Block 1 – Place Value

Year 3/4

#MathsEveryoneCan

2019-20
How to use the mixed-age SOL

In this document, you will find suggestions of how you may structure a progression in learning for a mixed-age class.

Firstly, we have created a yearly overview.

<table>
<thead>
<tr>
<th>Autumn</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Number: Place Value</td>
</tr>
<tr>
<td></td>
<td>Y1: Numbers to 20, Y2: Numbers to 100</td>
</tr>
<tr>
<td></td>
<td>Number: Addition and Subtraction</td>
</tr>
<tr>
<td></td>
<td>Year 1: Numbers within 20 (including recognising money)</td>
</tr>
<tr>
<td></td>
<td>Year 2: Numbers within 100 (including money)</td>
</tr>
<tr>
<td></td>
<td>Number: Year 1: Place Value to 50 and Multiplication</td>
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<tr>
<td></td>
<td>Year 2: Multiplication</td>
</tr>
<tr>
<td></td>
<td>Consolidation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Number: Year 1: Division</td>
</tr>
<tr>
<td></td>
<td>Year 1: Place Value to 100</td>
</tr>
<tr>
<td></td>
<td>Year 2: Statistics</td>
</tr>
<tr>
<td></td>
<td>Geometry: Year 1: Shape and Consolidation</td>
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<tr>
<td></td>
<td>Year 2: Properties of Shape</td>
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<tr>
<td></td>
<td>Number: Year 1: Fractions and Consolidation</td>
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<tr>
<td></td>
<td>Year 2: Fractions</td>
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<tr>
<td></td>
<td>Consolidation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Summer</th>
<th></th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Geometry: Position and Direction</td>
</tr>
<tr>
<td></td>
<td>Measurement: Time</td>
</tr>
<tr>
<td></td>
<td>Problem solving and efficient methods</td>
</tr>
<tr>
<td></td>
<td>Measurement: Year 1: Weight and Volume</td>
</tr>
<tr>
<td></td>
<td>Year 2: Mass, Capacity and Temperature</td>
</tr>
<tr>
<td></td>
<td>Consolidation and Investigations</td>
</tr>
</tbody>
</table>

Each term has 12 weeks of learning. We are aware that some terms are longer and shorter than others, so teachers may adapt the overview to fit their term dates.

The overview shows how the content has been matched up over the year to support teachers in teaching similar concepts to both year groups. Where this is not possible, it is clearly indicated on the overview with 2 separate blocks.

For each block of learning, we have grouped the small steps into themes that have similar content. Within these themes, we list the corresponding small steps from one or both year groups. Teachers can then use the single-age schemes to access the guidance on each small step listed within each theme.

The themes are organised into common content (above the line) and year specific content (below the line). Moving from left to right, the arrows on the line suggest the order to teach the themes.
How to use the mixed-age SOL

Here is an example of one of the themes from the Year 1/2 mixed-age guidance.

### Subtraction

**Year 1 (Aut B2, Spr B1)**
- How many left? (1)
- How many left? (2)
- Counting back
- Subtraction - not crossing 10
- Subtraction - crossing 10 (1)
- Subtraction - crossing 10 (2)

**Year 2 (Aut B2, B3)**
- Subtract 1-digit from 2-digits
- Subtract with 2-digits (1)
- Subtract with 2-digits (2)
- Find change - money

In order to create a more coherent journey for mixed-age classes, we have re-ordered some of the single-age steps and combined some blocks of learning e.g. Money is covered within Addition and Subtraction.

The bullet points are the names of the small steps from the single-age SOL. We have referenced where the steps are from at the top of each theme e.g. Aut B2 means Autumn term, Block 2. Teachers will need to access both of the single-age SOLs from our website together with this mixed-age guidance in order to plan their learning.

### Points to consider

- Use the mixed-age schemes to see where similar skills from both year groups can be taught together. Learning can then be differentiated through the questions on the single-age small steps so both year groups are focusing on their year group content.
- When there is year group specific content, consider teaching in split inputs to classes. This will depend on support in class and may need to be done through focus groups.
- On each of the block overview pages, we have described the key learning in each block and have given suggestions as to how the themes could be approached for each year group.
- We are fully aware that every class is different and the logistics of mixed-age classes can be tricky. We hope that our mixed-age SOL can help teachers to start to draw learning together.
In this section, content from single-age blocks are matched together to show teachers where there are clear links across the year groups. Teachers may decide to teach the lower year’s content to the whole class before moving the higher year on to their age-related expectations. The lower year group is not expected to cover the higher year group’s content as they should focus on their own age-related expectations.

In this section, content that is discrete to one year group is outlined. Teachers may need to consider a split input with lessons or working with children in focus groups to ensure they have full coverage of their year’s curriculum. Guidance is given on each page to support the planning of each block. The themes should be taught in order from left to right.
## WRM – Year 3/4 – 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><strong>Autumn</strong></td>
<td></td>
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</tr>
<tr>
<td>Number: Place Value</td>
<td></td>
<td></td>
<td>Number: Addition and Subtraction</td>
<td></td>
<td></td>
<td>Number: Multiplication and Division</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td>Measurement: Length, Perimeter and Area</td>
<td>Number: Fractions</td>
<td></td>
<td></td>
<td>Y3: Measurement: Mass and Capacity</td>
<td></td>
<td></td>
<td>Y4: Number: Decimals</td>
<td></td>
<td>Consolidation</td>
</tr>
<tr>
<td>Number: Multiplication and Division</td>
<td></td>
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<tr>
<td><strong>Summer</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number: Decimals (including Money)</td>
<td>Measurement: Time</td>
<td>Statistics</td>
<td>Geometry: Properties of Shape (including Y4 Position and Direction)</td>
<td></td>
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</tr>
</tbody>
</table>

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Within this block, Year 4 are introduced to a lot of new content including Roman Numerals, Rounding and Negative Numbers. Year 3 could also look at Roman Numerals as they are expected to recognise Roman Numerals to 12 on a clock face in later blocks.

Counting in different multiples could be done throughout the block as lesson starters with links between the different multiples being highlighted.
Block 1 - Place Value

Theme 1 – Roman numerals
Roman Numerals

Notes and Guidance

Children will build on their knowledge of numerals to 12 on a clock face, from Year 3, to explore Roman Numerals to 100.

They explore what is the same and what is different between the number systems, including the fact that in the Roman system there is no symbol for zero and so no placeholders.

Mathematical Talk

Why is there no zero in the Roman Numerals? What might it look like?

Can you spot any patterns? If 20 is XX what might 200 be?

How can you check you have represented the Roman Numeral correctly? Can you use numbers you know, such as 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, and for a bit of fun they could test the teacher!

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

Complete the diagrams.

Complete the function machines.
Roman Numerals

Reasoning and Problem Solving

Solve the following calculation:

$$\text{XIV} + \text{XXXVI} = ____$$

Answer: L

Other possible calculations include:

- $\text{C} \div \text{II} = \text{L}$
- $\text{L} \div \text{I} = \text{L}$
- $\text{X} \times \text{V} = \text{L}$
- $\text{XXV} \times \text{II} = \text{L}$
- $\text{LXV} - \text{XV} = \text{L}$
- $\text{C} - \text{L} = \text{L}$
- $\text{XX} + \text{XX} + \text{X} = \text{L}$

Mo says:

In the 10 times table, all the numbers have a zero. Therefore, in Roman Numerals all multiples of 10 have an $X$.

Research and give examples to prove whether or not Mo is correct.

Mo is incorrect. A lot of multiples of 10 have an $X$ in them, but the $X$ can mean different things depending on its position. For example, $X$ in 10 just means one ten, but $X$ in $XL$ means 10 less than 50. $X$ in 60 ($LX$) means 10 more than 50. The number 50 has no $X$ and neither does 100.
Hundreds

Notes and Guidance

Children build on their understanding of tens and link this to 100.
This is the first time they explore 100 explicitly. It is crucial that children understand that ten tens make 100 and a hundred ones make 100.
They use a variety of concrete equipment to see this relationship. Once children understand the concept of 100, they will count objects and numbers in multiples of 100 up to 1,000.

Varied Fluency

Use bundles of straws in tens, bead strings and Base 10 to explore how many tens make a hundred. Children use the equipment to count up and down in tens to make 100.
There are 3 tens this is thirty.
There are _____ tens is _____.
There are _____ tens in one hundred.

There are 100 sweets in each jar.

How many sweets are there altogether?
Write your answer in numerals and words.

Complete the number tracks.

<table>
<thead>
<tr>
<th>200</th>
<th>300</th>
<th>500</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>900</td>
<td>800</td>
<td>500</td>
</tr>
</tbody>
</table>

Mathematical Talk

How many tens have you made? How else can we say this?
What do these digits represent?
How many ones have you made? How else can you say this?
If we continue counting in tens, what do we say after 100?
What numbers wouldn’t we say?
Hundreds

Reasoning and Problem Solving

True or False?

If I count in 100s from zero, all of the numbers will be even. Convince me.

True, because if you start with zero and add 100 you get an even number, and you are adding another even so the number will always be even.

Sort these statements into always, sometimes or never.

- When counting in hundreds, the ones column changes.
- When counting in hundreds, the hundreds column changes.
- To count in hundreds we use 3-digit numbers.

- Never
- Always
- Sometimes

Whitney thinks the place value grid is showing the number eight.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>● ● ●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Do you agree? Explain why.

Using all of the counters, what is the smallest number you can make?

What other numbers could you make?

Whitney is incorrect because there are eight counters in the hundreds column so they represent eight hundreds. The number is 800.

The smallest number that can be made is 8.

Other possible numbers include: 80, 170, 350, etc.
Count in 50s

Notes and Guidance

Children use their knowledge of the patterns in the 5 times table to count in steps of 50.

They should start from any given multiple of 50 and be able to count both forwards and backwards.

Mathematical Talk

What is the same and what is different between counting in 5s and counting in 50s?

Hence, what is the connection between the 5 times table and the 50 times table?

Can you notice a pattern as the numbers increase/decrease?

Can you correct the mistakes in each?

Varied Fluency

Look at the number patterns. What do you notice?

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
</tr>
</tbody>
</table>

Complete the number tracks.

<table>
<thead>
<tr>
<th></th>
<th>50</th>
<th>150</th>
<th>200</th>
<th>350</th>
<th>450</th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>700</td>
<td>650</td>
<td>500</td>
<td>350</td>
<td></td>
</tr>
</tbody>
</table>

Circle and explain the mistake in each sequence.

- 50, 100, 105, 200, 250, 300...
- 990, 950, 900, 850, 800...
## Count in 50s

### Odd One Out

| 100, 150, 200, 215, 300 |

Circle the odd one out. Explain how you know.

215 is the odd one out because it is not a multiple of 50. If we were counting up in 50s from 100, it should have been 250 not 215.

### Which is quicker: counting to 50 in 10s or counting to 150 in 50s?

Explain your answer.

It is quicker to count to 150 in 50s as it would only be 3 steps whereas counting to 50 in 10s would be 5 steps.

### Always, Sometimes, Never

Sort the statements into always, sometimes or never.

- **Always**
  - When counting in 50s starting from 0, the numbers are all even.
  - There are only two digits in a multiple of 50.

- **Sometimes**
  - Only the hundreds and tens column changes when counting in 50s.
Count in 1,000s

Notes and Guidance

Children look at four-digit numbers for the first time. They explore what a thousand is through concrete and pictorial representations, to recognise that 1,000 is made up of ten hundreds.

They count in multiples of 1,000, representing numbers in numerals and words.

Mathematical Talk

How many hundreds are there in one thousand?
How many hundreds make ____ thousands?

How is counting in thousands similar to counting in 1s?

When counting in thousands, which is the only digit to change?

How many sweets would there be in ___ jars?

Varied Fluency

___ tens make ____ hundred.

___ hundreds make ____ thousand.

How many sweets are there altogether?

1,000 1,000 1,000

There are three jars of ____ sweets.
There are ___ sweets altogether.

What numbers are represented below?

1,000 1,000 1,000
## Count in 1,000s

### Reasoning and Problem Solving

**Always, Sometimes, Never**

- When counting in hundreds, the ones digit changes.
- The thousands column changes every time you count in thousands.
- To count in thousands, we use 4-digit numbers.

**Never, when counting in hundreds, the ones digit always stays the same.**

**Always, the thousands column changes every time you count in thousands.**

**Sometimes, to count in thousands, we use 4-digit numbers.**

**Rosie says,**

> If I count in thousands from zero, I will always have an even answer.

**True or false? Explain how you know.**

**True, because they all end in zero, which are multiples of 10 and multiples of 10 are even.**
Count in 25s

Notes and Guidance

Children will count in 25s to spot patterns. They use their knowledge of counting in 50s and 100s to become fluent in 25s.

Children should recognise and use the number facts that there are two 25s in 50 and four 25s in 100.

Mathematical Talk

What is the first/second number pattern counting up in? Can you notice a pattern as the numbers increase/decrease? Are any numbers in both of the number patterns? Why?

What digit do multiples of 25 end in?

What’s the same and what’s different when counting in 50s and 25s?

Varied Fluency

Look at the number patterns. What do you notice?

<table>
<thead>
<tr>
<th></th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
</tr>
</tbody>
</table>

Complete the number tracks

<table>
<thead>
<tr>
<th></th>
<th>25</th>
<th>75</th>
<th>125</th>
<th>150</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>725</td>
<td>700</td>
<td>650</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>

Circle the mistake in each sequence.

<table>
<thead>
<tr>
<th></th>
<th>2,275</th>
<th>2,300</th>
<th>2,325</th>
<th>2,350</th>
<th>2,400,...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000</td>
<td>975</td>
<td>925</td>
<td>900</td>
<td>875 ...</td>
</tr>
</tbody>
</table>
Count in 25s

Reasoning and Problem Solving

Whitney is counting in 25s and 1,000s. She says:

- Multiples of 1,000 are also multiples of 25
- Multiples of 25 are therefore multiples of 1,000

Do you agree with Whitney? Explain why.

I don’t agree. Multiples of 1,000 are multiples of 25 because 25 goes into 1,000 exactly, but not all multiples of 25 are multiples of 1,000 e.g. 1,075

Two race tracks have been split into 25m intervals.

Race track A

Race track B

Possible answers:

Race track A has miscounted when adding 25 m to 100 m. After this they have continued to count in 25s correctly from 150

Race track B has miscounted when adding 25 m to 150 m. They have then added 25 m from this point.

Ron is counting down in 25s from 790. Will he say 725? Explain your answer.

No, he will not say 725 because:

790, 765, 740, 715, 690, 665, ...

What errors have been made?
Block 1 - Place Value

Theme 3 – Representing numbers
Numbers to 1,000

Notes and Guidance

In this small step, children will primarily use Base 10 to become familiar with any number up to 1,000.

Using Base 10 will emphasise to children that hundreds are bigger than tens and tens are bigger than ones.

Children need to see numbers with zeros in different columns, and show them with concrete and pictorial representations.

Mathematical Talk

Does it matter which order you build the number in?

Can you have more than 9 of the same type of number e.g. 11 tens?

Can you create a part-whole model using or drawing Base 10 in each circle?

Varied Fluency

Write down the number represented with Base 10 in each case.

<table>
<thead>
<tr>
<th>Representation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Base 10 Representation 1" /></td>
<td></td>
</tr>
<tr>
<td><img src="image2" alt="Base 10 Representation 2" /></td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Base 10 Representation 3" /></td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="Base 10 Representation 4" /></td>
<td></td>
</tr>
</tbody>
</table>

Use Base 10 to represent the numbers.

700 120 407 999

Mo is drawing numbers. Can you complete them for him?

246 390 706

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Numbers to 1,000

Reasoning and Problem Solving

Teddy has used Base 10 to represent the number 420. He has covered some of them up.

110 is the missing amount.

Possible ways:
- 1 hundred and 1 ten
- 11 tens
- 110 ones
- 10 tens and 10 ones
- 50 ones and 6 tens etc.

Work out the amount he has covered up.

How many different ways can you make the missing amount using Base 10?

Which child has made the number 315?

Dora

Mo

Dora and Mo have both made the number 315, but represented it differently.

3 hundreds, 1 ten and 5 ones is the same as 2 hundreds, 10 tens and 15 ones.

Explain how you know.
100s, 10s and 1s (1)

Notes and Guidance

Children should understand that a 3-digit number is made up of 100s, 10s and 1s.

They read numbers shown in different representations on a place value grid, and write them in numerals.

They should be able to represent different 3-digit numbers in various ways such as Base 10 or numerals.

Mathematical Talk

What is the value of the number shown on the place value chart?

Why is it important to put the values into the correct column on the place value chart?

How many more are needed to complete the place value chart?

Can you make your own numbers using Base 10? Ask a friend to tell you what number you have made.

Varied Fluency

What is the value of the number represented in the place value chart?

![Place Value Chart]

Write your answer in numerals and in words.

Complete this place value chart so that it shows the number 354

![Place Value Chart]

Represent the number using a part-whole model.

How many different ways can you make the number 452? Can you write each way in expanded form? (e.g. 400 + 50 + 2)

Compare your answer with a partner.
100s, 10s and 1s (1)

Reasoning and Problem Solving

The place value grid shows the number 467

Is Eva correct? Explain your reasoning.

What do you notice about the number shown?

Possible answers:
I disagree because there are six hundreds, four tens and seven ones so the number is 647.

I notice that 647 and 467 have the same digits but in a different order so the digits have different values.

Using each digit card, which numbers can you make?

The numbers that can be made are:
- 503
- 530
- 305
- 350
- (0)35
- (0)53

Use the place value grid to help.

Compare your answers with a partner.
100s, 10s and 1s (2)

Notes and Guidance

Children use place value counters to represent different numbers and understand how a number is made.

Their work with Base 10 should help them understand that the hundreds counter is worth more than the tens counter and the tens counter is worth more than the ones counter.

Mathematical Talk

What is the same and what is different about Base 10 and place value counters?

Why do we not call this number 300506?

What number would be shown if 1/10/100 was added?

Why is it important to put the values into the correct column on the place value grid?

What do we need to do if there is a zero in the number we are representing?

Varied Fluency

What number is shown on the place value chart?

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

If one more 10 is added, what number would be shown?

Use place value counters and a place value grid to represent the numbers:

615
208
37

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

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
### 100s, 10s and 1s (2)

#### Reasoning and Problem Solving

Using place value counters, how many different ways can you make four hundred and fifty?

Show your solutions as calculations.

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Eva

The number in the place value grid is the greatest number you can make with 8 counters.

Eva is incorrect because you could make 800 which is greater than 611. She thinks you need to have at least one counter in each column.

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Do you agree? Explain your answer.

E.g. four hundreds counters and 5 tens counters. As a calculation this would be: 450 = 100 + 100 + 100 + 10 + 10 + 10 + 10 + 10

<table>
<thead>
<tr>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Dora

The place value chart shows 607

Dora is correct because there are six counters in the hundreds column, none in the tens column and seven in the ones column.

Jack

I think it shows 670

If it was 670 there would be seven counters in the tens column and none in the ones column.

Who is correct? Explain your reasoning.
Number Line to 1,000

Notes and Guidance

Children estimate, work out and write numbers on a number line.

Number lines should be shown with or without start and end numbers, and with numbers already placed on it.

Children may still need Base 10 and/or place values to work with as they develop their understanding of the number line.

Mathematical Talk

What is the value of each interval on the number line?
Which side of the number line did you start from? Why?
When estimating where a number should be placed, what facts can help you?
Can you draw a number line where 600 is the starting number, and 650 is half way along?
What do you know about the number that A is representing? A is more/less than ___________
What value can A definitely not be? How do you know?

Varied Fluency

Draw an arrow to show the number 800

Draw an arrow to show the number 560

Which letter is closest to 250?

Estimate the value of A.
Number Line to 1,000

Reasoning and Problem Solving

Estimate where seven hundred and twenty-five will go on each of the number lines.

- 725 is in different places because each line has different numbers at the start and end so the position of 725 changes.

  All three of the number lines have different scales and therefore the difference between 725 and the starting and finishing number is different on all three number lines.

If the arrow is pointing to 780, what could the start and end numbers be?

Find three different ways and explain your reasoning.

Example answers:

- Start 0 and end 1,000 because 500 would be in the middle and 780 would be further along than 500
- Start 730 and end 790
- Start 700 and end 800
- etc.
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.
1,000s, 100s, 10s and 1s

Reasoning and Problem Solving

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.

4,098

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
Partitioning

Notes and Guidance

Children explore how numbers can be partitioned in more than one way.

They need to understand that, for example, \(5000 + 300 + 20 + 9\) is equal to \(4000 + 1300 + 10 + 19\).
This is crucial to later work on adding and subtracting 4-digit numbers and children explore this explicitly.

Mathematical Talk

What number is being represented?

If we have 10 hundreds, can we exchange them for something?

If you know ten 100s are equal to 1,000 or ten 10s are equal to 100, how can you use this to make different exchanges?

**Varied Fluency**

Move the Base 10 around and make exchanges to represent the number in different ways.

\[
\begin{align*}
2000 &+ 400 + \square + 4 \\
1000 &+ \square + \square + 14 \\
1000 &+ 1300 + \square + \square
\end{align*}
\]

Represent the number in two different ways in a part-whole model.

Eva describes a number. She says,
“My number has 4 thousands and 301 ones”
What is Eva's number?
Can you describe Eva's number in a different way?
### Partitioning

**Reasoning and Problem Solving**

<table>
<thead>
<tr>
<th>Which is the odd one out?</th>
<th>3,500</th>
<th>3,500 ones</th>
<th>35 tens</th>
<th>35 tens is the odd one out because it does not make 3,500, it makes 350</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 thousands and 15 hundreds</td>
<td>35 tens</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Explain how you know.

<table>
<thead>
<tr>
<th>Jack says:</th>
<th>My number has five thousands, three hundreds and 64 ones.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amir says:</td>
<td>My number has fifty three hundreds, 6 tens and 4 ones.</td>
</tr>
</tbody>
</table>

Who has the largest number? Explain.

Some place value counters are hidden.

The total is six thousand, four hundred and thirty two.

Which place value counters could be hidden?

Think of at least three solutions.

Possible answers:

- One 1,000 counter and one 100 counter.
- Ten 100 counters and ten 10 counters.
- Eleven 100 counters.
Number Line to 10,000

Notes and Guidance

Children estimate, label and draw numbers on a number line to 10,000.

They need to understand that it is possible to count forwards or backwards, in equal steps, from both sides.

Number lines should be shown with or without start and end numbers, or with numbers already placed on it.

Mathematical Talk

Which side of the number line did you start from? Why?

When estimating where a number should be placed, on a number line, what can help you?

Can you use your knowledge of place value to prove that you are correct?

When a number line has no values at the end, what strategies could you use to help you figure out the missing value? Could there be more than one answer?
Number Line to 10,000

Reasoning and Problem Solving

Place 6,750 on each of the number lines.

6,000 7,000

6,500 8,000

0 10,000

Are they in the same place on each line? Why?

No, each line has different numbers at the start and end so the position of 6,750 changes.

If the number on the number line is 9,200, what could the start and end numbers be? Find three different possible answers.

Possible answers:
- 8,400 – 9,500
- 5,000 – 10,000
- 9,120 – 9,920
Block 1 - Place Value

Theme 4 – Find more or less
1, 10, 100 More or Less

Notes and Guidance

Building on children’s learning in Year 2 where they explored finding one more/less, children now move onto finding 10 and 100 more or less than a given number.

Show children that they can represent their answer in a variety of different ways. For example, as numerals or words, or with concrete manipulatives.

Mathematical Talk

What is 10 more than/less than ____?  

What is 100 more than/less than ____?  

Which column changes? Can more than one column change?  

What happens when I subtract 10 from 209? Why is this more difficult?

Varied Fluency

Put the correct number in each box.

Show ten more and ten less than the following numbers using Base 10 and place value counters.

550  
724  
302

Complete the table.

<table>
<thead>
<tr>
<th>100 less</th>
<th>Number</th>
<th>100 more</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100 1</td>
<td></td>
</tr>
</tbody>
</table>
1, 10, 100 More or Less

Reasoning and Problem Solving

| 10 more than my number is the same as 100 less than 320 | The number described is 210 because 100 less than 320 is 220, which means 220 is 10 more than the original number. | A counter is missing on the place value chart. |
| What is my number? | | Possible answers: |
| Explain how you know. | | 401 |
| | | 311 |
| Write your own similar problem to describe the original number. | | 302 |
| I think of a number, add ten, subtract one hundred and then add one. | The start number was 345 because one less than 256 is 255, one hundred more than 255 is 355 and ten less than 355 is 345. To check I can follow the steps back to get 256. | What number could it have been? |
| My answer is 256 | | |
| What number did I start with? | | |
| Explain how you know. | | |
| What can you do to check? | | |
1,000 More or Less

Notes and Guidance

Children have explored finding 1, 10 and 100 more or less, in Year 3. They now extend their learning by finding 1,000 more or less than a given number.

Show children that they can represent their answer in a number of ways, for example using place value counters, Base 10 or numerals.

Mathematical Talk

What is 1,000 more than/less than a number?
Which column changes when I find 1,000 more or less?
What happens when I subtract 1,000 from 9,209?
Can you show me two different ways of showing 1,000 more/less than e.g. pictures, place value charts, equipment.

Complete this sentence: I know that 1,000 more than ____ is ____ because ... I can prove this by ____.

Varied Fluency

Fill in the missing values.

9,523 + 10 = 

+ 3,589 = 3,689

3,891 + = 4,891

Complete the table.

<table>
<thead>
<tr>
<th>1,000 less</th>
<th>Number</th>
<th>1,000 more</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1" alt="Place Value Counter" /></td>
<td><img src="image2" alt="Place Value Counter" /></td>
</tr>
</tbody>
</table>

Find 1,000 more and 1,000 less than each number.

5,000 | 7,500 | 2,359 | 8,999

Use concrete resources to prove you are correct.
1,000 More or Less

Reasoning and Problem Solving

Complete the missing boxes:

- 4,896 → +1,000 → 
- 3,784 → → 2,784
- → −1,000 → 986

Jack says:

When I add 1,000 to 4,325, I only have to change the thousands digit (4).

Is he correct? Which digit does he need to change?

Fill in the boxes by finding the patterns:

- 6,310

10 less than my number is 1,000 more than 5,300. What is my number?

Can you write your own problem similar to this?

Yes, he is correct. He will need to change the thousands digit (4).
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 10</td>
<td>1 1</td>
</tr>
<tr>
<td>100 100 100 10 1</td>
<td>1 1</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

A whole number is rounded to 370
What could the number be?
Write down all the possible answers.

<table>
<thead>
<tr>
<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>
</table>

Two different two-digit numbers both round to 40 when rounded to the nearest 10
The sum of the two numbers is 79
What could the two numbers be?
Is there more than one possibility?

| 35 + 44 = 79 | 35 + 44 = 79 |
| 36 + 43 = 79 | 36 + 43 = 79 |
| 37 + 42 = 79 | 37 + 42 = 79 |
| 38 + 41 = 79 | 38 + 41 = 79 |
| 39 + 40 = 79 | 39 + 40 = 79 |

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?

Say whether each number on the number line is closer to 500 or 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>50</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td></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

### Always, Sometimes, Never

Explain your reasons for each statement.

- A number with a five in the tens column rounds up to the nearest hundred.
- A number with a five in the ones column rounds up to the nearest hundred.
- A number with a five in the hundreds column rounds up to the nearest hundred.

### Sometimes

- 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.

### Always

- A whole number is rounded to the nearest 100, the answer is 200
- When the same number is rounded to the nearest 10, the answer is 250
- What could the number be?
  - Is there more than one possibility?
- Using the digit cards 0 to 9, can you make whole numbers that fit the following rules? You can only use each digit once.
  - 1. When rounded to the nearest 10, I round to 20
  - 2. When rounded to the nearest 10, I round to 10
  - 3. When rounded to the nearest 100, I round to 700

### Example

- 245, 246, 247, 248 and 249 are all possible answers.
- 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 the Nearest 1,000

Notes and Guidance

Children build on their knowledge of rounding to the nearest 10 and 100, to round to the nearest thousand for the first time.

Children must understand which multiples of 1,000 a number sits between.

When rounding to the nearest 1,000, children should look at the digits in the hundreds column.

Mathematical Talk

Which thousands numbers does ____ sit between?

How can the number line help you to see which numbers round up/down?

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

Varied Fluency

Say whether each number on the number line is closer to 3,000 or 4,000

Round 3,280, 3,591 and 3,700 to the nearest thousand.

Round these numbers to the nearest 1,000

- Eight thousand and fifty-six
- 5 thousands, 5 hundreds, 5 tens and 5 ones
- LXXXII

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></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LXX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LXXXII</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Round to the Nearest 1,000

Reasoning and Problem Solving

David's mum and dad are buying a car. They look at the following cars:

- **Car A**: 9,869 miles advertised as approximately 10,000 miles
- **Car B**: 8,501 miles advertised as approximately 8,000 miles
- **Car C**: 7,869 miles advertised as approximately 8,000 miles

Are all of the cars correctly advertised? Explain your reasoning.

Car B is incorrectly advertised. It should be rounded up to 9,000.

A number is rounded to the nearest thousand.

- The answer is 7,000
- What could the original number have been?
  - Give five possibilities.
  - What is the greatest number possible?
  - What is the smallest number possible?

Possible answers:

- 6,678
- 7,423
- 7,192
- 6,991

Greatest: 7,499
Smallest: 6,500

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Compare Objects

Notes and Guidance

Children use objects to represent numbers to 1,000. When given two numbers represented by objects, they use comparative language and symbols to determine which is greatest/smallest. Children can make the numbers using concrete manipulatives and draw them pictorially. Use stem sentences to ensure the correct vocabulary is being used e.g. _____ is greater than _____.

Mathematical Talk

How do you know which number is greater? Do you start counting hundreds, tens or ones first? Why?

What strategy did you use to compare the two numbers? Is this the same or different to your partner?

Are the Base 10 and place value counters showing the same amount? How do you know?

Is there only one answer?

Varied Fluency

Represent and compare the numbers using place value counters.

<table>
<thead>
<tr>
<th></th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>452</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>542</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

______ is greater than ______

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

Draw objects to make the statement true.

<
## Compare Objects

### Reasoning and Problem Solving

**Which image is the odd one out?**

- Image 1 contains the numbers 100, 100, 100, 100, 100, 1, 1, 10, 10, 10, 10, 10, 1.

<table>
<thead>
<tr>
<th>539</th>
<th>540</th>
<th>541</th>
<th>542</th>
<th>543</th>
<th>544</th>
</tr>
</thead>
</table>

The part-whole model is the odd one out because it shows 643 whereas all the other images show 543.

Children could show 543 in a part-whole model correctly, in Base 10 a different way or with place value counters in a different way.

**True or False?**

- The image is not correct because the number 244 is represented on both sides of the inequality symbol.

An equal sign should have been used.

- The number on the left must be made larger or the number on the right must be made smaller, to make this true.

**Explain why. How else can you represent the number?**

500 140 3
Compare Numbers

Notes and Guidance

Children compare numbers presented as numerals rather than objects. They need to be encouraged to use previous learning to choose an efficient method to compare the numbers. For example, children may choose to place the numbers on a number line, make them using concrete manipulatives or draw them in a place value chart to compare.

Mathematical Talk

What strategy did you use to compare the numbers?

What materials would be useful to help you compare the numbers?

How do you know which number is the smallest /greatest?
Which column do you start comparing from? Why?

Can you find more than one way to complete the statements?

Varied Fluency

Circle the greatest number in each pair.

Nine hundred and two

500 and 63

7 hundreds and 6 ones

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

399

800

Complete the statements.

600 + 70 + 4 > 600 + _____ + 4

Two hundred and five < ______________
**Compare Numbers**

**Reasoning and Problem Solving**

Amir has 3 jars of sweets.

- **Jar A** contains 235 sweets.
- **Jar C** contains 175 sweets.

**Jar B** could contain any number of sweets between 176 and 234 inclusive.

**Discussion point:** Could **B** contain 175 or 235 sweets? Why?

I am thinking of a number.

- It is between 300 and 500.
- The digits add up to 14.
- The difference between the greatest digit and the smallest digit is 2.
- What could my number be?
- Is there only one option?
- Explain each step of your working.

The only possibilities to go in the hundreds column are 3 and 4.
If it was 3, the other two digits would have to total 11 and none of these pairs give the correct difference between the greatest and smallest digit, so the number has to have 4 in the hundreds column.

How many sweets could be in **jar B**?
Explain how you know.

- Jar A has the most sweets in. Jar C has the least sweets in.

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Order Numbers

Notes and Guidance

Children explore ordering a set of numbers from smallest to greatest and greatest to smallest. They need to be able to explain their reasoning throughout. They could still use Base 10 or other concrete materials to help them to make decisions about ordering.

At this point, children are introduced to the words ascending and descending.

Mathematical Talk

How do you know you have created the greatest/smallest number?

What number is being represented by the place value counters/Base 10?

What does the word ascending/descending mean?

Can you find more than one way to order your numbers?

Varied Fluency

Here are three digit cards.

What is the greatest number you can make?
What is the smallest number you can make?

Use the symbols <, > or = to make the statement correct.

Here is a list of numbers.

Place the numbers in ascending order.
Now place them in descending order.
What do you notice?
Whitney has six different numbers. She put them in ascending order then accidentally spilt some ink onto her page. Two of her numbers are now covered in ink.

214, 243, 256, 289

What could the hidden numbers be? Explain how you know.

The first number could be anything between 215 and 242

The second hidden number could be anywhere between 257 and 288

True or False?

When ordering numbers you only need to look at the place value column with the highest value.

False. For example, if you are ordering numbers in the hundreds you should start by looking at the hundreds column, but sometimes two numbers will have the same number of hundreds and so you will also need to look at other columns.
Compare 4-digit Numbers

Notes and Guidance

Children compare 4-digit numbers using comparison language and symbols to determine/show which is greater and which is smaller.

Children should represent numbers using concrete manipulatives, draw them pictorially and write them using numerals.

Mathematical Talk

Which two numbers are being represented?

Do you start counting the thousands, hundreds, tens or ones first? Why?

Which column do you start comparing from? Why?

What strategy did you use to compare the two numbers? Is this the same or different to your partner?

How many answers can you find?

Varied Fluency

Complete the statements using <, > or =

Circle the smallest amount in each pair.

Two thousand, three hundred and ninety seven

3,792

6,000 + 400 + 50 + 6

6,455

9 thousands, 2 hundreds and 6 ones

9,602

Complete the statements.

1,985 > ___

4,203 < 4,000 + ___ + 4
### Compare 4-digit Numbers

#### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>I am thinking of a number. It is greater than 3,000, but smaller than 5,000</th>
<th>I have 13 numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The digits add up to 15</td>
<td>3,228</td>
</tr>
<tr>
<td>What could the number be?</td>
<td>3,282</td>
</tr>
<tr>
<td>Write down as many possibilities as you can.</td>
<td>3,822</td>
</tr>
<tr>
<td>The difference between the largest and smallest digit is 6. How many numbers do you now have?</td>
<td>4,560</td>
</tr>
<tr>
<td></td>
<td>4,650</td>
</tr>
<tr>
<td></td>
<td>4,506</td>
</tr>
<tr>
<td></td>
<td>4,605</td>
</tr>
<tr>
<td></td>
<td>3,660</td>
</tr>
<tr>
<td></td>
<td>3,606</td>
</tr>
<tr>
<td></td>
<td>3,147</td>
</tr>
<tr>
<td></td>
<td>3,174</td>
</tr>
<tr>
<td></td>
<td>3,417</td>
</tr>
<tr>
<td></td>
<td>3,471</td>
</tr>
</tbody>
</table>

Use digit cards 1 to 5 to complete the comparisons:

- $\boxed{564} \, < \, \boxed{73} \, \boxed{2}$
- $\boxed{23} \, > \, \boxed{2335}$

You can only use each digit once.

Possible answer:

- $564 \, < \, 5732$
- $2438 \, > \, 2335$
Order Numbers

Notes and Guidance

Children explore ordering a set of numbers in ascending and descending order. They reinforce their understanding by using a variety of representations.

Children find the largest or smallest number from a set.

Mathematical Talk

Which number is the greatest? Which number is smallest? How do you know?

Why have you chosen to order the numbers this way?

What strategy did you use to solve this problem?

Varied Fluency

Fill in the circle using <, > or =

2,764 \[\text{blocks}\] \[\text{XXVII}\]

Here are four digit cards: 4 0 5 3

Arrange them to make as many different 4-digit numbers as you can and put them in ascending order.

Rearrange four counters in the place value chart to make different numbers.

<table>
<thead>
<tr>
<th>1000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Record all your numbers and write them in descending order.
Order Numbers

Reasoning and Problem Solving

Alex has ordered five 4-digit numbers. The smallest number is 3,450, and the largest number is 3,650.

All the other numbers have digit totals of 20.

What could the other three numbers be?

What mistake has been made?

1,354 3,273 3,314 989 9,993

smallest            greatest

Put these amounts in ascending order.

Half of 2,400

LXXXVI

Half of 2,400

Put one number in each box so that the list of numbers is ordered smallest to largest.

Possible answer:

Can you find more than one way?
Block 1 - Place Value

Theme 7 – Negative numbers
Negative Numbers

Notes and Guidance
Children recognise that there are numbers below zero. It is essential that this concept is linked to real life situations such as temperature, water depth etc. Children should be able to count back through zero using correct mathematical language of “negative four” rather than “minus four” for example. This counting can be supported through the use of number squares, number lines or other visual aids.

Mathematical Talk
What number is missing next to $-5$? Can you count up to fill in the missing numbers?
Can you use the words positive and negative in a sentence to describe numbers?
What do you notice about positive and negative numbers on the number line? Can you see any patterns?
Is $-1$ degrees warmer or colder than $-4$ degrees?

Varied Fluency

- Complete the number lines
  
  $\begin{array}{c|c|c|c|c|c|c}
  -5 & -4 & \cdot & \cdot & 0 & 1 & 3 \\
  \end{array}$
  
  $\begin{array}{c|c|c|c|c|c|c}
  -4 & \cdot & 0 & 1 \\
  \end{array}$

- Fill in the missing temperatures on the thermometers.

- Dexter is counting backwards out loud. He says, “Two, one, negative one, negative two, negative three …” What mistake has Dexter made?
Negative Numbers

Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Can you spot the mistake in these number sequences?</th>
<th>a) 2, 0, 0, −2, −4</th>
<th>a) 0 is incorrect as it is written twice.</th>
<th>Teddy counted down in 3s until he reached −18</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 2, 0, 0, −2, −4</td>
<td>b) 1, −2, −4, −6, −8</td>
<td>b) 1 is incorrect. The sequence has a difference of 2 each time, so the first number should be 2</td>
<td>He started at 21, what was the tenth number he said?</td>
</tr>
<tr>
<td>b) 1, −2, −4, −6, −8</td>
<td>c) 5, 0, −5, −10, −20</td>
<td>c) −20 is incorrect. The sequence is decreasing by 5, so the final number should be −15</td>
<td>−6</td>
</tr>
<tr>
<td>c) 5, 0, −5, −10, −20</td>
<td>Explain how you found the mistake and convince me you are correct.</td>
<td>Ensure the first number said is 21 21, 18, 15, 12, 9, 6, 3, 0, −3, −6, ...</td>
<td></td>
</tr>
</tbody>
</table>