THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 6 | Weeks 1–12

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Rapid Reasoning

Year 6 | Week 3

As this is the third week of *Rapid Reasoning* in Year 6, hopefully children will be increasingly confident and able to answer all three questions in the time given.

This is the last week that the Year 6 objectives introduced will focus on **place value**.

The following Year 6 objectives continue to be a focus from weeks 1 and 2:

- reading, writing, ordering and comparing numbers up to 10,000,000
- rounding numbers to any degree of accuracy
- using negative numbers in context, including calculating intervals across zero
- recognising the place value of each digit in a number up to 10,000,000.

Q1 Match the decimal fractions to their fraction equivalents.

$\frac{1}{5}$	0.3
$\frac{30}{100}$	0.2
$\frac{1}{4}$	0.6
$\frac{6}{10}$	0.72
$\frac{72}{100}$	0.25

2 marks

Q2 This temperature scale shows the average temperature in a city.

a Look at the arrow. What is the average temperature in winter?

°C

1 mark

The average temperature in summer is 23°C **higher** than winter.

b What is the average temperature in summer?

°C

1 mark

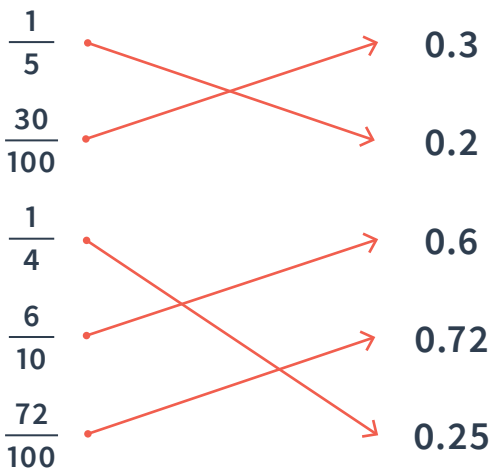
Q3 Place these lengths in order, starting with the **longest**.

3.5m	310,000cm	340cm
320mm	30,000mm	3km

Longest

1 mark

Q1 Match the decimal fractions to their fraction equivalents.



2 marks

Q2 This temperature scale shows the average temperature in a city.

a Look at the arrow. What is the average temperature in winter?

−6 °C

1 mark

The average temperature in summer is 23°C **higher** than winter.

b What is the average temperature in summer?

17 °C

1 mark

Q3 Place these lengths in order, starting with the **longest**.

3.5m	310,000cm	340cm
320mm	30,000mm	3km

Longest 310,000cm

3km

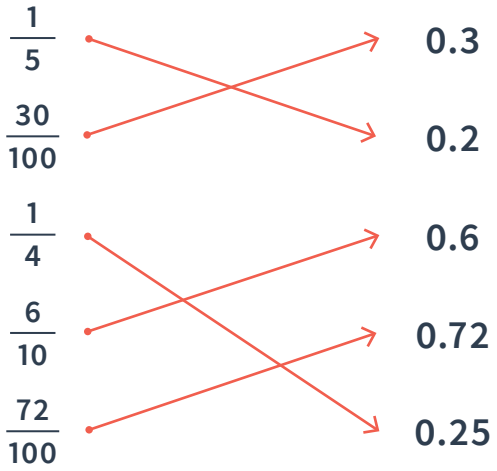
30,000mm

3.5m

340cm

320mm

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for all five correctly matched:  Award **ONE** mark for three correctly matched.	2	Do **NOT** accept more than one fraction equivalence matched two a single decimal fraction.
Q2a	−6	1	Do not accept 8.
Q2b	17	1	Do not accept −17 or 23.
Q3	310,000cm 3km 30,000mm 3.5m 340cm 320mm	1	

Q1 At the start of May, there were 3,043 cans of fizzy orange in the shop. During May,

- 11,392 more cans of fizzy orange were delivered
- 13,832 cans of fizzy orange were sold.

How many cans of fizzy orange were left in the shop at the end of June?

cans

1 mark

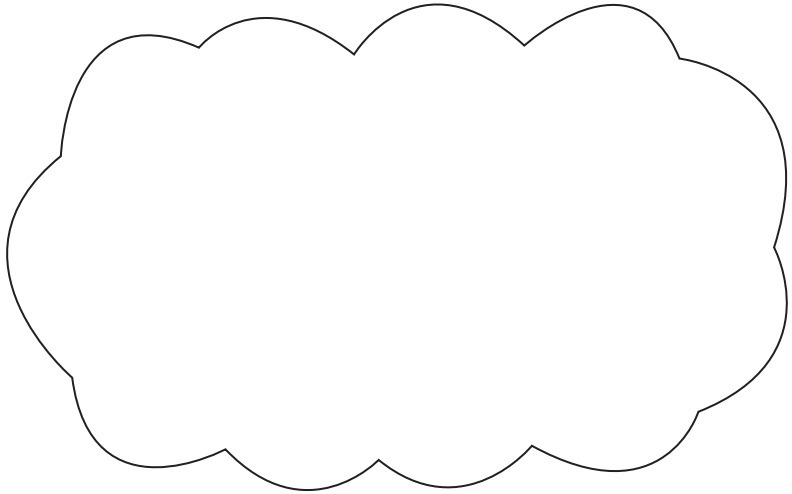
Q2 Evie eats $\frac{3}{4}$ of a 120g chocolate bar.

Josh eats 70% of a 120g chocolate bar.

Circle the name of the person that eats the most chocolate.

Evie Josh

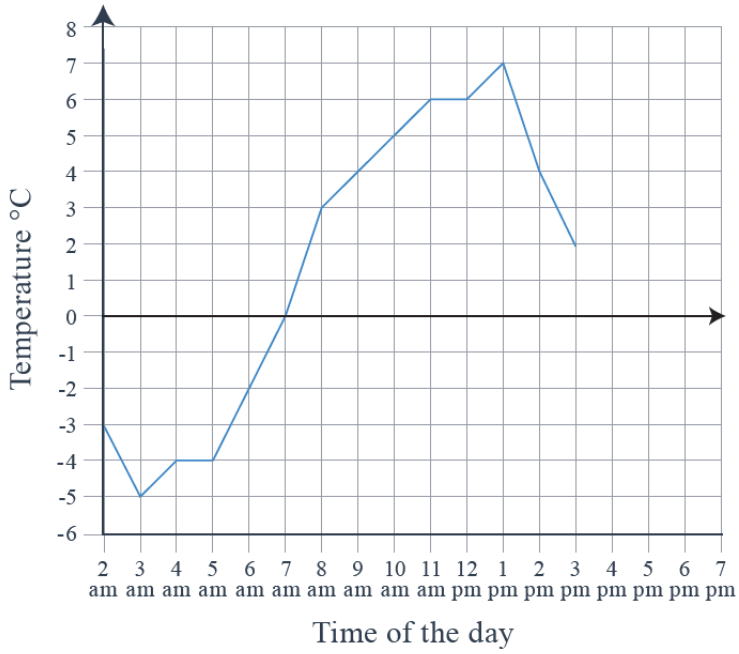
Explain how you know.



1 mark

Q3 Tallulah records the temperature outside on a cold Saturday in Norwich.

She plots her readings on a line graph.



a What is the difference between the highest and lowest temperature?

_____ °C

1 mark

b At what time(s) was it 4°C?

_____

1 mark

c The temperature **decreases** by 4°C from 3pm to 6pm.

At what time(s) was it 1°C?

_____ pm

1 mark

Q1 At the start of May, there were 3,043 cans of fizzy orange in the shop. During May,

- 11,392 more cans of fizzy orange were delivered
- 13,832 cans of fizzy orange were sold.

How many cans of fizzy orange were left in the shop at the end of June?

603 cans

1 mark

Q2 Evie eats $\frac{3}{4}$ of a 120g chocolate bar.

Josh eats 70% of a 120g chocolate bar.

Circle the name of the person that eats the most chocolate.

(Evie) Josh

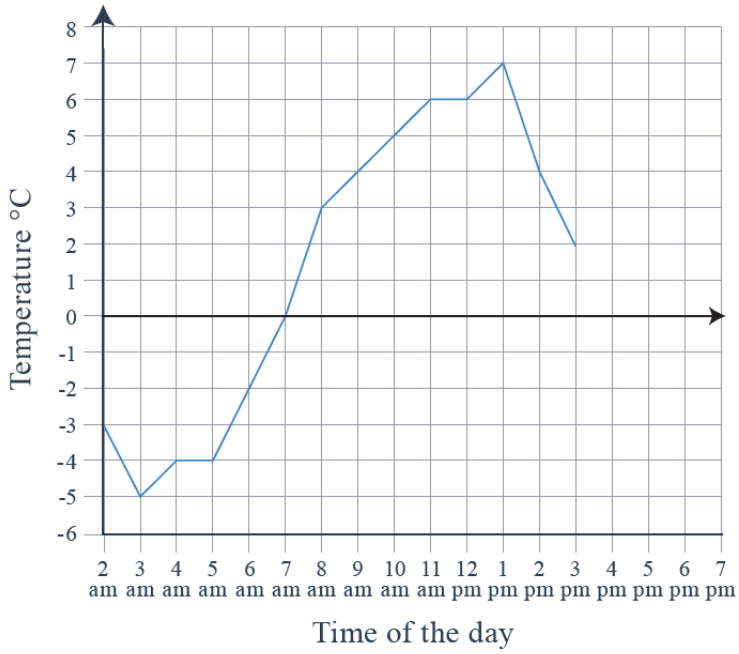
Explain how you know.

See mark scheme for examples

1 mark

Q3 Tallulah records the temperature outside on a cold Saturday in Norwich.

She plots her readings on a line graph.



a What is the difference between the highest and lowest temperature?

12 °C

1 mark

b At what time(s) was it 4°C?

9am and 2pm

1 mark

c The temperature **decreases** by 4°C from 3pm to 6pm.

At what time(s) was it 1°C?

4 pm

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of 603. Award **ONE** mark for evidence of a **complete** method with no more than one arithmetic error. For example: 3,043 + 11,392 = 14,435 14,435 − 13,832 = wrong answer.	2	
Q2	Award **ONE** mark for **BOTH** the correct identification of 'Evie' **AND** an explanation that explains why $\frac{3}{4}$ is a larger proportion than 70% for example: $\frac{3}{4}$ is the same as 75%. 75% is larger than 70% **OR** $\frac{3}{4}$ of 120 = 90, 70% of 120 = 84.	1	Do **NOT** accept vague explanations, including explanations that compare the proportions without explanation. For example, do **NOT** accept either: $\frac{3}{4}$ is bigger than 75% **OR** 70% is smaller than $\frac{3}{4}$.
Q3a	12°C	1	Do not accept −12.
Q3b	9am and 2pm	1	**BOTH** must be present for the award of the mark. AM/PM must be present or times given in 24 hour clock format (i.e 09:00 and 14:00).
Q3c	4pm	1	Do not accept 4.

Q1 Match the decimal fractions to their fraction equivalents.

$\frac{35}{100}$	0.6
$\frac{22}{100}$	0.35
$\frac{3}{4}$	0.75
$\frac{3}{5}$	0.8
$\frac{80}{100}$	0.22

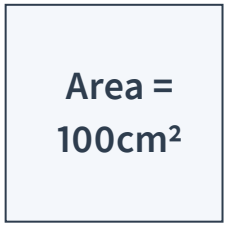
2 marks

Q2 Tallulah is thinking of a number.
She doubles it.
She adds 12.
She divides her answer by 4 and subtracts 3.
Her answer is 18.

What was the number that Tallulah started with?

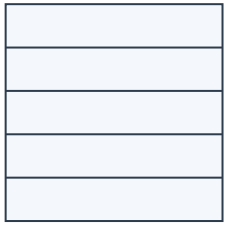
2 marks

Q3 The area of this square is 100cm².



Not to scale

The square is split into five identical rectangles.

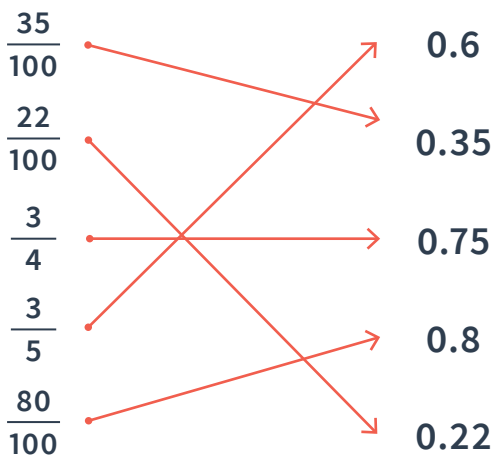


Not to scale

What is the **perimeter** of **one** of the rectangles? Don't forget your units.

2 marks

Q1 Match the decimal fractions to their fraction equivalents.



2 marks

Q2 Tallulah is thinking of a number.
She doubles it.
She adds 12.
She divides her answer by 4 and subtracts 3.
Her answer is 18.

What was the number that Tallulah started with?

36

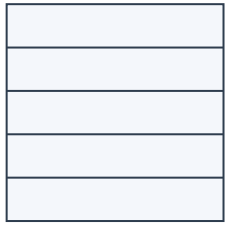
2 marks

Q3 The area of this square is 100cm².

Area = 100cm²

Not to scale

The square is split into five identical rectangles.

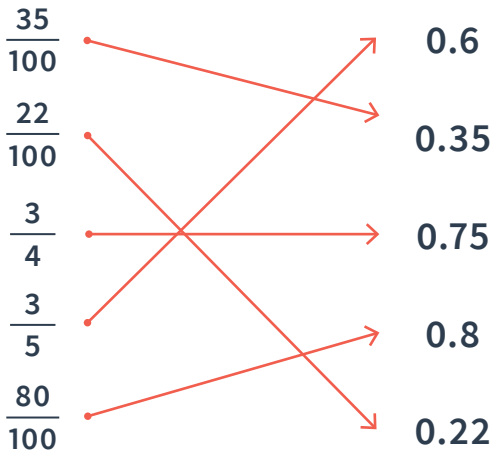


Not to scale

What is the **perimeter** of **one** of the rectangles? Don't forget your units.

24cm

2 marks

	Requirement	Mark	Additional guidance
Q1a	Award **TWO** marks for all five correctly matched:  Award **ONE** mark for three correctly matched.	2	
Q2	Award **TWO** marks for the correct answer of 36. Award **ONE** mark for a complete correct method, with no more than one arithmetic error.	2	
Q3	Award **TWO** marks for the correct answer of: $4\frac{1}{2}$ or $4\frac{2}{4}$ (or any equivalent). Award **ONE** mark for the answer of $\frac{18}{4}$.	2	Correct units must be given for the award of **TWO** marks. Answer of 24cm² would be credited with **ONE** mark.

What are examiners looking for?

Q2 **Tallulah is thinking of a number.**
She doubles it.
She adds 12.
She divides her answer by 4 and subtracts 3.
Her answer is 18.

What was the number that Tallulah started with?

36

2 marks

Why are we asking this question?

This question is designed to test children's understanding of inverse operations, and how they apply this knowledge to a complex set of instructions.

What common errors do we expect to see?

Children give the answer 21. This indicates that children have not used the inverse operation, and instead have used 18 and carried out the instructions in the order written.

Children give the answer 31.5. This indicates that children have successfully identified the inverse operations, but have incorrectly multiplied by 4 before adding 3, rather than adding 3 then multiplying by 4. This is a common error when more than one step is presented in the same sentence.

How to encourage children to solve this question

Children should begin by identifying the inverse operations for each of the steps given in the problem. By the start of Year 6, children should be secure at the identification of the inverse operation for each operation. Remind children that they can annotate and draw over the question. This can be particularly helpful in questions like this, where children should be encouraged to record the inverse operation next to each step of the problem.

Q2 **Tallulah is thinking of a number.**

She doubles it. ÷ 2

She adds 12. – 12

She divides her answer by 4 and subtracts 3. × 4 + 3

Her answer is 18.

What was the number that Tallulah started with?

36

2 marks

Children should then be encouraged to write out and solve each of the steps using the inverse operations they have identified, starting with 'answer' given in the question, 18.

18 **+ 3** = 21
21 **× 4** = 44
44 **– 12** = 32
32 **÷ 2** = 18

Q1 Josh posts four large letters.

The postage costs the same for each letter.

He pays with a £20 note.

His change is £14.28.

What is the cost of posting **one** letter?

Don't forget to add units.

2 marks

Q2 Here are some digit cards.

4	5	8	6

Write all four digit numbers above 6,500 that can be made using these digit cards.

2 marks

Q3 Here is a timetable showing the bus times from Great Yarmouth to Norwich.

Great Yarmouth	9.35	9.55	10.15	10.35
Acle	9.45	10.05	10.25	10.45
Blofield	10.01	10.21	10.41	11.01
Thorpe	10.23	10.43	11.03	11.23
Norwich	10.55	11.15	11.35	11.55

a How many minutes does the bus take to get from Great Yarmouth to Thorpe?

minutes

1 mark

Rachel needs to be in Norwich for 11:30.

b What is the latest time she can leave Blofield?

.

1 mark

One day, the 10:35 bus from Great Yarmouth is running 18 minutes late.

c What time will the bus get to Acle?

.

1 mark

Q1 Josh posts four large letters.

The postage costs the same for each letter.

He pays with a £20 note.

His change is £14.28.

What is the cost of posting **one** letter?

Don't forget to add units.

£1.43

2 marks

Q2 Here are some digit cards.

4	5	8	6

Write all four digit numbers above 6,500 that can be made using these digit cards.

6,548 6,584

6,854 6,845

8,456 8,465

8,645 8,654

8,564 8,546

2 marks

Q3 Here is a timetable showing the bus times from Great Yarmouth to Norwich.

Great Yarmouth	9.35	9.55	10.15	10.35
Acle	9.45	10.05	10.25	10.45
Blofield	10.01	10.21	10.41	11.01
Thorpe	10.23	10.43	11.03	11.23
Norwich	10.55	11.15	11.35	11.55

a How many minutes does the bus take to get from Great Yarmouth to Thorpe?

48 minutes

1 mark

Rachel needs to be in Norwich for 11:30.

b What is the latest time she can leave Blofield?

10 . 21

1 mark

One day, the 10:35 bus from Great Yarmouth is running 18 minutes late.

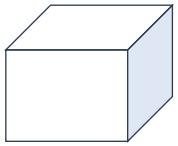
c What time will the bus get to Acle?

11 . 03

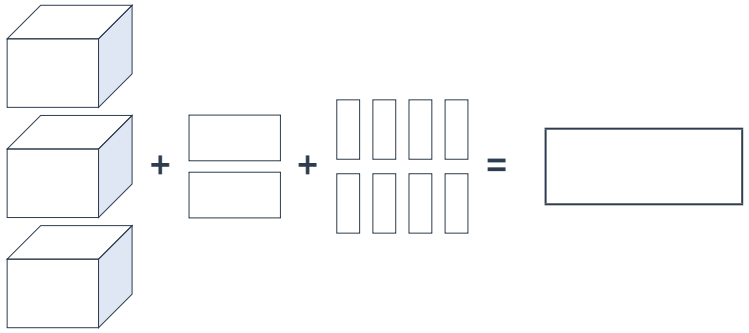
1 mark

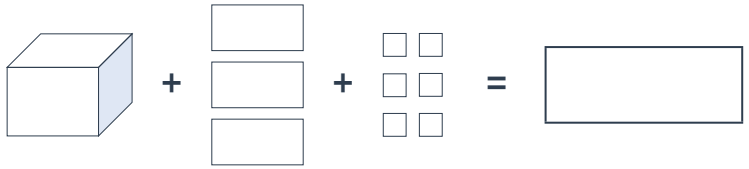
	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of £1.43. Award **ONE** mark for: • 1.43 or 1.43p **OR** • a complete method, with up to one arithmetic error • e.g. £20 − £14.28 = £5.72 • £5.72 ÷ 4 = wrong answer.	2	Correct units must be given for the award of TWO marks.
Q2	Award **TWO** marks for **ALL** ten correct answers, without duplication, as shown below. 6,548 6,584 6,854 6,845 8,456 8,465 8,645 8,654 8,564 8,546 Award **ONE** mark for either: a) 10 correct answers and up to two incorrect answers b) 10 correct answers, plus duplication c) Five or more correct answers and NO incorrect answers.	2	Answers can be given in any order. Commas are not required for the award of marks.
Q3a	48 minutes	1	
Q3b	10.21	1	
Q3c	11.03	1	

Q1

 = 1000  = 100  = 10 = 1

Complete the value of each diagram.





1 mark

Q2

Circle the **TWO** prime numbers below.

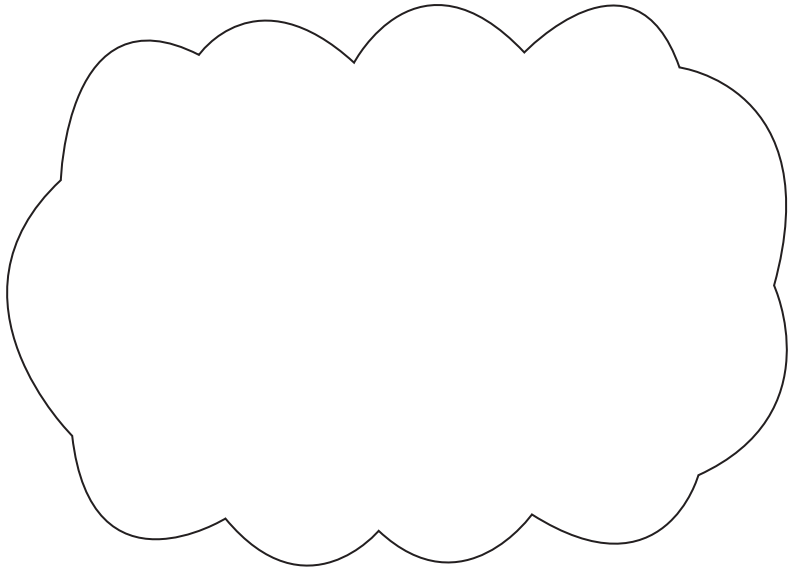
27 37 39 48 89

2 marks

Q3

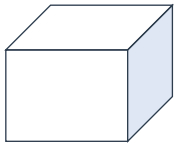
Milan says "0.25 is smaller than $\frac{2}{5}$."

Explain why he is correct.

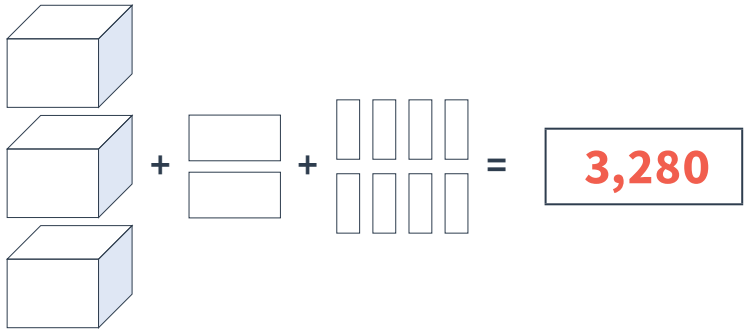


1 mark

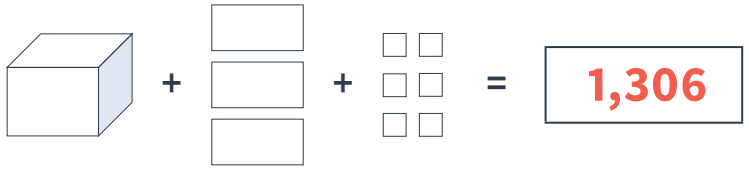
Q1

 = 1000  = 100  = 10  = 1

Complete the value of each diagram.



3,280



1,306

1 mark

Q2

Circle the **TWO** prime numbers below.

27 (37) 39 48 (89)

2 marks

Q3

Milan says "0.25 is smaller than $\frac{2}{5}$."

Explain why he is correct.

See mark scheme for examples

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **ONE** mark for both: 3,280 **AND** 1,306	1	
Q2	Award **TWO** marks for both: 37 **AND** 89 circled. Award **ONE** mark for either 37 **OR** 89 circled with no incorrect answers circled.	2	
Q3	Award **ONE** mark for an explanation showing that 0.25 is less than $\frac{2}{5}$, e.g. • 0.25 is 25% and is 40% and 25% is smaller than 40% • 0.25 is $\frac{5}{20} < \frac{8}{20}$ • 0.25 is $\frac{1}{4}$ and you need 8 quarters to make 2, but only 5 lots of $\frac{2}{5}$ to make 2 • $\frac{2}{5}$ = 0.4.	1	Do **NOT** accept vague or inaccurate explanations, e.g. • because $\frac{1}{4}$ is bigger than $\frac{2}{5}$ • because $\frac{1}{4}$ comes first on a number line.

THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning