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Links to prior learning/ objectives	Resources	Vocabulary:
~ Place value of ones, tens, hundreds and thousands. ~ focussed on multiplication facts for 2,5,10,3,4 and 8. ~ Strategies for multiplication and division. ~ Understanding of area and multiplication facts to support them with calculating the area. ~ Understanding of estimation and inverse. ~ Ability to check the accuracy of calculations. ~ They will have experienced different units of measure, but they will have represented them separately with no decimal notation.	Base10, number lines, multiplication squares, place value sliders, physical objects. **Mastery:** (where to find some resources) • Teaching for Mastery • White Rose **New and old documents** • Mastery maths stickers • Nrich (curriculum mapping)	Multiply, multiplication, formal written method, place value, three digits, two digits, place value Area, rectilinear, multiplication facts, multiply, algebra. Units, measure, convert, conversion, kilometre, metre, hour, minute, second, place value, multiplying, dividing, Multiplying, dividing, division, multiply, adding, addition, scaling, correspondence, distributive law, doubling, halving. Estimation, inverse, approximate, check, accuracy,

Objectives and Teaching

| Week 1

Barriers to ARE (misconceptions)
Children may struggle with their place value understanding which will make the formal written method difficult.
Children may not have a strong understanding of multiplication facts. | Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

• To know how to multiply a two-digit number by a one-digit number.
• To understand how to multiply a two-digit number by a one-digit number.
• To know how to multiply a three-digit number by a one-digit number.
• To understand how to multiply a three-digit number by a one-digit number
• To understand how to use a formal method. |

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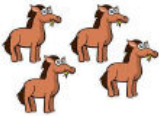| Fluency	Reasoning	Problem Solving
Calculate 12 × 4 Use place value counters and the formal method. 1 2 × 4 Calculate: 4 3 3 6 7 4 3 9 × 3 × 4 × 5 × ☐ 1 ☐ 6 Each horse eats 37 carrots a day. How many do they eat altogether?	Here are three multiplications. 6 1 7 4 2 6 × 5 × 7 × 4 3 5 4 9 8 8 2 4 Correct the multiplications.	Tom baked muffins in a tray like this. Tom wasn't sure how many he baked, but he used 27, 28 or 29 tins! When he counted them there were 174 muffins. How many tins did he use?

| Week 2 Children may not understand the properties of rectilinear shapes. Children may confuse area with perimeter. Children may miscount the squares or miscalculate when multiplying.	Find the area of rectilinear shapes by counting squares. • To know what area means. • To develop the skill of finding the area of rectilinear shapes. • To understand how to find the area of a rectilinear shape.

Fluency	Reasoning	Problem Solving

Give children a pre-cut piece of paper that measures 15 cm by 15 cm
How many post it notes cover your piece of paper?

Give the children 10 squares, 5 measuring one measurement and 5 measuring another (e.g. 5 squares measuring 5 cm by 5 cm and 5 squares measuring 10 cm by 10 cm)
Make the same shape using the smaller squares and the larger squares.
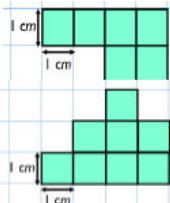E.g.
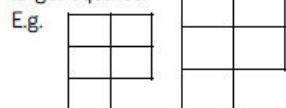
Discuss which has the larger area and why.

Look at the shapes and discuss what's the same and what's different?
Which shape has the largest area?

Work out the area of these shapes.
The shape is made of ___ squares.
The area of the shape is ___ square centimetres or ___ cm²
The shape is made of ___ squares.
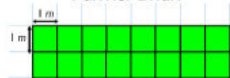The area of the shape is ___ square centimetres or ___ cm²

Farmer Greg and Farmer Brian are measuring their fields in square metres.

Farmer Greg   Farmer Brian

Whose field is larger?

What is the area of the playground in square metres?
Each square is worth 1 m²

Two children have measured the top of their desk. They used different sized squares.

Nima: The area of the table top is 7 squares.
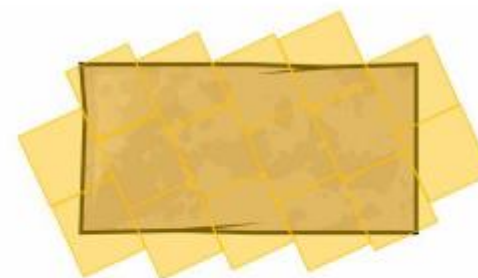
Jen: The area of the table top is 12 squares.

Who used the biggest squares? How do you know?

Mikey has taken a bite of the chocolate bar.

The chocolate bar was a rectangle. Can you work out how many squares of chocolate there were to start with?

Leona is finding the area of a floor tile.
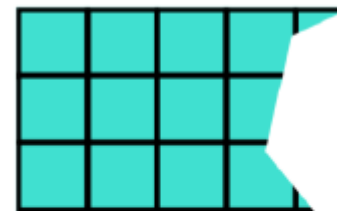
She says the area is 16 squares.

Do you agree?
Explain why.

Always, sometimes, never

If you draw a square on squared paper it will have an even area.

Prove it

This rectangle has had part of it ripped off.

What is the smallest number of squares it could have had?

What is the largest number of squares it could have had if its width was no more than 5 times larger that its height?

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You have 5 square cm tiles. How many different shapes can you make? Draw the shapes on 1 cm squared paper.

Use 16 identical squares. Take half of the squares to make a rectangle and the other half to make a different rectilinear shape.
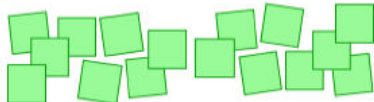
What's the same, what's different?

Max is building a patio made of 20 square slabs.
What could the patio look like?
Design it on squared paper.
Max is using 6 coloured square slabs in his design.
None of them are touching each other.
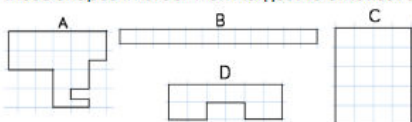Where could they be in the designs you have made?

Use the words 'greater than' and 'less than' to compare the rectilinear shapes.
Complete the sentence stems using < and >

_____ cm² ◯ _____ cm²   _____ cm² ◯ _____ cm²

Put these shapes in order from largest to smallest area.
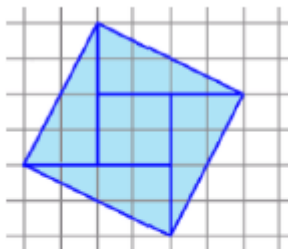
A   B   C

D

Here is a shape.
Draw a shape that has a smaller area but an area greater than 7 cm².
Draw a shape that has an equal area but looks different.

Work out the area of this shape.

Cut out the triangles and squares to make a new shape.
Can you make a rectangle?
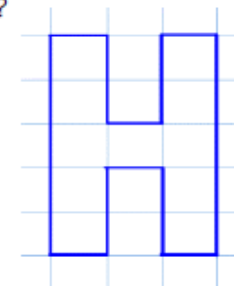Can you make a different rectangle?

Look at the shapes. Can you spot the pattern and explain how the area is changing each time?

Draw the next shape. What is its area?

Can you predict what the area of the 6th shape would be?

Can you spot any patterns in your answers?

Can you make some capital letters on squared paper using less than 20 squares?

Make a word from some and count the total area of the letters.
Which ones have a line of symmetry?
What is the area of half of each letter?

Use 12 plastic or card squares which are all exactly the same size.

How many different ways could you arrange them into a rectilinear shape with an area of 12 squares?

Shape C has been deleted!

Its area is bigger than B's but smaller than D's.

Can you draw what shape C could look like?

B   D

Shape A went missing too.
- It had the smallest area.
- It was symmetrical.

Can you draw what it could have looked like?

| **Week 3**	Convert between different units of measure [for example, **kilometre to metre;** hour to minute]
Children may mix up the relationships between the different units of measure. Children may struggle to apply their understanding of place value when dividing and multiplying by 10,100 and 1000. Children may struggle with the placement of the decimal place.	- To know the relationship between units of measure. - To know how to convert between different units of measure. - To develop the skill of converting between units of measure. - To understand how to convert between units of measure.
Fluency	**Reasoning**	**Problem Solving**

Complete the statements.

3000m = [ ] km

5km = [ ] m

500m = [ ] km

9500m = [ ] km

Complete the bar model.

3 kilometres
[ ]	1800 metres
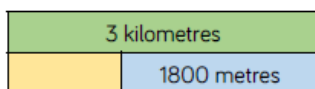
Use <, > or = to make the statements correct.

500m ◯ $\frac{1}{2}$ km

7km ◯ 800m

5km ◯ 500m

James and Sita do a sponsored walk for charity.

They walk 15km altogether.

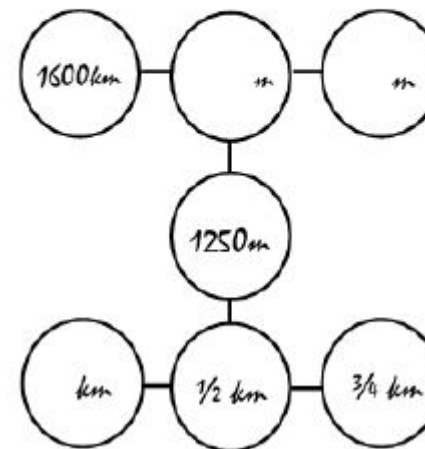James walks double the amount that Sita walks.

How far does Sita walk?

They each raise £1 for every 500m they walk.

How much money do they each make?

James _____   Sita _____

Complete the missing measurements so that each line of three gives a total distance of 2km.

1600km   ↑↑   ↑↑

1250m

km   ½ km   ¾ km

Week 4

Children may struggle to see the relationship between multiplication and addition.

Children may struggle to hold more than one piece of information at a time when using the distributive law.

Children may not have a secure understanding of the 4 operations and the relationships between them, so they struggle to find missing numbers.

Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

- To know the relationship between multiplication and division.
- To know how to use the distributive law.
- To know how to solve problems involving scaling.
- To understand how to solve problems involving scaling.
- To know how to solve correspondence problems.

Fluency	Reasoning	Problem Solving

Johnny says he can represent the total number of vertices of his shapes like this:

$4 \times 7 + 3 \times 3 = 37$

Find the total number of vertices for these sets of shapes in the same way

Use circles, squares and pentagons to represent the following total of vertices:

| 21 | 22 | 23 |

Using the 6 and 4 times tables how many different ways can you make a total of 40?
Represent this with manipulatives.

Using the vertices of squares and triangles, how many ways can you balance the equation?

= ____

Spiders have 8 legs and ants have 6 legs.

There are 288 legs in a vegetable patch.

How many spiders and ants could there be?

Week 5	Estimate and use inverse operations to check answers to a calculation.
Children may struggle to use what they know- such as rounding- to estimate answers. Children may struggle to estimate rather than accurately calculate. Children may not recognise the relationship between the numbers within an addition and subtraction/ multiplication and division calculations.	• To know how to estimate answers to calculations. • To understand how to estimate answers to calculations. • To know how to use the inverse operation. • To understand how to use the inverse operation. • To know how to check the accuracy of a calculation.

Fluency	**Reasoning**	**Problem Solving**

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Julie has 578 stamps, Heidi has 456 stamps. How many stamps do they have altogether? Show how you can check your answer using the inverse. Estimate the answers to these number sentences. Show your working. 3243 + 4428 7821- 2941 Check the answers to the following calculations using the inverse. Show all your working. 762 + 345 = 1107 2456- 734 = 1822	Always, sometimes, never. The difference between two odd numbers is odd. Hazel fills in this bar model | 2821	
2178	| She makes the following calculations from it. 2821 − 2178 = 757 2821 − 757 = 2178 2178 + 757 = 2821 757 + 2178 = 2821 Is she correct? Explain why.	Harry thinks of a number, he multiplies it by 3, adds 7 and then divides it by 2. How could he get back to his original number? If Harry starts with the number 3, write out all the calculations he will do to get back to his original number. With a friend, discuss before working each out which will be greater or smaller than the other. Why do you think this? What key facts did you use? 3567 − 567 ◯ 3677 − 344 4738 + 36 ◯ 4738 + 18 + 18 2139 − 85 + 27 ◯ 2151 − 86 + 30

Week 6	Assessment/ recapping/ misconceptions from the half term	
Fluency	**Reasoning**	**Problem Solving**