



THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions
and curriculum resources

Rapid Reasoning

Year 5 | Week 7

This week, the new Year 5 objectives that are introduced continue to focus on **statistics** with children being introduced to line graphs for the first time.

Year 5 objectives introduced in a reasoning context for the first time this week include:

- solve comparison, sum and difference problems using information presented in a line graph.

Objectives from *Fluent in Five* that are also tested in a reasoning context this week include:

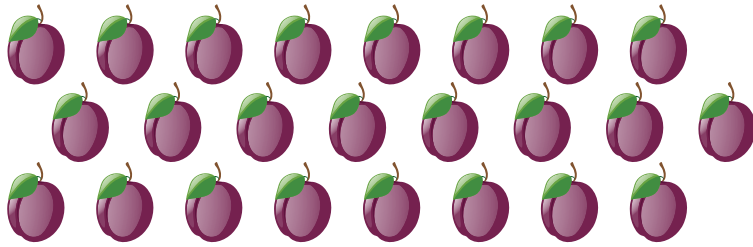
- calculating statements for multiplication and division
- finding increasingly more complex fractions of quantities and amounts.

Please note that some questions are worth two marks, and by their very nature, answers to these questions are never clear-cut. For a full breakdown of how marks would be awarded for these questions, please refer to the mark schemes provided.

Q1

There are 24 plums in a box.

$\frac{2}{6}$ of the plums are bruised.



Draw a ring around the number of bruised plums.

1 mark

Q2

TURBO TYRES Special Offer!
Get all of your tyres changed in one go!

This garage is offering to change all **four** of a car's tyres at once.

418 cars have booked in for the offer.

How many tyres will the garage need to change altogether?

tyres

1 mark

Q3

Tom counts in multiples of 25.

He counts **three multiples**.

Sean counts in multiples of 9.

He counts **eight multiples**.

Olivia counts in multiples of 6.

She counts **thirteen multiples**.

Safaa counts in multiples of 7.

She counts **eleven multiples**.

They all begin at zero.

Write the children's names in order of the number they end on, from the largest to the smallest number.

largest



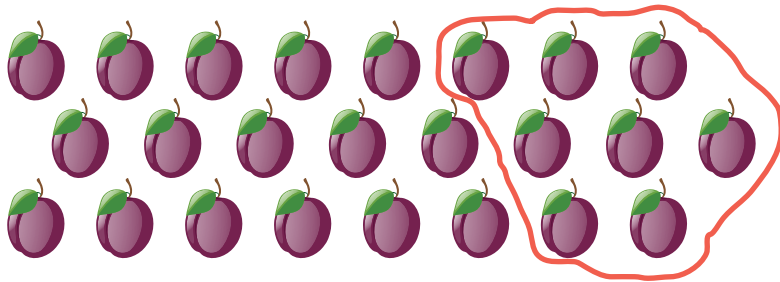
smallest

1 mark

Q1

There are 24 plums in a box.

$\frac{2}{6}$ of the plums are bruised.



Draw a ring around the number of bruised plums.

1 mark

Q2

TURBO TYRES Special Offer!
Get all of your tyres changed in one go!

This garage is offering to change all **four** of a car's tyres at once.

418 cars have booked in for the offer.

How many tyres will the garage need to change altogether?

1,672 tyres

1 mark

Q3

Tom counts in multiples of 25.

He counts **three multiples**.

Sean counts in multiples of 9.

He counts **eight multiples**.

Olivia counts in multiples of 6.

She counts **thirteen multiples**.

Safaa counts in multiples of 7.

She counts **eleven multiples**.

They all begin at zero.

Write the children's names in order of the number they end on, from the largest to the smallest number.

largest

Olivia



Safaa

Tom

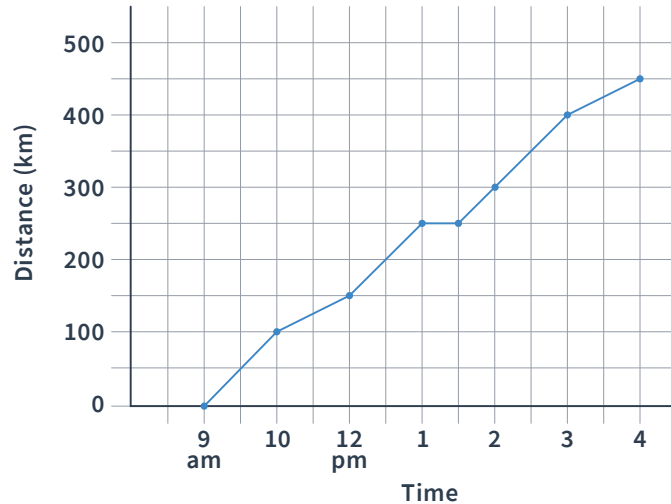
smallest

Sean

1 mark

	Requirement	Mark	Additional guidance
Q1	Any 8 plums circled	1	
Q2	1,672 tyres	1	
Q3	Olivia, Safaa, Tom, Sean	1	The totals are Olivia (78), Safaa (77), Tom (75) and Sean (72).

- Q1** This line graph shows a journey that a delivery lorry makes.



- a** By what time had the lorry travelled 200km?

1 mark

- b** How far did the lorry travel between 2.00pm and 4.00pm?

1 mark

- Q2** A fast-food restaurant sells 2,560 of their new Triple Taster Burgers in a week.
The burgers cost £3 each.

How much money does the restaurant get from selling the new burger?

£

1 mark

Q3

This table shows the number of people in the audience at three different concerts.

Band name	Number in audience
The Patterned Penguins	2,915
El Vez and the Fajitas	4,867
Giants of Rock	7,949

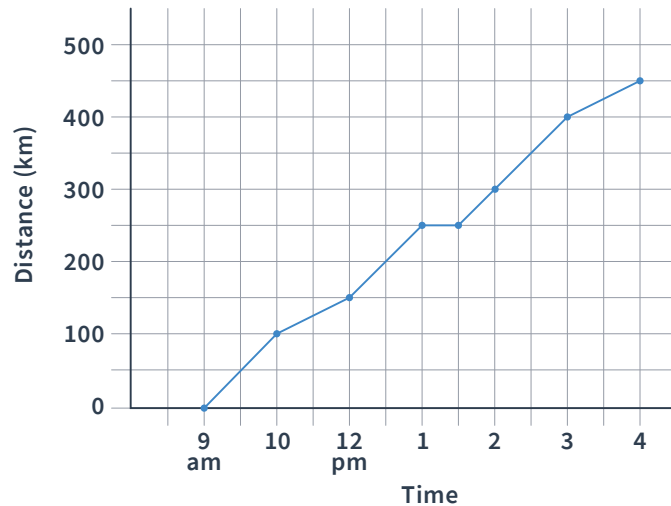
Sofia says, “There were more people at the Giants of Rock concert than at the other two concerts put together.”

How many more people attended the Giants of Rock concert than the other two combined? Show your working.

2 marks

Q1

This line graph shows a journey that a delivery lorry makes.



a

By what time had the lorry travelled 200km?

12.30pm

1 mark

b

How far did the lorry travel between 2.00pm and 4.00pm?

150km

1 mark

Q2

A fast-food restaurant sells 2,560 of their new Triple Taster Burgers in a week.

The burgers cost £3 each.

How much money does the restaurant get from selling the new burger?

£ 7,680

1 mark

Q3

This table shows the number of people in the audience at three different concerts.

Band name	Number in audience
The Patterned Penguins	2,915
El Vez and the Fajitas	4,867
Giants of Rock	7,949

Sofia says, “There were more people at the Giants of Rock concert than at the other two concerts put together.”

How many more people attended the Giants of Rock concert than the other two combined? Show your working.

167 more people

2 marks

	Requirement	Mark	Additional guidance
Q1a	12.30pm	1	pm not required for the mark.
Q1b	150km	1	
Q2	£7,680	1	
Q3	167 more people Award TWO marks for the correct answer of 167 more people. Award ONE mark for evidence of a complete working with no more than one arithmetic error.	2	

Q1

Class 5 children are running 5km as a relay.
Zac starts by running 265m.
Aliyah then runs 280m.

How many more metres does the class need to run?

 m

2 marks

Q2

Tick the largest amount.

 $\frac{2}{3}$ of 24 cubes☐ $\frac{3}{4}$ of 24 cubes☐ $\frac{1}{2}$ of 34 cubes☐ $\frac{1}{3}$ of 45 cubes☐

1 mark

Q3

This table shows the total amount of different types of fruit that a supermarket has.

Complete the table using your knowledge of multiplication and division.

Type of fruit	Number of packs	Number in each pack	Total number
Pears		6	72
Plums	15	8	
Pomegranates	12	4	
Peaches		5	150

2 marks

- Q1** Class 5 children are running 5km as a relay.
Zac starts by running 265m.
Aliyah then runs 280m.

How many more metres does the class need to run?

4,455 m

2 marks

- Q2** Tick the largest amount.

$\frac{2}{3}$ of 24 cubes

☐

$\frac{3}{4}$ of 24 cubes

☒

$\frac{1}{2}$ of 34 cubes

☐

$\frac{1}{3}$ of 45 cubes

☐

1 mark

- Q3** This table shows the total amount of different types of fruit that a supermarket has.

Complete the table using your knowledge of multiplication and division.

Type of fruit	Number of packs	Number in each pack	Total number
Pears	12	6	72
Plums	15	8	120
Pomegranates	12	4	48
Peaches	30	5	150

2 marks

	Requirement	Mark	Additional guidance																				
Q1	4,455m Award TWO marks for the correct answer of 4,455m. Award ONE mark for evidence of complete working. The conversion from km to m must be carried out correctly for the award of ONE mark.	2	Do NOT accept 4.45m. Accept 4.45km if the metres provided at the end of the answer box has been crossed out.																				
Q2	$\frac{3}{4}$ of 24 cubes.	1	Amounts are as follows: $\frac{2}{3}$ of 24 cubes = 16 $\frac{1}{2}$ of 34 cubes = 17 $\frac{3}{4}$ of 24 cubes = 18 $\frac{1}{3}$ of 45 cubes = 15																				
Q3	<table border="1"> <thead> <tr> <th>Type of fruit</th><th>Number of packs</th><th>Number in each pack</th><th>Total number</th></tr> </thead> <tbody> <tr> <td>Pears</td><td>12</td><td>6</td><td>72</td></tr> <tr> <td>Plums</td><td>15</td><td>8</td><td>120</td></tr> <tr> <td>Pomegranates</td><td>12</td><td>4</td><td>48</td></tr> <tr> <td>Peaches</td><td>30</td><td>5</td><td>150</td></tr> </tbody> </table> Award ONE mark for two or three correct answers and BOTH marks for all four.	Type of fruit	Number of packs	Number in each pack	Total number	Pears	12	6	72	Plums	15	8	120	Pomegranates	12	4	48	Peaches	30	5	150	2	
Type of fruit	Number of packs	Number in each pack	Total number																				
Pears	12	6	72																				
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Peaches	30	5	150																				

Q1

Ryan writes this nonsense poem:

“A crocodile
swam the River Nile
5 times with style
in a swimming trial.
It took quite a while.
(He soon lost his smile!)”

The River Nile is about 6,853km long.

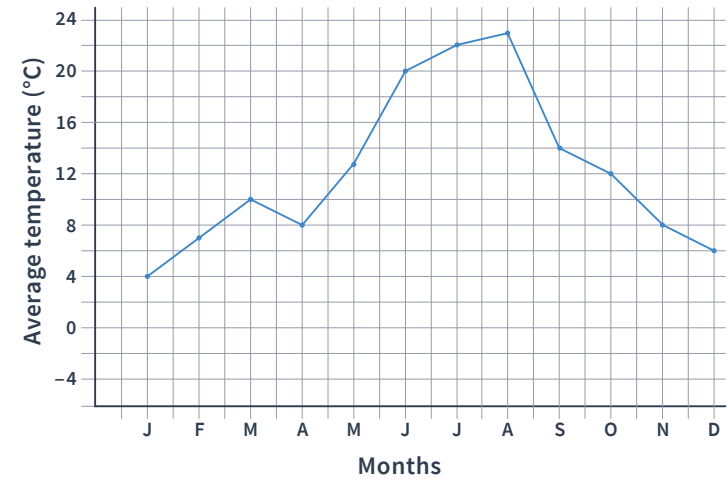
Calculate the number of kilometres the crocodile in Ryan’s poem swam in total.

km

1 mark

Q2

This line graph shows the average temperature in a city over a year.



a

How much warmer was it in July than in April?

°C

1 mark

b

What temperature was the warmest month?

°C

1 mark

Q3

Here are two multiplication facts:

$10 \times 6 = 60$

$8 \times 6 = 48$

Explain how you could use one or both of these known facts to find the answer to these problems.

A) 18×6

B) 16×6

C) 200×6

2 marks

Q1

Ryan writes this nonsense poem:

“A crocodile
swam the River Nile
5 times with style
in a swimming trial.
It took quite a while.
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The River Nile is about 6,853km long.

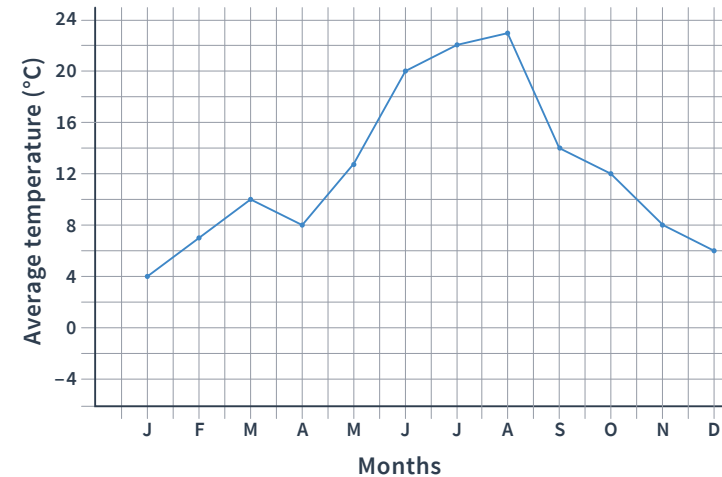
Calculate the number of kilometres the crocodile in Ryan’s poem swam in total.

34,265 km

1 mark

Q2

This line graph shows the average temperature in a city over a year.



a

How much warmer was it in July than in April?

14 °C

1 mark

b

What temperature was the warmest month?

23 °C

1 mark

Q3

Here are two multiplication facts:

$10 \times 6 = 60$

$8 \times 6 = 48$

Explain how you could use one or both of these known facts to find the answer to these problems.

A) 18×6

Add the answers to 10×6

and 8×6 [Answer = 108]

B) 16×6

Double the answer to 8×6

[Answer = 96]

C) 200×6

Double the answer to 10×6 and then

multiply by 10 [Answer = 1,200]

2 marks

	Requirement	Mark	Additional guidance
Q1	34,265km	1	
Q2a	14°C	1	
Q2b	23°C	1	
Q3	A) Add the answers to 10×6 and 8×6 [Answer = 108] B) Double the answer to 8×6 [Answer = 96] C) Double the answer to 10×6 and then multiply by 10 [Answer = 1,200] Award ONE mark for two accurate strategies and BOTH marks for all three.	2	Accept any other correct strategies that work.

What are examiners looking for?**Q3**

Here are two multiplication facts:

$10 \times 6 = 60$

$8 \times 6 = 48$

Explain how you could use one or both of these known facts to find the answer to these problems.

A) 18×6 **Add the answers to 10×6**

and 8×6 [Answer = 108]

B) 16×6 **Double the answer to 8×6**

[Answer = 96]

C) 200×6 **Double the answer to**
 10×6 and then multiply by 10

[Answer = 1,200]

2 marks

Why are we asking this question?

This question has been written to assess children's ability to apply known multiplication facts and their place value knowledge in different ways in order to solve multiplication problems.

What common errors do we expect to see?

Some children may think that they can apply known facts using an additive relationship when there is not one. For example, they may think that, as $10 \times 6 = 60$, 18×6 will simply be $60 + 8$.

$$\begin{array}{ccc}
 10 \times 6 = 60 & & \\
 + 8 \quad \downarrow & & \downarrow \quad + 8? \\
 18 \times 6 = ? & &
 \end{array}$$

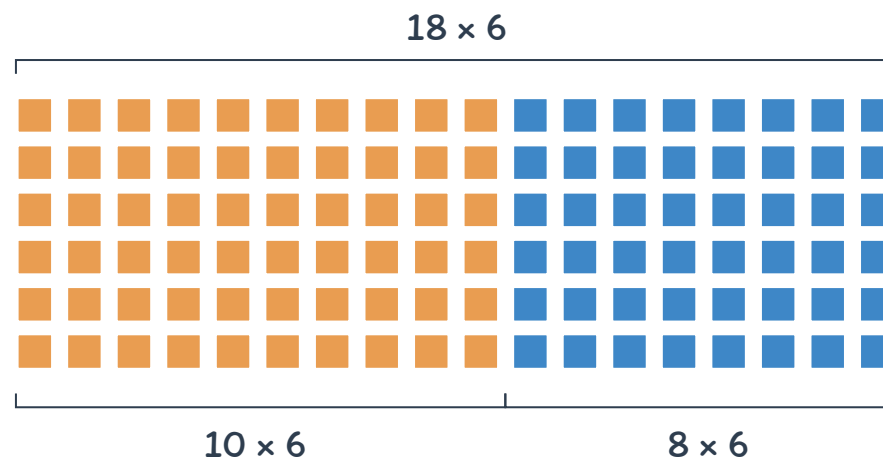
The same error could be used with the 8×6 fact to give the answer 58 (because $8 \times 6 = 48$ and 18 is 10 more than 8) and with the 10×6 fact to give the answer 66 (because $10 \times 6 = 60$ and 16 is 6 more than 10).

How to encourage children to solve this question

The key to solving this question is two-fold:

- 1) Children need to be able to see the numerical links between the known facts and the multiplication questions. Encourage them to look carefully at each problem and ask whether they can find any links between these and the known facts given to them. Can they use this to help?
- 2) Children need to be able to recognise how multiplication facts can be altered and/or combined. For example, having identified that 16 is double 8, they can then apply this and find that 16×6 will be double the answer to 8×6 .

If children need further reinforcing of the concepts in this question, provide two sets of differently-coloured cubes and encourage them to make arrays to model the way that multiplications can be combined when they multiply by the same number (this is the distributive law of multiplication: $a \times (b + c) = a \times b + a \times c$). And so, $6 \times 18 = 6 \times (10 + 8) = 6 \times 10 + 6 \times 8$.

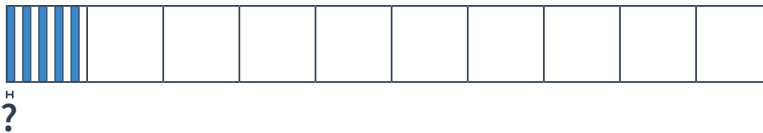


- Q1** A carpenter has a plank of wood.
He cuts it into 10 equal pieces.



- a** What fraction is one of the pieces he cuts?

- b** A painter takes one of the pieces of wood and paints 10 equal stripes on it.



- What fraction of the whole plank is one of the stripes she paints?

- Q2** Each player in a 7-a-side rugby team is awarded £4,685 for getting to the final.

How much does the team win in total?

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1 mark

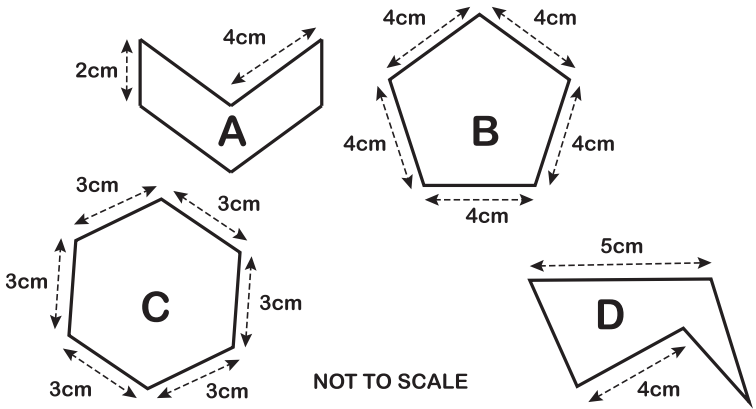
1 mark

1 mark

Q3

a

Sort the shapes by writing each shape's letter in the correct space.



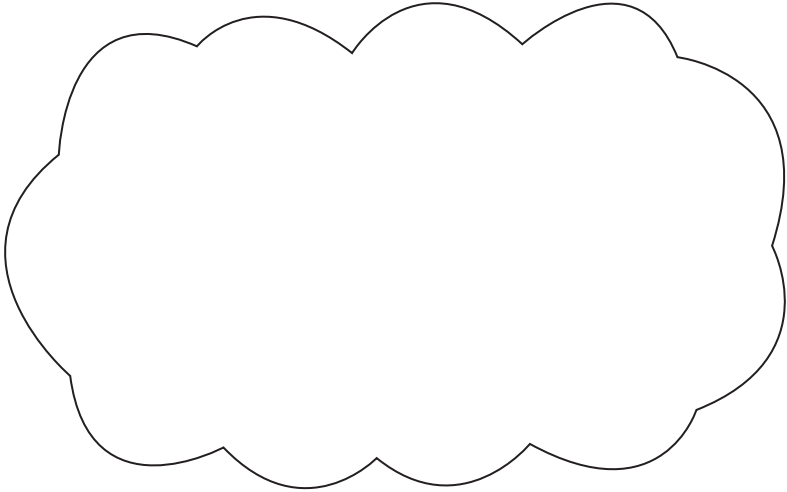
	REGULAR	IRREGULAR
PENTAGON		
NOT A PENTAGON		

1 mark

b

Brandon wants to put a rectangle in the bottom left-hand part of the table.

Is he correct? Explain your answer.



1 mark

- Q1** A carpenter has a plank of wood.
He cuts it into 10 equal pieces.



- a** What fraction is one of the pieces he cuts?

1

10

- b** A painter takes one of the pieces of wood and paints 10 equal stripes on it.



- What fraction of the whole plank is one of the stripes she paints?

1

100

- Q2** Each player in a 7-a-side rugby team is awarded £4,685 for getting to the final.

How much does the team win in total?

£32,795

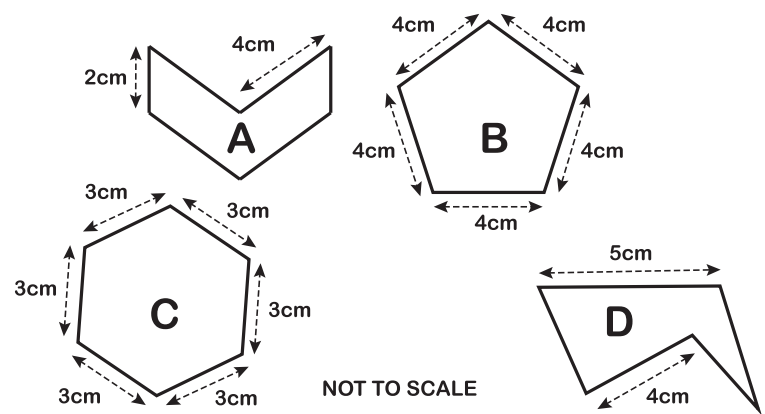
1 mark

1 mark

Q3

a

Sort the shapes by writing each shape's letter in the correct space.



	REGULAR	IRREGULAR
PENTAGON	B	D
NOT A PENTAGON	C	A

1 mark

b

Brandon wants to put a rectangle in the bottom left-hand part of the table.

Is he correct? Explain your answer.

See mark scheme for examples

1 mark

	Requirement	Mark	Additional guidance									
Q1a	$\frac{1}{10}$	1										
Q1b	$\frac{1}{100}$	1										
Q2	£32,795	1										
Q3a	<table><tr><td></td><td>REGULAR</td><td>IRREGULAR</td></tr><tr><td>PENTAGON</td><td>B</td><td>D</td></tr><tr><td>NOT A PENTAGON</td><td>C</td><td>A</td></tr></table>		REGULAR	IRREGULAR	PENTAGON	B	D	NOT A PENTAGON	C	A	1	
	REGULAR	IRREGULAR										
PENTAGON	B	D										
NOT A PENTAGON	C	A										
Q3b	A rectangle is irregular and so should go in the bottom right-hand section of the table.	1	Accept any reasoning that suggests that rectangles can be regular (this is true — squares are a form of regular rectangle) as well as irregular and so it could go in either of the two bottom sections, depending on what it looks like.									



THIRD SPACE LEARNING

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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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