Autumn Scheme of Learning

Year 3/4

#MathsEveryoneCan

2019-20
Notes and Guidance

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>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td><strong>Week 2</strong></td>
<td><strong>Week 3</strong></td>
</tr>
<tr>
<td>Number: Place Value Y1 - Numbers to 20</td>
<td>Number: Addition and Subtraction Year 1: Numbers within 20 (including recognising money)</td>
<td>Geometry: Year 1: Shape and Consolidation</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td><strong>Week 5</strong></td>
<td><strong>Week 6</strong></td>
</tr>
<tr>
<td>Number: Place Value to 100</td>
<td>Year 2: Properties of Shape</td>
<td>Measurement: Year 1: Volume and Capacity</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td><strong>Week 8</strong></td>
<td><strong>Week 9</strong></td>
</tr>
<tr>
<td>Year 2: Statistics</td>
<td>Year 2: Fractions</td>
<td>Measurement: Year 2: Mass, Capacity and Temperature</td>
</tr>
<tr>
<td><strong>Week 10</strong></td>
<td><strong>Week 11</strong></td>
<td><strong>Week 12</strong></td>
</tr>
<tr>
<td>Number: Place Value to 50 and Multiplication Year 2: Multiplication</td>
<td>Number: Year 1: Fractions and Consolidation</td>
<td>Consolidation and Investigations</td>
</tr>
</tbody>
</table>

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.

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.
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**

<table>
<thead>
<tr>
<th>Year 1 (Aut B2, Spr B1)</th>
<th>Year 2 (Aut B2, B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many left? (1)</td>
<td>Subtract 1-digit from 2-digits</td>
</tr>
<tr>
<td>How many left? (2)</td>
<td>Subtract with 2-digits (1)</td>
</tr>
<tr>
<td>Counting back</td>
<td>Subtract with 2-digits (2)</td>
</tr>
<tr>
<td>Subtraction - not crossing 10</td>
<td>Find change - money</td>
</tr>
<tr>
<td>Subtraction - crossing 10 (1)</td>
<td></td>
</tr>
<tr>
<td>Subtraction - crossing 10 (2)</td>
<td></td>
</tr>
</tbody>
</table>

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.
<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>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number: Place Value</td>
<td>Number: Addition and Subtraction</td>
<td>Number: Multiplication and Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>Number: Multiplication and Division</td>
<td>Measurement: Length, Perimeter and Area</td>
<td>Number: Fractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y3: Measurement: Mass and Capacity</td>
<td>Y4: Number: Decimals</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>Summer</strong></td>
<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>
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.
Add and subtract multiples
Year 3 (Aut B2)
- Add and subtract multiples of 100
- 3-digit and 1-digit numbers
- 3-digit and 2-digit numbers
- Add and subtract 100s
- Spot the pattern
Year 4 (Aut B2)
- Add and subtract 1s, 10s, 100s and 1,000s

Addition - adding more
Year 3 (Aut B2)
- Add 3-digit and 1-digit - crossing 10
- Add 3-digit and 2-digit - crossing 100
- 2-digit and 3-digit - not crossing 10/100 (addition)
- 2-digit and 3-digit - crossing 10 or 100
- 3-digit numbers - not crossing 10 or 100
- 3-digit numbers - crossing 10 or 100

Year 4 (Aut B2)
- Add two 4-digit numbers - no exchange
- Add two 4-digit numbers - one exchange
- Add two 4-digit numbers - more than one exchange

Children start by pattern spotting when adding ones and multiples of 10
When adding, children begin by adding numbers with no exchange before moving onto exploring exchange by using concrete and pictorial representations to support their understanding.

Year 3 focus on adding 3-digit numbers whilst Year 4 focus on adding 4-digit numbers.
Addition and Subtraction (2)

Common Content

Subtraction

- Year 3 (Aut B2)
  - Subtract 1-digit from 3-digits
  - Subtract 2-digits from 3-digits - crossing 100
  - 2-digits and 3-digits - not crossing 10 or 100
  - 2-digits and 3-digits - crossing 10 or 100
  - 3-digit and 3-digit (no exchange)
  - 3-digit and 3-digit (exchange)

- Year 4 (Aut B2)
  - Subtract two 4-digit numbers - no exchange
  - Subtract two 4-digit numbers - one exchange
  - Subtract two 4-digit numbers - more than one exchange
  - Efficient subtraction

Estimate and check

- Year 3 (Aut B2)
  - Estimate answers
  - Check answers

- Year 4 (Aut B2)
  - Estimate answers
  - Checking strategies

Subtraction is broken down into small steps focusing on different numbers of digits with or without exchange. Year 4 then consider the most efficient strategies when tackling different subtractions.

Both year groups look at how to estimate answers. This gives Year 4 the chance to consolidate their learning on rounding. Both year groups also draw their learning together through checking strategies.
Addition & Subtraction

Theme 1 – Add and Subtract Multiples
Add & Subtract Multiples of 100

Notes and Guidance

Children are introduced to adding numbers greater than 100

They will apply their prior knowledge of adding and subtracting ones and tens to adding and subtracting multiples of 100

Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of the digits.

Mathematical Talk

What is the same and what is different about 2 ones and 3 ones, 2 tens and 3 tens and 2 hundreds and 3 hundreds?

What is ____ hundreds and ____ hundreds equal to?

How many different ways can you represent 200 + 300?

Varied Fluency

Complete:

- 2 ones and 3 ones is equal to ____ ones.
- 2 tens and 3 tens is equal to ____ tens.
- 2 hundreds and 3 hundreds is equal to ____ hundreds.

Complete each box for 400 + 500

<table>
<thead>
<tr>
<th>Draw It</th>
<th>Write It</th>
<th>Part-Whole</th>
<th>Number Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>___ hundreds and ___ hundreds is equal to ___ hundreds</td>
<td></td>
<td>___ + ___ = ___</td>
</tr>
</tbody>
</table>

Use the bar model to complete the number sentences.

<table>
<thead>
<tr>
<th>600</th>
<th>____ + ___ = 600</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>600 = ___ − ___</td>
</tr>
<tr>
<td>400</td>
<td>600 = ___ − ___</td>
</tr>
<tr>
<td>200</td>
<td>600 = ___ − ___</td>
</tr>
<tr>
<td>200</td>
<td>600 = ___ − ___</td>
</tr>
</tbody>
</table>

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Add & Subtract Multiples of 100

Reasoning and Problem Solving

| _____ + _____ = 800 | 0 + 800  
|                   | 100 + 700  
|                   | 200 + 600  
|                   | 300 + 500  
|                   | 400 + 400  
|                   | 500 + 300  
|                   | 600 + 200  
|                   | 700 + 100  
|                   | 800 + 0    |

Each of the missing numbers are multiples of 100

Find all the possible missing numbers.

If I know 700 – 500 = 200, what else do I know?

Show me using concrete and pictorial representations.

Odd One Out

Which is the odd one out?

- **Possible answers:**
  - The odd one out could be 300 + 500 = 800 because it does not have the number 200 in the calculation.
  - The odd one out could also be 200 + 700 = 900 because the answer is not 800

Explain why.
3-digit & 1-digit Numbers

Notes and Guidance

During this small step, children add and subtract ones from a 3-digit number without an exchange. They consider which digits are affected when adding ones. For example, if a child is completing \(214 - 3\) and \(214 + 3\) they see that they just need to focus on the ones column. Therefore all they need to do is \(4 + 3\) and \(4 - 3\) respectively. The use of the column method can be used but mental arithmetic is the best strategy.

Mathematical Talk

Which column do I need to focus on?

What is the same about the subtractions? What changes each time? Write the number sentence that would come next in each list. Can you write the number sentence that would come before?

Can you use < and > to compare Jack and Tommy’s team points?

Varied Fluency

Use the place value grid to complete the calculations.

\[214 - 3 = \_\_\_\_\_\_ \quad 214 + 3 = \_\_\_\_\_\_\]

Complete:

| 356 - 5 = | 356 - 5 = | 356 - 5 = |
| 357 - 5 = | 356 - 4 = | 366 - 5 = |
| 358 - 5 = | 356 - 3 = | 376 - 5 = |
| 359 - 5 = | 356 - 2 = | 386 - 5 = |

Jack has 534 team points and gets four more. Tommy has 534 team points and loses four of his. How many team points does each person have? Who has the most?
3-digit & 1-digit Numbers

Reasoning and Problem Solving

Rosie has added or subtracted ones to get this answer.

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

Possible answers
340 + 2
341 + 1
342 + 0
343 – 1
344 – 2
345 – 3
346 – 4
347 – 5
348 – 6
349 – 7
350 – 8

What could her calculation have been?

Her starting numbers are between and include 340 and 350

Did you use a strategy?

Do you see a pattern?

Which image does not represent 339 – 8?

The number line does not, because it starts at 340 not 339

Alex thinks the chart shows 456 – 4
Do you agree?

No, I disagree. Alex has subtracted 4 tens not 4 ones.

When the ones digit in the 3-digit number increases, the ones we subtract decreases.
3-digit & 2-digit Numbers

Notes and Guidance

Children look at what happens to a 3-digit number when a multiple of 10 is added or subtracted. Different representations such as Base 10, arrow cards, place value charts should be used. The use of the column method is exemplified in this example, but children should explore whether or not this is needed and explain why. Mental methods should be encouraged throughout.

Mathematical Talk

How many tens can we add to 352 without exchanging? How many tens can we subtract from 352 without exchanging?

What patterns can you see between the additions and subtractions? Can you see links between the columns?

Can you compare the calculations without finding the answer?

Varied Fluency

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Use place value counters to complete the number sentences.

352 + 4 tens = ___
352 - 2 tens = ___

Complete:

<table>
<thead>
<tr>
<th>793 - 60 =</th>
<th>793 - 60 =</th>
<th>733 + 60 =</th>
</tr>
</thead>
<tbody>
<tr>
<td>793 - 70 =</td>
<td>783 - 60 =</td>
<td>723 + 60 =</td>
</tr>
<tr>
<td>793 - 80 =</td>
<td>773 - 60 =</td>
<td>713 + 60 =</td>
</tr>
<tr>
<td>793 - 90 =</td>
<td>763 - 60 =</td>
<td>703 + 60 =</td>
</tr>
</tbody>
</table>

Complete using <, > or =

773 + 1 ___ 773 + 10
653 + 10 ___ 653 - 10
647 + 10 ___ 657 - 10
721 + 10 ___ 653 + 10

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## 3-digit & 2-digit Numbers

### Reasoning and Problem Solving

#### Spot the Mistake

<table>
<thead>
<tr>
<th>Amir</th>
<th>Rosie</th>
</tr>
</thead>
<tbody>
<tr>
<td>589 – 70 is equal to 582</td>
<td>Amir has subtracted 7 ones instead of 7 tens. The answer should be 519</td>
</tr>
<tr>
<td>What should the answer be?</td>
<td>When I calculated 392 subtract 20 I used my known fact that 9 – 2 = 7</td>
</tr>
</tbody>
</table>

Explain Rosie’s method.

Rosie was able to use this fact because 9 tens subtract 2 tens is like doing 9 ones subtract 2 ones. We do not need to subtract any ones or hundreds so those columns will stay the same.

#### Write one calculation that could complete all of the statements.

| 456 – 10 < | Possible answers include: |
| 466 + 1 > | 496 – 30 |
| 466 + 0 = | 406 + 60 |

(Any calculation with an answer of 466)
Add & Subtract 100s

Notes and Guidance

Children build on their knowledge of adding 100s together e.g. 300 + 500, by adding ones and tens to solve calculations such as 234 + 500

It is important to develop flexibility and ask the children why the column method isn’t always the most effective method. Highlight that when adding and subtracting 100s, the ones and tens columns are not affected.

Mathematical Talk

What do you notice when we add and subtract 100s from a 3-digit number?

Do I need to add or subtract £200 to solve the worded problem? Can you show this on a number line or a bar model?

Is there more than one way to complete the boxes?

Varied Fluency

Use the place value grid and Base 10 to help you calculate two hundred and thirty-four add three hundred.

<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>

Eva has saved £675
She saved £200 more than Tommy.
How much has Tommy saved?

Complete the boxes with a calculation that either adds or subtracts 100s.

401 + 300  \hspace{1cm} \hspace{1cm} 961 − 200

Smallest  \hspace{1cm} 105 + 100  \hspace{1cm} Greatest

Smallest  \hspace{1cm} 393 − 200  \hspace{1cm} Greatest
Add & Subtract 100s

Reasoning and Problem Solving

Teddy starts with the number 356
He adds a multiple of 100
His new number is greater than 500 but less than 800
Complete the table.

<table>
<thead>
<tr>
<th>Numbers he couldn't have added</th>
<th>Numbers he could have added</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

She is correct because both give an answer of 606

Alex

306 + 300 = 906 – 300

Complete the scenarios so they match the bar model.

<table>
<thead>
<tr>
<th>476</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>676</td>
</tr>
</tbody>
</table>

Ron has ____ altogether.
He spends _____ and has £476 pounds left.

Jack has ______
Eva has £200
They have ____ altogether.

Amir has £200 more than Rosie.
Amir has ______
Rosie has ______

Draw your own bar model where one of the parts is a multiple of 100
Write scenarios to match the bar model.

Ron has £676 altogether.
He spends £200 and has £476 pounds left.

Jack has £476
Eva has £200
They have £676 altogether.

Amir has £200 more than Rosie.
Amir has £676
Rosie has £476

Children will then draw their own bar models to match the numbers they have chosen.
Pattern Spotting

Notes and Guidance

Children consolidate adding ones, tens and hundreds to 3-digit numbers.

Drawing the previous steps together, children look for patterns between calculations to enable them to predict answers and to develop their number sense.

Ensure children reflect on the similarities and differences between calculations to highlight the patterns.

Mathematical Talk

What do you notice? Which strategy can we use to add these numbers?

Do we need to write a zero in the hundreds column when there are no hundreds left?

If I know 7 + 8 = 15, what else do I know?

Varied Fluency

What has happened to each starting number? How do you know?

Calculate:

253 + 2   253 + 20   253 + 200
253 − 2   253 − 20   253 − 200

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

If we know 250 + 40 = 290, what else do we know?
Show your findings in part-whole models or bar models and write number sentences to match.
Pattern Spotting

Reasoning and Problem Solving

Dora uses column addition to solve $251 + 4$

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Is this the most efficient method?

Explain what Dora could have done.

Tell Dora how she can use your strategy to solve $241 + 40$ and $241 + 400$

The best strategy is to complete $1 + 4$, which is 5 and the 2 hundreds and 5 tens stay the same.

When adding 40 it is the tens column which Dora needs to look at because 40 is 4 tens.

When adding 400, she needs to look at the hundreds column because 400 is 4 hundreds.

Investigate

Does adding and subtracting ones to a 3-digit number only affect the ones column?

Does adding and subtracting tens to a 3-digit number only affect the tens column?

No, the ones can change the ones column and any column to the left e.g. $123 + 9$ and $402 - 4$

The tens column can change itself and the hundreds column e.g. $456 + 50$ and $456 - 60$

When adding and subtracting from any column, it can only affect its own column and columns to the left.

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1s, 10s, 100s, 1,000s

Notes and Guidance

Children build on prior learning of adding and subtracting hundreds, tens and ones. They are introduced to adding and subtracting thousands.

Children should use concrete representations (Base 10, place value counters etc.) before moving to abstract and mental methods.

Mathematical Talk

Can you represent the numbers using Base 10 and place value counters? What’s the same about the representations? What’s different?

If we are adding tens, are the digits in the tens column the only ones that change? Do the ones/hundreds/thousands ever change?

Varied Fluency

The number being represented is _____.

Add 3 thousands to the number. What do you have now?
Add 3 hundreds to the number. What do you have now?
Subtract 3 tens from the number. What do you have now?
Add 5 ones to the number. What do you have now?

Here is a number.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Add 3 thousands to the number.
Subtract 4 thousands from the answer.
Subtract 2 ones.
Add 5 tens.
What number do you have now?
### 1s, 10s, 100s, 1,000s

#### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Which questions are easy?</th>
<th>Which questions are hard?</th>
<th>Mo says,</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,273 + 4 = ___</td>
<td>8,273 + 4 and 8,273 – 5 thousands are easier because you do not cross any boundaries. 8,723 + 4 tens and 8,273 – 500 are harder because you have to cross boundaries and make an exchange.</td>
<td></td>
</tr>
<tr>
<td>8,273 + 4 tens = ___</td>
<td></td>
<td>When I add hundreds to a number, only the hundreds column will change.</td>
</tr>
<tr>
<td>8,273 – 500 = ___</td>
<td></td>
<td>Is Mo correct? Explain your answer.</td>
</tr>
<tr>
<td>8,273 – 5 thousands = ___</td>
<td></td>
<td>Mo is incorrect because when you add hundreds to a number and end up with more than ten hundreds, you have to make an exchange which also affects the thousands column.</td>
</tr>
</tbody>
</table>

Why are some easier than others?
Add 3-digit & 1-digit Numbers

Notes and Guidance

Children add ones to a 3-digit number, with an exchange. They discover that when adding ones it can affect the ones column and the tens column.

Children learn that we can only hold single digits in each column, anything over must be exchanged.

The use of 0 e.g. 145 – 5 is important so they know to use zero as a place holder.

Mathematical Talk

When you add ones to a number does it always, sometimes or never affect the tens column?

What is the largest digit you can have in each column? Why?

How does using the number line support partitioning the number? What number bonds help us with this method?

Varied Fluency

We can use Base 10 to solve 245 + 7

Use this method to calculate:

357 + 8 286 + 5 419 + 1

We can use a number line to calculate 346 + 7

Use this method to calculate:

46 + 4 = 50 50 + 3 = 53

so 346 + 7 = 353

564 + 8 716 + 9 327 + 5

We can partition our 1-digit number to calculate 379 + 5

Use this method to calculate:

379 + 1 = 380 380 + 4 = 384

178 + 9 826 + 7 359 + 8
Add 3-digit & 1-digit Numbers

Reasoning and Problem Solving

**Always, Sometimes, Never**

When 7 and 5 are added together in the ones column, the digit in the ones column of the answer will always be 2.

What other digits would always give a 2 in the ones column? Prove it.

<table>
<thead>
<tr>
<th>Always</th>
<th>1 + 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 + 0</td>
</tr>
<tr>
<td></td>
<td>9 + 3</td>
</tr>
<tr>
<td></td>
<td>8 + 4</td>
</tr>
<tr>
<td></td>
<td>6 + 6</td>
</tr>
</tbody>
</table>

will also always give a 2 in the ones column.

<table>
<thead>
<tr>
<th>Which questions are harder to calculate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>234 + 3 =</td>
</tr>
<tr>
<td>506 + 8 =</td>
</tr>
<tr>
<td>455 + 7 =</td>
</tr>
<tr>
<td>521 + 6 =</td>
</tr>
</tbody>
</table>

Explain your answer.

<table>
<thead>
<tr>
<th>The second and third are harder as an exchange needs to be made.</th>
</tr>
</thead>
</table>

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Add 3-digit & 2-digit Numbers

Notes and Guidance

Children add multiples of 10, to a 3-digit number with an exchange.

They recognise that when adding tens, it can change the tens and hundreds column. Encourage children to count in tens rather than use column addition.

Draw on knowledge of inverse to work out missing number problems.

Mathematical Talk

How many tens do we have? How many tens do we need to exchange for 100?

If we know how to count in tens, do we always need to use the column method or other methods?

Would it be easier for us to just count up in our heads?

Varied Fluency

Mo uses Base 10 to calculate 176 + 40

Use Mo's method to calculate:
276 + 40  266 + 40  266 + 70

Miss Wilson has 237 marbles in a box. She adds 8 more bags of 10 marbles. How many marbles does she have now? Write the calculation for this problem.

Complete the bar models.

What do you notice?
### Add 3-digit & 2-digit Numbers

#### Reasoning and Problem Solving

**Eva and Amir are calculating 783 + 90**

Eva's method:
- 783 + 100 = 883
- 883 - 10 = 873

Amir's method is a more efficient method of adding 90. Give children time to discuss each method and try them out with different numbers.

**Whose method do you prefer? Explain why.**

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

- 336 + 80
- 453 + 60
- 347 + 70
- 285 + 80

285 + 80 is the odd one out because in all the others the tens columns add up to 11 tens.

**Sort these calculations into two groups. Justify your answer.**

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>257 + 60</td>
<td>70 + 637</td>
</tr>
<tr>
<td>40 + 234</td>
<td>20 + 391</td>
</tr>
</tbody>
</table>

**Possible ways to sort:**
- Odds and evens
- Over and under 500
- Exchanging and not exchanging

**Compare your groups with a friend. Are they the same?**
2-digit & 3-digit Numbers

Notes and Guidance

Children focus on the position of numbers and place value to add and subtract 2-digit and 3-digit numbers.

They represent numbers using Base 10 and line up the place value columns.

In this step, children add numbers without an exchange.

Mathematical Talk

Where would these digits go on the place value chart? Why?

When we subtract, why do we not make both numbers? Why do we make both numbers when we add?

What is the same about the additions and subtractions? What changes?

Varied Fluency

Match the calculation to the correct representation and solve.

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 + 461</td>
<td></td>
<td></td>
</tr>
<tr>
<td>553 – 32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>544 + 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Represent the calculations using Base 10 and solve them.

388 – 44
167 + 32
265 – 43

Calculate:

365
+ 23
365
− 23
365
+ 32
365
− 32
2-digit & 3-digit Numbers

Reasoning and Problem Solving

Eva has 169 sweets in a jar. She gives 37 sweets to Mo. Which model represents this problem?

a)  

\[
\begin{array}{c|c|c}
| & 132 & \\
|---|---|---
| 37 | 169 |
\end{array}
\]

c)  

\[
\begin{array}{c|c|c}
| & 169 & \\
|---|---|---
| 37 | 132 |
\end{array}
\]

C is correct because 37 + 132 = 169

37 is a part, 132 is a part and 169 is the whole.

Explain the mistake Jack has made.

\[
\begin{array}{c|c|c|c}
| & 2 & 3 & 1 \\
|---|---|---|
+ & 6 & 3 \\
\hline
\end{array}
\]

Eva has 169 sweets. Mo has 121 sweets.

Which addition will find how many sweets they have altogether?

\[
\begin{array}{c|c|c}
| & 1 & 2 & 1 \\
|---|---|---|
+ & 7 & 7 \\
\hline
\end{array}
\]

Explain your answer.

Jack has put 63 in the wrong place value columns.

Both are correct because addition is commutative and the numbers can be added either way round.
Add 2-digit & 3-digit Numbers

Notes and Guidance

Children deepen their understanding of adding 2-digit and 3-digit numbers in this step. They start adding numbers where there is an exchange from ones to tens, they then move on to exchanging tens to hundreds before adding numbers where there are exchanges in both columns.

Highlight the links between the concrete representations and the column method to support children in understanding how the column method works.

Mathematical Talk

What happens when we have 10 ones in a column? How many tens do we exchange 10 ones for? How do we show the exchange in the column method?

What happens when we have 10 tens in a column? How many hundreds do we exchange 10 tens for? How do we show the exchange in the column method?

What do you notice about the additions in the models? How many exchanges do we need to make?

Varied Fluency

Annie uses Base 10 to calculate 317 + 46

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use Annie’s method to calculate:

327 + 46  537 + 36  538 + 32  267 + 24

Dexter uses place value counters to calculate 163 + 52

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</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>
</tbody>
</table>

Use Dexter’s method to calculate:

372 + 64  537 + 82  537 + 72  248 + 70

Complete the models using column addition.
Add 2-digit & 3-digit Numbers

Reasoning and Problem Solving

Eva is incorrect because she has not exchanged ten ones for one ten or shown this in the column method.

Here is her working out:

\[
\begin{array}{c}
265 + 27 = 282 \\
\hline
\end{array}
\]

Eva

She should have added an extra ten to the tens column. The correct answer is 292.

Sort the additions into the table.

<table>
<thead>
<tr>
<th>No exchange</th>
<th>Exchange 10 ones</th>
<th>Exchange 10 tens</th>
</tr>
</thead>
<tbody>
<tr>
<td>375 + 18</td>
<td>456 + 72</td>
<td>912 + 79</td>
</tr>
<tr>
<td>910 + 79</td>
<td>456 + 27</td>
<td>342 + 35</td>
</tr>
</tbody>
</table>

Can you write 2 more additions in each column?

Choose one 2-digit and one 3-digit number.
Write additions that have an exchange in the ones and the tens columns.

No exchange:
910 + 79
342 + 35

Exchange 10 ones
375 + 18
456 + 27
912 + 79

Exchange 10 tens
456 + 72

23 + 487
35 + 467
56 + 756
619 + 81
Add Two 3-digit Numbers (1)

Notes and Guidance

Children add two 3-digit numbers with no exchange. They should focus on the lining up of the digits and setting the additions clearly out in columns. Having exchanged between columns in recent steps, look out for children who exchange ones and tens when they don’t need to. Reinforce that we only exchange when there are 10 or more in a column.

Mathematical Talk

Where would these digits go on the place value chart? Why?

Why do we make both numbers when we add?

Can you represent _____ using the equipment?

Can you draw a picture to represent this?

Why is it important to put the digits in the correct column?

Varied Fluency

Complete the calculations.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>20</td>
<td>11</td>
</tr>
</tbody>
</table>

___ + ___ = ___

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

___ + ___ = ___

Use the column method to calculate:

- Three hundred and forty-five add two hundred and thirty-six.
- Five hundred and sixteen plus three hundred and sixty-two.
- The total of two hundred and forty-seven and four hundred and two.
Add Two 3-digit Numbers (1)

Reasoning and Problem Solving

Jack is calculating $506 + 243$
Here is his working out.

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

Can you spot Jack's mistake? Work out the correct answer.

Jack hasn't used zero as a place holder in the tens column. The correct answer should be 749

Here are three digit cards.

2 3 4

Alex and Teddy are making 3-digit numbers using each card once.

Alex's number is 432
Teddy's number is 234
The total is 666

Alex
I have made the greatest possible number.

Teddy
I have made the smallest possible number.

Work out the total of their two numbers.
Add Two 3-digit Numbers (2)

Notes and Guidance

Children add two 3-digit numbers with an exchange. They start by adding numbers where there is one exchange required before looking at questions where they need to exchange in two different columns. Children may use Base 10 or place value counters to model their understanding. Ensure that children continue to show the written method alongside the concrete so they understand when and why an exchange takes place.

Mathematical Talk

How many ones do we need to exchange for one ten?

How many tens do we need to exchange for one hundred?

Can you work out how many points Eva and Ron scored each over the two games?

Why is it so important to show the exchanged digit on the column method?

Varied Fluency

Use place value counters to calculate 455 + 436

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Eva and Ron are playing a game.
Eva scores 351 points and Ron scores 478 points.
How many points do they score altogether?
How many more points does Ron score than Eva?

Eva and Ron play the game again.
Eva scores 281 points, Ron scores 60 less than Eva.
How many points do they score altogether?

Complete the models.

<table>
<thead>
<tr>
<th>457</th>
<th>187</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>349</td>
</tr>
</tbody>
</table>

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Add Two 3-digit Numbers (2)

Reasoning and Problem Solving

Roll a 1 to 6 die. Fill in a box each time you roll.

\[ \square \square \square + \square \square \square = \]

Can you make the total:

- An odd number
- An even number
- A multiple of 5
- The greatest possible number
- The smallest possible number

Discuss the rules with the children and what they would need to roll to get them e.g. to get an odd number only one of the ones should be odd because if both ones have an odd number, their total will be even.

Complete the statements to make them correct.

\[
\begin{align*}
487 + 368 & \quad \bigcirc \quad 487 + 468 \\
326 + 258 & \quad \bigcirc \quad 325 + 259 \\
391 + 600 & \quad = \quad 401 + \_\_\_ \\
\end{align*}
\]

Explain why you do not have to work out the answers to compare them.

- \(< \quad \bigcirc \quad 590 \):
  - In the first one we start with the same number, so the one we add more to will be greater.
  - In the second 325 is one less than 326 and 259 is one more than 258, so the total will be the same.
  - In the last one 401 is 10 more than 391, so we need to add 10 less than 600.
Add Two 4-digit Numbers (1)

Notes and Guidance

Children use their understanding of addition of 3-digit numbers to add two 4-digit numbers with no exchange.

They use concrete equipment and a place value grid to support their understanding alongside column addition.

Mathematical Talk

How many ones are there altogether? Can we make an exchange? Why? (Repeat questions for other columns)

Is it more difficult to add 3-digit or 4-digit numbers without exchanging? Why?

How can you find the missing numbers? Do you need to add or subtract?

Varied Fluency

Use counters and a place value grid to calculate 242 + 213

Use counters and a place value grid to calculate 3,242 + 2,213

<table>
<thead>
<tr>
<th>1,000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>100</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>1000</td>
<td>100</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Now calculate 3,242 + 213 in the same way. What is the same and what is different?

Work out the missing numbers.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>___</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

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Add Two 4-digit Numbers (1)

Reasoning and Problem Solving

Rosie adds 2 numbers together that total 4,444

Both numbers have 4 digits.

All the digits in both numbers are even.

What could the numbers be?
Prove it.
How many ways can you find?

Possible answers:

2,222 + 2,222
2,244 + 2,200
2,242 + 2,220
2,442 + 2,002
2,242 + 2,202
2,424 + 2,020
2,422 + 2,022
2,444 + 2,000

There are more possible pairs.
This includes 0 as an even number.
Discussion could be had around whether 0 is odd or even and why.

Two children completed the following calculation:

1,234 + 345

My answer is 1,589

Dora

My answer is 4,684

Alex

Both of the children have made a mistake in their calculations.
Calculate the actual answer to the question.
What mistakes did they make?

The actual answer is 1,579
Dora’s mistake was a miscalculation for the 10s column, adding 30 and 40 to get 80 rather than 70
Alex’s mistake was a place value error, placing the 3 hundred in the thousands column and following the calculation through incorrectly.
Add Two 4-digit Numbers (2)

Notes and Guidance

Children add two 4-digit numbers with one exchange. They use a place value grid to support understanding alongside column addition.

They explore exchanges as they occur in different place value columns and look for similarities/differences.

Mathematical Talk

How many ones do we have altogether? Can we make an exchange? Why? How many ones do we exchange for one ten? Do we have any ones remaining? (Repeat for other columns.)

Why is it important to line up the digits in the correct column when adding numbers with different amounts of digits?

Which columns are affected if there are more than ten tens altogether?

Varied Fluency

Rosie uses counters to find the total of 3,356 and 2,435

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>+</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

5 7 9 1

Use Rosie's method to calculate:


Dexter buys a laptop costing £1,265 and a mobile phone costing £492

How much do the laptop and the mobile phone cost altogether?

Complete the bar models.

1,185  405

3,535  2,634

3,264  1,655

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Add Two 4-digit Numbers (2)

Reasoning and Problem Solving

What is the missing 4-digit number?

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>__</td>
<td>__</td>
<td>__</td>
<td>__</td>
</tr>
<tr>
<td>+</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

2,554

Annie, Mo and Alex are working out the solution to the calculation 6,374 + 2,823

**Annie’s Strategy**

6,000 + 2,000 = 8,000
300 + 800 = 110
70 + 20 = 90
4 + 3 = 7
8,000 + 110 + 90 + 7 = 8,207

**Mo’s Strategy**

<table>
<thead>
<tr>
<th>6</th>
<th>3</th>
<th>7</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

**Alex’s Strategy**

<table>
<thead>
<tr>
<th>6</th>
<th>3</th>
<th>7</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

Who is correct?

Alex is correct with 9,197

Annie has miscalculated 300 + 800, forgetting to exchange a ten hundreds to make a thousand (showing 11 tens instead of 11 hundreds).

Mo has forgotten both to show and to add on the exchanged thousand.
Add Two 4-digit Numbers (3)

Notes and Guidance

Building on adding two 4-digit numbers with one exchange, children explore multiple exchanges within an addition.

Ensure children continue to use equipment alongside the written method to help secure understanding of why exchanges take place and how we record them.

Mathematical Talk

How many ones do we have altogether? Can we make an exchange? Why? How many ones do we exchange for one ten? How many ones are remaining? (Repeat for each column.)

Why do you have to add the digits from the right to the left, starting with the smallest place value column? Would the answer be the same if you went left to right?

What is different about the total of 4,844 and 2,156? Can you think of two other numbers where this would happen?

Varied Fluency

Use counters and a place value grid to calculate:

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>+</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td></td>
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<tr>
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<td>5</td>
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<tr>
<td>1</td>
<td>7</td>
<td>7</td>
<td>2</td>
<td>+</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Find the total of 4,844 and 2,156

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,844</td>
<td>2,156</td>
<td>1,111</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

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

3,456 + 789 〇 1,810 + 2,436
2,829 + 1,901 〇 2,312 + 2,418
7,542 + 1,858 〇 902 + 8,496
1,818 + 1,999 〇 3,110 + 707
Add Two 4-digit Numbers (3)

Reasoning and Problem Solving

Jack says,

When I add two numbers together I will only ever make up to one exchange in each column.

Do you agree? Explain your reasoning.

Jack is correct. When adding any two numbers together, the maximum value in any given column will be 18 (e.g. 18 ones, 18 tens, 18 hundreds). This means that only one exchange can occur in each place value column. Children may explore what happens when more than two numbers are added together.

Complete:

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>?</td>
<td>?</td>
<td>8</td>
</tr>
<tr>
<td>+</td>
<td>?</td>
<td>8</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Mo says that there is more than one possible answer for the missing numbers in the hundreds column. Is he correct? Explain your answer.

Mo is correct. The missing numbers in the hundreds column must total 1,200 (the additional 100 has been exchanged).

Possible answers include:

- 6,338 + 2,987
- 6,438 + 2,887

The solution shows the missing numbers for the ones, tens and thousands columns.
Addition & Subtraction

Theme 3 – Subtraction
Subtract 1-digit from 3-digits

Notes and Guidance

Children subtract a 1-digit number from a 3-digit number using an exchange.

Children need to be secure in the fact that 321 is 3 hundreds, 2 tens and 1 one but that it is also 3 hundreds, 1 ten and 11 ones.

If children are not secure with regrouping, it is important to revisit this before subtracting.

Mathematical Talk

How many ones do we exchange for one ten?

Why do all these subtractions require an exchange? When do we not need to exchange?

Which method do you prefer? Can you calculate the subtractions mentally?

Varied Fluency

Teddy uses Base 10 to calculate 321 – 4

Use this method to calculate:

322 – 4  
322 – 7  
435 – 7

Dora uses the part-whole model and number line to solve 132 – 4

Use this method to calculate:

132 – 8  
123 – 8  
123 – 5

Red team have 672 points.
Blue team have 7 fewer points than red team.
How many points do blue team have?
## Subtract 1-digit from 3-digits

### Reasoning and Problem Solving

<table>
<thead>
<tr>
<th>Ron and Jack use Base 10 to solve 225 – 8</th>
<th>Both methods can get the answer of 217 but I would choose Jack’s because he has already exchanged one of his tens for ten ones.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ron’s method:</td>
<td>Whitney has 125 stickers. She gives less than 10 stickers to Eva. She has an odd number of stickers left. How many stickers might Whitney have given away?</td>
</tr>
<tr>
<td>![Ron's method diagram]</td>
<td>What do you notice is the same about your answers? If Whitney had an even number of stickers left, how many might she have given away?</td>
</tr>
<tr>
<td>Jack’s method:</td>
<td>Explain how you would solve these calculations:</td>
</tr>
<tr>
<td>![Jack's method diagram]</td>
<td>564 – ____ = 558</td>
</tr>
<tr>
<td>Explain which method you would use and why.</td>
<td>____ – 8 = 725</td>
</tr>
<tr>
<td></td>
<td>352 = 361 – ____</td>
</tr>
</tbody>
</table>

| Whitney might have given Eva 2, 4, 6 or 8 stickers. All the answers are even. If Whitney had an even number of stickers left she might have given 1, 3, 5, 7 or 9 away. | Children explain their methods, they may count on or back, use a number line, part-whole model or Base 10 |

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Subtract 2-digits from 3-digits

Notes and Guidance

Children subtract multiples of 10 from a 3-digit number, with an exchange. The examples show different ways this concept could be taught using number lines and part-whole models.

The column method could be used, however, it is not the most efficient method.

Counting backwards in tens or using 100 to help will support mental strategies.

Mathematical Talk

How many tens do we exchange one hundred for?

How can we partition 70 to subtract it from 240 more efficiently? Show this on the number line.

Can you model Amir’s method using a number line?

Varied Fluency

Rosie uses Base 10 to subtract 70 from 321

Use Rosie’s method to calculate:

$$321 - 80 \quad 421 - 6\text{ tens} \quad 451 - 60$$

Count back in tens to solve 240 - 70

Amir calculates 425 - 90 by subtracting 100 and then adding 10

Use Amir’s method to solve:

$$386 - 90 \quad 574 - 90 \quad 212 - 90$$
### Subtract 2-digits from 3-digits

#### Reasoning and Problem Solving

| Complete the missing digits.                  | 13☐ - 50 = 85   |
|                                           | 334 - ☐0 = 294 |
|                                           | 545 = 6☐5 - 70 |

| 135  |
| 40   |
| 615  |

| How many different methods could you use to solve 837 – 90? |
| Possible methods: 837 – 100 = 737 737 + 10 = 747 |
| 90 = 37 and 53 (could show in part-whole model) 837 – 37 = 800 800 – 53 = 747 |
| 837 – 30 = 807 807 – 60 = 747 |

| Share your methods with a partner. |
| Expanded or formal written methods. |

| Whitney thinks the rule for the function machine is subtract 60 |
| Is she correct? Explain why. |
| The rule is subtract 70 |

<table>
<thead>
<tr>
<th>Input</th>
<th>Rule</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>567</td>
<td>?</td>
<td>497</td>
</tr>
</tbody>
</table>
2-digit & 3-digit Numbers

Notes and Guidance

Children focus on the position of numbers and place value to add and subtract 2-digit and 3-digit numbers.

They represent numbers using Base 10 and line up the place value columns.

In this step, children add numbers without an exchange.

Mathematical Talk

Where would these digits go on the place value chart? Why?

When we subtract, why do we not make both numbers? Why do we make both numbers when we add?

What is the same about the additions and subtractions? What changes?

Varied Fluency

Match the calculation to the correct representation and solve.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 + 461</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>553 − 32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>544 + 22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Represent the calculations using Base 10 and solve them.

388 − 44
167 + 32
265 − 43

Calculate:

365 + 23
365 − 23
365 + 32
365 − 32
2-digit & 3-digit Numbers

Reasoning and Problem Solving

Eva has 169 sweets in a jar. She gives 37 sweets to Mo. Which model represents this problem?

a)  
\[
\begin{array}{c|c}
| & \\
\hline
37 & 132 \\
\hline
& 169 \\
\end{array}
\]

C is correct because 37 + 132 = 169

37 is a part, 132 is a part and 169 is the whole.

b)  

132 → 169 → 37

c)  
\[
\begin{array}{c|c}
| & \\
\hline
37 & 169 \\
\hline
& 132 \\
\end{array}
\]
d)  

132 → 37 → 169

Express the mistake Jack has made.

\[
\begin{array}{c|c}
H & O \\
\hline
2 & 3 & 1 \\
\hline
+ & 6 & 3 \\
\hline
\end{array}
\]

Jack has put 63 in the wrong place value columns.

Rosie has 77 sweets. Mo has 121 sweets. Which addition will find how many sweets they have altogether?

121 + 77 + 121

Both are correct because addition is commutative and the numbers can be added either way round.

Explain your answer.
Subtract 2-digits from 3-digits

Notes and Guidance

Children focus on the position of numbers and place value to subtract 2-digits from 3-digits using the column method. Children start by exchanging one ten for ten ones. Next they exchange one hundred for ten tens before subtracting numbers where there are exchanges in both columns. Encourage children to use Base 10 and place value counters so they can physically exchange and see the link between the concrete and the written column method.

Mathematical Talk

How does the concrete representation match the written column method?

How do you know that you need to exchange?

What do you notice about the subtractions to find the missing numbers? How many exchanges are there?

Varied Fluency

Teddy uses Base 10 to subtract 28 from 255

<table>
<thead>
<tr>
<th>H</th>
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<th>H</th>
<th>T</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use Teddy’s method to calculate:

365 – 48

492 – 38

722 – 16

Alex uses place value counters to calculate 434 – 72

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use Alex’s method to calculate:

248 – 67

247 – 67

354 – 92

Calculate the missing number in each model.

411

? 86

? 69

? 332
Subtract 2-digits from 3-digits

Reasoning and Problem Solving

Rosie thinks $352 - 89 = 337$

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>−</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

Rosie is incorrect because she has subtracted the digits in a different order instead of exchanging.
The answer should be 263

Alex, Teddy and Dora are trying to work out $300 - 57$

Who has the most efficient way of working it out? Explain how you know.

Alex: I know that take away means difference, so I can do 299 take away 56 and get the right answer.

Teddy: I can count on from 57 to 100, and then count on to 300

Dora: I can use the column method to work it out and exchange when I need to.
Subtract 3-digits from 3-digits (1)

Notes and Guidance

It is important for the children to understand that there are different methods of subtraction. They need to explore efficient strategies for subtraction, including:
• counting on (number lines)
• near subtraction
• number bonds

They then move on to setting out formal column subtraction supported by practical equipment.

Mathematical Talk

Which strategy would you use and why?

How could you check your answer is correct?

Does it matter which number is at the top of the subtraction?

Varied Fluency

We can count on using a number line to find the missing value on the bar model. E.g.

Use this method to find the missing values.

There are 146 girls and boys in a swimming club. 115 of them are girls. How many are boys?

Mo uses Base 10 to subtract 142 from 373

Use Mo’s method to calculate:

Subtract 3-digits from 3-digits (1)

Reasoning and Problem Solving

Start with the number 888
Roll a 1-6 die three times, to make a 3-digit number.
Subtract the number from 888
What number have you got now?

What’s the smallest possible difference?
What’s the largest possible difference?
What if all the digits have to be different?
Will you ever find a difference that is a multiple of 10? Why?
Do you have more odd or even differences?

The smallest difference is 222 from rolling 111
The largest difference is 777 from rolling 666

Children will never have a multiple of 10 because you can’t roll an 8 to subtract 8 ones.
Children may investigate what is subtracted in the ones column to make odd and even numbers.

Use the digit cards to complete the calculation.

0 3 4 4 6
7 7 8 9

The digits in the shaded boxes are odd.

Is there more than one answer?

Possible answers include:
987 – 647 = 340
879 – 473 = 406
Subtract 3-digits from 3-digits (2)

Notes and Guidance

Children explore column subtraction using concrete manipulatives. It is important to show the column method alongside so that children make the connection to the abstract method and so understand what is happening. Children progress from an exchange in one column, to an exchange in two columns. Reinforce the importance of recording any exchanges clearly in the written method.

Mathematical Talk

Which method would you use for this calculation and why?

What happens when you can’t subtract 9 ones from 7 ones? What do we need to do?

How would you teach somebody else to use column subtraction with exchange?

Why do we exchange? When do we exchange?

Varied Fluency

Complete the calculations using place value counters.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>372 − 145</td>
<td>300</td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>629 − 483</td>
<td>600</td>
<td>20</td>
<td>9</td>
</tr>
</tbody>
</table>

Complete the column subtractions showing any exchanges.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>683 − 234</td>
<td>500</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>234 − 195</td>
<td>200</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>507 − 451</td>
<td>400</td>
<td>50</td>
<td>1</td>
</tr>
</tbody>
</table>

©White Rose Maths
Subtract 3-digits from 3-digits (2)

Reasoning and Problem Solving

Work out the missing digits.

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>?</td>
<td>3</td>
</tr>
<tr>
<td>−</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

533 − 218 = 315
504 − 258 = 246

Eva is working out 406 − 289

Here is her working out:

Step 1

$$\begin{array}{c}
3 \\
406 \\
\hline
-289 \\
\hline
7
\end{array}$$

Step 2

$$\begin{array}{c}
2 \\
406 \\
\hline
-289 \\
\hline
027
\end{array}$$

Eva has exchanged from the hundred column to the ones so there are 106 ones in the ones column. She should have exchanged 1 hundred for 10 tens and then 1 ten for 10 ones.

406 − 289 = 117

Explain her mistake.

What should the answer be?
Subtract Two 4-digit Numbers (1)

Building on their experiences in Year 3, children use their knowledge of subtracting using the formal column method to subtract two 4-digit numbers.

Children will focus on calculations with no exchanges, concentrating on the value of each digit.

Notes and Guidance

Varied Fluency

Eva uses place value counters to calculate 3,454 − 1,224

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>− 1</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Use Eva's method to calculate:

\[ 2,348 − 235 = \underline{2113} = 4,572 − 2,341 \]
\[ 6,582 − 582 = \underline{6000} = 7,262 − 7,151 \]

Use a bar model to represent each problem.

There are 3,597 boys and girls in a school. 2,182 are boys. How many are girls?

Car A travels 7,653 miles per year. Car B travels 5,612 miles per year. How much further does Car A travel than Car B per year?

Mathematical Talk

Do you need to make both numbers when you are subtracting with counters? Why?

Why is it important to always subtract the smallest place value column first?

How are your bar models different for the two problems? Can you use the written method to calculate the missing numbers?
Subtract Two 4-digit Numbers (1)

Reasoning and Problem Solving

Eva is performing a column subtraction with two four digit numbers.

The larger number has a digit total of 35
The smaller number has a digit total of 2
Use cards to help you find the numbers.
What could Eva's subtraction be?
How many different options can you find?

9998 - 1100 = 8898
9998 - 1010 = 8988
9998 - 1001 = 8997
9998 - 2000 = 7998
9989 - 1100 = 8889
9989 - 1010 = 8979
9989 - 1001 = 8998
9989 - 2000 = 7989
9899 - 1100 = 8799
9899 - 1010 = 8889
9899 - 1001 = 8898
9899 - 2000 = 7899
8999 - 1100 = 8799
8999 - 1010 = 8889
8999 - 1001 = 8898
8999 - 2000 = 7899

There are counters to the value of 3,470 on the table but some have been covered by the splat.

What is the total of the counters covered?
How many different ways can you make the missing total?

3470 − 1260 = 2210
Possible answers include:
- two 1000s, two 100s and one 10
- twenty-two 100s and one 10
- twenty-two 100s and ten 1s
Subtract Two 4-digit Numbers (2)

Notes and Guidance

Building on their experiences in Year 3, children use their knowledge of subtracting using the formal column method to subtract two 4-digit numbers.

Children explore subtractions where there is one exchange. They use place value counters to model the exchange and match this with the written column method.

Varied Fluency

Dexter is using place value counters to calculate 5,643 − 4,316

<table>
<thead>
<tr>
<th>1,000s</th>
<th>100s</th>
<th>10s</th>
<th>1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>−</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

Use Dexter’s method to calculate:

4,721 − 3,605 = 4,721 − 3,650 = 4,172 − 3,650 =

Dora and Mo are collecting book tokens.
Dora has collected 1,452 tokens.
Mo has collected 621 tokens fewer than Dora.

Represent this scenario on a bar model.
What can you find out?

Mathematical Talk

When do we need to exchange in a subtraction?
How do we indicate the exchange on the written method?

How many bars are you going to use in your bar model?
Can you find out how many tokens Mo has?
Can you find out how many tokens they have altogether?

Can you create your own scenario for a friend to represent?
Subtract Two 4-digit Numbers (2)

Reasoning and Problem Solving

Add children and teachers together first.

1,179 + 27 = 1,206

Subtract this from total number of people.

1,235 − 1,206 = 29

29 parents.

Find the missing numbers that could go into the spaces.

____ − 1,345 = 4__6

Give reasons for your answers.

What is the greatest number that could go in the first space?

What is the smallest?

How many possible answers could you have?

What is the pattern between the numbers?

What method did you use?

Possible answers:

1,751 and 0
1,761 and 10
1,771 and 20
1,781 and 30
1,791 and 40
1,801 and 50
1,811 and 60
1,821 and 70
1,831 and 80
1,841 and 90
1,841 is the greatest
1,751 is the smallest.

There are 10 possible answers. Both numbers increase by 10.

1,235 people go on a school trip.

There are 1,179 children and 27 teachers. The rest are parents.

How many parents are there?

Explain your method to a friend.
Subtract Two 4-digit Numbers (3)

Notes and Guidance

Children explore what happens when a subtraction has more than one exchange. They can continue to use manipulatives to support their understanding. Some children may feel confident calculating with a written method.

Encourage children to continue to explain their working to ensure they have a secure understanding of exchange within 4-digits numbers.

Mathematical Talk

When do we need to exchange within a column subtraction?

What happens if there is a zero in the next column? How do we exchange?

Can you use place value counters or Base 10 to support your understanding?

How can you find the missing 4-digit number? Are you going to add or subtract?

Varied Fluency

_use place value counters and the column method to calculate:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5,783</td>
<td>6,737</td>
<td>8,252</td>
</tr>
<tr>
<td>1,205</td>
<td>2,037</td>
<td>2,037</td>
</tr>
<tr>
<td>844</td>
<td>759</td>
<td>6,560</td>
</tr>
<tr>
<td>398</td>
<td>889</td>
<td>1,589</td>
</tr>
</tbody>
</table>

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>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8,435</td>
<td></td>
</tr>
<tr>
<td>367</td>
<td>579</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are ____ magazines left.

Find the missing 4-digit number.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>+</td>
<td>4</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Amir and Tommy solve a problem.

Amir:
When I subtract 546 from 3,232 my answer is 2,714.

Tommy:
When I subtract 546 from 3,232 my answer is 2,686.

Who is correct?
Explain your reasoning.
Why is one of the answers wrong?

Tommy is correct.
Amir is incorrect because he did not exchange, he just found the difference between the numbers in the columns instead.

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

First you need to find the number of visitors on Sunday which is
2,114 − 650 = 1,464

Then you need to add Saturday’s visitors to that number to solve the problem.
1,464 + 2,114 = 3,578

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

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

Notes and Guidance

Children use their understanding of column subtraction and mental methods to find the most efficient methods of subtraction.

They compare the different methods of subtraction and discuss whether they would partition, take away or find the difference.

Varied Fluency

Ron, Rosie and Dexter are calculating $7,000 - 3,582$

Here are their methods:

<table>
<thead>
<tr>
<th></th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ron</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>− 3</td>
<td>5</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
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<td>Rosie</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>− 3</td>
<td>5</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
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Dexter

3,000 + 400 + 18 = 3,418

Whose method is most efficient?

Use the different methods to calculate $4,000 - 2,831$

Find the missing numbers.

What methods did you use?

<p>| | |</p>
<table>
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<tbody>
<tr>
<td>3,465</td>
<td></td>
</tr>
<tr>
<td>2,980</td>
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Amir has £1,000

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?

Children should use the three methods demonstrated in the varied fluency section to get an answer of £545

Look at each pair of calculations. Which one out of each pair has the same difference as 2,450 – 1,830?

2,451 – 1,831

2,500 – 1,880

2,449 – 1,829

Added one to each number.

Added 50 to both numbers.

Subtracted one from each number.

The difference is 620

When is it useful to use difference to solve subtractions?
**Estimate Answers**

**Notes and Guidance**

Children check how reasonable their answers are. While rounding is not formally introduced until Year 4, it is helpful that children can refer to ‘near numbers’ to see whether an estimate is sensible.

Discuss why estimations are important. Consider real life situations where children or adults need to estimate. Encourage children to estimate calculations before working out precisely to help to check working.

**Mathematical Talk**

What would you estimate this to be?

Why did you choose this number?

Why is/isn’t this a sensible estimation to an answer?

How does estimating answers help us in real life?

**Varied Fluency**

 Estimate the position of arrows A and B on the number line. Use your estimations to estimate the difference between A and B.

Match each number to its ‘near number’.

<table>
<thead>
<tr>
<th>497</th>
<th>304</th>
<th>52</th>
<th>27</th>
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</thead>
<tbody>
<tr>
<td>30</td>
<td>500</td>
<td>50</td>
<td>300</td>
</tr>
</tbody>
</table>

Use the near numbers to estimate the answers to the calculations:

- $497 + 304$  
- $304 - 27$  
- $27 + 52 + 304$

- $27 + 304$  
- $497 - 52$  
- $304 - 52 - 27$

- $52 + 497$  
- $497 - 304$  
- $304 + 52 - 27$
Estimate Answers

Reasoning and Problem Solving

Tommy

I estimate 143 – 95 will be 50 because I will subtract 100 from 150

Is this a good estimate? Why?

Are there any other ways he could have estimated?

Yes, because he found two numbers close to the original numbers.

He could have rounded to the nearest 10 and calculated.

140 – 100 (= 40)

Use the number cards to make different calculations with an estimated answer of 70

Possible answers:

121 – 48 (120 – 50)

41 + 33 (40 + 30)

398 – 328 (400 – 330)
Children explore ways of checking to see if an answer is reasonable.

Checking using inverse is to be encouraged so that children are using a different method and not just potentially repeating an error, for example, if they add in a different order.

How can you tell if your answer is sensible?

Does knowing if a number is close to a multiple of 100 help when adding and subtracting 3-digit numbers? How does it help?

Does it help to check your answer if you spot which numbers are near to multiples of 10?

How does counting in 10s, 50s and 100s help?

Use a subtraction to check the answer to the addition.

134 + 45 = 179

Alex has baked 145 cakes for a bun sale. She sells 78 cakes. How many does she have left?

Show your answer using a bar model and check your answer using an addition.

Write all the calculations you could make using these cards.
Check Answers

Reasoning and Problem Solving

Mo

If I add two numbers together, I can check my answer by using a subtraction of the same numbers after e.g. to check $23 + 14$, I can do $14 - 23$.

Do you agree? Explain why.

No, because you cannot have “part subtract part”.
You need to find the whole and this needs to be at the start of the subtraction then you subtract a part to check the remaining part.

I completed an addition and then used the inverse to check my calculation.

When I checked my calculation, the answer was 250.

One of the other numbers was 355.

What could the calculation be?

$$\_\_ + \_\_ = \_\_$$

$$\_\_ - \_\_ = 250$$

Possible answers:

$355 - 105 = 250$

$605 - 355 = 250$

So the calculation could have been:

$250 + 105 = 355$

$250 + 355 = 605$
Estimate Answers

Notes and Guidance

In this step, children use their knowledge of rounding to estimate answers for calculations and word problems.

They build on their understanding of near numbers in Year 3 to make sensible estimates.

Mathematical Talk

When in real life would we use an estimate?

Why should an estimate be quick?

Why have you rounded to the nearest 10/100/1,000?

Varied Fluency

Match the calculations with a good estimate.

- $345 + 1,234$  
  - $3,000 + 6,000$
- $2,985 + 6,325$  
  - $3,500 + 1,200$
- $3,541 + 1,179$  
  - $350 + 1,200$
- $2,135 + 6,292$  
  - $2,000 + 6,000$

Alex is estimating the answer to $3,625 + 4,277$

She rounds the numbers to the nearest thousand, hundred and ten to give different estimates. Complete her working.

Original calculation: $3,625 + 4,277 = ____$

Round to nearest thousands: $4,000 + 4,000 = ____$

Round to nearest hundreds: $3,600 + ____ = ____$

Round to nearest tens: ____ + ____ = ____

 Decide whether to round to the nearest 10, 100 or 1,000 and estimate the answers to the calculations.

- $4,623 + 3,421$
- $9,732 - 6,489$
- $8,934 - 1,187$
Estimate Answers

Reasoning and Problem Solving

Game

The aim of the game is to get a number as close to 5,000 as possible.

Each child rolls a 1-6 die and chooses where to put the number on their grid.

Once they have each filled their grid, they add up their totals to see who is the closest.

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<td>+</td>
<td>?</td>
<td>?</td>
<td>?</td>
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</tbody>
</table>

The aim of the game can be changed, i.e. make the smallest/largest possible total etc. Dice with more faces could also be used.

The estimated answer to a calculation is 3,400
The numbers in the calculation were rounded to the nearest 100 to find an estimate.
What could the numbers be in the original calculation?

Use the number cards and + or − to make three calculations with an estimated answer of 2,500

Possible answers include

2,343 + 1,089 =
4,730 − 1,304 =
3,812 − 1,295 (3,800 − 1,300 = 2,500)
4,002 − 1,489 (4,000 − 1,500 = 2,500)
1,449 + 1,120 (1,400 + 1,100 = 2,500)
Checking Strategies

Notes and Guidance

Children explore ways of checking to see if an answer is correct by using inverse operations.

Checking using inverse is to be encouraged so that children are using a different method and not just potentially repeating an error, for example, if they add in a different order.

Mathematical Talk

How can you tell if your answer is sensible?

What is the inverse of addition?

What is the inverse of subtraction?

Varied Fluency

2,300 + 4,560 = 6,860

Use a subtraction to check the answer to the addition.
Is there more than one subtraction we can do to check the answer?

If we know 3,450 + 4,520 = 7,970, what other addition and subtraction facts do we know?

___ + ___ = ___
___ - ___ = ___
___ - ___ = ___

Does the equal sign have to go at the end? Could we write an addition or subtraction with the equals sign at the beginning? How many more facts can you write now?

Complete the pyramid.
Which calculations do you use to find the missing numbers?
Which strategies do you use to check your calculations?
Here is a number sentence.

350 + 278 + 250

Add the numbers in different orders to find the answer. Is one order of adding easier? Why?

Create a rule when adding more than one number of what to look for in a number.

I completed an addition and then used the inverse to check my calculation. When I checked my calculation, the answer was 3,800. One of the other numbers was 5,200. What could the calculation be?

___ + ___ = ___

___ − ___ = 3,800

It is easier to add 350 and 250 to make 600 and then add on 278 to make 878. We can look for making number bonds to 10, 100 or 1,000 to make a calculation easier.

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?

<table>
<thead>
<tr>
<th>897</th>
<th></th>
<th>832</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>762</td>
</tr>
</tbody>
</table>

Possible answers:

5,200 − 1,400 = 3,800
9,000 − 5,200 = 3,800

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

There are many correct answers.

Top row missing boxes need to total 303

Middle row total 368

Bottom row total 438

<table>
<thead>
<tr>
<th>897</th>
<th>270</th>
<th>33</th>
</tr>
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<tbody>
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