



# **ST. AUGUSTINE OF CANTERBURY CATHOLIC PRIMARY SCHOOL**

## **Progression in Calculation Policy**

### **Mission Statement**

"I called you by your name, you are mine." Isaiah 43

The mission of our school is to support and further the teachings of Christ and His Church.

We welcome and embrace individuals of all abilities and cultural backgrounds.

We aim to enhance and celebrate their moral, physical, social and emotional development, so that they may reach their full potential in an atmosphere of stability, care and respect.

We believe that education is for all and in partnership with parents, carers, children and the wider Catholic community: we will strive and succeed in a wholly inclusive setting.

### **Equality Statement**

This policy has been equality impact assessed and we believe that it is in line with the Equality Act 2010 as it is fair, it does not prioritise or disadvantage any pupil and it helps to promote equality at Augustine of Canterbury Catholic Primary School. We have carefully considered and analysed the impact of this policy on equality and the possible implications for pupils with protected characteristics, as part of our commitment to meet the Public Sector Equality Duty (PSED) requirement to have due regard to the need to eliminate discrimination, advance equality of opportunity and foster good relations.

Date issued: February 2025

Date to be reviewed: February 2026

Written by: Miss Lisa Richardson (Mathematics co-ordinator)



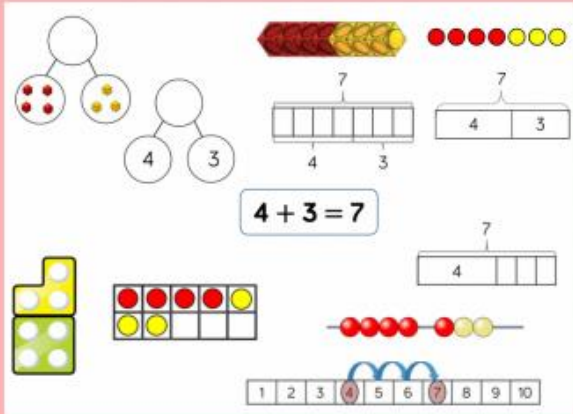
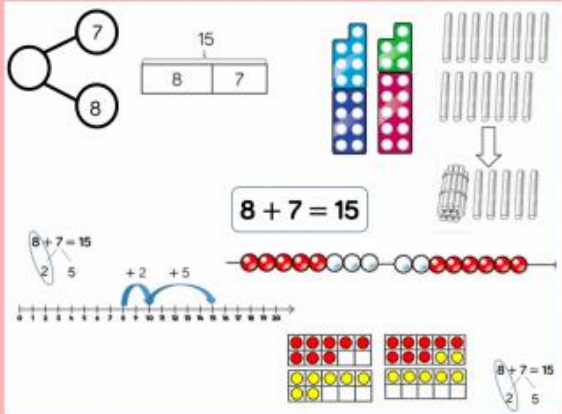
### Guidance for teachers

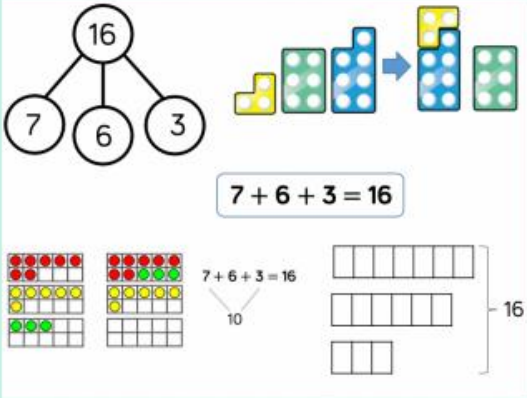
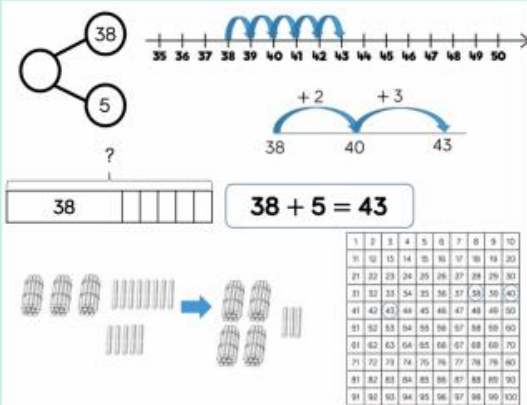
The calculation policy has been taken and adapted from White Rose Maths. It is divided into four sections: addition, subtraction, multiplication and division. The calculation policy follows the same concrete, pictorial, abstract approach as the main schemes of learning.

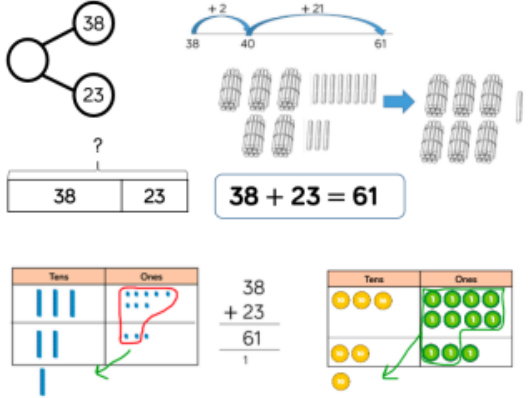
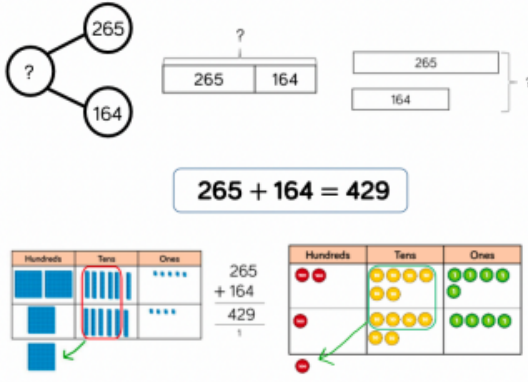
For full Calculation Policy please click the hyper link below:

[WRM calculation policy 2024 All year groups.pdf](#)

# Addition:

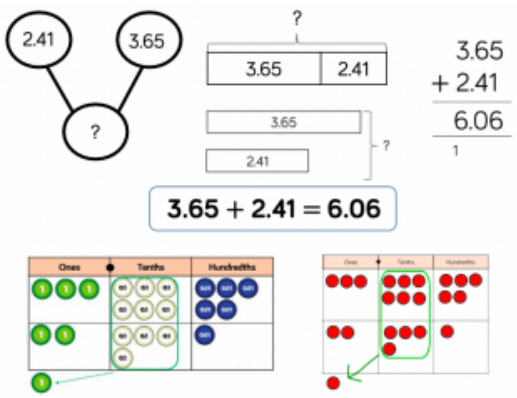
| Skill                           | Year Group | Representation and Models                                                                                                                            |                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add 1-digit numbers to 10       | 1          | Part-whole model<br>Bar model<br>Number shapes<br>Ten frames (within 10)<br>Bead strings (10)<br>Number tracks                                       |   | <p>When adding numbers to 10, children can explore both aggregation and augmentation.</p> <p>The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.</p> <p>The combination bar model, ten frame, bead string and number track support augmentation.</p>                                                                     |
| Add 1 and 2-digit numbers to 20 | 1          | Part-whole model<br>Bar model<br>Number shapes<br>Tens frames (within 20)<br>Bead strings (20)<br>Number tracks<br>Number lines (labelled)<br>Straws |  | <p>When adding 1-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. <b><u>In year 1</u></b>, this is only done just by counting on. <b><u>From year 2</u></b>, different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition the jumps.</p> |

|                                  |   |                                                                                                              |                                                                                      |                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------|---|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add three 1-digit numbers        | 2 | Part-whole model<br>Bar model<br>Tens frames (within 20)<br>Number shapes                                    |   | <p>When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently. This supports children in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.</p>                              |
| Add 1 and 2-digit numbers to 100 | 2 | Part-whole model<br>Bar model<br>Number lines (Labelled)<br>Number lines (blank)<br>Straws<br>Hundred Square |  | <p>When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. They should also apply their knowledge of number bonds to add more efficiently eg. <math>8 + 5 = 13</math> so <math>38 + 5 = 43</math>. Hundred squares and straws can support the children to find the number bond to 10.</p> |

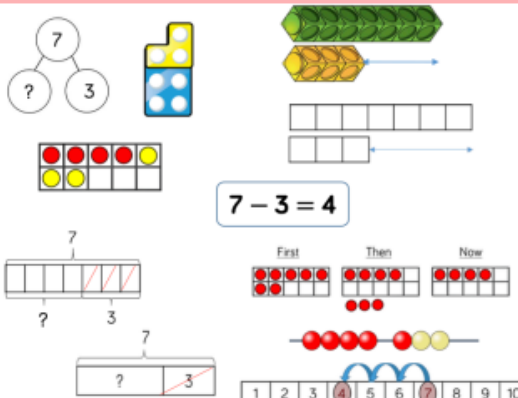
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|-------------------------|---|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add two 2-digit numbers | 2 | Part-whole model<br>Bar model<br>Number lines (blank)<br>Straws<br>Base 10<br>Place Value Counters |  <p><math>38 + 23 = 61</math></p>     | <p>Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiple of 10 to become more efficient.</p> <p><b>From year 3</b>, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.</p> |
| Add with up to 3-digits | 3 | Part-whole model<br>Bar model<br>Base 10<br>Place Value Counters<br>Column Addition                |  <p><math>265 + 164 = 429</math></p> | <p>Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p>                                                                                                                        |

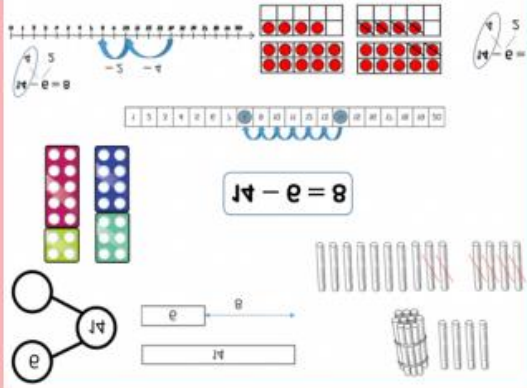
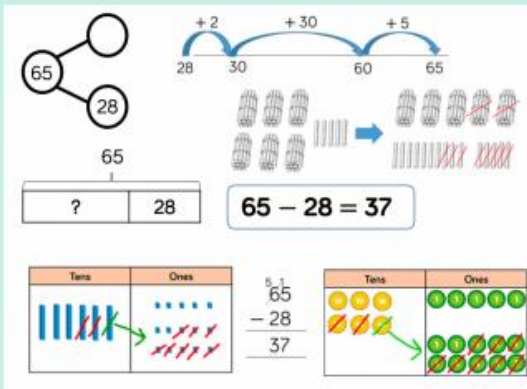


|                                 |   |                                                                                    |                                                |                                                                                                                                                                                                                                                   |
|---------------------------------|---|------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add with up to 4-digits         | 4 | Part-whole model<br>Bar model<br>Base 10<br>Place Value Counter<br>Column Addition | <p><math>1,378 + 2,148 = 3,526</math></p>      | Base 10 and place counters are the most effective manipulatives when adding numbers up to 4 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.          |
| Add with more than 4 digits     | 5 | Part-whole model<br>Bar model<br>Place Value Counter<br>Column Addition            | <p><math>104,328 + 61,731 = 166,059</math></p> | Base 10 and place counters are the most effective manipulatives when adding numbers with more than 4 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. |
| Add with up to 3 decimal places | 5 | Part-whole model<br>Bar model<br>Place Value Counter<br>Column Addition            |                                                | Place value counter are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimals places. Ensure children have experience of adding decimals with a variety of                                                          |

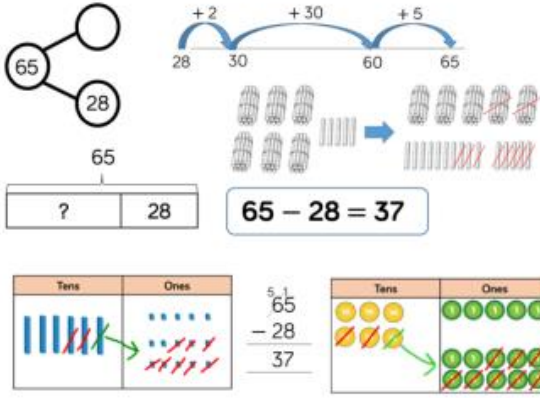
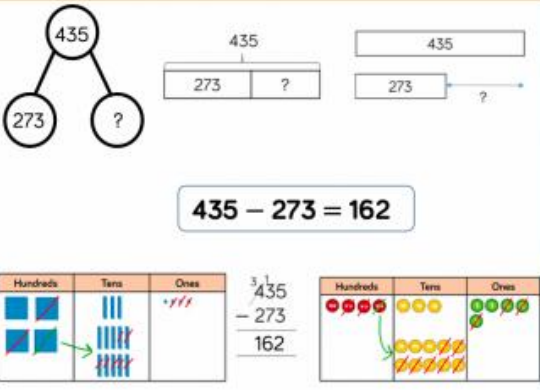
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|  |  |  |  | <p>decimal place. This includes putting this into context when adding money and other measure.</p> |
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## Subtraction:

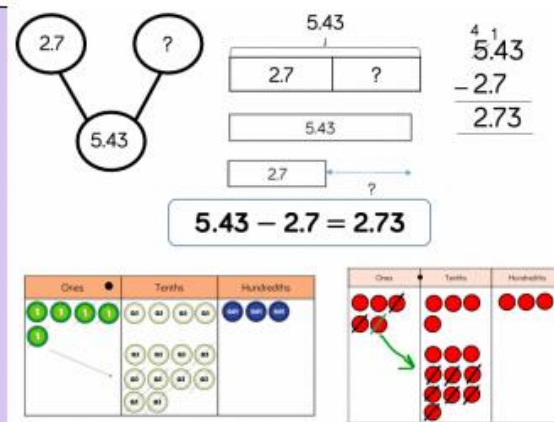
| Skill                              | Year Group | Representations and Models                                                                                     |                                                                                      |                                                                                                                                                                                                                                                |
|------------------------------------|------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subtract two 1-digit numbers to 10 | 1          | Part-whole model<br>Bar model<br>Number shapes<br>Ten frames (within 10)<br>Bead strings (10)<br>Number tracks |  | Part-whole models, bar models, ten frames and number shapes support partitioning.<br>Ten frames, number track, single bar models and bead strings support reduction.<br>Cubes and bar models with two bars can support finding the difference. |

|                                      |   |                                                                                                                                                    |                                                                                      |                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subtract 1 and 2-digit numbers to 20 | 1 | Part-whole model<br>Bar model<br>Number shapes<br>Ten frames (within 20)<br>Bead string (20)<br>Number tracks<br>Number lines (labelled)<br>Straws |   | <p><b>In year 1</b>, subtracting 1-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines. <b>From year 2</b>, children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.</p>    |
| Subtract 1 and 2-digit number to 100 | 2 | Part-whole model<br>Bar model<br>Number lines (labelled)<br>Number lines (blank)<br>Straws<br>Hundred square                                       |  | <p>Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient. From year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As number become larger, straws become less efficient.</p> |



|                              |   |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|---|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subtract two 2-digit numbers | 2 | Part-whole model<br>Bar model<br>Number lines (blank)<br>Straws<br>Base 10<br>Place value counter |  <p>The diagram illustrates the subtraction <math>65 - 28 = 37</math> using three methods:</p> <ul style="list-style-type: none"> <li><b>Part-whole model:</b> A circle containing 65 is split into two smaller circles, one containing 28 and the other containing a question mark.</li> <li><b>Number line:</b> A horizontal line with arrows showing jumps from 28 to 30 (+2), 30 to 60 (+30), and 60 to 65 (+5).</li> <li><b>Base 10 blocks:</b> A bar model with a bar of length 65, divided into a section of length 28 and a section of length 37. Below it, base 10 blocks (tens rods and ones units) are shown, with some crossed out to represent the subtraction process.</li> </ul> | <p>Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient.</p> <p>From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.</p> |
| Subtract with up to 3-digits | 3 | Part-whole model<br>Bar model<br>Base 10<br>Place value counters<br>Column subtraction            |  <p>The diagram illustrates the subtraction <math>435 - 273 = 162</math> using three methods:</p> <ul style="list-style-type: none"> <li><b>Part-whole model:</b> A circle containing 435 is split into two smaller circles, one containing 273 and the other containing a question mark.</li> <li><b>Bar model:</b> A bar of length 435, divided into a section of length 273 and a section of length 162.</li> <li><b>Column subtraction:</b> A grid showing the subtraction process in columns (Hundreds, Tens, Ones) using base 10 blocks (cubes, rods, and units).</li> </ul>                                                                                                             | <p>Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p>                                                                                                |
| Subtract with up to 4-digits | 4 | Part-whole model<br>Bar model<br>Base 10<br>Place value counter<br>Column subtraction             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Base 10 and place value counter are the most effective manipulatives when subtracting numbers with up to 4 digits.</p>                                                                                                                                                                                                                                     |



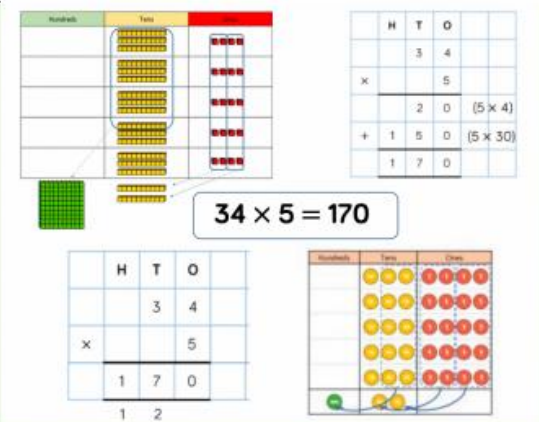
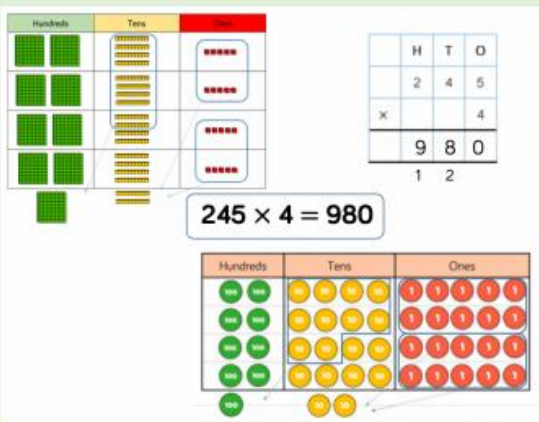


Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting into context using money and other measures.

## Multiplication:

| Skill                                       | Year group | Representation and Models                                                                     |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------|------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solve one-step problems with multiplication | 1/2        | Bar model<br>Number shapes<br>Counters<br>Ten frames<br>Bead string<br>Number lines<br>Arrays | <p>One bag holds 5 apples.<br/>How many apples do 4 bags hold?</p> <p> <math>5 + 5 + 5 + 5 = 20</math><br/> <math>4 \times 5 = 20</math><br/> <math>5 \times 4 = 20</math> </p> | <p>Children represent multiplication as repeated addition in many different ways.</p> <p><b>In year 1</b>, children use concrete and pictorial representations to solve problem. They are not expected to record multiplication formally.</p> <p><b>In year 2</b>, children are introduced to the multiplication symbol.</p> |
| Multiply 2-digit by 1-digit numbers         | 3/4        | Place value counter<br>Base 10<br>Expanded written method                                     |                                                                                                                                                                                 | <p>Informal method and the expanded method are used in <b>year 3</b> before moving on</p>                                                                                                                                                                                                                                    |

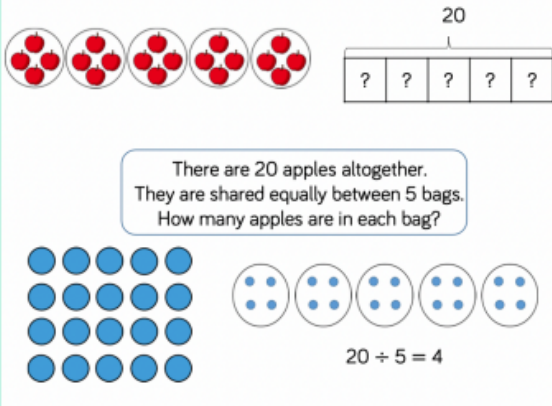
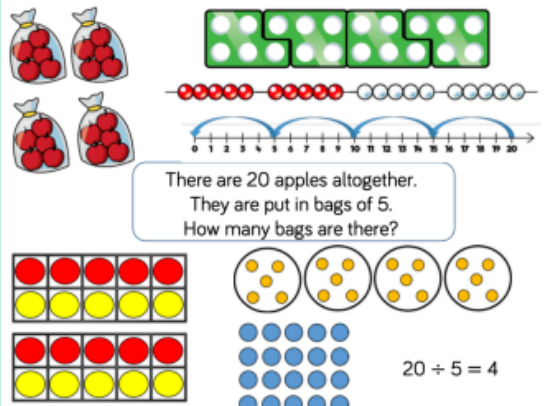


|                                     |   |                                                        |                                                                                      |                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------|---|--------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     |   | Short written method                                   |   | <p>to the short multiplication method in <b>year 4</b>.</p> <p>Place value counters should be used to support the understanding on the method rather than supporting the multiplication, as children should use their timetable knowledge</p>                                                                                                                         |
| Multiply 3-digit by 1-digit numbers | 4 | Place value counter<br>Base 10<br>Short written method |  | <p>When moving on to 3-digit by 1-digit multiplication, encourage the children to move towards the formal written method.</p> <p>Base 10 and place value counter continue to support the understanding of the written method.</p> <p>Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.</p> |
| Multiply 4-digit by 1-digit numbers | 5 | Place value counters<br>Short written method           |                                                                                      | <p>When multiplying 4-digit numbers, place value counters are the best manipulative to use to</p>                                                                                                                                                                                                                                                                     |

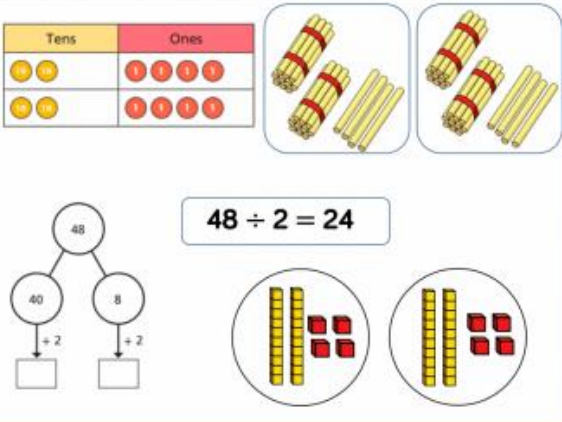
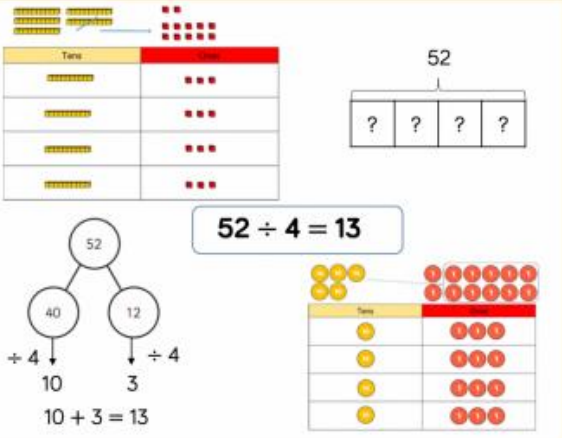


|                                     |     |                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----|---|---|---|--|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|----|---|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     |     |                                                                       | <div><div><div><div>Thousands</div><div>Hundreds</div><div>Tens</div><div>Ones</div></div><div><div><div>1</div><div>8</div><div>2</div><div>6</div></div><div><div>3</div><div>3</div><div>3</div><div>3</div></div><div><div>5</div><div>4</div><div>7</div><div>8</div></div></div><div><math>1,826 \times 3 = 5,478</math></div><div><table><tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>1</td><td>8</td><td>2</td><td>6</td></tr><tr><td>x</td><td></td><td></td><td></td><td>3</td></tr><tr><td></td><td>5</td><td>4</td><td>7</td><td>8</td></tr><tr><td></td><td>2</td><td></td><td>1</td><td></td></tr></table></div></div></div>                       |                                                                                                                                     | Th | H | T | O |  | 1 | 8 | 2 | 6 | x |   |  |   | 3 |   | 5 | 4 | 7 | 8 |   | 2  |   | 1  |     | support their understanding of formal written method.<br>If children are multiplying larger numbers and struggling with their times tables, encourage the use of times table grid so that the children can focus on the written method. |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | Th  | H                                                                     | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | O                                                                                                                                   |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | 1   | 8                                                                     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6                                                                                                                                   |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| x                                   |     |                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3                                                                                                                                   |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | 5   | 4                                                                     | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 8                                                                                                                                   |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | 2   |                                                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| Multiply 2-digit by 2-digit number  | 5   | Place value counter<br>Base 10<br>Short written method<br>Grid method | <div><div><div><div>20</div><div>2</div></div><div><div><div>30</div><div>1</div></div><div><div><div>20</div><div>2</div></div><div><div><div>600</div><div>60</div><div>20</div><div>2</div></div></div></div><div><math>22 \times 31 = 682</math></div><div><table><tr><td></td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td>2</td><td>2</td></tr><tr><td>x</td><td></td><td>3</td><td>1</td></tr><tr><td></td><td>6</td><td>6</td><td>0</td></tr><tr><td></td><td>6</td><td>8</td><td>2</td></tr></table><table><tr><td>x</td><td>20</td><td>2</td></tr><tr><td>30</td><td>600</td><td>60</td></tr><tr><td>1</td><td>20</td><td>2</td></tr></table></div></div></div></div> |                                                                                                                                     | H  | T | O |   |  | 2 | 2 | x |   | 3 | 1 |  | 6 | 6 | 0 |   | 6 | 8 | 2 | x | 20 | 2 | 30 | 600 | 60                                                                                                                                                                                                                                      | 1 | 20 | 2 | When multiplying a multi-digit number by 2-digits, use the area model to help children to understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10.<br>The grid method matches the area method before moving on to the formal written method. |
|                                     | H   | T                                                                     | O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     |     | 2                                                                     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| x                                   |     | 3                                                                     | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | 6   | 6                                                                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
|                                     | 6   | 8                                                                     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| x                                   | 20  | 2                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| 30                                  | 600 | 60                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| 1                                   | 20  | 2                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                     |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |
| Multiply 2-digit by 3-digit numbers | 5   | Place value counter<br>Short written method<br>Grid method            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Children can continue to use the area model when multiplying 3-digits by 2-digits.<br>Place value counters become more efficient to |    |   |   |   |  |   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |    |   |    |     |                                                                                                                                                                                                                                         |   |    |   |                                                                                                                                                                                                                                                                                                                                   |

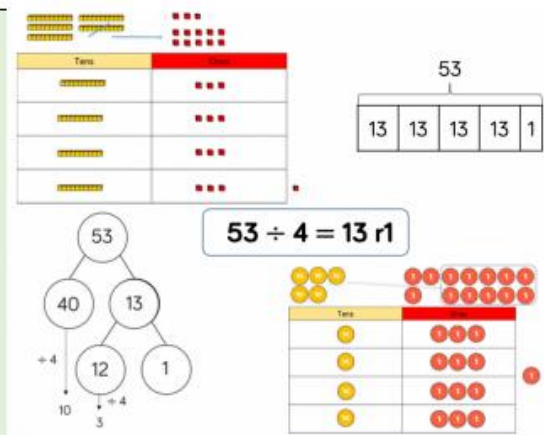
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|--------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  |     |                                                                                                        |   | <p><b>In year 1</b>, children use pictorial representations to solve problems. They are not expected to record division formally.</p> <p><b>In year 2</b>, children are introduced to the division symbol.</p>                                                                                                                    |
| Solve one-step problem with divisions (grouping) | 1/2 | Real life objects<br>Number shapes<br>Bead strings<br>Ten frames<br>Number lines<br>Arrays<br>Counters |  | <p>Children solve problems by groping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.</p> |
| Divide 2-digits by 1-digit (no exchange)         | 3   | Straws<br>Base 10<br>Bar model<br>Place value counters<br>Part-whole model                             |                                                                                      | <p>When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.</p>                                                                                                                                                                                                              |



|                                                      |     |                                                                            |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|-----|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      |     |                                                                            |  <p>48 ÷ 2 = 24</p>  | <p>Straws, Base 10 and place value counters can all be used to share number into equal groups.</p> <p>Part-whole models can provide children with a clear written method that matches the concrete representation.</p>                                                                                                                           |
| Divide 2-digits by 1-digit (sharing with exchange)   | 3   | Straws<br>Base 10<br>Bar model<br>Place value counters<br>Part-whole model |  <p>52 ÷ 4 = 13</p> | <p>When dividing numbers involving an exchange, children can use Base 10 and place value counter to exchange one ten for tens ones.</p> <p>Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows. Flexible partitioning in a part-whole model support this method.</p> |
| Divide 2-digits by 1-digit (sharing with remainders) | 3/4 | Straws<br>Base 10<br>Bar model<br>Place value counters<br>Part-whole model |                                                                                                         | <p>When dividing numbers with remainders, children can use base 10 and place value counters to exchange one ten for ten ones.</p>                                                                                                                                                                                                                |



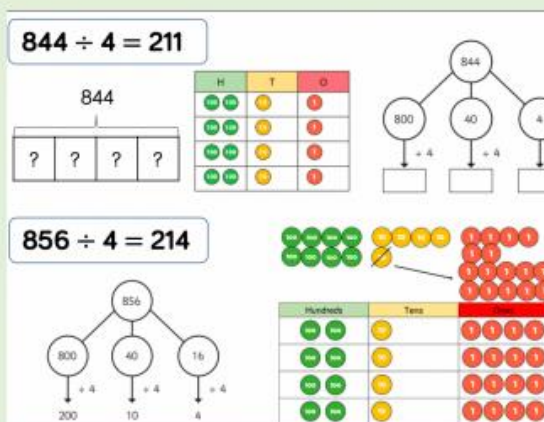


Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. Flexible partitioning on a part-whole model supports this method.

Divide 2-digits by 1-digit  
(sharing with exchange)

4

Base 10  
Bar model  
Place value counters  
Part-whole model



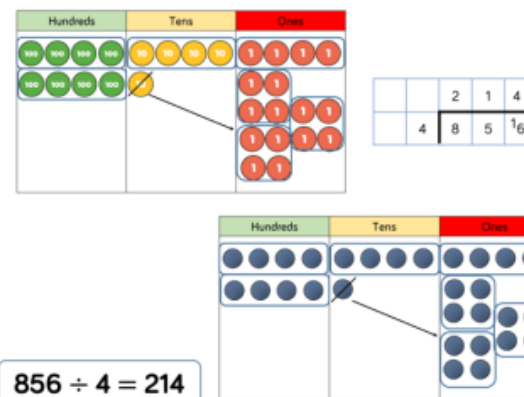
Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also highlight remainders. Flexible partitioning in a part-whole model supports the method.

Divide 3-digits by 1-digit  
(grouping)

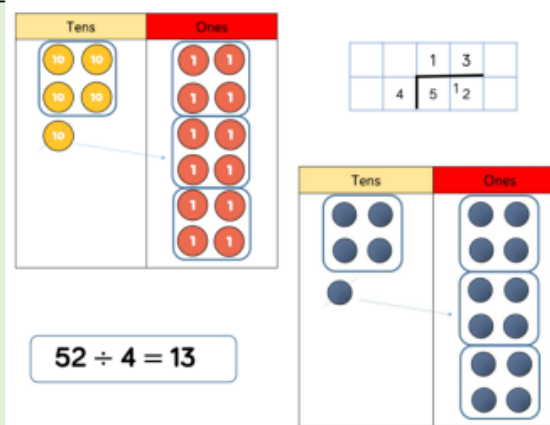
4

Base 10  
Bar model  
Place value counters  
Part-whole model

Children can continue to use grouping to support their understanding of short division when



dividing a 3-digit number by a 1-digit number. Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.



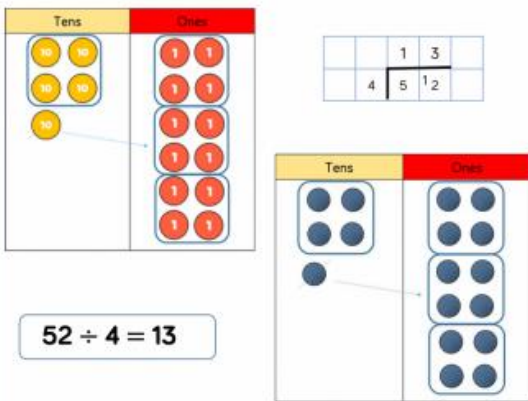
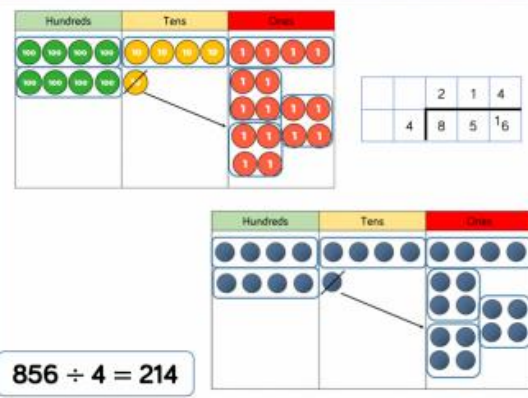
When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor. Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?' Remainders can also be seen as they are left ungrouped.

Divide 3-digits by 1 digit (grouping)

4/5

Place value counter  
Counters  
Place value grid  
Written short division

When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

|                                       |   |                                                                                |                                                                                                          |                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|---|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |   |                                                                                |  <p>52 ÷ 4 = 13</p>   | <p>Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?' Remainders can also be seen as they are left ungrouped.</p>                                                                                                   |
| Divide 4-digits by 1 digit (grouping) | 5 | Place value counters<br>Counters<br>Place value grid<br>Written short division |  <p>856 ÷ 4 = 214</p> | <p>Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number. Place value counters can be used to support this understanding. Children can also draw their own counters and group them through a more pictorial method.</p> |

Divide multi-digits by 2-digits  
(short division)

6

Written short division  
List of multiples

|  |    |   |   |   |
|--|----|---|---|---|
|  |    | 0 | 3 | 6 |
|  | 12 | 4 | 4 | 7 |
|  |    |   | 3 | 2 |

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

|    |   |   |    |    |
|----|---|---|----|----|
|    | 0 | 4 | 8  | 9  |
| 15 | 7 | 7 | 13 | 13 |
|    |   | 3 | 3  | 5  |

|    |    |    |    |    |    |     |     |     |     |
|----|----|----|----|----|----|-----|-----|-----|-----|
| 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 |
|----|----|----|----|----|----|-----|-----|-----|-----|

When children begin to divide up to 4- digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Divide multi-digits by 2-digits  
(long division)

6

Written short division  
List of multiples

|   |   |   |   |   |
|---|---|---|---|---|
|   |   | 0 | 3 | 6 |
| 1 | 2 | 4 | 3 | 2 |
| - |   | 3 | 6 | 0 |
|   |   |   | 7 | 2 |
| - |   |   | 7 | 2 |
|   |   |   |   | 0 |

(x30)  
12 x 1 = 12  
12 x 2 = 24  
12 x 3 = 36  
12 x 4 = 48  
12 x 5 = 60  
12 x 6 = 72  
12 x 7 = 84  
12 x 8 = 96  
12 x 9 = 108  
12 x 10 = 120

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

|    |   |   |   |   |
|----|---|---|---|---|
|    | 0 | 4 | 8 | 9 |
| 15 | 7 | 3 | 3 | 5 |
| -  |   | 6 | 0 | 0 |
|    |   | 1 | 3 | 3 |
| -  |   |   | 1 | 2 |
|    |   |   |   | 0 |
| -  |   |   |   | 1 |
|    |   |   |   | 3 |
|    |   |   |   | 5 |
|    |   |   |   | 0 |

(x400)  
1 x 15 = 15  
2 x 15 = 30  
3 x 15 = 45  
4 x 15 = 60  
5 x 15 = 75  
10 x 15 = 150

Children can also divide by 2-digit numbers using long division. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

When a remainder is left at the end of a calculation, children can either leave it