar, 6 tablespoons golden syrup, 375 g oats and 60 g sultanas.

Alex has two packets of sweets.

In the first packet, for every 2 strawberry sweets there are 3 orange.

In the second packet, for one strawberry sweet, there are three orange.

Each packet has the same number of sweets.

The second packet contains 15 orange sweets.

How many strawberry sweets are in the first packet?

Second packet:
15 orange
5 strawberry.

So there are 20 sweets in each packet.

First packet:
8 strawberry
12 orange

The first packet contains 8 strawberry sweets.