

<p>Resources</p> <p>100 squares, place value counters, place value grids, bar models, reasoning sentence openers</p> <p>Base10, place value charts, rulers, number lines that go below zero, rectangles, money, axis, place value counters, place value sliders</p>	<p>Links to prior learning/ objectives</p> <p>Compared and ordered numbers to 1,000. ~ used Base10 to represent Place value of ones, tens, hundreds and thousands. ~ focussed on multiplication facts for 2,5,10,3,4 and 8. ~ had experience of interpreting bar charts, pictograms and tables. ~ counted in multiples of 2,5 and 10 which link with the scales along a graph. ~ seen units of measure but as separate (4Kg and 600g), converting only simple known facts(1000g = 1kg/ 100cm=1m/ 10mm= 1cm/ 1000ml = 1l).</p> <p>Mastery: (where to find some resources)</p> <ul style="list-style-type: none"> • Teaching for Mastery • White Rose New and old documents • Mastery maths stickers • Nrich (curriculum mapping) 	<p>Vocabulary:</p> <p>Addition, add, plus, total, equals, altogether, equal to, subtract, minus, left, operation, inverse, steps, method, interpret, understand, present, discrete data, continuous data, graph, bar chart, compare, sum, difference, pictogram, table, time graph, survey, questionnaire</p>
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Objectives and Teaching

<p>Week 1</p> <p>Barriers to ARE (misconceptions)</p> <p>Place value understanding. Accuracy with counting Fluency with building ten Ability to exchange when necessary. Accuracy when completing column addition/ subtraction Reading and Interpreting word problems</p>	<p>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p> <ul style="list-style-type: none"> • To develop the skill of understanding the steps in 2 step problems • To understand which operation and method is needed in an operation • To develop the skill of solving 2 step problems • To develop the skill of explaining my methods to solve a problem
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<p>Fluency</p> <p>A shop has 8,435 magazines. 367 are sold in the morning and 579 are sold in the afternoon. How many magazines are left?</p>	<p>Problem Solving</p>	<p>Reasoning</p>
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Daniel buys a new laptop costing £1,265. He also buys a new mobile phone costing £492. What is the total cost? His friend, Paul, buys a smart watch for £342. How much money have they spent altogether?

- There are 2,452 people at a theme park. 538 are children, how many are adults?

Sarah draws a diagram to help.
Circle the correct diagram.

Adults	
2,452	538

2,452	
Adults	538

538	
2,452	Adults

Use the correct diagram to help you solve the problem.

Complete the missing numbers.

$$\begin{array}{r}
 4\boxed{6}\boxed{} \\
 +2\ 5\boxed{}\ 1 \\
 \hline
 \boxed{}\ 7\ 8\ 9
 \end{array}$$

There were 2,114 visitors to the museum on Saturday. 650 more people visited the museum on Saturday than on Sunday.



Altogether how many people visited the museum over the two days?

What do you need to do first to solve this problem?

Find the missing numbers that could go into the boxes.

Give reasons for your answers.

$$\boxed{} - 1,345 = 4\boxed{}6$$

What is the greatest number which could go in the first box?
What is the smallest?
How many possible answers could you have?
What is the pattern between the numbers?

Alice is trying to complete a sticker book.
 It needs 350 stickers overall.
 She has 134 in the book and a further 74 ready to stick in.
 How many more stickers will she need?

A supermarket has 1284 loaves of bread at the start of the day.
 During the day, 857 loaves are sold and a further 589 loaves are delivered.
 How many loaves of bread are there at the end of the day?

Jamal has £1000.



He buys a scooter for £345 and a skateboard for £110.

How much money does he have left?

Show 3 different methods of finding the answer.

Explain how you completed each one.

Which is the most effective method?

Archie and Sophie are both working out the answer to the following question

$$350 + 278 + 250$$

They have both used different strategies.

Archie's method	Sophie's method
$350 + 278 = 628$ $628 + 250 = 878$	$350 + 250 = 600$ $600 + 278 = 878$
Answer = 878	Answer = 878

Which do you prefer?

Explain why.

Use the method you preferred to solve

$$320 + 458 + 180$$

These three chicks lay some eggs.



Beth lays twice as many as Kelsey.
Caroline lays 4 more than Beth.
They lay 44 eggs in total.
How many eggs does Caroline lay?

In the number square below, each horizontal row and vertical column adds up to 1,200
Find the missing numbers.
Is there more than one option?

897		
		832
	762	

Check the rows and columns using the inverse and adding the numbers in different orders.



Three Primary Schools join together to go on a school visit to The Deep in Hull. 1,235 people go on the trip. There are 1,179 children and 27 teachers. The rest are parents.

How many parents are there?

What do you need to do first?

Which operation do you use?

Week 2

Barriers to ARE (misconceptions)

Counting in multiples of 2, 5, 10, 100, 50, 25.
 Reading and interpreting the axis of a graph.
 Interpreting what a graph demonstrates.
 Recognising the value of what something represents (picture in a pictogram).
 Reading and interpreting of questions

Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
 Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

- To know how to interpret discrete data charts
- To develop the skill of presenting discrete data
- To know how to interpret continuous data charts
- To develop the skill of presenting continuous data
- To develop the skill of solving comparison problems in data.
- To develop the skill of solving sum problems in data.
- To develop the skill of solving difference problems in data.

Fluency

Produce your own bar chart showing how the children in your class travel to school.

Problem Solving

Reasoning



Autumn 2 Year 4

- Here is a graph showing how a group of children travel to school.



Car Bus Walk Bike

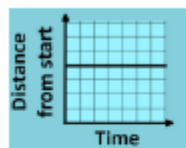
How many children get the bus to school?

What is the most/ least popular way to get to school?

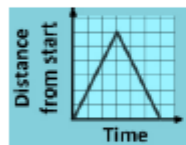
- Here is a table with data from a bakery on how many cakes they sold each day. Choose a way to represent this data.

M	T	W	Th	F	Sa	Su
34	43	46	55	72	86	76

- Can you match the graph to the activity?



A bike travels away from home at a steady speed



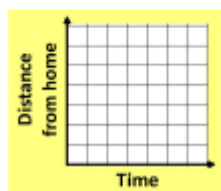
A car remains parked in a car park.



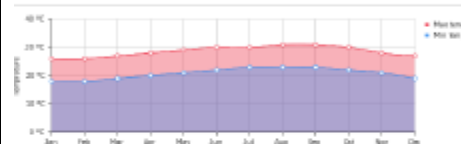
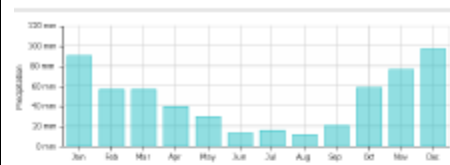
A runner runs at a steady pace to the end of a track and then runs back.

Draw a distance time graph to show the following story.

A man goes out for a walk with his dog. He stops at the shop to buy a paper. He walks home quickly.



- Here are two graphs showing the amount of precipitation and the temperature in Hawaii. What's the same and what's different?



Draw a graph that has both the rainfall and the maximum temperature on it. How could you complete the graph? How could you place both scales on one graph?

What do you notice about the different seasons in Hawaii? When is the most/least rainfall?

Choose your own place in the world and find out the rainfall and temperature. Plot it on a bar graph and time graph.

Week 3

Barriers to ARE (misconceptions)

Place value understanding.

Combining the decimal digits to read as 9.35 nine point thirty-five rather than nine point three five. Recognising that there are digits less than ones.

Round decimals with one decimal place to the nearest whole number

Compare numbers with the same number of decimal places up to two decimal places.

- To develop the skill of rounding decimals with one decimal place to the nearest whole number.
- To develop the skill of comparing numbers with the same number of decimal places up to two decimal places.



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Rounding understanding- recognising each whole number either side and not moving a whole one/ten/hundred/ tenth/ hundredths less. Recognising the number of digits per number and their value.

- To understand how to solve problems comparing numbers with the same number of decimal places.
- To understand how to solve problems rounding decimals to the nearest whole number.

Fluency

Round the following numbers to the nearest whole number:

3.2 =

4.7 =

25.5 =

Write all the decimals with one decimal place that round to 32 to the nearest whole number.

Sort the numbers below into the table rounding each of them to the nearest whole number.

23.1	23.2	24.4
23.5	23.4	24.3
23.9	22.8	22.5

Rounds to 23	Rounds to 24

Problem Solving

Roll two dice. Using the numbers make two numbers with one decimal place. Round the numbers to the nearest whole number. How many combinations of the two dice can you find that would round to the same whole number?



Using the digit cards below, how many numbers can you make with one decimal place that would round to 45. You can only use each card once per number.

3	4	4	5	6
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Can you make more or less numbers that round to 46?

If you were given this number card:

7

How many numbers could you make that round to 47?

Reasoning

Which decimals below round to 4 when rounded to the nearest whole number?

4.2, 3.8, 4.5, 3.5, 4.7

Explain your reasoning.

Two numbers with one decimal place both round to 23

The numbers add up to 46

What could the two numbers be?

Explain your thinking.



Autumn 2 Year 4

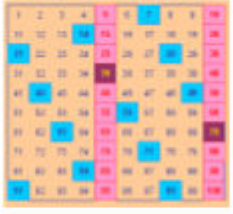
<p>Week 4</p> <p>Barriers to ARE (misconceptions)</p> <p>Difficulty with recalling multiplication facts especially 2,5,10.</p> <p>Ability to use what they know to create derived facts- 6×7 as 3×7 and 3×7.</p> <p>Ability to recognise patterns between multiplication facts.</p> <p>Seeing multiplying by 0 or 1 as no lots of or 1 lot of so the answer will be nothing or the same amount.</p> <p>Seeing dividing by 1 and sharing the amount into groups of 1 so the number of groups is the same as the amount.</p> <p>Keeping track of what they have multiplied when multiplying 3 numbers.</p>	<p>Count in multiples of 6, 7, 9, 25 and 1000.</p> <p>Recall multiplication and division facts for multiplication tables up to 12×12</p> <p>Use place value, known and derived facts to multiply and divide mentally, including:</p> <p>multiplying by 0 and 1; dividing by 1; multiplying together three numbers</p> <ul style="list-style-type: none"> • To develop the skill of counting in multiples of 6, 7, 9, 25 and 100. • To develop the skill of recalling multiplication facts to 12×12 • To develop the skill of recalling division facts for multiplications to 12×12 • To develop the skill of multiplying by 0 and 1 • To develop the skill of dividing by 1 • To develop the skill of multiplying 3 numbers
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<p style="text-align: center;">Fluency</p> <p>Find the next two numbers</p> <p>6, 12, 18, 24, 7, 14, 21, 28, 35, 9, 18, 27, 36 25, 50, 75, 5000, 6000, 7000</p> <p>Fill in the missing numbers:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>14</td> <td></td> <td>28</td> <td>35</td> <td></td> </tr> <tr> <td>100</td> <td></td> <td></td> <td>175</td> <td>200</td> </tr> </table>	14		28	35		100			175	200	<p style="text-align: center;">Problem Solving</p> <p>Mr Hamm has three disco lights. The first light shines for 3 seconds then is off for 3 seconds. The second light shines for 4 seconds then is off for four seconds. The third light shines for 5 seconds then is off for 5 seconds. All the lights have just come on. When is the first time all the lights will be off? When is the next time all the lights will come on at the same time?</p>	<p style="text-align: center;">Reasoning</p> <p>Always, Sometimes, Never</p> <p>Hayley is counting in 25s and 1,000s. She says:</p> <ul style="list-style-type: none"> - Multiples of 1,000 are also multiples of 25. - Multiples of 25 are therefore multiples of 1,000. <p>Are these statements always, sometimes or never true?</p> <p>Convince me that the number 14 will be in this sequence if it is continued. 49, 42, 35, 28</p>
14		28	35									
100			175	200								

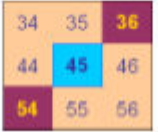
Hassan counts on in 25's from 250.
Circle the numbers he will say.

990, 125, 300, 440, 575, 700

Here is a hundred square.



Some numbers have been shaded in blue, and some in pink. Can you notice the pattern?
Why are some numbers maroon?



What is the same and what is different about these two number sequences?
6, 12, 18, 24, 30.....
45, 36, 27, 18, 9.....

Week 5
Barriers to ARE (misconceptions)
Struggle to see the link between place value/ base ten system and dividing by 10 or 100.
Ability to see how a non-decimal number becomes a decimal number after dividing by 10 or 100.
Understanding of the key facts with regards to conversion of units of measure.
Understanding of units of measure.

Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths




- To develop the skill of recognising ones, tenths and hundredths in a number
- To understand how to divide a one or two digit number by 10
- To understand how to divide a one or two digit number by 100

Fluency
Complete the table below:

Starting number	÷ 10	÷ 100
34		
57		
60		
7		

Problem Solving
Katya has multiplied a number by 100. Her answer is between 40 and 45.
What number could she have multiplied?
How many possibilities can you find?

Reasoning
I divide a number by 100 and the answer is 0.5.
What number did I start with?
Prove how you know

<p>Divide  by 10</p> <p>Complete the calculations</p> <ul style="list-style-type: none"> ○ $42 \div 10 =$ ○ $42 \div 100 =$ ○ $9 \div 10 =$ ○ $9 \div 100 =$ <p>What do you notice?</p>	<p>Use the number cards below to fill in the missing digits.</p> <p><input type="text"/> $0 \div 10 =$ <input type="text"/></p> <p><input type="text"/> $.4 \times 10 = 3$ <input type="text"/></p> <p><input type="text"/> 8 <input type="text"/> $\div 100 = 1$ <input type="text"/> 6</p> <p>5. <input type="text"/> $2 \times 100 =$ <input type="text"/> 7 <input type="text"/></p> <div style="display: flex; flex-wrap: wrap; justify-content: center; gap: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">9</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">7</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">3</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">2</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">1</div> </div> <div style="display: flex; flex-wrap: wrap; justify-content: center; gap: 10px; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">8</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">4</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">9</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">5</div> <div style="border: 1px solid black; padding: 5px; width: 30px; height: 30px; text-align: center; margin: 2px;">6</div> </div>	<p>True or False A two digit number divided by 10 always gives an answer with one decimal place. E.g. $52 \div 10 = 5.2$ Prove it.</p> <p>Jessie and Tammy are dividing numbers by 10 and 100. They start with the same 1 digit number.</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 10px auto;"> <p>My number has 0 ones and 4 tenths</p> </div> <div style="display: flex; justify-content: center; gap: 20px; margin: 10px auto;">   </div> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 10px auto;"> <p>My number has 0 ones, 0 tenths and 4 hundredths</p> </div> <p>What number did they start with? Prove it.</p>
<p>Week 6</p> <p>Barriers to ARE (misconceptions)</p> <p>Multiplication knowledge. Understanding of factors. Recognising that multiplication is commutative. Being able to use mental strategies- keep a track and remember the steps taken. Being able to articulate what steps they have completed mentally.</p>	<p>Recognise and use factor pairs and commutativity in mental calculations</p> <ul style="list-style-type: none"> • To understand what a factor pair is • To recognise factor pairs in mental calculations • To recognise commutativity in mental calculations 	
<p>Fluency</p>	<p>Problem Solving</p>	<p>Reasoning</p>



Autumn 2 Year 4

Use 16 cubes.



How many different arrays can you make?

Think about making towers of cubes that are equal in height.

Can you write a multiplication sentence to describe the towers?

The numbers in your multiplication sentences are the factors of 16!

$$7 \times 5 = \square = 5 \times \square$$

Find the missing numbers

$$12 \times 6 = 6 \times \underline{\quad}$$

$$2 \times 3 \times 5 = \underline{\quad} \times 5$$

$$2 \times 7 \times 5 = \underline{\quad} \times 5$$

13 x 12 can be solved by using factor pairs, eg 13 x 3 x 4 or 13 x 2 x 6.

What factor pair could you use to solve 17 x 8?

Place <, >, or = in these number sentences to make them correct:

$$50 \times 4 \square 4 \times 50$$

$$4 \times 50 \square 40 \times 5$$

$$200 \times 5 \square 3 \times 300$$

The school has a singing group of more than 12 singers but less than 32.

They sing together in different ways.

Sometimes they sing in pairs and sometimes in groups of 3, 4 or 6.

Whatever size groups they are in, no one is left out and everyone is singing.

How many singers are there in the school choir?



Fill in the missing numbers

$$25 \times 3 = \square \times \square \times \square$$

Use factor pairs to solve 15 x 8. Is there more than one way you can do it?

- Multiply a number by itself and then make one factor one more and the other one less. What do you notice? Does this always happen?

$$\text{Eg } 4 \times 4 = 16$$

$$6 \times 6 = 36$$

$$5 \times 3 = 15$$

$$7 \times 5 = 35$$

Try out more examples to prove your thinking.

Week 7

Barriers to ARE (misconceptions)

Key skills and going over misconceptions from the term

Fluency

Problem Solving

Reasoning