THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 5 | Week 1

This is the first week that children will have met *Rapid Reasoning* in Year 5 and therefore they may find it more challenging to begin with. Depending on your class, you may wish to introduce children to the expectation of completing two questions initially, before extending to all three questions by the end of the week.

As we are at the start of Year 5, the majority of the objectives covered this week involve Year 4 content. The Year 4 objectives that are re-introduced this week focus on **place value**.

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

- reading, writing, ordering and comparing numbers up to 1,000,000
- recognising the place value of each digit in a number up to 1,000,000 (extending from a four-digit number in Year 4).

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

- adding and subtracting numbers mentally (using numbers up to 1,000).

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.

We hope your class enjoys this first week of *Rapid Reasoning*!

Q1 Zac has 110 cubes and uses them to make 10 equal towers.

Isla has 84 cubes and uses them to make 7 equal towers.

Whose towers are tallest and by how many cubes?

[ ]'s towers are tallest by [ ].

2 marks

Q2 Mara says, "Today is the 176th day of the year!"

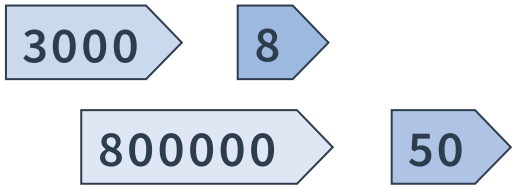
It is not a leap year.

How many days are left in this year?

[ ]

1 mark

Q3 Lee uses all of these place-value arrow cards to make a number.



What is Lee's number? Write your answer in **words**.

1 mark

Q1 Zac has 110 cubes and uses them to make 10 equal towers.

Isla has 84 cubes and uses them to make 7 equal towers.

Whose towers are tallest and by how many cubes?

[Isla] 's towers are tallest by [1] .

2 marks

Q2 Mara says, "Today is the 176th day of the year!"

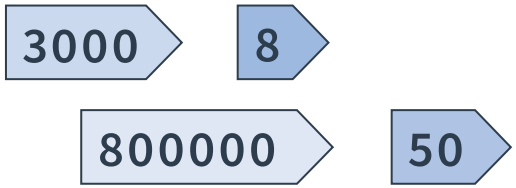
It is not a leap year.

How many days are left in this year?

[189]

1 mark

Q3 Lee uses all of these place-value arrow cards to make a number.



What is Lee's number? Write your answer in **words**.

Eight hundred and three thousand and fifty-eight

1 mark

	Requirement	Mark	Additional guidance
Q1	Isla's towers are tallest by **1.**	1	
Q2	189	1	
Q3	Eight hundred and three thousand and fifty-eight	1	

Q1 A transporter lorry is on a journey of 850km to deliver some cars.

It has 264km to go.

How many kilometres has the lorry travelled already?

1 mark

Q2 Here are the populations of four different towns.

Town	Population
Milltown	729,051
Northville	720,915
Brindon	725,901
Framley	720,951

a Write the town names in order from smallest to largest population.

1 mark

b How many **more** people live in Brindon than Northville?

1 mark

Q3 Write one quadrilateral name in each part of this diagram.

parallelogram | square | rhombus | rectangle

	All sides are equal	Not all sides are equal
Has right angles		
Has no right angles		

2 marks

Q1 A transporter lorry is on a journey of 850km to deliver some cars.

It has 264km to go.

How many kilometres has the lorry travelled already?

586km

1 mark

Q2 Here are the populations of four different towns.

Town	Population
Milltown	729,051
Northville	720,915
Brindon	725,901
Framley	720,951

a Write the town names in order from smallest to largest population.

Northville, Framley, Brindon, Milltown

1 mark

b How many **more** people live in Brindon than Northville?

4,986 people

1 mark

Q3 Write one quadrilateral name in each part of this diagram.

parallelogram | square | rhombus | rectangle

	All sides are equal	Not all sides are equal
Has right angles	**square**	**rectangle**
Has no right angles	**rhombus**	**parallelogram**

2 marks

<table>
<tr><th></th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>Q1</td><td>586km</td><td>1</td><td></td></tr>
<tr><td>Q2a</td><td>Northville, Framley, Brindon, Milltown</td><td>1</td><td></td></tr>
<tr><td>Q2b</td><td>4,986 people</td><td>1</td><td></td></tr>
<tr><td>Q3</td><td>
<table>
<tr><th></th><th>All sides are equal</th><th>Not all sides are equal</th></tr>
<tr><td>Has right angles</td><td>square</td><td>rectangle</td></tr>
<tr><td>Has no right angles</td><td>rhombus</td><td>parallelogram</td></tr>
</table>
Award TWO marks for all shapes correctly placed.
Award ONE mark for three shapes correctly placed.
</td><td>1</td><td></td></tr>
</table>

Q1 Class 3 children have planted four sunflower seeds.

They use a table to record each plant's height.

Plant	Height
A	178cm
B	$1\frac{3}{4}$ m
C	170cm
D	1 metre 80 centimetres

Write the letters of the plants in order from tallest to shortest sunflower.

1 mark

Q2 Two of these numbers add together to make a total of 733.

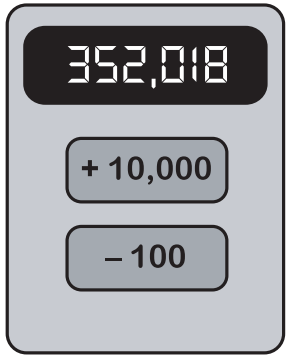
457 386 276 473

Which two numbers are they?

[ ] and [ ]

1 mark

Q3 This machine has two operation buttons and a screen showing the score.



Write Max's new score.

1 mark

Q1 Class 3 children have planted four sunflower seeds.

They use a table to record each plant's height.

Plant	Height
A	178cm
B	$1\frac{3}{4}$ m
C	170cm
D	1 metre 80 centimetres

Write the letters of the plants in order from tallest to shortest sunflower.

D | A | B | C

1 mark

Q2 Two of these numbers add together to make a total of 733.

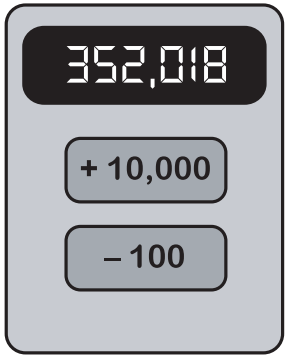
457 386 276 473

Which two numbers are they?

457 and 276

1 mark

Q3 This machine has two operation buttons and a screen showing the score.



Write Max's new score.

381,718

1 mark

	Requirement	Mark	Additional guidance
Q1	D A B C	1	
Q2	457 and 276	1	Numbers may be given in any order.
Q3	381,718	1	

What are examiners looking for?

Q1 **Class 3 children have planted four sunflower seeds.**

They use a table to record each plant's height.

Plant	Height
A	178cm
B	$1\frac{3}{4}$ m
C	170cm
D	1 metre 80 centimetres

Write the letters of the plants in order from tallest to shortest sunflower.

D	A	B	C

1 mark

Why are we asking this question?

This question has been designed to assess children's ability to compare and then order a series of measurements (in this case, lengths) and tests their understanding of conversion between different units of length.

What common errors do we expect to see?

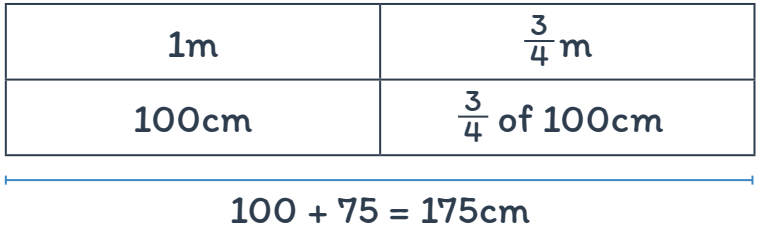
Some children may compare the numbers in each measurement and ignore the units. Children who do this may give an answer that implies length A is the tallest (178) and length B is the shortest ($1\frac{3}{4}$).

Some children may order the heights correctly, but may misread the problem, ordering each measurement from shortest to tallest rather than the other way around. Children who make this mistake will give an answer of C, B, A, D.

How to encourage children to solve this question

In order to compare any group of measurements, it is always helpful to convert into the same unit. Rather than deal with decimal values, encourage children to consider how they might convert into centimetres. Two of the measurements are already in centimetres and children may recognise that they only need to convert the remaining two measurements.

For children who are unsure how to convert $1\frac{3}{4}$m and 1m 80cm into centimetres, begin by encouraging them to visualise a metre ruler and use their knowledge of this to help. Sketching a bar model can be useful when converting between units, but it may be a little unnecessary in a question such as this where only 1 metre is being converted:



When comparing the measurements, children may find it useful to write each value vertically aligned so that they can compare digits more easily.

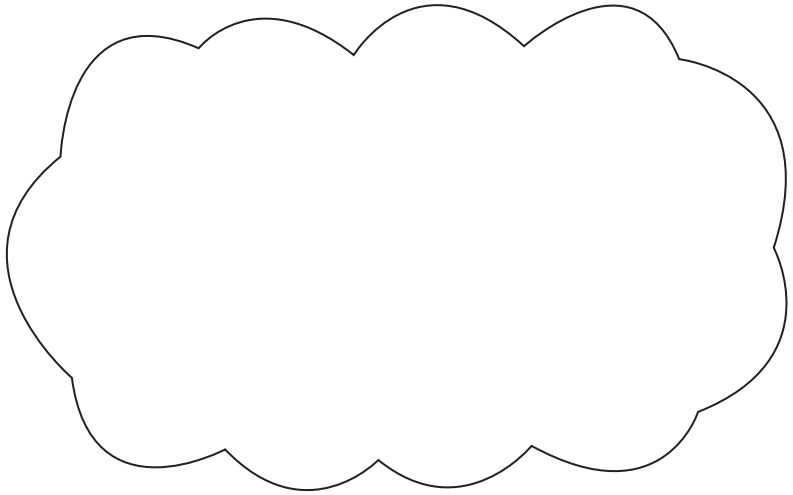
Q1 Which of these calculations is the odd one out? Explain your answer.

A $121 \div \square = 11$

B $\square \times 5 = 60$

C $9 \times \square = 72$

D $\square \div 7 = 7$



1 mark

Q2 458 490 482 443

Otis adds two of these numbers mentally.

In his calculation he exchanges twice to create one ten and one hundred.

Write Otis' calculation and work out the total.

1 mark

Q3 Match up each number with the value of the 9 digit.

329,450	nine hundred thousand
294,305	9,000
935,042	900
450,923	ninety thousand

2 marks

Q1 Which of these calculations is the odd one out? Explain your answer.

A $121 \div \square = 11$

B $\square \times 5 = 60$

C $9 \times \square = 72$

D $\checkmark \div 7 = 7$

See mark scheme for examples

1 mark

Q2 458 490 482 443

Otis adds two of these numbers mentally.

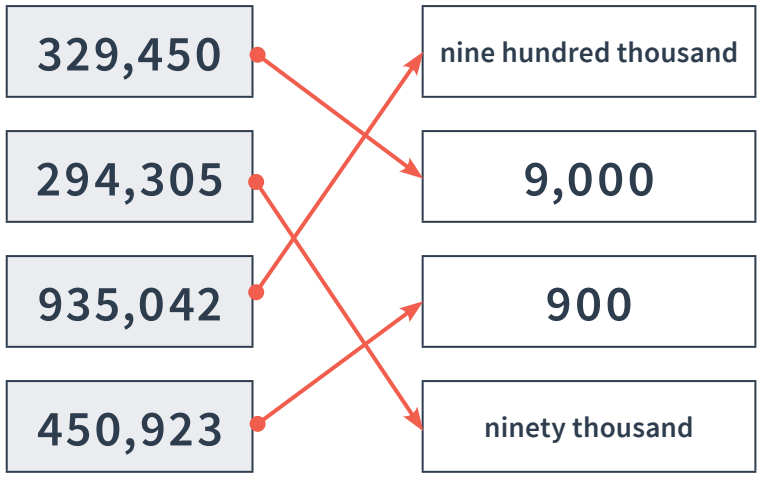
In his calculation he exchanges twice to create one ten and one hundred.

Write Otis' calculation and work out the total.

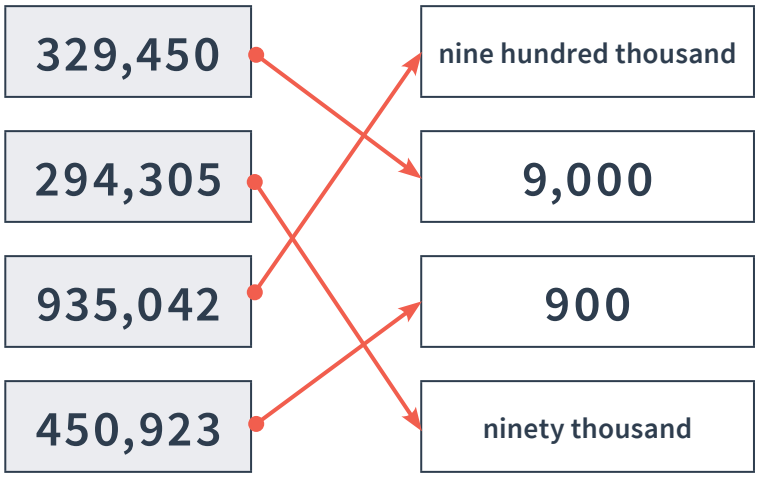
458 + 482 = 940

1 mark

Q3 Match up each number with the value of the 9 digit.



2 marks

	Requirement	Mark	Additional guidance
Q1	**D** is the odd one out because all the other missing numbers can be solved by using division. D is solved by multiplying the two known numbers instead.	1	Accept any reasonable alternative answers.
Q2	458 + 482 = 940	1	Addition may be written as 482 + 458 = 940.
Q3	 Award **TWO** marks for all numbers correctly matched. Award **ONE** mark for two or more numbers correctly matched.	2	

Q1 Complete the table.

Number in words	Number in numerals
four hundred and two thousand and eleven	
	675,306
one hundred and twelve thousand and forty	

2 marks

Q2

8	2	4	3	6	2

Jordan takes three cards and multiplies the digits together.

Aliyah takes the remaining three cards and multiplies them.

They both make the same total.

What is the total that both children make?

1 mark

Q3

5	6	7	+	2	3	8

Change one digit in the calculation so that the answer is a multiple of 10.

[ ] + [ ] = [ ]

1 mark

Q1 Complete the table.

Number in words	Number in numerals
four hundred and two thousand and eleven	402,011
six hundred and seventy-five thousand, three hundred and six	675,306
one hundred and twelve thousand and forty	112,040

2 marks

Q2

8	2	4	3	6	2

Jordan takes three cards and multiplies the digits together.

Aliyah takes the remaining three cards and multiplies them.

They both make the same total.

What is the total that both children make?

48

1 mark

Q3

5	6	7	+	2	3	8

Change one digit in the calculation so that the answer is a multiple of 10.

562 + 238 = 800

1 mark

<table>
<tr><th></th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>Q1</td><td>
<table>
<tr><th>Number in words</th><th>Number in numerals</th></tr>
<tr><td>four hundred and two thousand and eleven</td><td>402,011</td></tr>
<tr><td>six hundred and seventy-five thousand, three hundred and six</td><td>675,306</td></tr>
<tr><td>one hundred and twelve thousand and forty</td><td>112,040</td></tr>
</table>
Award TWO marks for all cells completed correctly.
Award ONE mark for two cells completed correctly.</td><td>2</td><td></td></tr>
<tr><td>Q2</td><td>48
Number trios are 3 x 8 x 2 and 4 x 6 x 2.</td><td>1</td><td></td></tr>
<tr><td>Q3</td><td>56<u>2</u> + 238 OR 567 + 23<u>3</u> OR <u>1</u>67 + 238
Award ONE mark for both correct answers.</td><td>1</td><td></td></tr>
</table>

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Rapid Reasoning

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