THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 4 | Week 6

This week, the new Year 4 objectives that are introduced continue to focus on **addition and subtraction**, with children being exposed to more complex problems, including those that require multiple steps.

Year 4 objectives introduced in a reasoning context for the first time this week include:

- adding and subtracting numbers mentally with increasingly large numbers (up to and including 1,000).

The following Year 4 objective continues to be a focus from week 5:

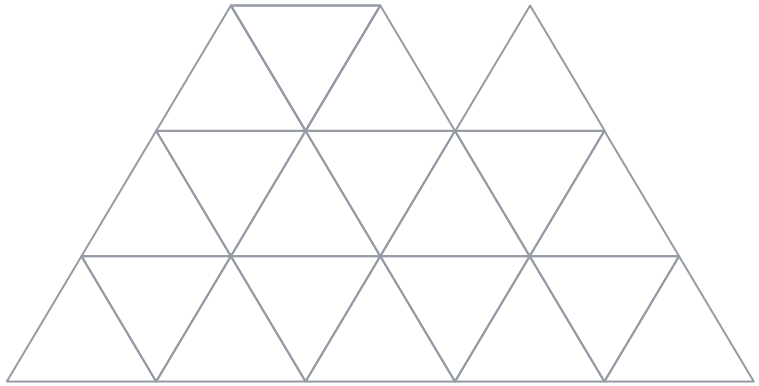
- adding and subtracting numbers with up to four digits, including using the formal written methods for addition and subtraction where these are appropriate.

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

- calculating statements for multiplication and division.

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

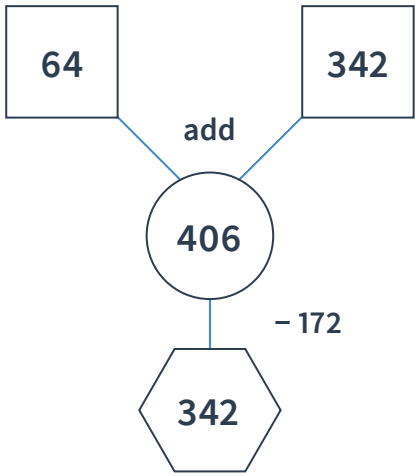


Shade triangles so that $\frac{3}{4}$ of the shape is **NOT** shaded.

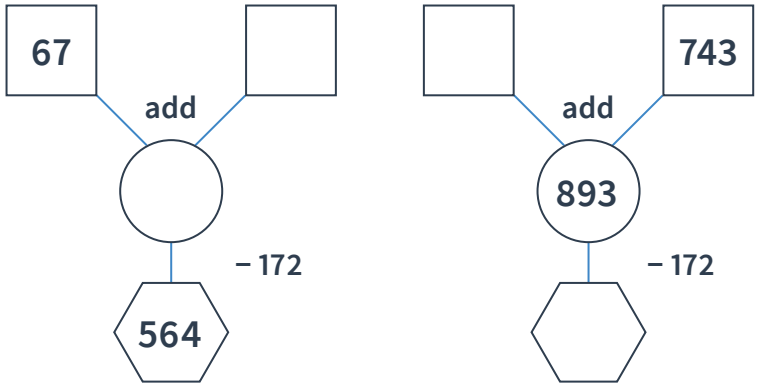
1 mark

Q2

Look at this diagram.



Complete the two diagrams below with the four missing numbers.



2 marks

Q3 Complete the sentences below by putting a number into the boxes.

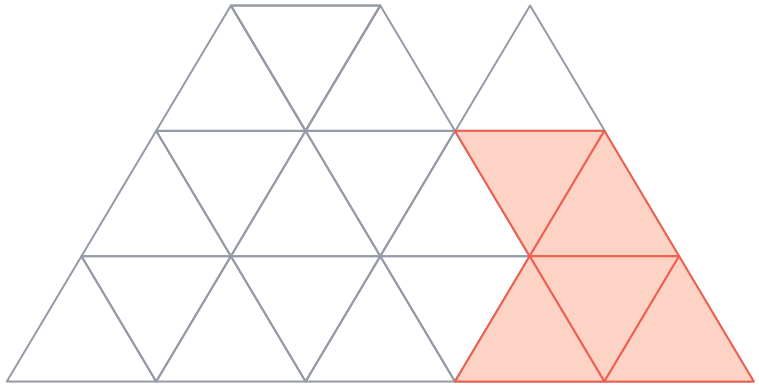
Number of right angles in half a turn: ☐

Number of right angles in a full turn: ☐

Number of right angles in a quarter turn: ☐

2 marks

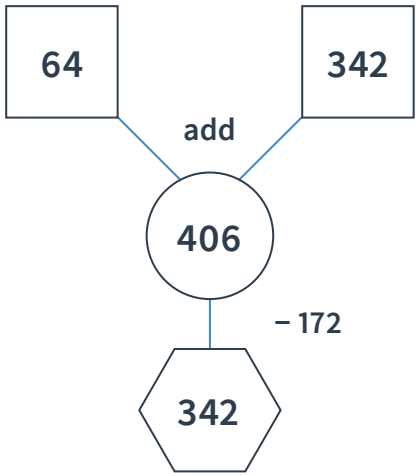
Q1



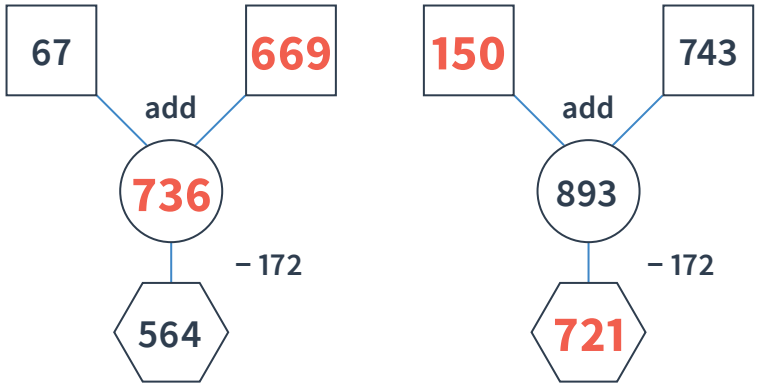
Shade triangles so that $\frac{3}{4}$ of the shape is **NOT** shaded.

1 mark

Q2 Look at this diagram.



Complete the two diagrams below with the four missing numbers.



2 marks

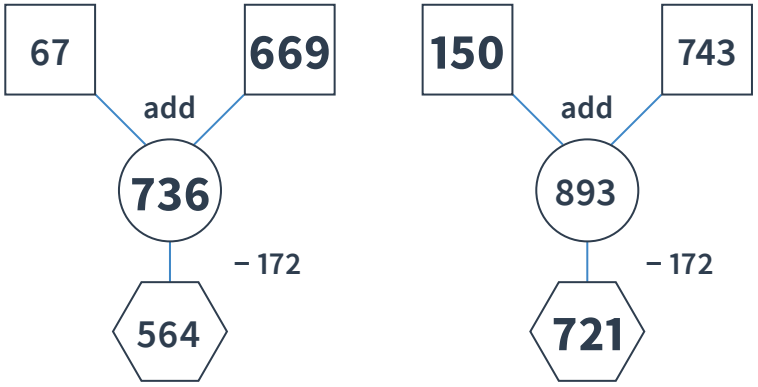
Q3 Complete the sentences below by putting a number into the boxes.

Number of right angles in half a turn: **2**

Number of right angles in a full turn: **4**

Number of right angles in a quarter turn: **1**

2 marks

	Requirement	Mark	Additional guidance
Q1	Any five triangles shaded.	1	
Q2	Award **TWO** marks for all four boxes completed correctly.  Award **ONE** mark for three boxes completed correctly.	2	
Q3	Award **TWO** marks for all three boxes completed correctly. **2** right angles are in half a turn. **4** right angles are in a full turn. **1** right angles is in a quarter turn. Award **ONE** mark for two boxes completed correctly.	2	

Q1 Orchard class go on a trip to the local lake.

Boats on the lake hold a maximum of 6 people.

There are 19 people that need to go on a boat.

How many boats do they need to use?

boats

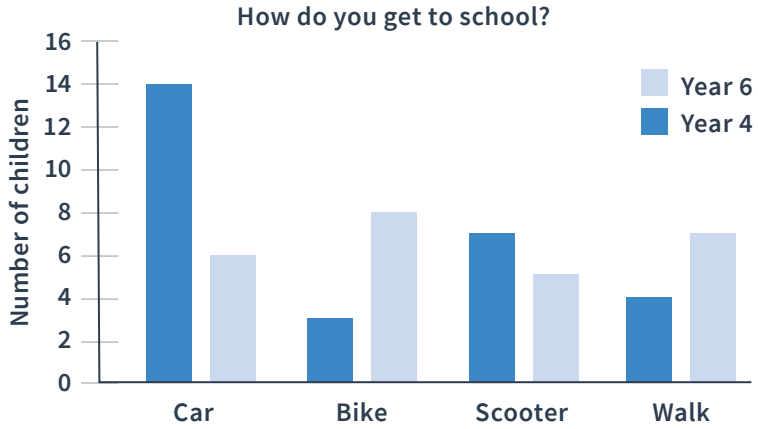
1 mark

Q2 Fill in the missing digits in this calculation.

3	8		3
	9	9	
6	8	4	0

2 marks

Q3 This chart shows how Year 6 and Year 4 get to school.



a What is the most popular way to get to school for children in Year 6?

1 mark

b How many children in Year 4 **do not** walk to school?

1 mark

Q1 Orchard class go on a trip to the local lake.

Boats on the lake hold a maximum of 6 people.

There are 19 people that need to go on a boat.

How many boats do they need to use?

4 boats

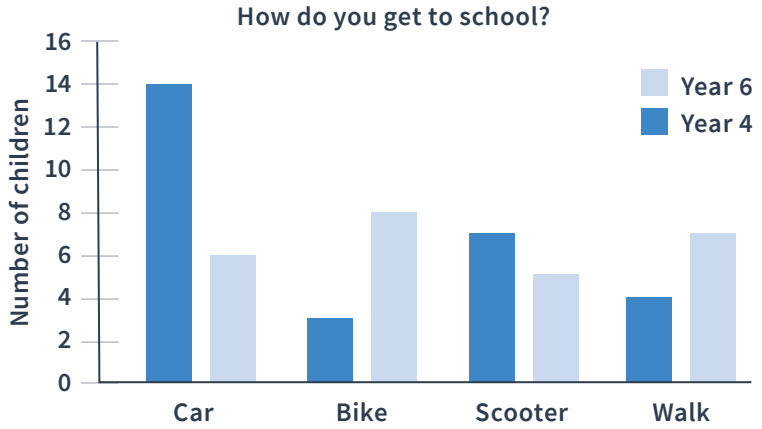
1 mark

Q2 Fill in the missing digits in this calculation.

3	8	4	3
2	9	9	7
6	8	4	0

2 marks

Q3 This chart shows how Year 6 and Year 4 get to school.



a What is the most popular way to get to school for children in Year 6?

Bike

1 mark

b How many children in Year 4 **do not** walk to school?

24

1 mark

	Requirement	Mark	Additional guidance
Q1	4	1	
Q2	Award **TWO** marks for all three digits added correctly. 3 8 4 3 2 9 9 7 6 8 4 0 Award **ONE** mark for two digits added correctly.	2	
Q3a	Bike	1	
Q3b	24	1	

Q1 In Year 4 there are 104 children in three classes.

Class 1 has 34 children.

Class 2 has 12 boys and 23 girls.

How many children are in Class 3?

children

2 marks

Q2 Plastic cups are sold in packs of 8.

For his party, Noah needs 28 cups.

How many packs of cups does Noah need?

packs

1 mark

Q3 Place these numbers in order, starting with the **largest**.

88,000 892 87,999 8,897 8,889

largest

1 mark

Q1 In Year 4 there are 104 children in three classes.

Class 1 has 34 children.

Class 2 has 12 boys and 23 girls.

How many children are in Class 3?

35 children

2 marks

Q2 Plastic cups are sold in packs of 8.

For his party, Noah needs 28 cups.

How many packs of cups does Noah need?

4 packs

1 mark

Q3 Place these numbers in order, starting with the **largest**.

88,000 892 87,999 8,897 8,889

largest 88,000

87,999

8,897

8,889

892

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of 35. Award **ONE** mark for evidence of an apocopate method with no more than one arithmetic error.	2	
Q2	4	1	
Q3	88,000 87,999 8,897 8,889 892	1	

What are examiners looking for?

Q1 **In Year 4 there are 104 children in three classes.**

Class 1 has 34 children.

Class 2 has 12 boys and 23 girls.

How many children are in Class 3?

35 children

2 marks

Why are we asking this question?

This question is designed to test children's ability to solve worded problems which have more than one step.

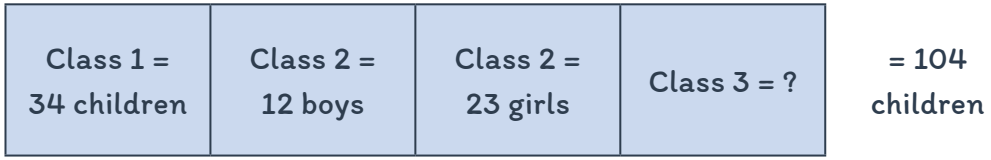
What common errors do we expect to see?

Children give the answer 35.
This indicates that they have just combined the number of boys and girls in Class 2 and have therefore misinterpreted the question.

Children give the answer 79.
This indicates that they have just combined the number of children in Class 2 and 3, and therefore have only carried out one of the steps needed to solve this problem. It is important that children carefully consider the instructions given in the shaded lozenge in the question, as this provides the key instructions that are needed in order to solve the problem.

How to encourage children to solve this question

When solving multiple step problems like this, a bar model can be a useful tool for children to identify the structure of the problem and the information they have been given.



They can then see that they need to add up the total of Class 1, Class 2 boys and Class 2 girls (69) and take this total away from 104 to find the number of children in Class 3 (35).

Q1 Fill in the boxes to complete this multiplication table.

×	8	3	
5	40	15	20
8			32
	80	30	

2 marks

Q2 Write in the missing digits.

□□ 8 − 1□9 = 569

1 mark

Q3 This pictogram shows the number of brothers or sisters children in Oak class have.

No brothers or sisters	○○○
1 brother or sister	
2 brothers or sisters	○○○○
3 or more brothers or sisters	

○ = 2

Complete the pictogram based on the clues below.

Twice as many children have 1 brother or sister than no brothers or sisters.

5 fewer children have 3 brothers or sisters compared to 2 brothers or sisters.

2 marks

Q1 Fill in the boxes to complete this multiplication table.

×	8	3	4
5	40	15	20
8	64	24	32
10	80	30	40

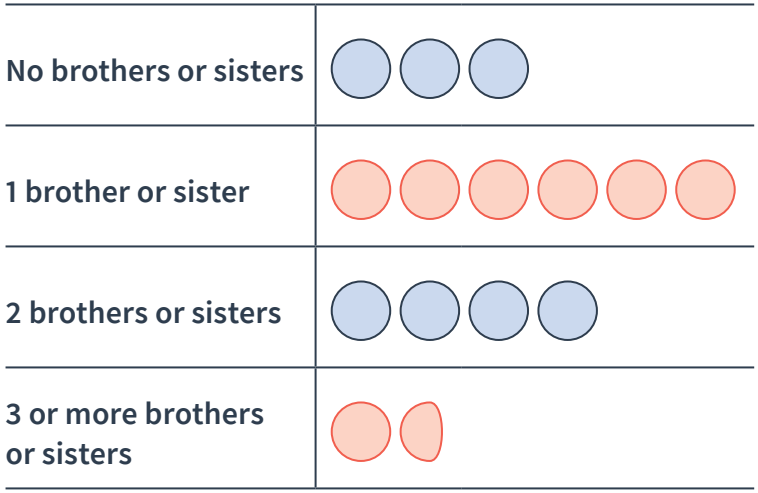
2 marks

Q2 Write in the missing digits.

7 6 8 − 1 9 9 = 569

1 mark

Q3 This pictogram shows the number of brothers or sisters children in Oak class have.

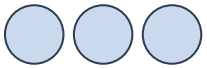
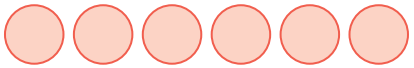
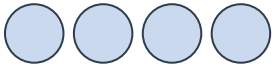


Complete the pictogram based on the clues below.

Twice as many children have 1 brother or sister than no brothers or sisters.

5 fewer children have 3 brothers or sisters compared to 2 brothers or sisters.

2 marks

	Requirement	Mark	Additional guidance
Q1	<table><tr><td>×</td><td>8</td><td>3</td><td>4</td></tr><tr><td>5</td><td>40</td><td>15</td><td>20</td></tr><tr><td>8</td><td>64</td><td>24</td><td>32</td></tr><tr><td>10</td><td>80</td><td>30</td><td>40</td></tr></table>	2	
Q2	7 6 8 − 1 9 9 = 569	1	All digits need to be completed correctly for the award of the mark.
Q3	<table><tr><td>No brothers or sisters</td><td>  </td></tr><tr><td>1 brother or sister</td><td>  </td></tr><tr><td>2 brothers or sisters</td><td>  </td></tr><tr><td>3 or more brothers or sisters</td><td>  </td></tr></table>	2	

Q1 Lily took 420 seconds to run 1 mile.

How many minutes did Lily take?

minutes

1 mark

Q2 At the start of June, there were 2,843 boxes of chocolates in the shop.

During June,

- 4,838 more boxes of chocolate were delivered
- 5,843 boxes of chocolate were sold.

How many boxes of chocolate were left in the shop at the end of June?

boxes

2 marks

Q3 Mike and his two friends go to the cinema.

Three tickets cost £21.30. They shared the cost between them.

They each buy popcorn for £3.50 and a drink for £2.10.

How much money does **each** person spend?

£

2 marks

Q1 Lily took 420 seconds to run 1 mile.

How many minutes did Lily take?

7 minutes

1 mark

Q2 At the start of June, there were 2,843 boxes of chocolates in the shop.

During June,

- 4,838 more boxes of chocolate were delivered
- 5,843 boxes of chocolate were sold.

How many boxes of chocolate were left in the shop at the end of June?

1,838 boxes

2 marks

Q3 Mike and his two friends go to the cinema.

Three tickets cost £21.30. They shared the cost between them.

They each buy popcorn for £3.50 and a drink for £2.10.

How much money does **each** person spend?

£ 12.70

2 marks

	Requirement	Mark	Additional guidance
Q1	7 minutes	1	
Q2	Award **TWO** marks for the correct answer of 1,838. Award **ONE** mark for evidence of an apocopate method with no more than one arithmetic error.	2	Commas do not need to be present for the award of the mark.
Q3	Award **TWO** marks for the correct answer of £12.70 or £12.70p. Award **ONE** mark for: final answers of £12.7 OR £12.7p **OR** £127p **OR** £1270p evidence of complete working with one arithmetic error, for example: £21.30 ÷ 3 = £7.10 £7.10 + £3.50 + £2.10 = wrong answer.	2	

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Rapid Reasoning

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