



THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions
and curriculum resources

Rapid Reasoning

Year 6 | Weeks 13-18



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Rapid Reasoning

Year 6 | Week 14

This week, the questions within *Rapid Reasoning* continue to focus on proportionality, including fractions and decimals.

The following objectives are introduced for the first time this week:

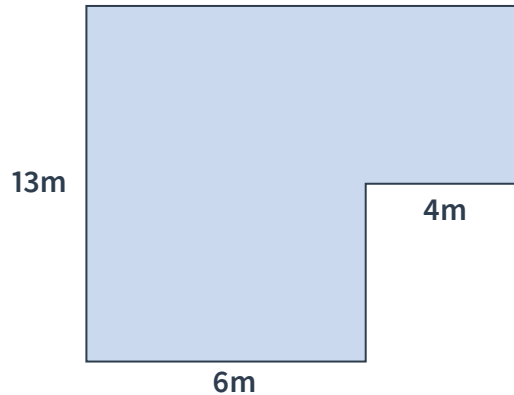
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$].

The following objectives, first introduced in week 13, continue to be a focus this week:

- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers.

As with previous weeks, other content from Year 6 that the children have met in previous weeks of *Rapid Reasoning*, along with objectives from previous years, will also feature this week.

Q1 This diagram shows some of the measurements of a school playground.



The school caretaker wants to put a fence up around the playground.

How long should the fence be?

 m

1 mark

Q2 India wants to know the number of days in 25 years.

She uses the grid method and says that the answer is 98.

Here is her working:

x	3	6	5		6
2	6	12	10		1 2
5	15	30	25		1 0
					1 5
					3 0
					+ 2 5
					9 8

Explain the mistake that India has made.

1 mark

Q3

A top football striker scores at an average rate of 2.68 goals per game.

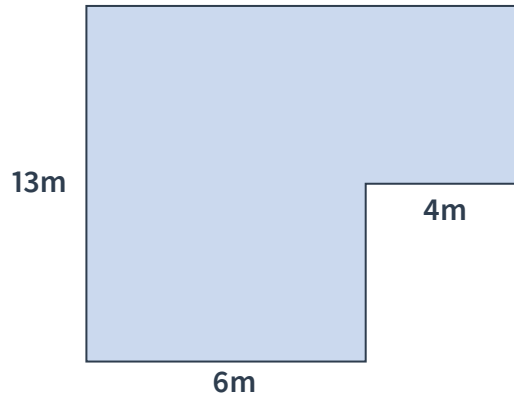
He has 9 games left in the season.

How many goals should the striker aim to score in the remaining 9 games? Round your answer to the nearest whole number of goals.

goals

2 marks

Q1 This diagram shows some of the measurements of a school playground.



The school caretaker wants to put a fence up around the playground.

How long should the fence be?

46 m

1 mark

Q2 India wants to know the number of days in 25 years.

She uses the grid method and says that the answer is 98.

Here is her working:

x	3	6	5
2	6	12	10
5	15	30	25

	6
	12
1	0
1	5
3	0
+	25
	98

Explain the mistake that India has made.

See mark scheme
for example

1 mark

Q3

A top football striker scores at an average rate of 2.68 goals per game.

He has 9 games left in the season.

How many goals should the striker aim to score in the remaining 9 games? Round your answer to the nearest whole number of goals.

24 goals

2 marks

	Requirement	Mark	Additional guidance
Q1	46m	1	
Q2	India has partitioned the numbers incorrectly. She has split 365 into 3, 6 and 5, rather than 300, 60 and 5 and she has split 25 into 2 and 5 rather than 20 and 5.	1	Accept any explanation that mentions the fact that incorrect place-value has been used.
Q3	24 goals Award TWO marks for a correct answer. Award ONE mark for a correct method with one arithmetic error. Also award ONE mark for an answer of 24.12 goals — which shows correct method, but without rounding to the nearest whole number.	2	

Q1 A bakery has $2\frac{1}{3}$ rhubarb pies left for sale.
A customer buys $\frac{3}{12}$ of a pie.

What fraction of the pies is left? Write your answer as a mixed number.

1 mark

Q2 Beresford United are running a Summer Soccer Skills Scheme for children in the local area.
1,936 children sign up to join the scheme.
The first thing the organisers do is to split the children into teams of 11.

How many teams will there be?

teams

2 marks

Q3 A factory produces 1,692 paintbrushes every day.

They are packaged into boxes of 9.

How many boxes does the factory produce every day?



boxes

1 mark

- Q1** A bakery has $2\frac{1}{3}$ rhubarb pies left for sale.
A customer buys $\frac{3}{12}$ of a pie.

What fraction of the pies is left? Write your answer as a mixed number.

$$2\frac{1}{12}$$

1 mark

- Q2** Beresford United are running a Summer Soccer Skills Scheme for children in the local area.
1,936 children sign up to join the scheme.
The first thing the organisers do is to split the children into teams of 11.

How many teams will there be?

176 teams

2 marks

Q3 A factory produces 1,692 paintbrushes every day.

They are packaged into boxes of 9.

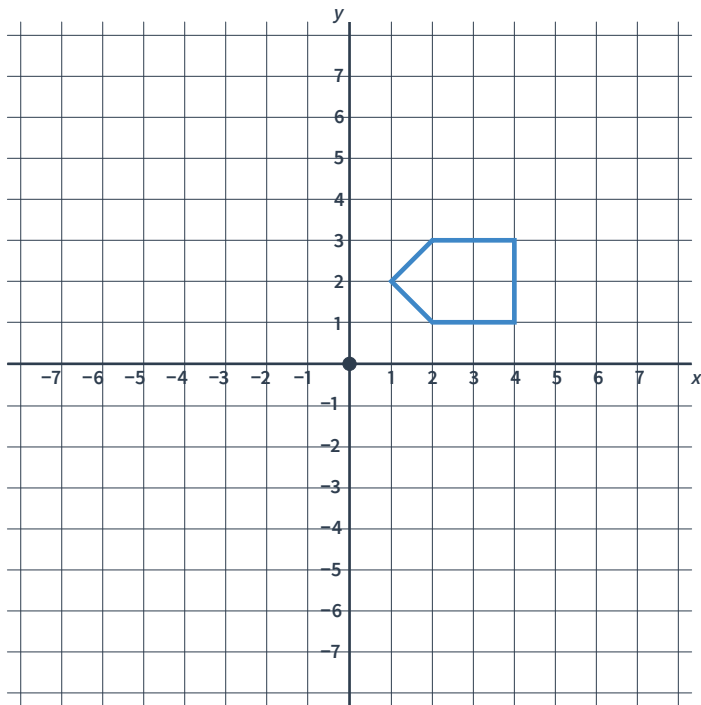
How many boxes does the factory produce every day?

188 boxes

1 mark

	Requirement	Mark	Additional guidance
Q1	$2\frac{1}{12}$ pies	1	
Q2	176 teams Award TWO marks for a correct answer. Award ONE mark for correct method, but with one arithmetic error.	2	An appropriate method could be: $ \begin{array}{r} 176 \\ 11 \overline{) 1936} \\ \underline{- 11} \\ 83 \\ \underline{- 77} \\ 66 \\ \underline{- 66} \\ 0 \end{array} $ $ \begin{array}{l} 11 \times 100 \\ 11 \times 70 \\ 11 \times 6 \\ \hline = 11 \times 176 \end{array} $
Q3	188 boxes	1	

Q1 Lily reflects this shape in one of the axes and translates it 4 squares down and 2 squares to the left.



She says, “My new shape looks exactly the same as the old one. It is just in a different position.”

a

In which axis has the shape been reflected?

axis

1 mark

b

Draw the position of the new shape on the grid.

1 mark

- Q2** Four children are playing a computer game. This table shows their scores:

	Name	Score
A	Alyce	9,016,547
B	Bobby	9,106,745
C	Carys	9,016,457
D	Dale	9,014,675

Write the letters A–D in order of score from highest to lowest.

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1 mark

- Q3** Kiera uses these digit cards to make a decimal.



She puts the 7 digit card where it is worth 7 thousandths.

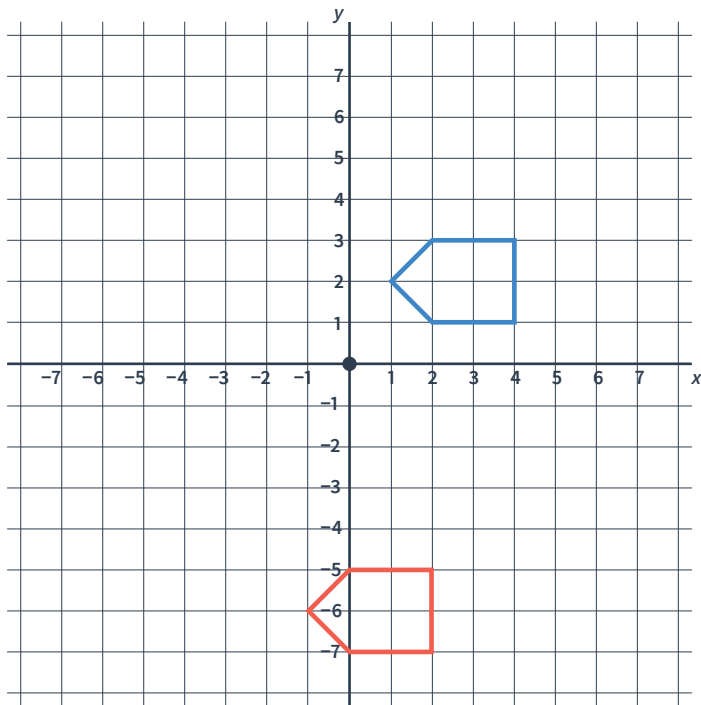
She puts the 2 digit where it is worth $\frac{2}{10}$.

What could Kiera's number be? Give two possible answers.

	or	
--	----	--

1 mark

Q1 Lily reflects this shape in one of the axes and translates it 4 squares down and 2 squares to the left.



She says, “My new shape looks exactly the same as the old one. It is just in a different position.”

a

In which axis has the shape been reflected?

x axis

1 mark

b

Draw the position of the new shape on the grid.

1 mark

- Q2** Four children are playing a computer game. This table shows their scores:

	Name	Score
A	Alyce	9,016,547
B	Bobby	9,106,745
C	Carys	9,016,457
D	Dale	9,014,675

Write the letters A–D in order of score from highest to lowest.

B **A** **C** **D**

1 mark

- Q3** Kiera uses these digit cards to make a decimal.



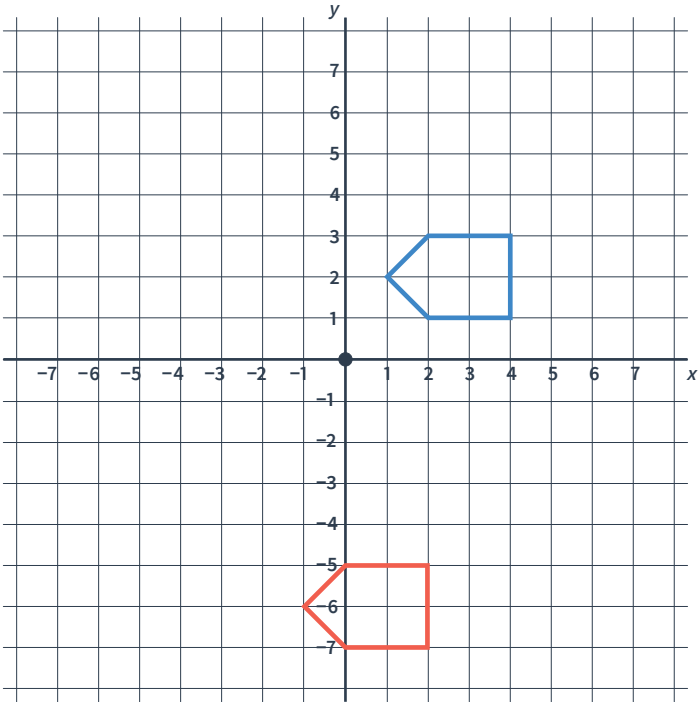
She puts the 7 digit card where it is worth 7 thousandths.

She puts the 2 digit where it is worth $\frac{2}{10}$.

What could Kiera's number be? Give two possible answers.

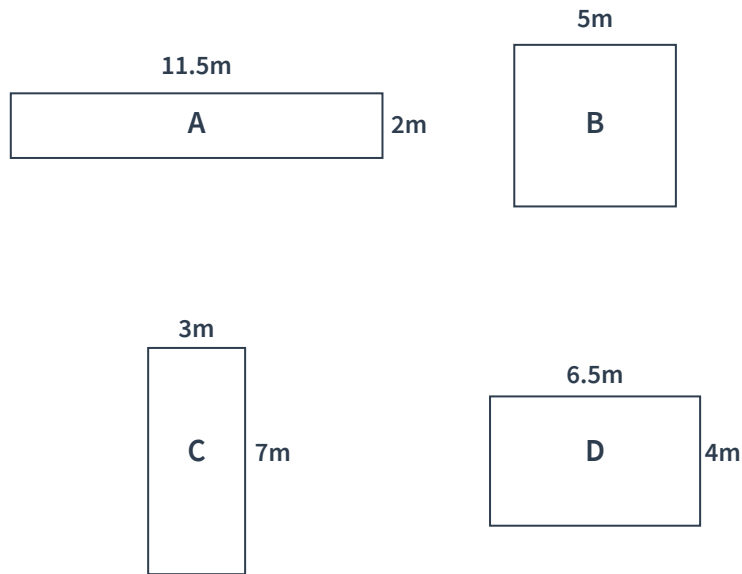
0.267 or **6.207**

1 mark

	Requirement	Mark	Additional guidance
Q1a	x axis	1	
Q1b		1	
Q2	B A C D	1	
Q3	0.267 or 6.207	1	

Q1

Write the letters A to D so that these shapes are in order from smallest to largest area.



Not to scale

Four empty rectangular boxes for writing the letters A, B, C, and D in order of increasing area.

1 mark

Q2

At the Perfect Pizza Co, they are running out of pizza.

$\frac{1}{8}$ of a pepperoni pizza is shared into 4 equal slices.

$\frac{1}{6}$ of a vegetarian pizza is shared into 5 equal slices.

Complete each sentence with a fraction.

One pepperoni slice equals $\frac{\square}{\square}$ of the pizza.

One vegetarian slice equals $\frac{\square}{\square}$ of the pizza.

The larger fraction is $\frac{\square}{\square}$.

2 marks

Q3

Imran and Chris both have part of their bags of sweets left.

Imran's bag of sweets had 35 sweets in and he now has $\frac{1}{5}$ left.

Chris' bag of sweets had 36 sweets in and he now has $\frac{2}{9}$ left.

How many sweets do they each have left?

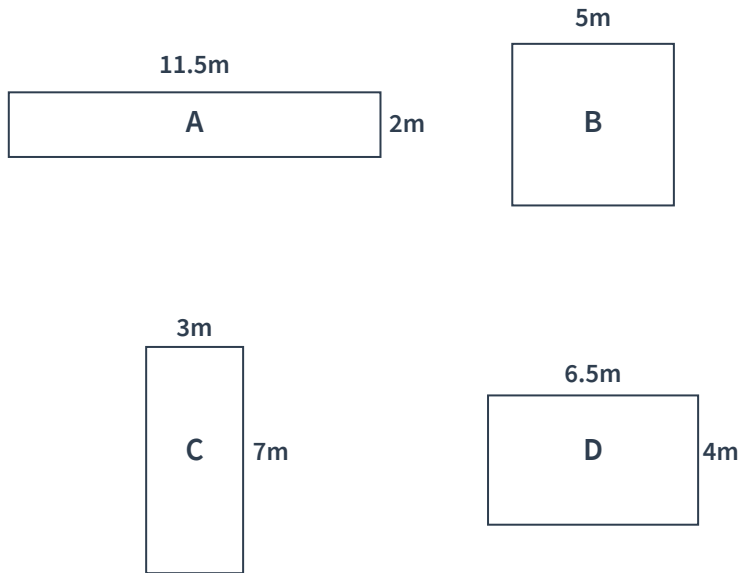
Imran = sweets left

Chris = sweets left

2 marks

Q1

Write the letters A to D so that these shapes are in order from smallest to largest area.



Not to scale



1 mark

Q2

At the Perfect Pizza Co, they are running out of pizza.

$\frac{1}{8}$ of a pepperoni pizza is shared into 4 equal slices.

$\frac{1}{6}$ of a vegetarian pizza is shared into 5 equal slices.

Complete each sentence with a fraction.

One pepperoni slice equals $\frac{1}{32}$ of the pizza.

One vegetarian slice equals $\frac{1}{30}$ of the pizza.

The larger fraction is $\frac{1}{30}$.

2 marks

Q3

Imran and Chris both have part of their bags of sweets left.

Imran's bag of sweets had 35 sweets in and he now has $\frac{1}{5}$ left.

Chris' bag of sweets had 36 sweets in and he now has $\frac{2}{9}$ left.

How many sweets do they each have left?

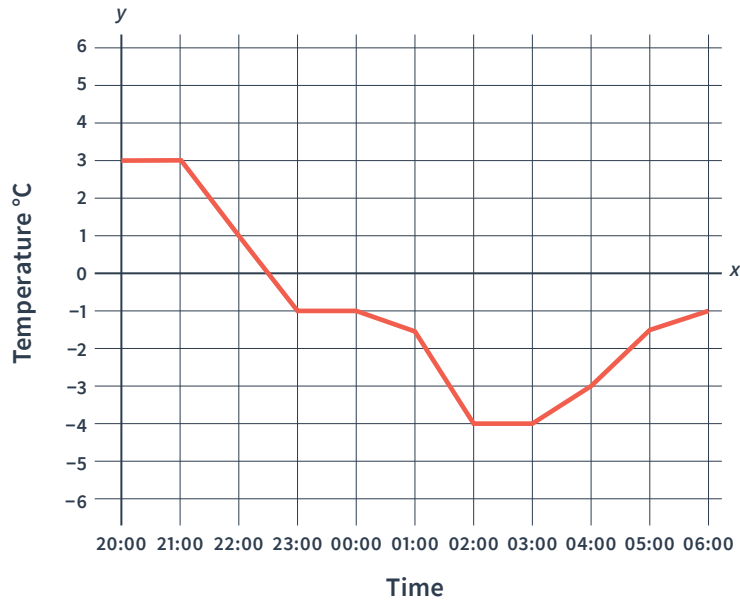
Imran = sweets left

Chris = sweets left

2 marks

	Requirement	Mark	Additional guidance
Q1	C A B D	1	
Q2	$\frac{1}{32}$, $\frac{1}{30}$, $\frac{1}{30}$ Award TWO marks for all three correct fractions. Award ONE mark for any two correct fractions.	2	Although these are the simplest form of these fractions, accept any equivalent fractions.
Q3	Imran = 7 sweets left Chris = 8 sweets left Award ONE mark for each correct answer.	2	

Q1 This line graph shows the change in temperature over a winter's night.



a

At what time of night was the temperature 0°C?

1 mark

b

What is the difference between the temperature at 10pm and the temperature 5 hours later?

 °C

1 mark

Q2

Ethan is given 65p pocket money a week by his gran.

He puts it in a special pot and has been saving it up for exactly a year.

How much money is in Ethan's pot?



2 marks

Q3

A local council has spent the day painting 1.3km of double yellow lines.

a

How many metres of double yellow lines have they painted?

 m

1 mark

The council use 1 pot of yellow paint every 100m of road they paint.

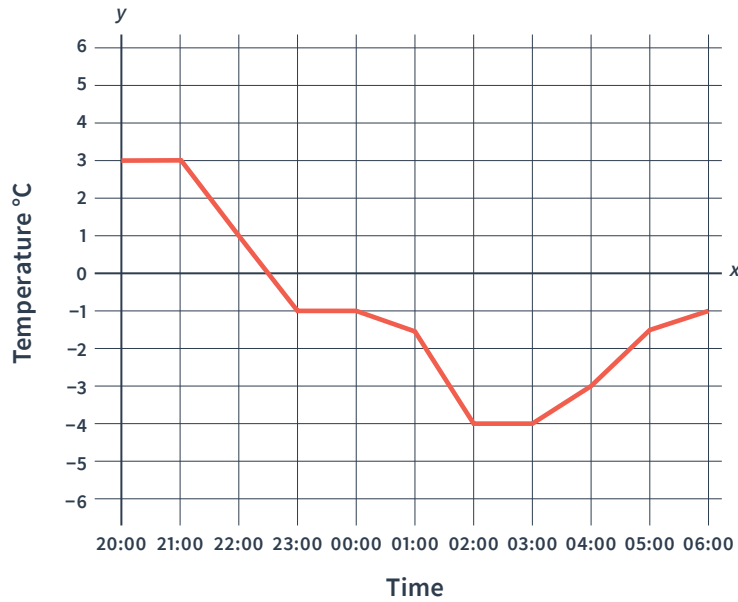
b

How many pots of paint will they need to paint a 2km stretch of road?

 pots

1 mark

Q1 This line graph shows the change in temperature over a winter's night.



a

At what time of night was the temperature 0°C?

22:30

1 mark

b

What is the difference between the temperature at 10pm and the temperature 5 hours later?

5 °C

1 mark

Q2

Ethan is given 65p pocket money a week by his gran.

He puts it in a special pot and has been saving it up for exactly a year.

How much money is in Ethan's pot?

£33.80

2 marks

Q3

A local council has spent the day painting 1.3km of double yellow lines.

a

How many metres of double yellow lines have they painted?

1,300 m

1 mark

The council use 1 pot of yellow paint every 100m of road they paint.

b

How many pots of paint will they need to paint a 2km stretch of road?

20 pots

1 mark

	Requirement	Mark	Additional guidance
Q1a	22:30 or 10:30pm	1	
Q1b	5°C	1	
Q2	3,380p or £33.80 Award TWO marks for the correct total. Award ONE mark for correct method but with one arithmetic mistake.	2	
Q3a	1,300m	1	
Q3b	20 pots	1	

What are examiners looking for?**Q2**

Ethan is given 65p pocket money a week by his gran.

He puts it in a special pot and has been saving it up for exactly a year.

How much money is in Ethan's pot?

£33.80

2 marks

Why are we asking this question?

This question is designed to assess children's ability to solve problems that involve the four operations (specifically, multiplication of two two-digit numbers).

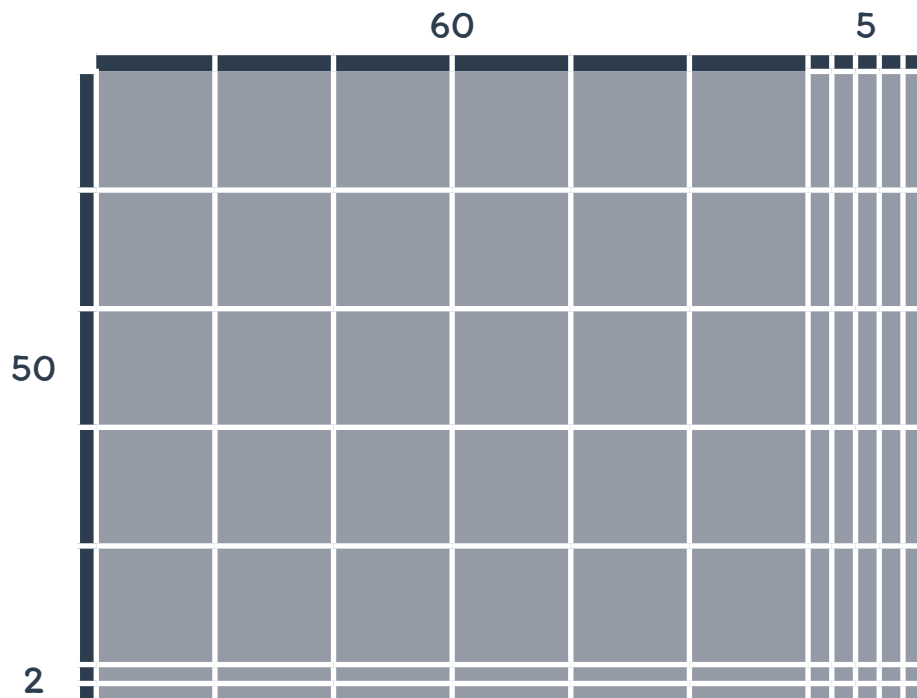
What common errors do we expect to see?

Some children may be unsure how to find the answer — either because they only see one number written in the problem or because they do not know the number of weeks in a year.

Some children may recognise the calculation needed but may partition the two-digit numbers incorrectly when multiplying. For example, they may incorrectly partition 52 as 5 and 2 and then find the total of 65×5 and 65×2 .

How to encourage children to solve this question

One way to encourage children to concretely model the multiplication required (65×52) is to use an area model of multiplication using Base 10 equipment (or a sketched version). Encourage them to lay out 6 tens and 5 ones and 5 tens and 2 ones to form a grid and then complete it. For example:



An alternative method might be to provide children with place-value arrow cards and encourage them to make each number so that they partition them correctly (i.e. understanding that $65 = 60 + 5$, not $6 + 5$).

Children may also respond well to being encouraged to explore mental methods with this particular problem. For example, they may recognise that 65×50 can be found quickly by multiplying 65 by 100 then halving and then this can be added to double 65 to find 65×52 .



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Rapid Reasoning


Do you have a group of pupils who need a boost in maths this term?

Each pupil could receive a personalised lesson every week from our specialist 1-to-1 maths tutors.

- Raise attainment
 - Plug any gaps or misconceptions
 - Boost confidence
-

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