Maths SATs Survival

Revision Guide and Quiz

Ratio and Proportion

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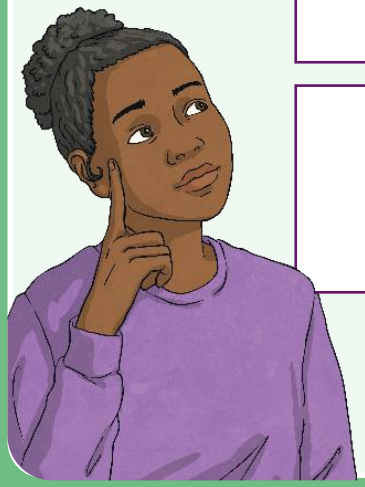
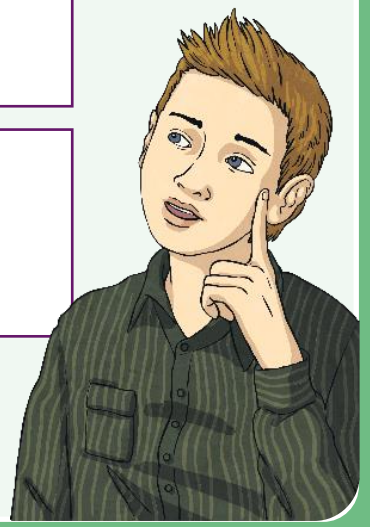
Solve problems involving ratio

Solve problems involving proportion

Solve problems involving calculating percentages

Solve problems involving scale factors





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Revise

Solve problems involving ratio

Ratio **compares** the parts of a total amount.

The total amount could get smaller or larger, but the relationships between the parts stays the same.

There are **10** marbles in a bag. The ratio of **red** to **blue** is **4:6**.

The total amount

The ratio of red marbles

The ratio of blue marbles

Just like fractions, ratios can be simplified by dividing by a common factor.

4:6 both have a common factor of 2 and can be simplified to 2:3.

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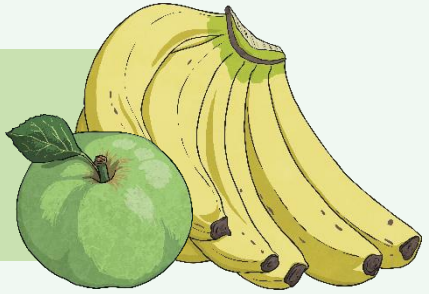
Revise

Solve problems involving ratio

There are **36** pieces of fruit in a box.

If the ratio of apples to bananas is **4:5**, how many bananas are there?



1. Divide the total amount by the total of all the parts in the ratio to find the value of one part:

$$36 \div (4 + 5) = 36 \div 9 = 4$$

2. Multiply each ratio by the value of one part.

You will notice that when you add the parts back together, they make the total amount:

16 + 20 = 36

	Apples	Bananas
Ratio	4	5
Amount	4 × 4 = 16	5 × 4 = 20

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Quiz

Solve problems involving ratio

In a bag of sweets, the ratio of red to green sweets is 8:7. If there are 225 sweets in the bag altogether, how many green sweets are there?

105 green sweets

75 green sweets

45 green sweets

Try again!

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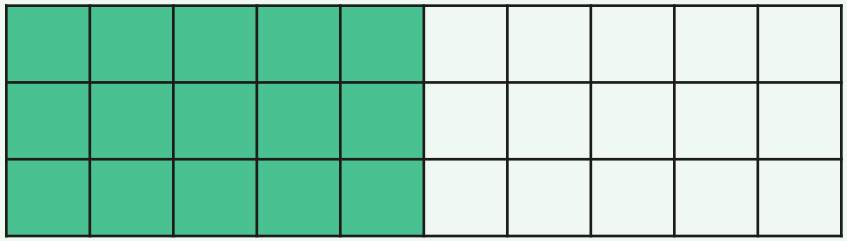
Quiz

Solve problems involving ratio

How many more squares need to be shaded to make the ratio of shaded to unshaded squares 3:2?



4 squares

2 squares

3 squares

Correct!

Try again!

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Quiz

Solve problems involving ratio

In a class of 32 children, 8 children can ride a horse.
What is the ratio of horse riders to non-horse riders?

8:3	8:32	1:3

Correct!

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Quiz

Solve problems involving ratio

Sarah and Rhys share out £192 using the ratio 3:5.
How much money does Sarah receive?

£64	£72	£120

Correct!

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Quiz

Solve problems involving ratio

There are 36 marbles in a bag. The ratio of red to blue to green marbles is 1:2:6. How many green marbles are there?

22 marbles

24 marbles

12 marbles

Try again!

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Quiz

Solve problems involving ratio

A recipe for a fruit smoothie says to use bananas and strawberries in the ratio 2:5. If I use 6 bananas, how many strawberries should I use?

15 strawberries

12 strawberries

10 strawberries

Choose another objective

Try again!

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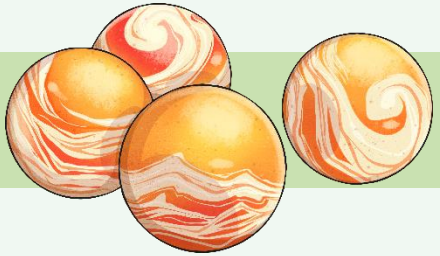
Revise

Solve problems involving proportion

Proportion describes **parts of a whole**.

There are **24** marbles in a jar.
There are **9 red** marbles and **15 yellow** marbles.



We can describe the proportions of the colours of the marbles using fractions, simplifying where necessary.

Red marbles	$\frac{9}{24} = \frac{3}{8}$
Yellow marbles	$\frac{15}{24} = \frac{5}{8}$

Remember, ratio is different to proportion as ratio **compares** the parts of a **total amount**.

The ratio of red marbles to yellow marbles is:

9:15

This can also be simplified to:

3:5

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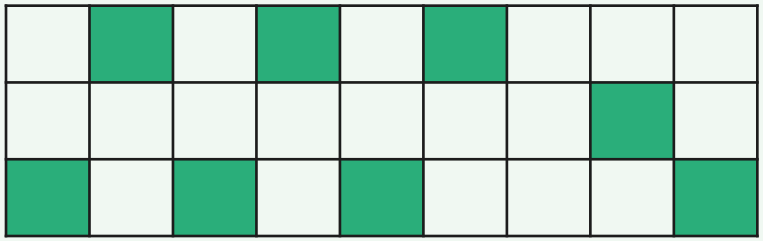
Quiz

Solve problems involving proportion

What is the proportion of shaded squares in this pattern?



8 in 27

8 in 19

27 in 8

Try again!

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Quiz

Solve problems involving proportion

In a class of 36 children, 9 children have been on holiday to Africa. What proportion of the class have been to Africa?

$\frac{9}{27}$

$\frac{4}{36}$

$\frac{1}{4}$

Try again!

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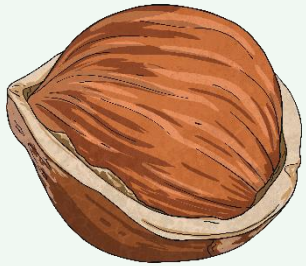
Quiz

Solve problems involving proportion

A recipe says to use hazelnuts and pecans in the ratio 3:7. What is the proportion of pecans in this recipe?



$\frac{7}{3}$	$\frac{7}{10}$	$\frac{3}{10}$

Try again!

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Quiz

Solve problems involving proportion

Out of the 240 children in key stage two, 3 in every 8 children have blue eyes. This is half of the proportion of the key stage one children. If there are 180 children in key stage one, how many key stage one children will have blue eyes?

120 children

190 children

135 children

Choose another objective

Try again!

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Revise

Solve problems involving calculating percentages

Calculating percentages of an amount

Find 32% of £130

Remember that to find 10% of any number, we can use place value understanding to divide by 10.
£130 ÷ 10 = £13 so 10% of £130 = £13

Multiply 10% of the amount by 3 to find 30%.
£13 × 3 = £39 so 30% of £130 = £39

Remember that to find 1% of any number, we can use a place value understanding to divide by 100.
£130 ÷ 100 = £1.30 so 1% of £130 = £1.30

Multiply 1% of the amount by 2 to find 2%.
£1.30 × 2 = £2.60 so 2% of £130 = £2.60

Add the value of 30% and 2% together to find the answer.
£39 + £2.60 = £41.60

32% of £130 = £41.60

Can you find the same percentage using a different method?

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Revise

Solve problems involving calculating percentages

Calculating percentage decreases

A pair of trainers costing £95 are reduced by 24% in a sale.
What is the new price?

First, calculate 24% of £95. You could use blocks of 10% and 1%.

10% = £95 ÷ 10 = £9.50
20% = £9.50 × 2 = £19

1% = £95 ÷100 = £0.95
4% = £0.95 × 4 = £3.80

24% = £19 + £3.80 = £22.80

Subtract 24% from the original price to find the reduced price.

£95 - £22.80 = £72.20

The sale price of the trainers is £72.20.

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Revise

Solve problems involving calculating percentages

Calculating percentage increases

A monthly contract for a smart phone is increased by 9% from £25.
What is the new price of the contract?

First calculate 9% of £25. You could use blocks of 10% and 1%.
10% of £25 = £25 ÷ 10 = £2.50
1% of £25 = £25 ÷100 = £0.25

9% of £25 = £2.50 - £0.25 = £2.25

Add 9% to the original price to find the increased price.
£25 + £2.25 = £27.25

The increased price of the contract is £27.25.

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Quiz

Solve problems involving calculating percentages

A pair of trainers costs £35.60. In the sale they have 10% off. What is the sale price?

£39.16	£32.56	£32.04

Try again!

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Quiz

Solve problems involving calculating percentages

1380 people visit the shopping centre during one day. 45% of the visitors have blonde hair. How many visitors **did not** have blonde hair?

621 visitors

759 visitors

690 visitors

Try again!

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Quiz

Solve problems involving calculating percentages

John works at the local newsagent on a Saturday. He earns £26.60. His wages increase by 25%. How much does he earn now?

£33.25	£19.95	£33.50

Try again!

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Quiz

Solve problems involving calculating percentages

The temperature of a cup of coffee is 26°C. The temperature decreases by 15% after ten minutes. What is the new temperature?

20.1°C	21.1°C	22.1°C

Choose another objective

Try again!

Revise

Solve problems involving scale factors

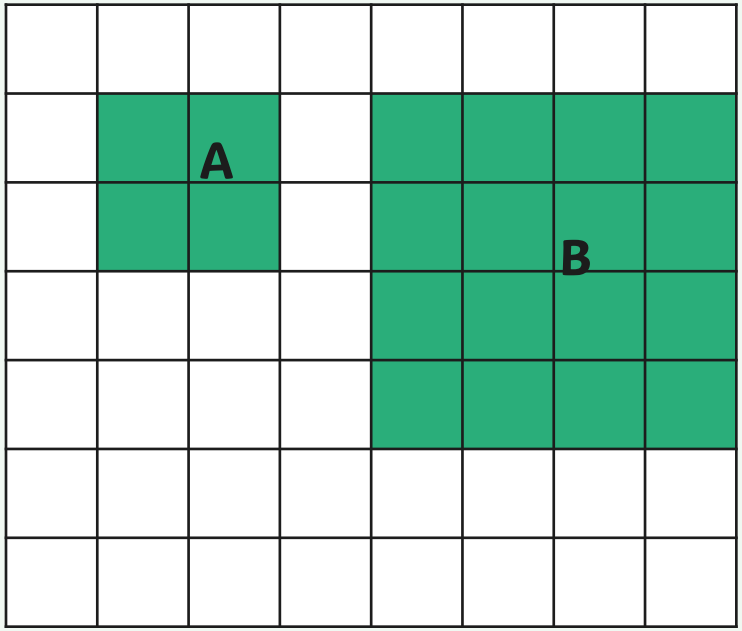
Scaling is when you reduce or enlarge dimensions proportionally.

Scaling is commonly used in maps, building plans and models, and is described as a ratio called **scale factor**.

The length of square A is 2.
The length of square B is 4. ×2

The width of square A is 2.
The width of square B is 4. ×2

Square B is an enlargement of square A using a **scale factor of 2**.



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Revise

Solve problems involving scale factors

A model car has a **scale factor of 1:18**.

The length of the **model car is 23cm**.
What is the length of the full-size car?

Using the scale factor, we can see that the dimensions of the full size car are 18 times larger than the model.

Use a written method to multiply 23cm by 18.
23 × 18 = 414cm = 4.14m

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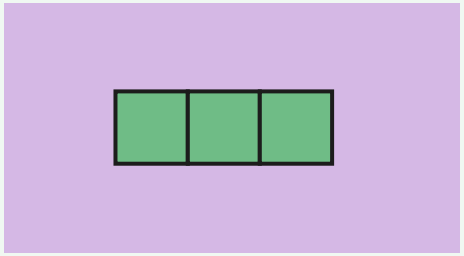
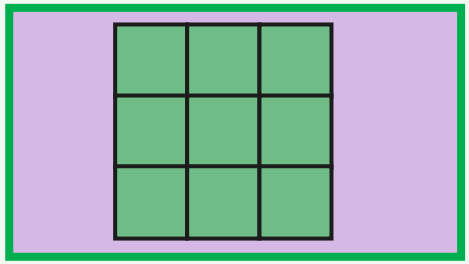
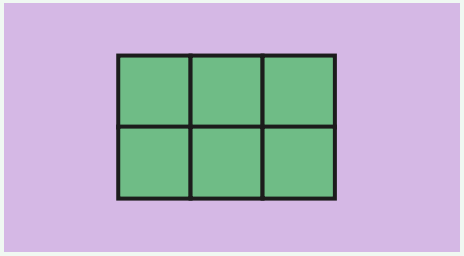
Quiz

Solve problems involving scale factors

Enlarge this square by a scale factor of 3.







Try again!

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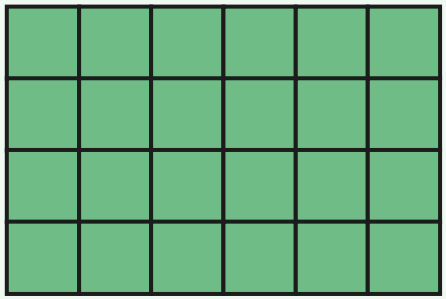
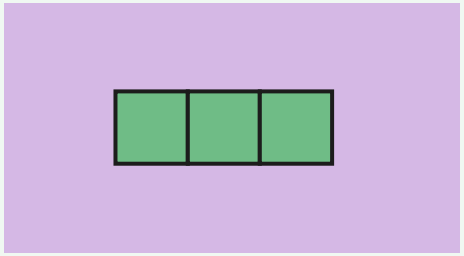
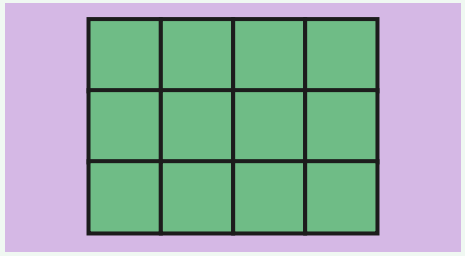
Quiz

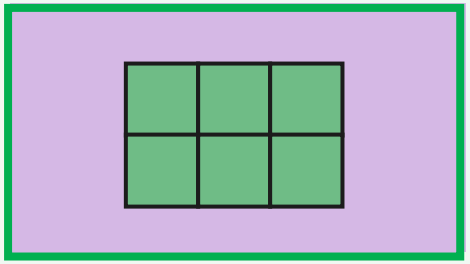
Solve problems involving scale factors

What is the correct reduction of this rectangle using a scale factor of 0.5?









Try again!

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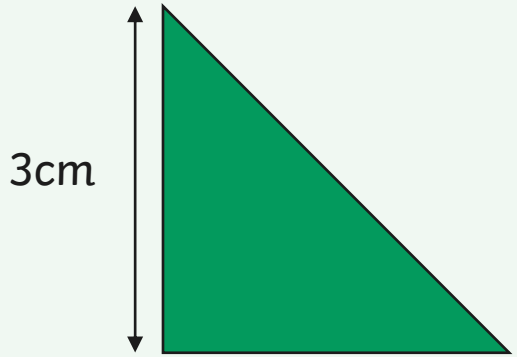
Quiz

Solve problems involving scale factors

What is the new measurement of the side of this triangle if it is enlarged using a scale factor of 2.5?



7.5cm

6.5cm

7cm

Correct!

Try again!

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Quiz

Solve problems involving scale factors

On a 1cm : 25 000cm scale map, a distance is measured as being 30cm. How far would this actually be in kilometres?

10km

7.5km

8km

Try again!

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Quiz

Solve problems involving scale factors

A regular pentagon with sides of 4cm is enlarged. What was the scale factor if the sides of the enlarged pentagon measure 14cm?

Scale factor of 3

Scale factor of 10

Scale factor of 3.5

Choose another objective

Try again!

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