New for 2020/21

2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

★ highlight key teaching points
★ recap essential content that children may have forgotten
★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.

Lesson-by-lesson overviews

We’ve always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we’ve listened! We’ve now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won’t suit everyone, but if it works for you, then please do make use of this resource as much as you wish.
Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete – Pictorial – Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children’s understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.
Supporting resources

We have produced supporting resources for every small step from Year 1 to Year 11.

The worksheets are provided in three different formats:

• Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
• Display version – great for schools who want to cut down on photocopying.
• PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at support@whiterosemaths.com
Meet the Characters

Children love to learn with characters and our team within the scheme will be sure to get them talking and reasoning about mathematical concepts and ideas. Who’s your favourite?

Teddy  Rosie  Mo  Eva  Alex
Jack  Whitney  Amir  Dora  Tommy
Dexter  Ron  Annie
## WRM – Year 5 – Scheme of Learning 2.0s

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number: Place Value</td>
<td>Number: Addition and Subtraction</td>
<td>Statistics</td>
<td>Number: Multiplication and Division</td>
<td>Measurement: Perimeter and Area</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Spring</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Number: Multiplication and Division</td>
<td>Number: Fractions</td>
<td></td>
<td></td>
<td>Number: Decimals and Percentages</td>
<td>Consolidation</td>
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<tr>
<td>Summer</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Measurement: Converting Units</td>
<td>Measurement: Volume</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consolidation</td>
<td>Number: Decimals</td>
<td>Geometry: Properties of Shape</td>
<td>Geometry: Position and Direction</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Overview

### Small Steps

<table>
<thead>
<tr>
<th>Topic</th>
<th>Notes for 2020/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000s, 100s, 10s and 1s</td>
<td>Before exploring numbers to 10,000 ensure that children are secure with 1000s,</td>
</tr>
<tr>
<td>Numbers to 10,000</td>
<td>100s, 10 and 1s.</td>
</tr>
<tr>
<td>Rounding to the nearest 10</td>
<td>You may also find it useful to recap rounding to the nearest 10 and 100</td>
</tr>
<tr>
<td>Rounding to the nearest 100</td>
<td>separately before expecting children to round to either 10, 100 and 1,000.</td>
</tr>
<tr>
<td>Round to nearest 10, 100 and 1,000</td>
<td>Work on Roman Numerals has been moved to the end of the block as we believe it</td>
</tr>
<tr>
<td>Numbers to 100,000</td>
<td>is important for children to be secure with our own number system before</td>
</tr>
<tr>
<td>Compare and order numbers to 100,000</td>
<td>exploring another.</td>
</tr>
<tr>
<td>Round numbers within 100,000</td>
<td></td>
</tr>
<tr>
<td>Numbers to a million</td>
<td></td>
</tr>
<tr>
<td>Counting in 10s, 100s, 1,000s, 10,000s, and 100,000s</td>
<td></td>
</tr>
<tr>
<td>Compare and order numbers to one million</td>
<td></td>
</tr>
<tr>
<td>Round numbers to one million</td>
<td></td>
</tr>
<tr>
<td>Negative numbers</td>
<td></td>
</tr>
<tr>
<td>Roman Numerals to 1,000</td>
<td></td>
</tr>
</tbody>
</table>
1,000s, 100s, 10s and 1s

Notes and Guidance

Children represent numbers to 9,999, using concrete resources on a place value grid. They understand that a four-digit number is made up of 1,000s, 100s, 10s and 1s.

Moving on from Base 10 blocks, children start to partition by using place value counters and digits.

Mathematical Talk

Can you represent the number on a place value grid? How many thousands/hundreds/tens/ones are there?

How do you know you have formed the number correctly? What could you use to help you?

How is the value of zero represented on a place value grid or in a number?

Varied Fluency

Complete the sentences.

There are _____ thousands, _____ hundreds, _____ tens and _____ ones.

The number is _____.

___ + ___ + ___ + ___ = ___

Complete the part-whole model for the number represented.

What is the value of the underlined digit in each number?

6,983  9,021  789  6,570

Represent each of the numbers on a place value grid.
Create four 4-digit numbers to fit the following rules:

- The tens digit is 3
- The hundreds digit is two more than the ones digit
- The four digits have a total of 12

Possible answers:

- 3,432
- 5,331
- 1,533
- 7,230

Use the clues to find the missing digits.

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  [ ] [ ] [ ] [ ]
```

The thousands and tens digit multiply together to make 36

The hundreds and tens digit have a digit total of 9

The ones digit is double the thousands digit.

The whole number has a digit total of 21

4,098
Numbers to 10,000

Notes and Guidance

Children use concrete manipulatives and pictorial representations to recap representing numbers up to 10,000.

Within this step, children must revise adding and subtracting 10, 100, and 1,000.

They discuss what is happening to the place value columns, when carrying out each addition or subtraction.

Mathematical Talk

Can you show me 8,045 (any number) in three different ways?

Which representation is the odd one out? Explain your reasoning.

What number could the arrow be pointing to?

Which column(s) change when adding 10, 100, 1,000 to 2,506?

Varied Fluency

Match the diagram to the number.

Which diagram is the odd one out?

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>Add 10</th>
<th>Add 100</th>
<th>Add 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,506</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,070</td>
<td></td>
</tr>
</tbody>
</table>
Dora has made five numbers, using the digits 1, 2, 3 and 4.

She has changed each number into a letter.

Her numbers are: 44,213, 43,123, 13,424, 31,413, 21,442

Tommy says he can order the following numbers by only looking at the first three digits:

- 12,516
- 12,832
- 12,679
- 12,538
- 12,794

Is he correct?

Explain your answer.

He is incorrect because two of the numbers start with twelve thousand, five hundred therefore you need to look at the tens to compare and order.
Round to the Nearest 10

Notes and Guidance

Children start to look at the position of a 2-digit number on a number line. They then apply their understanding to 3-digit numbers, focusing on the number of ones and rounding up or not.

Children must understand the importance of 5 and the idea that although it is in the middle of 0 and 10, that by convention any number ending in 5 is always rounded up, to the nearest 10.

Mathematical Talk

What is a multiple of 10?

Which multiples of 10 does ___ sit between?

Which column do we look at when rounding to the nearest 10?

What do we do if the number in that column is a 5?

Which number is being represented? Will we round it up or not? Why?

Varied Fluency

- Which multiples of 10 do the numbers sit between?

- Say whether each number on the number line is closer to 160 or 170?

Round 163, 166 and 167 to the nearest 10

- Complete the table:

<table>
<thead>
<tr>
<th>Start number</th>
<th>Rounded to the nearest 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 100 100 10 1 1</td>
<td></td>
</tr>
<tr>
<td>100 100 100 10 1 1 1</td>
<td></td>
</tr>
<tr>
<td>851</td>
<td></td>
</tr>
<tr>
<td>XCVIII</td>
<td></td>
</tr>
</tbody>
</table>
### Round to the Nearest 10

#### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>A whole number is rounded to 370</th>
<th>365</th>
<th>366</th>
<th>367</th>
<th>368</th>
<th>369</th>
<th>370</th>
<th>371</th>
<th>372</th>
<th>373</th>
<th>374</th>
</tr>
</thead>
<tbody>
<tr>
<td>What could the number be?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Write down all the possible answers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>370</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Two different two-digit numbers both round to 40 when rounded to the nearest 10</th>
<th>35 + 44 = 79</th>
<th>36 + 43 = 79</th>
<th>37 + 42 = 79</th>
<th>38 + 41 = 79</th>
<th>39 + 40 = 79</th>
</tr>
</thead>
<tbody>
<tr>
<td>The sum of the two numbers is 79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What could the two numbers be?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there more than one possibility?</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Whitney says:**

847 to the nearest 10 is 840

---

**Do you agree with Whitney?**

**Explain why.**

---

**I don’t agree with Whitney because:**

847 rounded to the nearest 10 is 850. I know this because ones ending in 5, 6, 7, 8 and 9 round up.
Round to the Nearest 100

Notes and Guidance

Children compare rounding to the nearest 10 (looking at the ones column) to rounding to the nearest 100 (looking at the tens column.)

Children use their knowledge of multiples of 100, to understand which two multiples of 100 a number sits between. This will help them to round 3-digit numbers to the nearest 100

Mathematical Talk

What’s the same/different about rounding to the nearest 10 and nearest 100? Which column do we need to look at when rounding to the nearest 100?

Why do numbers up to 49 round down to the nearest 100 and numbers 50 to 99 round up?

What would 49 round to, to the nearest 100?

Can the answer be 0 when rounding?

Varied Fluency

Which multiples of 100 do the numbers sit between?

810 820 830 840 850 860 870 880 890

Say whether each number on the number line is closer to 500 or 600.

500 535 556 568 600

Round 535, 556 and 568 to the nearest 100

Use the stem sentence: ____ rounded to the nearest 100 is ____.

Complete the table:

<table>
<thead>
<tr>
<th>Start number</th>
<th>Rounded to the nearest 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>994</td>
<td></td>
</tr>
<tr>
<td>XLV</td>
<td></td>
</tr>
</tbody>
</table>
## Round to the Nearest 100

### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Always, Sometimes, Never</th>
<th>Always – a number with five in the tens column will be 50 or above so will always round up. Sometimes – a number with five in the ones column might have 0 to 4 in the tens column (do not round up) or 5 to 9 (round up). Sometimes – a number with five in the hundreds column will also round up or down dependent on the number in the tens column.</th>
<th>When a whole number is rounded to the nearest 100, the answer is 200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explain your reasons for each statement.</td>
<td>When the same number is rounded to the nearest 10, the answer is 250</td>
</tr>
<tr>
<td></td>
<td>• A number with a five in the tens column rounds up to the nearest hundred.</td>
<td>What could the number be?</td>
</tr>
<tr>
<td></td>
<td>• A number with a five in the ones column rounds up to the nearest hundred.</td>
<td>Is there more than one possibility?</td>
</tr>
<tr>
<td></td>
<td>• A number with a five in the hundreds column rounds up to the nearest hundred.</td>
<td>Using the digit cards 0 to 9, can you make whole numbers that fit the following rules? You can only use each digit once.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. When rounded to the nearest 10, I round to 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. When rounded to the nearest 10, I round to 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. When rounded to the nearest 100, I round to 700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To 20, it could be 15 to 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To 10, it could be 5 to 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To 700, it could be 650 to 749</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use each digit once: 5, 24, 679 or 9, 17, 653 etc.</td>
</tr>
</tbody>
</table>

To 20, it could be 15 to 24
To 10, it could be 5 to 14
To 700, it could be 650 to 749
Use each digit once: 5, 24, 679 or 9, 17, 653 etc.
Round to 10, 100 and 1,000

Notes and Guidance

Children build on their knowledge of rounding to 10, 100 and 1,000 from Year 4. They need to experience rounding up to and within 10,000.

Children must understand that the column from the question and the column to the right of it are used e.g. when rounding 1,450 to the nearest hundred – look at the hundreds and tens columns. Number lines are a useful support.

Mathematical Talk

Which place value column do we need to look at when we round to the nearest 1,000?

When is it best to round to the nearest 10? 100? 1,000?
Can you give an example of this?
Can you justify your reasoning?

Is there more than one solution?
Will the answers to the nearest 100 and 1,000 be the same or different for the different start numbers?

Varied Fluency

**Complete the table.**

<table>
<thead>
<tr>
<th>Start Number</th>
<th>Rounded to the nearest 10</th>
<th>Rounded to the nearest 100</th>
<th>Rounded to the nearest 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCCLXIX</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**For each number, find five numbers that round to it when rounding to the nearest 100**

<table>
<thead>
<tr>
<th>Start Number</th>
<th>Nearest 10</th>
<th>Nearest 100</th>
<th>Nearest 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>365</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,242</td>
<td></td>
<td></td>
<td>4,770</td>
</tr>
</tbody>
</table>

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Rounding to 10, 100 and 1,000

Reasoning and Problem Solving

My number rounded to the nearest 10 is 1,150
Rounded to the nearest 100 it is 1,200
Rounded to the nearest 1,000 it is 1,000

Jack

1,150
1,151
1,152
1,153
1,154

What could Jack's number be?
Can you find all of the possibilities?

2,567 to the nearest 100 is 2,500

I do not agree with Whitney because 2,567 rounded to the nearest 100 is 2,600. I know this because if the tens digit is 5, 6, 7, 8 or 9 we round up to the next hundred.

Whitney

4,725 to the nearest 1,000 is 5,025

Teddy has correctly changed four thousand to five thousand but has added the tens and the ones back on. When rounding to the nearest thousand, the answer is always a multiple of 1,000

Teddy

Explain the mistake Teddy has made.
Numbers to 100,000

Notes and Guidance

Children focus on numbers up to 100,000
They represent numbers on a place value grid, read and write
numbers and place them on a number line to 100,000

Using a number line, they find numbers between two points,
place a number and estimate where larger numbers will be.

Mathematical Talk

How can the place value grid help you to add 10, 100 or 1,000
to any number?
How many digits change when you add 10, 100 or 1,000? Is it
always the same number of digits that change?
How can we represent 65,048 on a number line?
How can we estimate a number on a number line if there are
no divisions?
Do you need to count forwards and backwards to find out if a
number is in a number sequence? Explain.

Varied Fluency

A number is shown in the place value grid.

<table>
<thead>
<tr>
<th>10,000s</th>
<th>1,000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Write the number in figures and in words.
• Alex adds 10 to this number
• Tommy adds 100 to this number
• Eva adds 1,000 to this number
Write each of their new numbers in figures and in words.

Complete the grid to show the same number in different ways.

<table>
<thead>
<tr>
<th>Counters</th>
<th>Part-whole model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar model</td>
<td>Number line</td>
</tr>
</tbody>
</table>

65,048

Complete the missing numbers.
59,000 = 50,000 + _____
_____ = 30,000 + 1,700 + 230
75,480 = _____ + 300 + _____
Here is a number line.

A = 2,800
B = 2,760

What is the value of A?

B is 40 less than A.
What is the value of B?

C is 500 less than B.
Add C to the number line.

Here are three ways of partitioning 27,650

27 thousands and 650 ones
27 thousands, 5 hundreds and 150 ones
27 thousands and 65 tens

Write three more ways

Possible answers:

2 ten thousands, 6 hundreds and 5 tens
20 thousands, 7 thousands and 650 ones

Rosie counts forwards and backwards in 10s from 317

Circle the numbers Rosie will count.

427 997 –7
1,666 3,210 5,627
–23 7 –3

Any positive number will have to end in a 7
Any negative number will have to end in a 3
**Compare and Order**

**Notes and Guidance**

Children will compare and order numbers up to 100,000 by applying their understanding from Year 4 and how numbers can be represented in different ways.

Children should be able to compare and order numbers presented in a variety of ways, e.g. using place value counters, part-whole models, Roman numerals etc.

**Mathematical Talk**

In order to compare numbers, what do we need to know?

What is the value of each digit in the number 63,320?

What is the value of _____ in this number?

What is the value of the whole? Can you suggest other parts that make the whole?

What number does MMXVII represent?

**Varied Fluency**

- Put these numbers in ascending order.

```
<table>
<thead>
<tr>
<th>10,000s</th>
<th>1,000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>32,130</td>
<td>31,202</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

- Add the symbol <, > or = to make the statement correct.

- Use six counters to make five different 5-digit numbers.

<table>
<thead>
<tr>
<th>10,000s</th>
<th>1,000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Place the digits cards 0 to 9 face down and select five of them.

Make the greatest number possible and the smallest number possible.

How do you know which is the greatest or smallest?

Dependent on numbers chosen.

- Smallest: 12,349
- Greatest: 94,321

I know this is the greatest number because the digit cards with the larger numbers are in the place value columns with the greater values.

Using the digit cards 0 to 9, create three different 5-digit numbers that fit the following clues:

- The digit in the hundreds column and the ones column have a difference of 2
- The digit in the hundreds column and the ten thousands column has a difference of 2
- The sum of all the digits totals 19

Possible answers include:

- 47,260
- 56,341
- 18,325
- 20,476
Round within 100,000

Notes and Guidance

Children continue to work on rounding, now using numbers up to 100,000. Children use their knowledge of multiples of 10, 100, 1,000 and 10,000 to work out which two numbers the number they are rounding sits between. A number line is a good way to visualise which multiple is the nearest. Children may need reminding of the convention of rounding up if numbers are exactly halfway.

Mathematical Talk

Which place value column do we need to look at when we round to the nearest 1,000?

Why would we round these distances to the nearest 1,000 miles?

When is it best to round to 10? 100? 1,000? Can you give an example of this? Can you justify your reasoning?

Varied Fluency

Round 85,617
- To the nearest 10
- To the nearest 100
- To the nearest 1,000
- To the nearest 10,000

Round the distances to the nearest 1,000 miles.

<table>
<thead>
<tr>
<th>Destination</th>
<th>Miles from Manchester airport</th>
<th>Miles to the nearest 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>3,334</td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>10,562</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>5,979</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>11,550</td>
<td></td>
</tr>
</tbody>
</table>

Complete the table.

<table>
<thead>
<tr>
<th>Rounded to the nearest 100</th>
<th>Start Number</th>
<th>Rounded to the nearest 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28,632</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55,555</td>
<td></td>
</tr>
</tbody>
</table>

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## Round within 100,000

### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Round 59,996 to the nearest 1,000</th>
<th>Both numbers round to 60,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round 59,996 to the nearest 10,000</td>
<td>Other examples:</td>
</tr>
<tr>
<td></td>
<td>19,721 to the nearest 1,000 and 10,000</td>
</tr>
<tr>
<td></td>
<td>697 to the nearest 10 and 100</td>
</tr>
<tr>
<td></td>
<td>22,982 to the nearest 100 and 1,000</td>
</tr>
</tbody>
</table>

What do you notice about the answers?

Can you think of three more numbers where the same thing could happen?

Two 5-digit numbers have a difference of five.

When they are both rounded to the nearest thousand, the difference is 1,000.

What could the numbers be?

<table>
<thead>
<tr>
<th>Two numbers with a difference of five where the last three digits are between 495 and 504</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. 52,498 and 52,503</td>
</tr>
</tbody>
</table>
**Numbers to One Million**

**Notes and Guidance**

Children read, write and represent numbers to 1,000,000.

They will recognise large numbers represented in a part-whole model, when they are partitioned in unfamiliar ways.

Children need to see numbers represented with counters on a place value grid, as well as drawing the counters.

**Mathematical Talk**

If one million is the whole, what could the parts be?

Show me 800,500 represented in three different ways. Can 575,400 be partitioned into 4 parts in a different way?

Where do the commas go in the numbers? How does the place value grid help you to represent large numbers?

Which columns will change in value when Eva adds 4 counters to the hundreds column?

**Varied Fluency**

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>T</td>
</tr>
<tr>
<td>32,651</td>
<td>456,301</td>
</tr>
</tbody>
</table>

Use counters to make these numbers on the place value chart.

Can you say the numbers out loud?

Complete the following part-whole diagrams.

Eva has the following number.

She adds 4 counters to the hundreds column. What is her new number?

©White Rose Maths
Describe the value of the digit 7 in each of the following numbers. How do you know?

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>407,338</td>
<td>407,338: The value is 7 thousand. It is to the left of the hundreds column.</td>
</tr>
<tr>
<td>700,491</td>
<td>700,491: The value is 7 hundred thousand. It is a 6-digit number and there are 5 other numbers in place value columns to the right of this number.</td>
</tr>
<tr>
<td>25,571</td>
<td>25,571: The value is 7 tens. It is one column to the left of the ones column.</td>
</tr>
</tbody>
</table>

The bar models are showing a pattern.

40,000

25,000 | 15,000

40,000

20,000 | 20,000

40,000

15,000 | 25,000

Draw the next three.

Create your own pattern of bar models for a partner to continue.
Counting in Powers of 10

Notes and Guidance

Children complete number sequences and can describe the term-to-term rule e.g. add ten each time. It is important to include sequences that go down as well as those that go up.

They count forwards and backwards in powers of ten up to 1,000,000

Mathematical Talk

Will there be any negative numbers in this sequence?

What pattern do you begin to see with the positive and negative numbers in the sequence?

What patterns do you notice when you compare sequences increasing or decreasing in 10s, 100s, 1,000s etc.?

Can you create a rule for the sequence?

Varied Fluency

Complete the sequence.

___, ___, 2, ___ , 22, ___, 42, ___, ___, 72

The rule for the sequence is ____________.

Circle and correct the mistake in each sequence.

- 7,875, 8,875, 9,875, 11,875, 12,875, 13,875, ...
- 864,664, 764,664, 664,664, 554,664, 444,664, ...

Here is a Gattegno chart showing 32,450

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>900</td>
</tr>
<tr>
<td>1,000</td>
<td>2,000</td>
<td>3,000</td>
<td>4,000</td>
<td>5,000</td>
<td>6,000</td>
<td>7,000</td>
<td>8,000</td>
<td>9,000</td>
</tr>
<tr>
<td>10,000</td>
<td>20,000</td>
<td>30,000</td>
<td>40,000</td>
<td>50,000</td>
<td>60,000</td>
<td>70,000</td>
<td>80,000</td>
<td>90,000</td>
</tr>
</tbody>
</table>

Cards

| +10 | −10 |
| +100| −100|
| +1,000| −1,000|
| +10,000| −10,000|

Give children a target number to make then let them choose a card. Children then need to adjust their number on the chart.
Counting in Powers of 10

Reasoning and Problem Solving

Amir writes the first five numbers of a sequence.

They are 3,666, 4,666, 5,666, 6,666, 7,666

The 10th term is 12,666 because Amir is adding 1,000 each time. He should have added 5,000 not doubled the 5th term.

The 10th term will be 15,322 because I will double the 5th term.

Amir

Is he correct? Explain why.

Rosie has made a mistake. She is counting in 100s; therefore the ones column should never change.

I am counting up in 10s from 184
I will include 224

Mo

I am counting up in 100s from 604
I will include 1,040

Rosie

Jack has also made a mistake as he is counting in 1,000s, so the tens and ones columns won't change.

I am counting up in 1,000s from 13
I will include 130,000

Jack

Who has made a mistake? Identify anyone who has made a mistake and explain how you know.
**Compare and Order**

**Notes and Guidance**

Children compare and order numbers up to 1,000,000 using comparison vocabulary and symbols.

They use a number line to compare numbers, and look at the importance of focusing on the column with the highest place value when comparing numbers.

**Mathematical Talk**

What do we need to know to be able to compare and order large numbers?

Why can’t we just look at the thousands columns when we are ordering these five numbers?

What is the value of each digit?

What is the value of ____ in this number?

What is the value of the whole? Can you suggest other parts that make the whole?

Can you write a story to support your part-whole model?

**Varied Fluency**

- Put the number cards in order of size.

  13,010  13,100  13,011  13,110  13,111

- Estimate the values of A, B and C.

  A  B  C

- Here is a table showing the population in areas of Yorkshire.

<table>
<thead>
<tr>
<th>Area</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halifax</td>
<td>88,134</td>
</tr>
<tr>
<td>Brighouse</td>
<td>32,360</td>
</tr>
<tr>
<td>Leeds</td>
<td>720,492</td>
</tr>
<tr>
<td>Huddersfield</td>
<td>146,234</td>
</tr>
<tr>
<td>Wakefield</td>
<td>76,886</td>
</tr>
<tr>
<td>Bradford</td>
<td>531,200</td>
</tr>
</tbody>
</table>

Use <, > or = to make the statements correct.

The population of Halifax ___ the population of Wakefield.

Double the population of Brighouse ___ the population of Halifax.
**Compare and Order**

**Reasoning and Problem Solving**

The missing number is an odd number. When rounded to the nearest 10,000 it is 440,000.
The sum of the digits is 23.

<table>
<thead>
<tr>
<th>475,000</th>
<th>?</th>
<th>407,500</th>
</tr>
</thead>
</table>

Greatest | Smallest

What could the number be?
Can you find three possibilities?

Possible answers include:
444,812
435,812
439,502

Here are four number cards.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>42,350</td>
<td>43,385</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>56,995</td>
<td>56,963</td>
</tr>
</tbody>
</table>

Four children take one each and say a clue.

- **Mo:** My number is 57,000 when rounded to the nearest 100.
- **Rosie:** My number has exactly three hundreds in it.
- **Jack:** My number is 43,000 when rounded to the nearest thousand.
- **Dora:** My number is exactly 100 less than 57,063.

Which card did each child have?
Round within a Million

Notes and Guidance
Children use numbers with up to six digits, to recap previous rounding, and learn the new skill of rounding to the nearest 100,000

They look at cases when rounding a number for a purpose, including certain contexts where you round up when you wouldn’t expect two e.g. to pack 53 items in boxes of 10 you would need 6 boxes.

Mathematical Talk
How many digits does one million have?
Why are we rounding these populations to the nearest 100,000?
Can you partition the number ______ in different ways?

Which digits do you need to look at when rounding to the nearest 10? 100? 1,000? 10,000? 100,000?

How do you know which has the greatest value? Show me.

Varied Fluency
Round these populations to the nearest 100,000

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
<th>Rounded to the nearest 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds</td>
<td>720,492</td>
<td></td>
</tr>
<tr>
<td>Durham</td>
<td>87,559</td>
<td></td>
</tr>
<tr>
<td>Sheffield</td>
<td>512,827</td>
<td></td>
</tr>
<tr>
<td>Birmingham</td>
<td>992,000</td>
<td></td>
</tr>
</tbody>
</table>

Round 450,985 to the nearest
- 10
- 100
- 1,000
- 10,000
- 100,000

At a festival, 218,712 people attend across the weekend. Tickets come in batches of 100,000
How many batches should the organisers buy?
## Round within a Million

### Reasoning and Problem Solving

| The difference between two 3-digit numbers is two. | 499 and 501  
498 and 500 | When the difference between A and B is rounded to the nearest 100, the answer is 700  
When the difference between B and C is rounded to the nearest 100, the answer is 400  
A, B and C are not multiples of 10  
What could A, B and C be? | A $-\; B$ is between 650 to 749  
B has to be greater than 400 to complete  
$B - C = 400$  
Possible answer:  
A = 1,241  
B = 506  
C = 59 |
Negative Numbers

Notes and Guidance

Children continue to explore negative numbers and their position on a number line.

They need to see and use negative numbers in context, such as temperature, to be able to count back through zero. They may need to be reminded to call them negative numbers e.g. “negative four” rather than “minus four.”

Mathematical Talk

Do we include zero when counting backwards?
Which is the coldest/warmest temperature?
How can we estimate where a number goes on this number line?
Does it help to estimate where zero goes first? Why?

What was the temperature increase/decrease? Can you show how you know the increase/decrease on a number line?

Varied Fluency

Here are three representations for negative numbers.

What is the same and what is different about each representation?

Estimate and label where 0, −12 and −20 will be on the number line.

Whitney visits a zoo.
The rainforest room has a temperature of 32°C
The Arctic room has a temperature of −24°C
Show the difference in room temperatures on a number line.
False: the difference is 30 degrees because it is 5 degrees from −5 to 0. Added to 25 totals 30.

False: it is negative 10 because the steps are going further away from zero.

True

Children may use concrete or pictorial resources to explain.

Put these statements in order so that the answers are from smallest to greatest.

• The difference between −24 and −76
• The even number that is less than −18 but greater than −22
• The number that is half way between 40 and −50
• The difference between −6 and 7

Ordered: −20, −5, 13, 52
Roman Numerals

Notes and Guidance

Building on their knowledge of Roman Numerals to 100, from Year 4, children explore Roman Numerals to 1,000.

They explore what is the same and what is different about the number systems, for example there is no zero in the Roman system.

Writing the date in Roman Numerals could be introduced and so this concept can be revisited every day.

Mathematical Talk

Why is there no zero in Roman Numerals?

Do you notice any patterns in the Roman number system?

How can you check you have represented the Roman Numeral correctly?

Can you use numbers you know, such as 1, 10 and 100 to help you?

Varied Fluency

Lollipop stick activity. The teacher shouts out a number and the children make it with lollipop sticks. Children could also do this in pairs or groups, or for a bit of fun they could test the teacher!

Each diagram shows a number in digits, words and Roman Numerals.

Complete the diagrams.

Complete the function machines.

\[
\begin{align*}
&\text{CCC} \quad + 10 \quad \longrightarrow \quad \text{DCLXXV} \\
&\text{---} \quad - 1 \quad \longrightarrow \quad \text{---}
\end{align*}
\]
Roman Numerals

Reasoning and Problem Solving

Solve

**CCCL + CL =**

How many calculations, using Roman Numerals, can you write to get the same total?

Possible answers:

- CD + C
- M ÷ II
- C + CC + CC
- C × V

Here is part of a Roman Numerals hundred square.

Complete the missing values.

<table>
<thead>
<tr>
<th>XLIV</th>
<th>XLV</th>
<th>XLVII</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LVI</td>
<td></td>
</tr>
<tr>
<td>LXIV</td>
<td>LXVI</td>
<td>LXVII</td>
</tr>
</tbody>
</table>

What patterns do you notice?

Missing Roman Numerals from the top row and left to right:

- XLVI
- LIV
- LV
- LXV