



THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions
and curriculum resources

Rapid Reasoning

Year 5 | Weeks 19-24



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Rapid Reasoning

Year 5 | Week 20

As with last week, the questions this week within *Rapid Reasoning* continue to focus on fractions and proportionality.

This week, children will be introduced to multiplying proper fractions and mixed number by whole numbers (including where the questions are supported by diagrams) for the first time.

Children's ability to add and subtract fractions with the same denominator and denominators that are multiples of the same number, which was first introduced in Week 19, also continues to be a focus this week.

As with previous weeks, other content from Year 5 that the children have met in previous weeks of *Rapid Reasoning*, along with Year 4 objectives, will also feature this week.

Q1

Complete the boxes to show each decimal number as a fraction.

$$0.67 = \frac{\boxed{}}{100}$$

$$\boxed{} = \frac{7}{10}$$

$$\frac{\boxed{}}{10} = 0.30$$

$$\boxed{} = \frac{85}{100}$$

2 marks

Q2

439 coaches have been hired to take people from a concert venue to the nearest railway station.

Each coach can carry 52 passengers.

How many people can be taken to the railway station in total?

people

2 marks

Q3

A pizza restaurant sells five different types of pizza.

At the 'Help Yourself' section, there are $1\frac{1}{2}$ pizzas for each type.

How many pizzas are there altogether?
Give your answer as a mixed number.

		pizzas

1 mark

Q1

Complete the boxes to show each decimal number as a fraction.

$$0.67 = \frac{\boxed{67}}{100}$$

$$\boxed{0.7} = \frac{7}{10}$$

$$\frac{\boxed{3}}{10} = 0.30$$

$$\boxed{0.85} = \frac{85}{100}$$

2 marks

Q2

439 coaches have been hired to take people from a concert venue to the nearest railway station.

Each coach can carry 52 passengers.

How many people can be taken to the railway station in total?

22,828 people

2 marks

Q3

A pizza restaurant sells five different types of pizza.

At the 'Help Yourself' section, there are $1\frac{1}{2}$ pizzas for each type.

How many pizzas are there altogether?
Give your answer as a mixed number.

$$\boxed{7} \frac{\boxed{1}}{\boxed{2}} \text{ pizzas}$$

1 mark

	Requirement	Mark	Additional guidance
Q1	67, 0.7 (or 0.70), 3, 0.85	2	
Q2	22,828 people Award TWO marks for a correct answer. Award ONE mark for a correct method with one arithmetic error.	2	An appropriate method could be: 400309 20,0001,500450 8006018 502 200001500450 8004506018 18 22828
Q3	7 $\frac{1}{2}$ pizzas	1	

What are examiners looking for?**Q2**

439 coaches have been hired to take people from a concert venue to the nearest railway station.

Each coach can carry 52 passengers.

How many people can be taken to the railway station in total?

22,828 people

2 marks

Why are we asking this question?

This question is designed to assess children's ability to multiply numbers with up to four-digits by a one- or two-digit number (in this case, to multiply a three-digit number by a two-digit number using long multiplication).

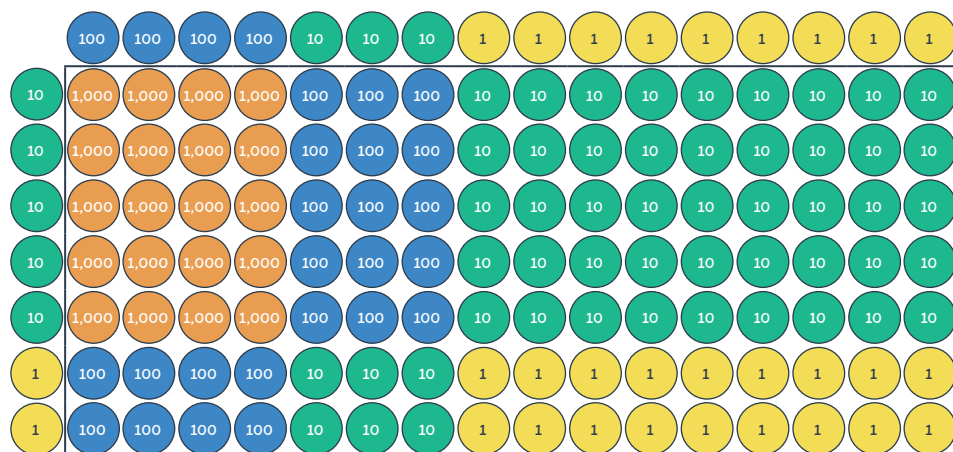
What common errors do we expect to see?

Some children may not comprehend the scenario correctly and may not recognise the correct operation needed to solve the problem.

Some children may partition 439 incorrectly as 4, 3 and 9, calculating the answer as the total of 4×52 , 3×52 and 9×52 . Others may make a similar error by partitioning 52 incorrectly instead (working out the total of 439×5 and 439×2). In both examples, children do not assign the correct place value to digits.

How to encourage children to solve this question

Children may benefit from using concrete representations to model a long multiplication method. For example:



Note that, although this is a useful way to consolidate children's understanding of the grid method of multiplication, it is not a quick strategy for children to use.

Encourage children to make the number 439 using arrow cards and then partition the number so that they are aware that they need to multiply 400×52 , 30×52 and 9×52 to find the overall answer.

Q1

Here are two multiplication facts:

$10 \times 9 = 90 \quad 7 \times 9 = 63$

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

A) 17×9

B) 14×9

C) 9×40

2 marks

Q2Jayden is calculating $3 \frac{1}{4} \times 6$.First he multiplies the whole number: $3 \times 6 = 18$ Then, he multiplies the fraction: $\frac{1}{4} \times 6 = \frac{6}{24}$ Finally, he combines the two: $18 + \frac{6}{24} = 18 \frac{6}{24}$ **a**

What mistake has Jayden made?

1 mark

b

What is the correct answer?

1 mark

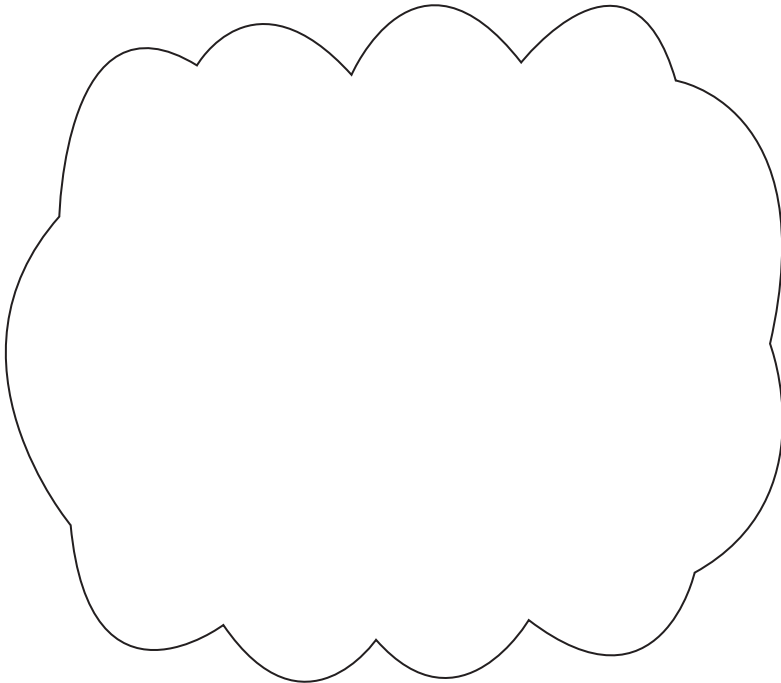
Q3

Shape A has 6 sides. One of its side lengths is 15cm. The rest are 9cm.

Shape B has 8 sides. All of its side lengths are 11cm. All of its angles are the same.

Shape C has 4 corners. One of them is a right-angle.

Is each shape **regular** or **irregular**? Explain your answers.



2 marks

Q1

Here are two multiplication facts:

$$10 \times 9 = 90 \quad 7 \times 9 = 63$$

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

A) 17×9

is the total of 10×9 and 7×9 .

B) 14×9

is double the answer to 7×9 .

C) 9×40

is four times the answer
to 10×9 .

2 marks

Q2

Jayden is calculating $3 \frac{1}{4} \times 6$.First he multiplies the whole number: $3 \times 6 = 18$ Then, he multiplies the fraction: $\frac{1}{4} \times 6 = \frac{6}{24}$ Finally, he combines the two: $18 + \frac{6}{24} = 18 \frac{6}{24}$

a

What mistake has Jayden made?

See mark scheme
for example

1 mark

b

What is the correct answer?

$$19 \frac{1}{2}$$

1 mark

Q3

Shape A has 6 sides. One of its side lengths is 15cm. The rest are 9cm.

Shape B has 8 sides. All of its side lengths are 11cm. All of its angles are the same.

Shape C has 4 corners. One of them is a right-angle.

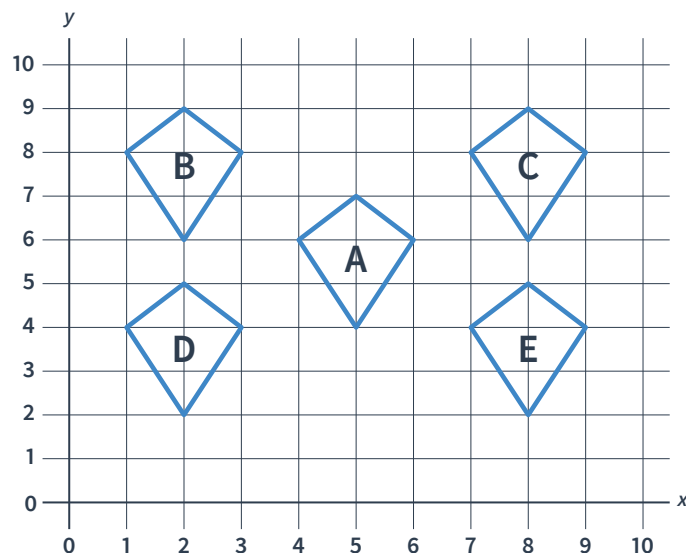
Is each shape **regular** or **irregular**? Explain your answers.

*See mark scheme
for example*

2 marks

	Requirement	Mark	Additional guidance
Q1	A) 17×9 is the total of 10×9 and 7×9. B) 14×9 is double the answer to 7×9. C) 9×40 is four times the answer to 10×9. Award TWO marks for all correct explanations. Award ONE mark for any two correct explanations.	2	
Q2a	Jayden has multiplied $\frac{1}{4}$ by 6 incorrectly. He has multiplied the denominator as well as the numerator. $\frac{1}{4}$ multiplied by 6 should be $\frac{6}{4}$.	1	
Q2b	$19 \frac{2}{4}$ or $19 \frac{1}{2}$	1	
Q3	Shape A is irregular because not all its side lengths are the same. Shape B is regular because all of its side lengths and angles are equal. Shape C is irregular because not all of its angles are the same. Award TWO marks for all correct answers. Award ONE mark for any two correct answers	2	

Q1 Shape A is moved 3 to the right and 2 down.



Which of these shapes shows Shape A in its new position? Write the correct letter.

1 mark

Q2 Kieran's auntie takes him out for a meal.

They order a large dish of chicken chow mein to share.

Kieran manages to eat $\frac{5}{12}$ of the food.

His auntie eats $\frac{3}{6}$ of the food.

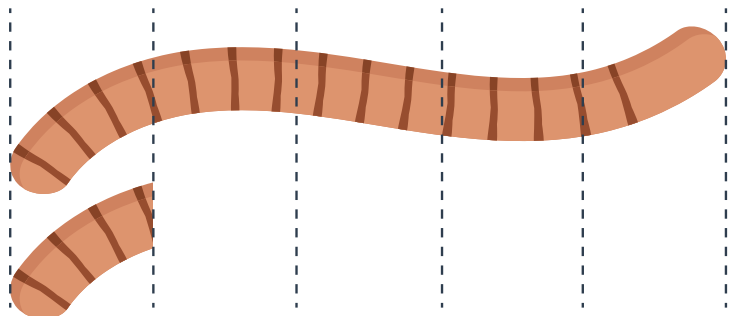
What fraction of the bowl of chow mein do they eat **altogether**?

1 mark

Q3

A blackbird is feeding her 5 chicks.

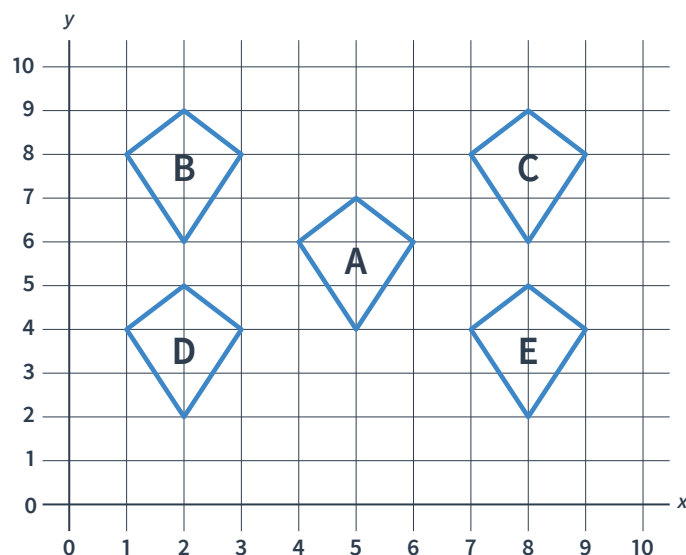
Each chick needs to eat $1\frac{1}{5}$ worms.



How many worms in total does need the blackbird need to find?

1 mark

Q1 Shape A is moved 3 to the right and 2 down.



Which of these shapes shows Shape A in its new position? Write the correct letter.

E

1 mark

Q2 Kieran's auntie takes him out for a meal.

They order a large dish of chicken chow mein to share.

Kieran manages to eat $\frac{5}{12}$ of the food.

His auntie eats $\frac{3}{6}$ of the food.

What fraction of the bowl of chow mein do they eat **altogether**?

11

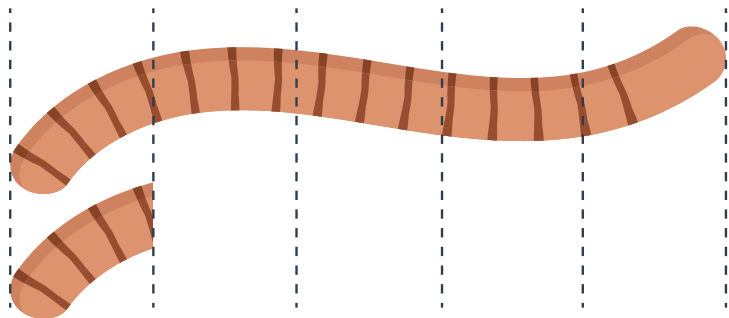
12

1 mark

Q3

A blackbird is feeding her 5 chicks.

Each chick needs to eat $1\frac{1}{5}$ worms.



How many worms in total does need the blackbird need to find?

6

worms

1 mark

	Requirement	Mark	Additional guidance
Q1	Shape E	1	
Q2	$\frac{11}{12}$	1	
Q3	6 worms	1	

Q1

A factory has a target of producing 4,970 boxes of chocolates every day.

Each box contains 12 individual chocolates.

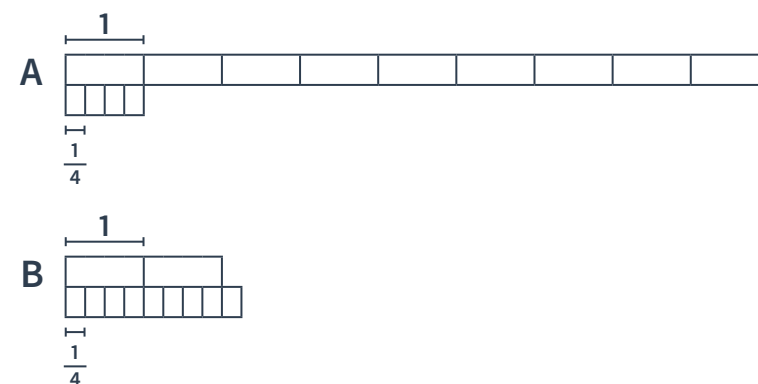
How many individual chocolates does the factory need to produce to meet its daily target?

chocolates

2 marks

Q2

Which of these bar models could you use to find the answer to $\frac{1}{4} \times 9$?



1 mark

What is $\frac{1}{4} \times 9$? Write your answer as a mixed number.

1 mark

Q3

Complete the missing fractions in these statements.

$$\frac{24}{40} + \frac{6}{20} = \frac{\boxed{}}{\boxed{}}$$

$$\frac{10}{16} + \frac{\boxed{}}{\boxed{}} = \frac{7}{8}$$

2 marks

Q1

A factory has a target of producing 4,970 boxes of chocolates every day.

Each box contains 12 individual chocolates.

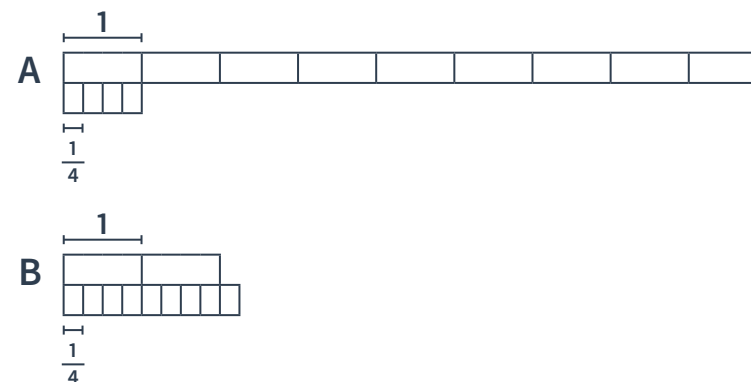
How many individual chocolates does the factory need to produce to meet its daily target?

59,640 chocolates

2 marks

Q2

Which of these bar models could you use to find the answer to $\frac{1}{4} \times 9$?



B

1 mark

What is $\frac{1}{4} \times 9$? Write your answer as a mixed number.

2 $\frac{1}{4}$

1 mark

Q3

Complete the missing fractions in these statements.

$$\frac{24}{40} + \frac{6}{20} = \frac{18}{20}$$

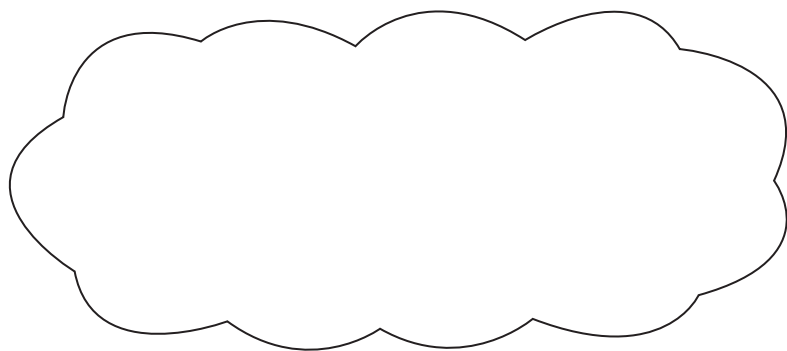
$$\frac{10}{16} + \frac{4}{16} = \frac{7}{8}$$

2 marks

	Requirement	Mark	Additional guidance
Q1	59,640 chocolates Award TWO marks for a correct answer. Award ONE mark for a correct method with one arithmetic error.	2	An appropriate method could be: <pre> 4 9 7 0 × 1 2 ----- 0 (0 × 2) 1 4 0 (70 × 2) 1 8 0 0 (900 × 2) 8 0 0 0 (4,000 × 2) 0 (0 × 10) 7 0 0 (70 × 10) 9 0 0 0 (900 × 10) 4 0 0 0 0 (4,000 × 10) ----- 5 9 6 4 0 </pre>
Q2	B, $2\frac{1}{4}$ Award ONE mark for each correct answer.	2	
Q3	$\frac{18}{20}$ (or $\frac{36}{40}$ or $\frac{9}{10}$) $\frac{4}{16}$ (or $\frac{2}{8}$ or $\frac{1}{4}$) Award ONE mark for each correct answer.	2	

Q1 Fleur says that 0.030 is equal to $\frac{30}{100}$.

Explain the mistake that Fleur has made.



1 mark

Q2 A carpenter has three pieces of wood.

$$\text{Piece A} = \frac{3}{7} \text{ m}$$

$$\text{Piece B} = \frac{1}{2} \text{ m}$$

$$\text{Piece C} = \frac{2}{14} \text{ m}$$

a The carpenter wants to make a length that is $\frac{4}{7}$ of a metre long.

Which two pieces of wood should he put together?

and

1 mark

b If $\frac{3}{8}$ m is cut from Piece B, what fraction of a metre will be left?

m

1 mark

Q3

This table shows the different films that are showing at the cinema.

Screen	Film name	Length (mins)	Showing times
1	Planet of the penguins	104 mins	3pm, 6pm, 9pm
2	Escape to Mars	125 mins	3.15pm, 6.15pm, 9.15pm
3	It's a chicken's life	95 mins	4pm, 7.45pm

a

How long is Escape to Mars in hours and minutes?

hours and minutes

1 mark

b

Ola wants to watch the 7.45pm showing of It's a chicken's life.

What time will the film end?

1 mark

Q1 Fleur says that 0.030 is equal to $\frac{30}{100}$.

Explain the mistake that Fleur has made.

*See mark scheme
for example*

1 mark

Q2 A carpenter has three pieces of wood.

$$\text{Piece A} = \frac{3}{7} \text{ m}$$

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$$\text{Piece C} = \frac{2}{14} \text{ m}$$

a The carpenter wants to make a length that is $\frac{4}{7}$ of a metre long.

Which two pieces of wood should he put together?

A

and

C

1 mark

b If $\frac{3}{8}$ m is cut from Piece B, what fraction of a metre will be left?

1

8

m

1 mark

Q3

This table shows the different films that are showing at the cinema.

Screen	Film name	Length (mins)	Showing times
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3	It's a chicken's life	95 mins	4pm, 7.45pm

a

How long is Escape to Mars in hours and minutes?

2

hours and

5

minutes

1 mark

b

Ola wants to watch the 7.45pm showing of It's a chicken's life.

What time will the film end?

9.20pm

1 mark

	Requirement	Mark	Additional guidance
Q1	The 3 digit is in the hundredths place, so the fraction is $\frac{3}{100}$.	1	
Q2a	A and C	1	
Q2b	$\frac{1}{8}$ m	1	
Q3a	2 hours and 5 minutes	1	
Q3b	9.20pm	1	



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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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