THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 3 | Week 1

This is the first week that children will have come across *Rapid Reasoning* and therefore they may find it challenging to begin with. Depending on the ability levels within your class, you may wish to introduce children to the expectation of first completing two questions, before extending to all three questions by the end of the week.

As we are at the start of Year 3, the majority of the objectives covered this week involve Year 2 content. The Year 2 objectives that are re-introduced this week focus on **place value**.

Year 3 objectives introduced in a reasoning context for the first time this week include:

- reading and writing numbers up to 1,000 in numerals and words (extending from number 0 up to 100 from Year 2)
- recognising the place value of each digit in a three-digit number (extending from a two-digit number in Year 2).

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

- adding a two-digit number and ones or tens
- number bonds to 20
- addition within 100.

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

a Write the number four hundred and seventy-nine in digits.

_____

1 mark

b Write the number 835 in words.

_____

_____

_____

_____

_____

1 mark

Q2

Leah wants to buy a bottle of water from a machine.

She puts **75p** into the machine.

The machine shows that she still needs to pay **20p more** to buy the bottle of water.

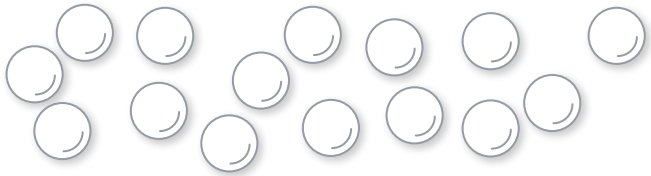
How much does the bottle of water cost?

_____ p

1 mark

Q3

Five children share 15 plastic counters equally between them.



How many counters does each child get?

_____ counters

1 mark

Q1

a Write the number four hundred and seventy-nine in digits.

479

1 mark

b Write the number 835 in words.

Eight hundred and thirty-five

1 mark

Q2

Leah wants to buy a bottle of water from a machine.

She puts **75p** into the machine.

The machine shows that she still needs to pay **20p more** to buy the bottle of water.

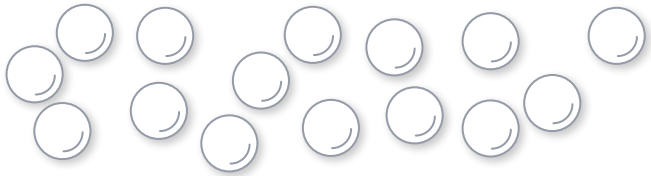
How much does the bottle of water cost?

95 p

1 mark

Q3

Five children share 15 plastic counters equally between them.



How many counters does each child get?

3 counters

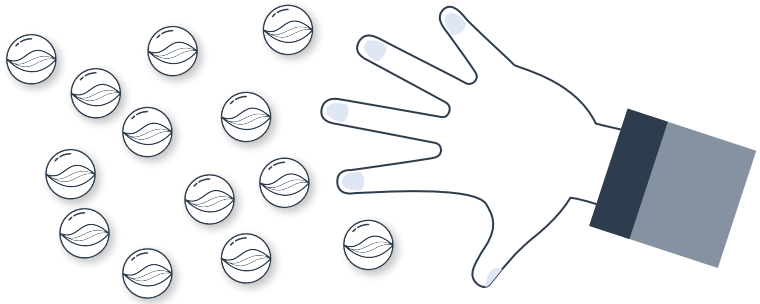
1 mark

	Requirement	Mark	Additional guidance
Q1a	479	1	
Q1b	Eight hundred and thirty-five	1	Capitalisation and hyphens are not required for the award of the mark. Spellings must be phonetically plausible.
Q2	95p	1	
Q3	3 counters	1	

Q1 Sam has 20 marbles.

He hides some of the marbles with his hand.

There are 13 marbles remaining.



How many marbles has Sam hidden?

_____ marbles

1 mark

Q2

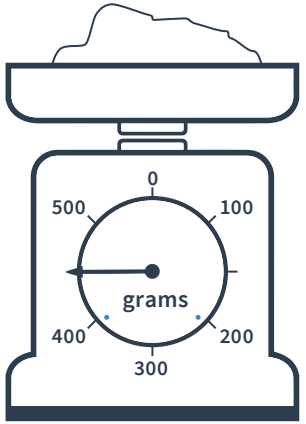
5	0	7	1

Tick each number that can be made using these digit cards.

- Seven hundred and fifteen ☐
- Five hundred and four ☐
- One hundred and fifty-six ☐
- Five hundred and seventy-one ☐
- One hundred and thirty ☐

1 mark

Q3 Krishna weighs a cupful of sand using scales.



How heavy is the sand?

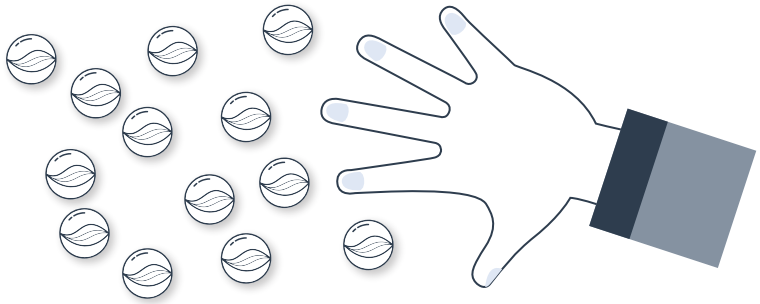
_____ g

1 mark

Q1 Sam has 20 marbles.

He hides some of the marbles with his hand.

There are 13 marbles remaining.



How many marbles has Sam hidden?

7 marbles

1 mark

Q2

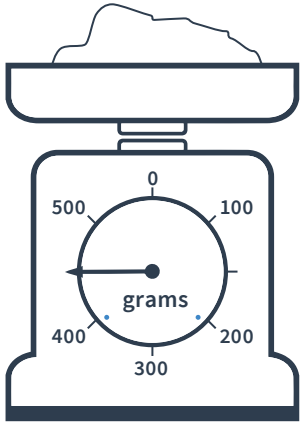
5	0	7	1

Tick each number that can be made using these digit cards.

Seven hundred and fifteen	✓
Five hundred and four	
One hundred and fifty-six	
Five hundred and seventy-one	✓
One hundred and thirty	

1 mark

Q3 Krishna weighs a cupful of sand using scales.



How heavy is the sand?

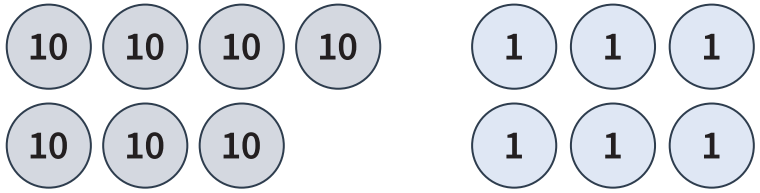
450 g

1 mark

	Requirement	Mark	Additional guidance
Q1	7 marbles	1	
Q2	Seven hundred and fifteen **AND** Five hundred and seventy-one	1	**BOTH** numbers should be ticked for the award of **ONE** mark. If any other number is ticked, mark as incorrect.
Q3	450g	1	

Q1

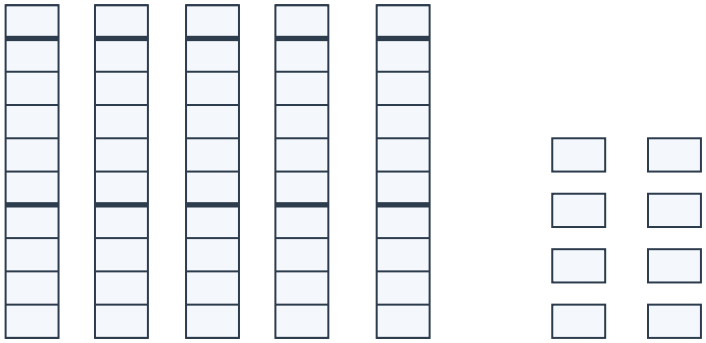
a



Can you use the picture above to work out the answer to 76 − 5 = ?

1 mark

b



Can you use the picture above to work out the answer to 58 − 7 = ?

1 mark

Q2

Tilly has these coins.

How much money does Tilly have altogether?

p

1 mark

Q3

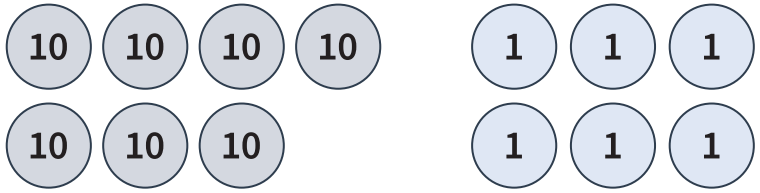
Fill in the missing numbers in these number sentences.

☐ × 10 = 80 35 ÷ 5 = ☐

2 marks

Q1

a

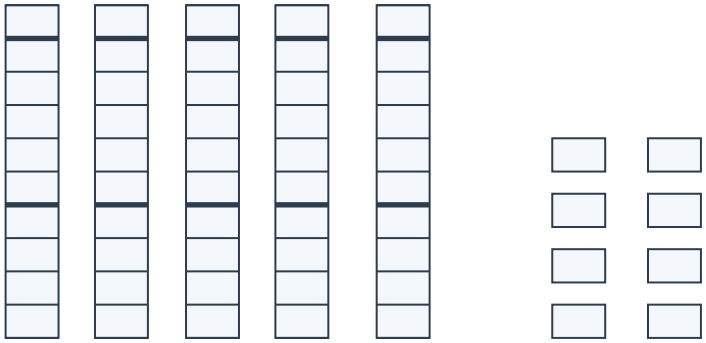


Can you use the picture above to work out the answer to 76 − 5 = ?

71

1 mark

b



Can you use the picture above to work out the answer to 58 − 7 = ?

51

1 mark

Q2

Tilly has these coins.

How much money does Tilly have altogether?

77 p

1 mark

Q3

Fill in the missing numbers in these number sentences.

8 × 10 = 80

35 ÷ 5 = 7

2 marks

	Requirement	Mark	Additional guidance
Q1a	71	1	
Q1b	51	1	
Q2	77p	1	
Q3	8, 7 **ONE** mark for each correctly identified number.	2	

Q1 Claire uses the digits 4, 7 and 6 to make a three-digit number.

Her number contains six hundreds.

Which **TWO** numbers could Claire's number be?

1 mark

Q2 Hamza scores 43 points in a computer game.

Kara scores 5 points more than Hamza.

Alicia scores 3 points less than Hamza.

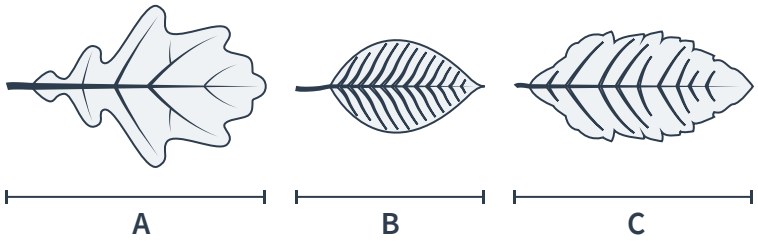
What are Kara and Alicia's scores?

Kara's score =

Alicia's score =

2 marks

Q3 Here are three leaves.



Write <, > or = to compare the lengths of the leaves.

Length A Length B

Length B Length C

2 marks

Q1 Claire uses the digits 4, 7 and 6 to make a three-digit number.

Her number contains six hundreds.

Which **TWO** numbers could Claire's number be?

647	674

1 mark

Q2 Hamza scores 43 points in a computer game.

Kara scores 5 points more than Hamza.

Alicia scores 3 points less than Hamza.

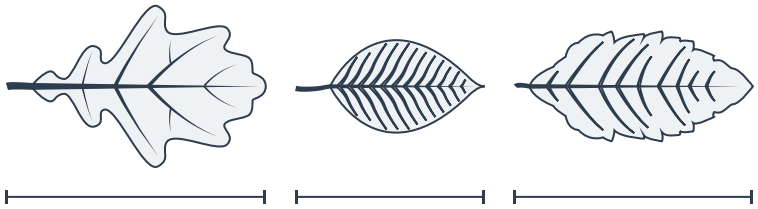
What are Kara and Alicia's scores?

Kara's score = 48

Alicia's score = 40

2 marks

Q3 Here are three leaves.



Write <, > or = to compare the lengths of the leaves.

Length A > Length B

Length B < Length C

2 marks

	Requirement	Mark	Additional guidance
Q1	647 and 674	1	Both answers are necessary to get **ONE** mark.
Q2	Kara's score = 48 Alicia's score = 40 **ONE** mark for each correct answer.	2	
Q3	Length A > Length B Length B < Length C **ONE** mark for each correct answer.	2	Symbols should be correctly orientated.

Q1 Krishna thinks of a number.

She adds 10 to it.

Krishna's new number is 82.

What was the number Krishna first thought of?

_____

1 mark

Q2

41<u>8</u>	800
3<u>7</u>2	80
<u>8</u>32	700
1<u>8</u>7	70
<u>7</u>41	8

Match each number with the value of the underlined digit.

2 marks

Q3

Which of these 2D shapes is not a hexagon?

Shape _____

1 mark

Q1 Krishna thinks of a number.

She adds 10 to it.

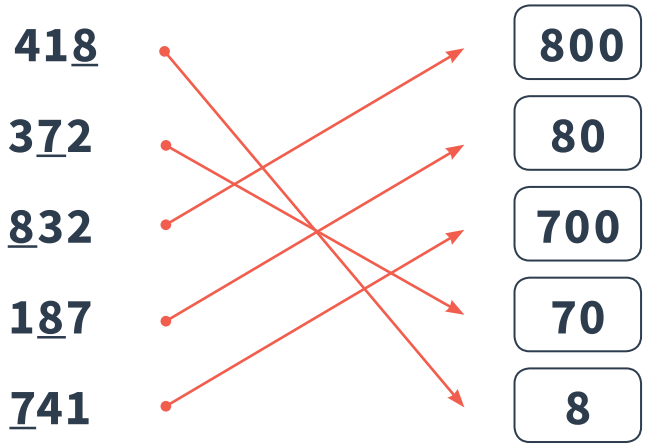
Krishna's new number is 82.

What was the number Krishna first thought of?

72

1 mark

Q2



Match each number with the value of the underlined digit.

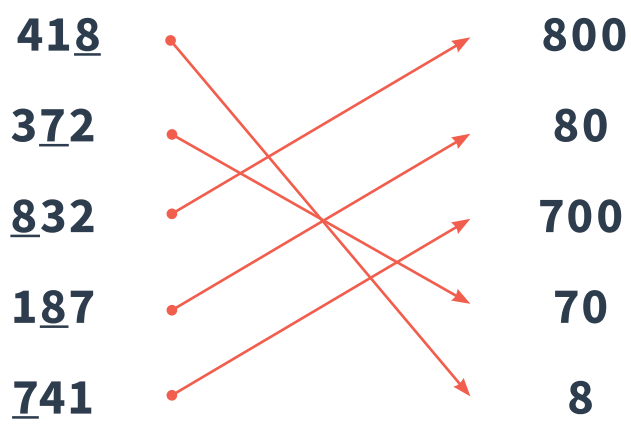
2 marks

Q3

Which of these 2D shapes is not a hexagon?

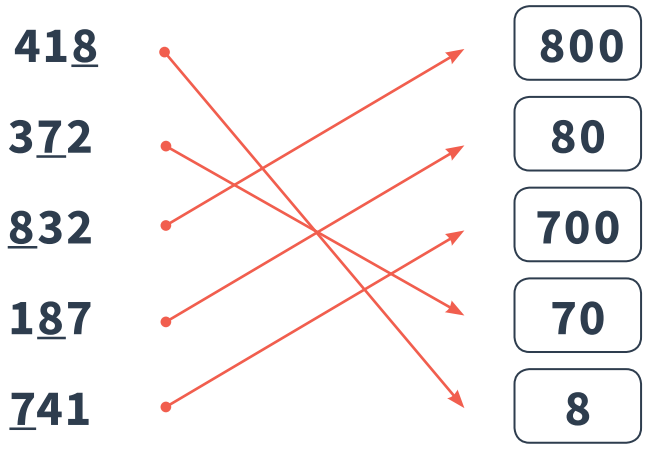
Shape C

1 mark

	Requirement	Mark	Additional guidance
Q1	72	1	
Q2	Numbers matched as follows:  **TWO** marks for all five numbers matched correctly. **ONE** mark for 3 or 4 numbers matched correctly.	2	
Q3	Shape C	1	Shape C is a pentagon. Although only shape B is a familiar regular hexagon, children should still recognise that shapes A and D both have six sides and are hexagonal.

What are examiners looking for?

Q2



Match each number with the value of the underlined digit.

2 marks

Why are we asking this question?

This question is designed to assess children's ability to recognise the place-value of each digit in a three-digit number. Specifically, this entails understanding that the position of a digit (its 'place') gives it its value and this corresponds to a number of hundreds, tens and ones, from left to right in the number.

What common errors do we expect to see?

We'd expect to see some children unable to recognise that the position of a digit determines its value.
These children view a number such as 741 as being made up of 7, 4 and 1 (in effect, 7 ones, 4 ones and 1 one), rather than 7 hundreds, 4 tens and 1 one. Therefore, for example, they would wish to answer that the value of the 7 in the number 741 is 7. We would expect these children to struggle with the task as they do not see the options they would like to match each number to.

We'd expect to see some children apply their knowledge of hundreds, tens and ones incorrectly.
In these cases, children often understand the positioning of hundreds, tens and ones, but assign a value of 100, 10 and 1 to a digit, rather than considering the role the digit plays in designating its worth. So, for example, the value of the 7 in the number 741 is seen to be worth 100 as it is in the hundreds place. Again, these children would be unable to complete the task when they do not see the options they would like to match each number to.

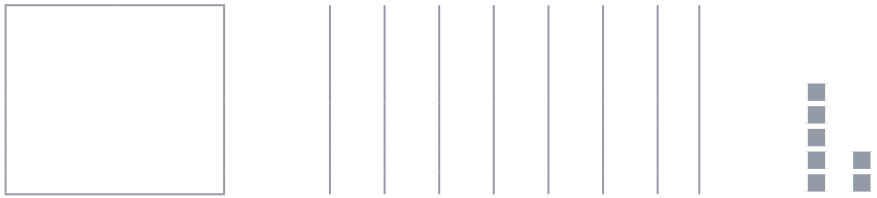
How to encourage children to solve this question

Encourage children to bring to mind the various ways that you have shown them to represent three-digit numbers in lessons. These will include things like the use of Dienes rods, place-value counters, grids and arrow cards.

When considering the numbers in this question, children should be encouraged to sketch a three-digit place value grid and represent each number on it by writing the three digits in the correct places. For example:

H	T	O
1	8	7

Children may find it beneficial to then 'translate' this grid into a simple sketch of the number modelled using base ten equipment. For example:



These very simple pictorial representations should help children to make the link between each digit and its place value. In the case of this question, it is important that they are then able to connect each digit's column value (eight tens) with its quantity value (eighty). Encourage them to consider each digit separately and to read their sketch from left to right (in this case, one hundred, eighty, seven).

When teaching this concept, it is important that children are given as many opportunities as possible to make conceptual connections between digits' positions and their value in numbers with three digits. The use of place value manipulatives are essential tools to help achieve this. For questions such as this one, a familiarity with place-value arrow cards would be particularly beneficial as children could visualise how each number could be separated into its constituent hundreds, tens and ones.

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Rapid Reasoning

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