



Power Maths calculation policy

St Leo's and Southmead Catholic Primary School

***Power Maths* calculation policy, LOWER KS2**

KEY STAGE 2

In Years 3 and 4, children develop the basis of written methods by building their skills alongside a deep understanding of place value. They should use known addition/subtraction and multiplication/division facts to calculate efficiently and accurately, rather than relying on counting. Children use place value equipment to support their understanding, but not as a substitute for thinking.

Key language: partition, place value, tens, hundreds, thousands, column method, whole, part, equal groups, sharing, grouping, bar model

Addition and subtraction: In Year 3 especially, the column methods are built up gradually. Children will develop their understanding of how each stage of the calculation, including any exchanges, relates to place value. The example calculations chosen to introduce the stages of each method may often be more suited to a mental method. However, the examples and the progression of the steps have been chosen to help children develop their fluency in the process, alongside a deep understanding of the concepts and the numbers involved, so that they can apply these skills accurately and efficiently to later calculations. The class should be encouraged to compare mental and written methods for specific calculations, and children should be encouraged at every stage to make choices about which methods to apply.


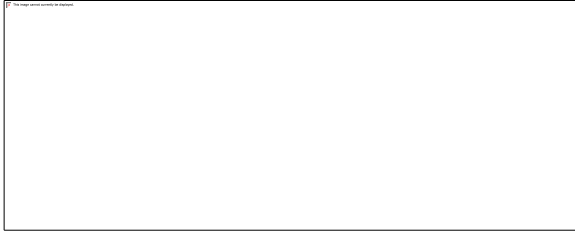


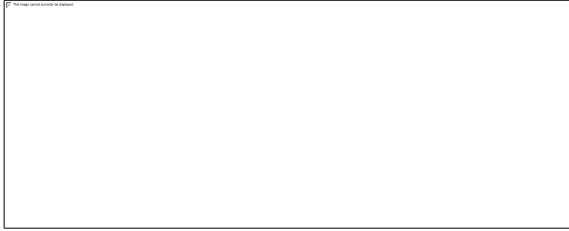

In Year 4, the steps are shown without such fine detail, although children should continue to build their understanding with a secure basis in place value. In subtraction, children will need to develop their understanding of exchange as they may need to exchange across one or two columns. By the end of Year 4, children should have developed fluency in column methods alongside a deep understanding, which will allow them to progress confidently in upper Key Stage 2.

Multiplication and division: Children build a solid grounding in times-tables, understanding the multiplication and division facts in tandem. As such, they should be as confident knowing that 35 divided by 7 is 5 as knowing that 5 times 7 is 35. Children develop key skills to support multiplication methods: unitising, commutativity, and how to use partitioning effectively. Unitising allows children to use known facts to multiply and divide multiples of 10 and 100 efficiently. Commutativity gives children flexibility in applying known facts to calculations and problem solving. An understanding of partitioning allows children to extend their skills to multiplying and dividing 2- and 3-digit numbers by a single digit. Children develop column methods to support multiplications in these cases. For successful division, children will need to make choices about how to partition. For example, to divide 423 by 3, it is effective to partition 423 into 300, 120 and 3, as these can be divided by 3 using known facts. Children will also need to understand the concept of remainder, in terms of a given calculation and in terms of the context of the problem.

Fractions: Children develop the key concept of equivalent fractions, and link this with multiplying and dividing the numerators and denominators, as well as exploring the visual concept through fractions of shapes. Children learn how to find a fraction of an amount, and develop this with the aid of a bar model and other representations alongside.

in Year 3, children develop an understanding of how to add and subtract fractions with the same denominator and find complements to the whole. This is developed alongside an understanding of fractions as numbers, including fractions greater than 1. In Year 4, children begin to work with fractions greater than 1.

Decimals are introduced, as tenths in Year 3 and then as hundredths in Year 4. Children develop an understanding of decimals in terms of the relationship with fractions, with dividing by 10 and 100, and also with place value.


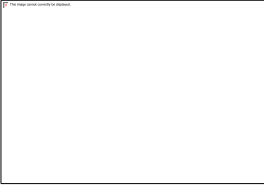
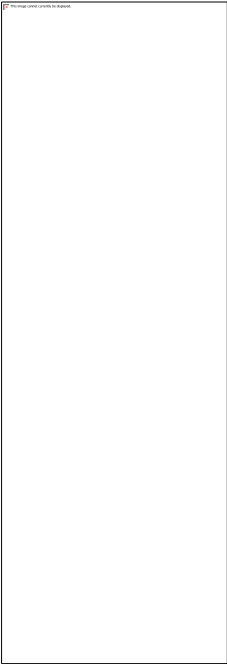

Year 3			
	Concrete	Pictorial	Abstract
Year 3 Addition			
Understanding 100s	<p>Understand the cardinality of 100, and the link with 10 tens.</p> <p>Use cubes to place into groups of 10 tens.</p> 	<p>Unitise 100 and count in steps of 100.</p> 	<p>Represent steps of 100 on a number line and a number track and count up to 1,000 and back to 0.</p> 
Understanding place value to 1,000	<p>Unitise 100s, 10s and 1s to build 3-digit numbers.</p> 	<p>Use equipment to represent numbers to 1,000.</p>  <p>Use a place value grid to support the structure of numbers to 1,000.</p> <p>Place value counters are used alongside other equipment. Children should understand how each counter represents a different unitised amount.</p>	<p>Represent the parts of numbers to 1,000 using a part-whole model.</p>  <p>$215 = 200 + 10 + 5$</p> <p>Recognise numbers to 1,000 represented on a number line, including those between intervals.</p>



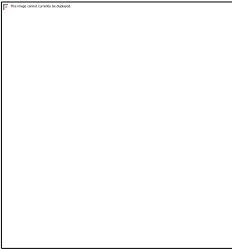
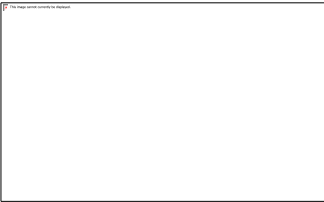


<p>Adding 100s</p>	<p>Use known facts and unitising to add multiples of 100.</p> <div data-bbox="376 284 734 475" style="border: 1px solid black; height: 120px; width: 160px; margin: 10px 0;"></div> <p> $3 + 2 = 5$ $3 \text{ hundreds} + 2 \text{ hundreds} = 5 \text{ hundreds}$ $300 + 200 = 500$ </p>	<p>Use known facts and unitising to add multiples of 100.</p> <div data-bbox="936 284 1079 571" style="border: 1px solid black; height: 180px; width: 64px; margin: 10px 0;"></div> <p> $3 + 4 = 7$ $3 \text{ hundreds} + 4 \text{ hundreds} = 7 \text{ hundreds}$ $300 + 400 = 700$ </p>	<p>Use known facts and unitising to add multiples of 100.</p> <p>Represent the addition on a number line.</p> <p>Use a part-whole model to support unitising.</p> <div data-bbox="1541 414 1944 673" style="border: 1px solid black; height: 162px; width: 180px; margin: 10px 0;"></div> <p> $3 + 2 = 5$ $300 + 200 = 500$ </p>
<p>3-digit number + 1s, no exchange or bridging</p>	<p>Use number bonds to add the 1s.</p> <div data-bbox="353 858 810 1056" style="border: 1px solid black; height: 124px; width: 204px; margin: 10px 0;"></div> <p> $214 + 4 = ?$ <i>Now there are 4 + 4 ones in total.</i> $4 + 4 = 8$ $214 + 4 = 218$ </p>	<p>Use number bonds to add the 1s.</p> <div data-bbox="936 858 1518 1114" style="border: 1px solid black; height: 160px; width: 260px; margin: 10px 0;"></div> <p> $245 + 4$ $5 + 4 = 9$ $245 + 4 = 249$ </p>	<p>Understand the link with counting on.</p> <p>$245 + 4$</p> <div data-bbox="1541 925 1989 1053" style="border: 1px solid black; height: 80px; width: 200px; margin: 10px 0;"></div> <p>Use number bonds to add the 1s and understand that this is more efficient and less prone to error.</p> <p>$245 + 4 = ?$</p> <p><i>I will add the 1s.</i> $5 + 4 = 9$ So, $245 + 4 = 249$</p>






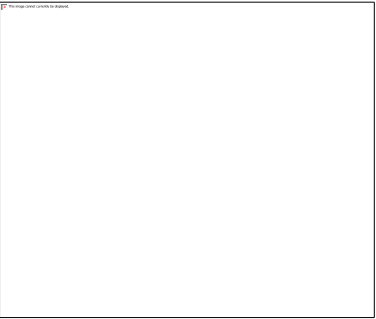
<p>3-digit number + 1s with exchange</p>	<p>Understand that when the 1s sum to 10 or more, this requires an exchange of 10 ones for 1 ten.</p> <p>Children should explore this using unitised objects or physical apparatus.</p>	<p>Exchange 10 ones for 1 ten where needed. Use a place value grid to support the understanding.</p> <div data-bbox="936 316 1339 662" style="border: 1px solid black; height: 217px; margin-bottom: 10px;"></div> <div data-bbox="936 694 1339 1029" style="border: 1px solid black; height: 210px; margin-bottom: 10px;"></div> <div data-bbox="936 1061 1339 1228" style="border: 1px solid black; height: 105px;"></div> <p>$135 + 7 = 142$</p>	<p>Understand how to bridge by partitioning to the 1s to make the next 10.</p> <div data-bbox="1536 284 1850 566" style="border: 1px solid black; height: 177px; margin-bottom: 10px;"></div> <p>$135 + 7 = ?$ $135 + 5 + 2 = 142$</p> <p>Ensure that children understand how to add 1s bridging a 100.</p> <p>$198 + 5 = ?$ $198 + 2 + 3 = 203$</p>
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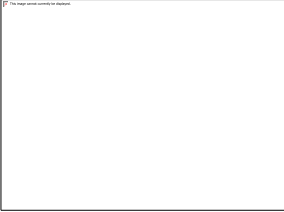





<p>3-digit number + 10s, no exchange</p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <div style="border: 1px solid black; height: 150px; width: 100%;"></div> <p>$234 + 50$ <i>There are 3 tens and 5 tens altogether.</i> $3 + 5 = 8$ <i>In total there are 8 tens.</i> $234 + 50 = 284$</p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>$351 + 30 = ?$</p> <div style="border: 1px solid black; height: 120px; width: 100%;"></div> <p>$5 \text{ tens} + 3 \text{ tens} = 8 \text{ tens}$ $351 + 30 = 381$</p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>$753 + 40$</p> <p><i>I know that $5 + 4 = 9$</i></p> <p><i>So, $50 + 40 = 90$</i> $753 + 40 = 793$</p>
<p>3-digit number + 10s, with exchange</p>	<p>Understand the exchange of 10 tens for 1 hundred.</p> <div style="border: 1px solid black; height: 90px; width: 100%;"></div>	<p>Add by exchanging 10 tens for 1 hundred.</p> <p>$184 + 20 = ?$</p> <div style="border: 1px solid black; height: 130px; width: 100%;"></div> <p>$184 + 20 = 204$</p>	<p>Understand how the addition relates to counting on in 10s across 100.</p> <div style="border: 1px solid black; height: 60px; width: 100%;"></div> <p>$184 + 20 = ?$</p> <p><i>I can count in 10s ... 194 ... 204</i> $184 + 20 = 204$</p> <p>Use number bonds within 20 to support efficient mental calculations.</p> <p>$385 + 50$ <i>There are 8 tens and 5 tens.</i> <i>That is 13 tens.</i> $385 + 50 = 300 + 130 + 5$ $385 + 50 = 435$</p>



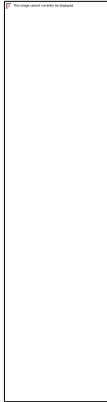

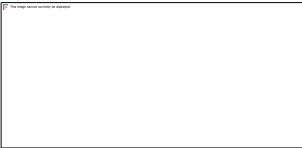
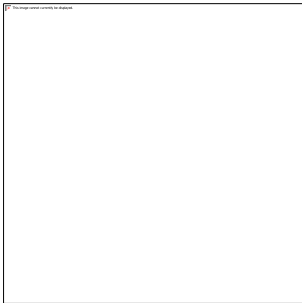


<p>3-digit number + 2-digit number</p>	<p>Use place value equipment to make and combine groups to model addition.</p> <div data-bbox="338 284 913 347" style="border: 1px solid black; height: 40px; width: 257px;"></div>	<p>Use a place value grid to organise thinking and adding of 1s, then 10s.</p>	<p>Use the vertical column method to represent the addition. Children must understand how this relates to place value at each stage of the calculation.</p>
<p>3-digit number + 2-digit number, exchange required</p>	<p>Use place value equipment to model addition and understand where exchange is required.</p> <p><i>Use place value counters to represent $154 + 72$.</i></p> <p><i>Use this to decide if any exchange is required.</i></p> <p><i>There are 5 tens and 7 tens. That is 12 tens so I will exchange.</i></p>	<p>Represent the required exchange on a place value grid using equipment.</p> <p>$275 + 16 = ?$</p> <div data-bbox="938 533 1117 1062" style="border: 1px solid black; height: 332px; width: 80px;"></div> <p>$275 + 16 = 291$</p> <p>Note: In this example, a mental method may be more efficient. The numbers for the example calculation have been chosen to allow children to visualise the concept and see how the method relates to place value. Children should be encouraged at every stage to select methods that are accurate and efficient.</p>	<p>Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.</p> <div data-bbox="1538 533 1671 1120" style="border: 1px solid black; height: 368px; width: 59px;"></div> <p>$275 + 16 = 291$</p>



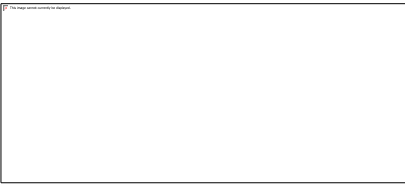


<p>3-digit number + 3-digit number, no exchange</p>	<p>Use place value equipment to make a representation of a calculation. This may or may not be structured in a place value grid.</p> <p><i>326 + 541 is represented as:</i></p> 	<p>Represent the place value grid with equipment to model the stages of column addition.</p>	<p>Use a column method to solve efficiently, using known bonds. Children must understand how this relates to place value at every stage of the calculation.</p>
<p>3-digit number + 3-digit number, exchange required</p>	<p>Use place value equipment to enact the exchange required.</p>  <p><i>There are 13 ones. I will exchange 10 ones for 1 ten.</i></p>	<p>Model the stages of column addition using place value equipment on a place value grid.</p> 	<p>Use column addition, ensuring understanding of place value at every stage of the calculation.</p>  <p><i>126 + 217 = 343</i> Note: Children should also study examples where exchange is required in more than one column, for example <i>185 + 318 = ?</i></p>




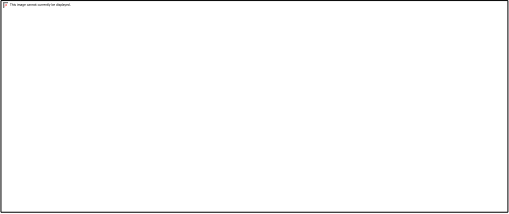

<p>Representing addition problems, and selecting appropriate methods</p>	<p>Encourage children to use their own drawings and choices of place value equipment to represent problems with one or more steps.</p> <p>These representations will help them to select appropriate methods.</p>	<p>Children understand and create bar models to represent addition problems.</p> <p>$275 + 99 = ?$</p>  <p>$275 + 99 = 374$</p>	<p>Use representations to support choices of appropriate methods.</p>  <p><i>I will add 100, then subtract 1 to find the solution.</i></p> <p>$128 + 105 + 83 = ?$ <i>I need to add three numbers.</i></p> 
<p>Year 3 Subtraction</p>			
<p>Subtracting 100s</p>	<p>Use known facts and unitising to subtract multiples of 100.</p>  <p>$5 - 2 = 3$ $500 - 200 = 300$</p>	<p>Use known facts and unitising to subtract multiples of 100.</p>  <p>$4 - 2 = 2$ $400 - 200 = 200$</p>	<p>Understand the link with counting back in 100s.</p>  <p>$400 - 200 = 200$</p> <p>Use known facts and unitising as efficient and accurate methods. <i>I know that $7 - 4 = 3$. Therefore, I know that $700 - 400 = 300$.</i></p>

<p>3-digit number – 1s, no exchange</p>	<p>Use number bonds to subtract the 1s.</p>  <p>$214 - 3 = ?$</p>  <p>$4 - 3 = 1$ $214 - 3 = 211$</p>	<p>Use number bonds to subtract the 1s.</p>  <p>$319 - 4 = ?$</p>  <p>$9 - 4 = 5$ $319 - 4 = 315$</p>	<p>Understand the link with counting back using a number line.</p> <p>Use known number bonds to calculate mentally.</p> <p>$476 - 4 = ?$</p>  <p>$6 - 4 = 2$ $476 - 4 = 472$</p>
<p>3-digit number – 1s, exchange or bridging required</p>	<p>Understand why an exchange is necessary by exploring why 1 ten must be exchanged.</p> <p>Use place value equipment.</p>	<p>Represent the required exchange on a place value grid.</p> <p>$151 - 6 = ?$</p> 	<p>Calculate mentally by using known bonds.</p> <p>$151 - 6 = ?$</p> <p>$151 - 1 - 5 = 145$</p>

<p>3-digit number – 10s, no exchange</p>	<p>Subtract the 10s using known bonds.</p>  <p>$381 - 10 = ?$</p> <p><i>8 tens with 1 removed is 7 tens.</i></p> <p>$381 - 10 = 371$</p>	<p>Subtract the 10s using known bonds.</p>  <p><i>8 tens – 1 ten = 7 tens</i></p> <p>$381 - 10 = 371$</p>	<p>Use known bonds to subtract the 10s mentally.</p> <p>$372 - 50 = ?$</p> <p>$70 - 50 = 20$</p> <p>So, $372 - 50 = 322$</p>
<p>3-digit number – 10s, exchange or bridging required</p>	<p>Use equipment to understand the exchange of 1 hundred for 10 tens.</p> 	<p>Represent the exchange on a place value grid using equipment.</p> <p>$210 - 20 = ?$</p>  <p><i>I need to exchange 1 hundred for 10 tens, to help subtract 2 tens.</i></p>  <p>$210 - 20 = 190$</p>	<p>Understand the link with counting back on a number line.</p> <p>Use flexible partitioning to support the calculation.</p> <p>$235 - 60 = ?$</p>  <p>$235 = 100 + 130 + 5$</p> <p>$235 - 60 = 100 + 70 + 5$</p> <p>$= 175$</p>

<p>3-digit number – up to 3-digit number</p>	<p>Use place value equipment to explore the effect of splitting a whole into two parts, and understand the link with taking away.</p> 	<p>Represent the calculation on a place value grid.</p> 	<p>Use column subtraction to calculate accurately and efficiently.</p> 
<p>3-digit number – up to 3-digit number, exchange required</p>	<p>Use equipment to enact the exchange of 1 hundred for 10 tens, and 1 ten for 10 ones.</p> 	<p><i>Model the required exchange on a place value grid.</i></p> <p>$175 - 38 = ?$ <i>I need to subtract 8 ones, so I will exchange a ten for 10 ones.</i></p>  	<p>Use column subtraction to work accurately and efficiently.</p>  <p>If the subtraction is a 3-digit number subtract a 2-digit number, children should understand how the recording relates to the place value, and so how to line up the digits correctly. Children should also understand how to exchange in calculations where there is a zero in the 10s column.</p> 

<p>Representing subtraction problems</p>		<p>Use bar models to represent subtractions.</p> <p>'Find the difference' is represented as two bars for comparison.</p>  <p>Bar models can also be used to show that a part must be taken away from the whole.</p>	<p>Children use alternative representations to check calculations and choose efficient methods.</p> <p>Children use inverse operations to check additions and subtractions. The part-whole model supports understanding.</p> <p><i>I have completed this subtraction.</i> $525 - 270 = 255$ <i>I will check using addition.</i></p> 
<p>Year 3 Multiplication</p>			
<p>Understanding equal grouping and repeated addition</p>	<p>Children continue to build understanding of equal groups and the relationship with repeated addition. They recognise both examples and non-examples using objects.</p> 	<p>Children recognise that arrays demonstrate commutativity.</p>  <p><i>This is 3 groups of 4.</i> <i>This is 4 groups of 3.</i></p>	<p>Children understand the link between repeated addition and multiplication.</p>  <p><i>8 groups of 3 is 24.</i></p> <p>$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24$ $8 \times 3 = 24$</p>









	<p>Children recognise that arrays can be used to model commutative multiplications.</p>  <p><i>I can see 3 groups of 8. I can see 8 groups of 3.</i></p>		<p>A bar model may represent multiplications as equal groups.</p>  <p>$6 \times 4 = 24$</p>
<p>Using commutativity to support understanding of the times-tables</p>	<p>Understand how to use times-tables facts flexibly.</p>   <p><i>There are 6 groups of 4 pens. There are 4 groups of 6 bread rolls.</i></p> <p><i>I can use $6 \times 4 = 24$ to work out both totals.</i></p>	<p>Understand how times-table facts relate to commutativity.</p>  <p>$6 \times 4 = 24$ $4 \times 6 = 24$</p>	<p>Understand how times-table facts relate to commutativity.</p> <p><i>I need to work out 4 groups of 7.</i></p> <p><i>I know that $7 \times 4 = 28$</i></p> <p><i>so, I know that</i></p> <p><i>4 groups of 7 = 28 and 7 groups of 4 = 28.</i></p>

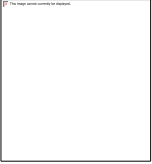




<p>Understanding and using $\times 3$, $\times 2$, $\times 4$ and $\times 8$ tables.</p>	<p>Children learn the times-tables as 'groups of', but apply their knowledge of commutativity.</p> <div data-bbox="338 316 882 491" style="border: 1px solid black; height: 110px; margin-bottom: 10px;"></div> <p><i>I can use the $\times 3$ table to work out how many keys.</i> <i>I can also use the $\times 3$ table to work out how many batteries.</i></p>	<p>Children understand how the $\times 2$, $\times 4$ and $\times 8$ tables are related through repeated doubling.</p> <div data-bbox="938 316 1435 691" style="border: 1px solid black; height: 235px; margin-bottom: 10px;"></div>	<p>Children understand the relationship between related multiplication and division facts in known times-tables.</p> <div data-bbox="1541 316 2004 472" style="border: 1px solid black; height: 98px; margin-bottom: 10px;"></div> <p>$2 \times 5 = 10$ $5 \times 2 = 10$ $10 \div 5 = 2$ $10 \div 2 = 5$</p>
<p>Using known facts to multiply 10s, for example 3×40</p>	<p>Explore the relationship between known times-tables and multiples of 10 using place value equipment.</p> <p><i>Make 4 groups of 3 ones.</i></p> <div data-bbox="338 943 891 995" style="border: 1px solid black; height: 33px; margin-bottom: 10px;"></div> <p><i>Make 4 groups of 3 tens.</i></p> <div data-bbox="338 1098 907 1177" style="border: 1px solid black; height: 50px; margin-bottom: 10px;"></div> <p><i>What is the same?</i> <i>What is different?</i></p>	<p>Understand how unitising 10s supports multiplying by multiples of 10.</p> <div data-bbox="938 842 1243 991" style="border: 1px solid black; height: 93px; margin-bottom: 10px;"></div> <div data-bbox="938 1026 1243 1182" style="border: 1px solid black; height: 98px; margin-bottom: 10px;"></div> <p><i>4 groups of 2 ones is 8 ones.</i> <i>4 groups of 2 tens is 8 tens.</i></p> <p>$4 \times 2 = 8$ $4 \times 20 = 80$</p>	<p>Understand how to use known times-tables to multiply multiples of 10.</p> <div data-bbox="1541 842 1845 995" style="border: 1px solid black; height: 96px; margin-bottom: 10px;"></div> <div data-bbox="1541 1031 1845 1174" style="border: 1px solid black; height: 90px; margin-bottom: 10px;"></div> <p>$4 \times 2 = 8$ $4 \times 20 = 80$</p>

<p>Multiplying a 2-digit number by a 1-digit number</p>	<p>Understand how to link partitioning a 2-digit number with multiplying.</p> <p><i>Each person has 23 flowers.</i></p> <p><i>Each person has 2 tens and 3 ones.</i></p> <div data-bbox="338 416 887 624" style="border: 1px solid black; height: 130px; width: 245px;"></div> <p><i>There are 3 groups of 2 tens.</i></p> <p><i>There are 3 groups of 3 ones.</i></p> <p>Use place value equipment to model the multiplication context.</p> <div data-bbox="338 916 875 1139" style="border: 1px solid black; height: 140px; width: 240px;"></div> <p><i>There are 3 groups of 3 ones.</i></p> <p><i>There are 3 groups of 2 tens.</i></p>	<p>Use place value to support how partitioning is linked with multiplying by a 2-digit number.</p> <p>$3 \times 24 = ?$</p> <div data-bbox="938 387 1440 639" style="border: 1px solid black; height: 158px; width: 224px;"></div> <p>$3 \times 4 = 12$</p> <div data-bbox="938 738 1440 991" style="border: 1px solid black; height: 158px; width: 224px;"></div> <p>$3 \times 20 = 60$</p> <p>$60 + 12 = 72$</p> <p>$3 \times 24 = 72$</p>	<p>Use addition to complete multiplications of 2-digit numbers by a 1-digit number.</p> <p>$4 \times 13 = ?$</p> <p>$4 \times 3 = 12$ $4 \times 10 = 40$</p> <p>$12 + 40 = 52$</p> <p>$4 \times 13 = 52$</p>
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<p>Multiplying a 2-digit number by a 1-digit number, expanded column method</p>	<p>Use place value equipment to model how 10 ones are exchanged for a 10 in some multiplications.</p> <p>$3 \times 24 = ?$</p> <p>$3 \times 20 = 60$ $3 \times 4 = 12$</p> <div data-bbox="344 488 902 667" style="border: 1px solid black; height: 112px; width: 249px;"></div> <p>$3 \times 24 = 60 + 12$ $3 \times 24 = 70 + 2$ $3 \times 24 = 72$</p>	<p>Understand that multiplications may require an exchange of 1s for 10s, and also 10s for 100s.</p> <p>$4 \times 23 = ?$</p> <div data-bbox="938 386 1285 906" style="border: 1px solid black; height: 326px; width: 155px;"></div> <p>$4 \times 23 = 92$</p> <div data-bbox="938 975 1272 1211" style="border: 1px solid black; height: 148px; width: 149px;"></div> <p>$5 \times 23 = ?$ $5 \times 3 = 15$ $5 \times 20 = 100$ $5 \times 23 = 115$</p>	<p>Children may write calculations in expanded column form, but must understand the link with place value and exchange.</p> <p>Children are encouraged to write the expanded parts of the calculation separately.</p> <div data-bbox="1541 450 2114 684" style="border: 1px solid black; height: 147px; width: 256px;"></div> <p>$5 \times 28 = ?$</p> <div data-bbox="1541 785 1744 999" style="border: 1px solid black; height: 134px; width: 91px;"></div>
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Year 3 Division			
<p>Using times-tables knowledge to divide</p>	<p>Use knowledge of known times-tables to calculate divisions.</p> <div data-bbox="338 368 891 472" style="border: 1px solid black; height: 65px; margin-bottom: 10px;"></div> <p><i>24 divided into groups of 8. There are 3 groups of 8.</i></p>	<p>Use knowledge of known times-tables to calculate divisions.</p> <div data-bbox="940 368 1059 903" style="border: 1px solid black; height: 335px; margin-bottom: 10px;"></div> <p><i>48 divided into groups of 4. There are 12 groups.</i></p> <p>$4 \times 12 = 48$ $48 \div 4 = 12$</p>	<p>Use knowledge of known times-tables to calculate divisions.</p> <p><i>I need to work out 30 shared between 5.</i></p> <p><i>I know that $6 \times 5 = 30$ so I know that $30 \div 5 = 6$.</i></p> <p>A bar model may represent the relationship between sharing and grouping.</p> <div data-bbox="1541 635 2051 719" style="border: 1px solid black; height: 53px; margin-bottom: 10px;"></div> <p>$24 \div 4 = 6$ $24 \div 6 = 4$</p> <p>Children understand how division is related to both repeated subtraction and repeated addition.</p> <div data-bbox="1541 986 1939 1102" style="border: 1px solid black; height: 73px; margin-bottom: 10px;"></div> <p>$24 \div 8 = 3$</p> <div data-bbox="1541 1206 2074 1326" style="border: 1px solid black; height: 75px; margin-bottom: 10px;"></div> <p>$32 \div 8 = 4$</p>


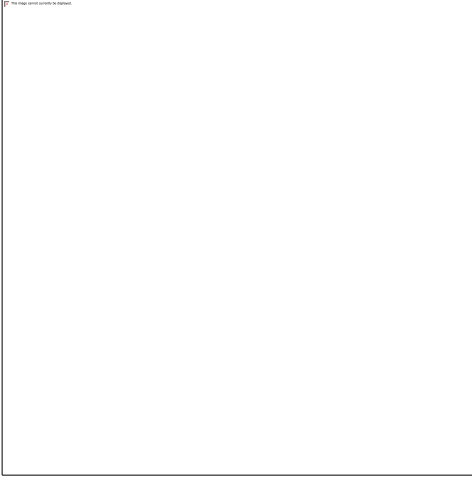
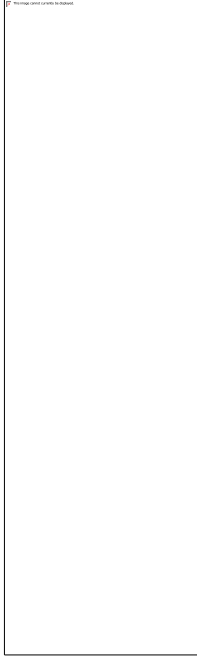
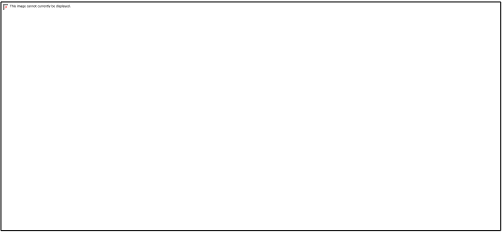

<p>Understanding remainders</p>	<p>Use equipment to understand that a remainder occurs when a set of objects cannot be divided equally any further.</p>  <p><i>There are 13 sticks in total. There are 3 groups of 4, with 1 remainder.</i></p>	<p>Use images to explain remainders.</p>  <p>$22 \div 5 = 4 \text{ remainder } 2$</p>	<p>Understand that the remainder is what cannot be shared equally from a set.</p> <p>$22 \div 5 = ?$</p> <p>$3 \times 5 = 15$ $4 \times 5 = 20$ $5 \times 5 = 25 \dots \text{this is larger than } 22$ So, $22 \div 5 = 4 \text{ remainder } 2$</p>
<p>Using known facts to divide multiples of 10</p>	<p>Use place value equipment to understand how to divide by unitising.</p> <p><i>Make 6 ones divided by 3.</i></p>  <p><i>Now make 6 tens divided by 3.</i></p>  <p><i>What is the same? What is different?</i></p>	<p>Divide multiples of 10 by unitising.</p>  <p><i>12 tens shared into 3 equal groups. 4 tens in each group.</i></p>	<p>Divide multiples of 10 by a single digit using known times-tables.</p> <p>$180 \div 3 = ?$</p> <p><i>180 is 18 tens.</i></p> <p><i>18 divided by 3 is 6. 18 tens divided by 3 is 6 tens.</i></p> <p>$18 \div 3 = 6$ $180 \div 3 = 60$</p>
<p>2-digit number divided by 1-digit number, no remainders</p>	<p>Children explore dividing 2-digit numbers by using place value equipment.</p>  <p>$48 \div 2 = ?$</p>	<p>Children explore which partitions support particular divisions.</p> 	<p>Children partition a number into 10s and 1s to divide where appropriate.</p>  <p>$60 \div 2 = 30$ $8 \div 2 = 4$ $30 + 4 = 34$ $68 \div 2 = 34$</p>

	<p><i>First divide the 10s.</i></p>  <p><i>Then divide the 1s.</i></p> 	<p><i>I need to partition 42 differently to divide by 3.</i></p>  <p>$42 = 30 + 12$</p> <p>$42 \div 3 = 14$</p>	<p>Children partition flexibly to divide where appropriate.</p> <p>$42 \div 3 = ?$ $42 = 40 + 2$</p> <p><i>I need to partition 42 differently to divide by 3.</i></p> <p>$42 = 30 + 12$</p> <p>$30 \div 3 = 10$ $12 \div 3 = 4$</p> <p>$10 + 4 = 14$ $42 \div 3 = 14$</p>
<p>2-digit number divided by 1-digit number, with remainders</p>	<p>Use place value equipment to understand the concept of remainder.</p> <p><i>Make 29 from place value equipment. Share it into 2 equal groups.</i></p>  <p><i>There are two groups of 14 and 1 remainder.</i></p>	<p>Use place value equipment to understand the concept of remainder in division.</p> <p>$29 \div 2 = ?$</p>  <p>$29 \div 2 = 14 \text{ remainder } 1$</p>	<p>Partition to divide, understanding the remainder in context.</p> <p><i>67 children try to make 5 equal lines.</i></p> <p>$67 = 50 + 17$ $50 \div 5 = 10$</p> <p>$17 \div 5 = 3 \text{ remainder } 2$ $67 \div 5 = 13 \text{ remainder } 2$</p> <p><i>There are 13 children in each line and 2 children left out.</i></p>

Year 4			
	Concrete	Pictorial	Abstract
Year 4 Addition			
Understanding numbers to 10,000	<p>Use place value equipment to understand the place value of 4-digit numbers.</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <p><i>4 thousands equal 4,000.</i></p> <p><i>1 thousand is 10 hundreds.</i></p>	<p>Represent numbers using place value counters once children understand the relationship between 1,000s and 100s.</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>$2,000 + 500 + 40 + 2 = 2,542$</p>	<p>Understand partitioning of 4-digit numbers, including numbers with digits of 0.</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <p>$5,000 + 60 + 8 = 5,068$</p> <p>Understand and read 4-digit numbers on a number line.</p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div>
Choosing mental methods where appropriate	<p>Use unitising and known facts to support mental calculations.</p> <p><i>Make 1,405 from place value equipment.</i></p> <p><i>Add 2,000.</i></p> <p><i>Now add the 1,000s.</i></p> <p><i>1 thousand + 2 thousands = 3 thousands</i></p> <p>$1,405 + 2,000 = 3,405$</p>	<p>Use unitising and known facts to support mental calculations.</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <p><i>I can add the 100s mentally.</i></p> <p>$200 + 300 = 500$</p> <p><i>So, $4,256 + 300 = 4,556$</i></p>	<p>Use unitising and known facts to support mental calculations.</p> <p>$4,256 + 300 = ?$</p> <p>$2 + 3 = 5$ $200 + 300 = 500$</p> <p>$4,256 + 300 = 4,556$</p>








<p>Column addition with exchange</p>	<p>Use place value equipment on a place value grid to organise thinking.</p> <p>Ensure that children understand how the columns relate to place value and what to do if the numbers are not all 4-digit numbers.</p> <p><i>Use equipment to show $1,905 + 775$.</i></p> <div data-bbox="333 517 884 686" style="border: 1px solid black; height: 100px; width: 246px;"></div> <p><i>Why have only three columns been used for the second row? Why is the Thousands box empty?</i></p> <p><i>Which columns will total 10 or more?</i></p>	<p>Use place value equipment to model required exchanges.</p> <div data-bbox="936 284 1487 1075" style="border: 1px solid black; height: 496px; width: 246px;"></div> <p>Include examples that exchange in more than one column.</p>	<p>Use a column method to add, including exchanges.</p> <div data-bbox="1536 284 1767 1238" style="border: 1px solid black; height: 598px; width: 103px;"></div> <p>Include examples that exchange in more than one column.</p>
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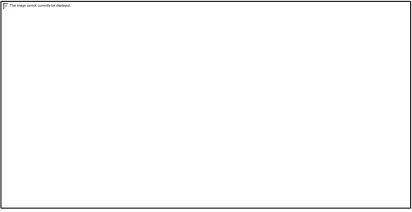




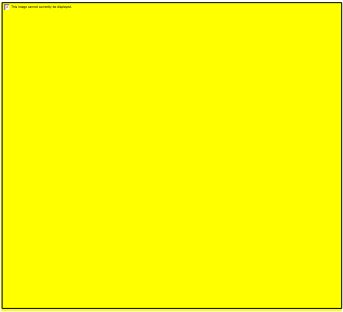
<p>Representing additions and checking strategies</p>		<p>Bar models may be used to represent additions in problem contexts, and to justify mental methods where appropriate.</p> <div data-bbox="945 320 1487 464" style="border: 1px solid black; height: 90px; margin-bottom: 10px;"></div> <p><i>I chose to work out $574 + 800$, then subtract 1.</i></p> <div data-bbox="940 628 1411 751" style="border: 1px solid black; height: 77px;"></div> <p><i>This is equivalent to $3,000 + 3,000$.</i></p>	<p>Use rounding and estimating on a number line to check the reasonableness of an addition.</p> <div data-bbox="1541 320 2094 360" style="border: 1px solid black; height: 25px; margin-bottom: 10px;"></div> <p>$912 + 6,149 = ?$</p> <p><i>I used rounding to work out that the answer should be approximately $1,000 + 6,000 = 7,000$.</i></p>
<p>Year 4 Subtraction</p>			
<p>Choosing mental methods where appropriate</p>	<p>Use place value equipment to justify mental methods.</p> <div data-bbox="338 1015 907 1246" style="border: 1px solid black; height: 145px; margin-bottom: 10px;"></div> <p><i>What number will be left if we take away 300?</i></p>	<p>Use place value grids to support mental methods where appropriate.</p> <div data-bbox="940 1015 1496 1118" style="border: 1px solid black; height: 65px; margin-bottom: 10px;"></div> <p>$7,646 - 40 = 7,606$</p>	<p>Use knowledge of place value and unitising to subtract mentally where appropriate.</p> <p>$3,501 - 2,000$</p> <p><i>3 thousands - 2 thousands = 1 thousand</i></p> <p>$3,501 - 2,000 = 1,501$</p>

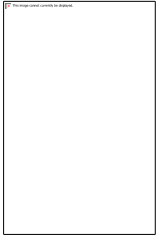


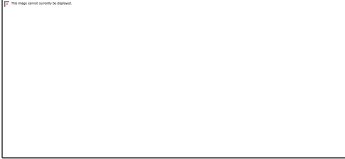

<p>Column subtraction with exchange</p>	<p>Understand why exchange of a 1,000 for 100s, a 100 for 10s, or a 10 for 1s may be necessary.</p> 	<p>Represent place value equipment on a place value grid to subtract, including exchanges where needed.</p> 	<p>Use column subtraction, with understanding of the place value of any exchange required.</p> 
<p>Column subtraction with exchange across more than one column</p>	<p>Understand why two exchanges may be necessary.</p> <p>$2,502 - 243 = ?$</p> 	<p>Make exchanges across more than one column where there is a zero as a place holder.</p> <p>$2,502 - 243 = ?$</p> 	<p>Make exchanges across more than one column where there is a zero as a place holder.</p> <p>$2,502 - 243 = ?$</p>

	<p><i>I need to exchange a 10 for some 1s, but there are not any 10s here.</i></p> <div data-bbox="338 284 848 571" style="border: 1px solid black; height: 180px; width: 228px;"></div>	<div data-bbox="938 181 1422 306" style="border: 1px solid black; height: 78px; width: 216px;"></div>	<div data-bbox="1538 181 1718 732" style="border: 1px solid black; height: 345px; width: 80px;"></div>
<p>Representing subtractions and checking strategies</p>		<p>Use bar models to represent subtractions where a part needs to be calculated.</p> <div data-bbox="938 850 1294 999" style="border: 1px solid black; height: 93px; width: 159px;"></div> <p><i>I can work out the total number of Yes votes using $5,762 - 2,899$.</i></p> <p>Bar models can also represent 'find the difference' as a subtraction problem.</p> <div data-bbox="938 1233 1263 1334" style="border: 1px solid black; height: 63px; width: 145px;"></div>	<p>Use inverse operations to check subtractions.</p> <p><i>I calculated $1,225 - 799 = 574$. I will check by adding the parts.</i></p> <div data-bbox="1538 948 1995 1070" style="border: 1px solid black; height: 77px; width: 204px;"></div> <p><i>The parts do not add to make 1,225. I must have made a mistake.</i></p>

<p>Year 4 Multiplication</p>			
<p>Multiplying by multiples of 10 and 100</p>	<p>Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.</p> <div data-bbox="338 403 696 571" style="border: 1px solid black; height: 105px; width: 160px; margin: 10px 0;"></div> <p><i>3 groups of 4 ones is 12 ones. 3 groups of 4 tens is 12 tens. 3 groups of 4 hundreds is 12 hundreds.</i></p>	<p>Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.</p> <div data-bbox="943 403 1301 571" style="border: 1px solid black; height: 105px; width: 160px; margin: 10px 0;"></div> <p>$3 \times 4 = 12$ $3 \times 40 = 120$ $3 \times 400 = 1,200$</p>	<p>Use known facts and understanding of place value and commutativity to multiply mentally.</p> <p>$4 \times 7 = 28$</p> <p>$4 \times 70 = 280$ $40 \times 7 = 280$</p> <p>$4 \times 700 = 2,800$ $400 \times 7 = 2,800$</p>
<p>Understanding times-tables up to 12×12</p>	<p>Understand the special cases of multiplying by 1 and 0.</p> <div data-bbox="338 798 831 943" style="border: 1px solid black; height: 91px; width: 220px; margin: 10px 0;"></div> <p>$5 \times 1 = 5$ $5 \times 0 = 0$</p>	<p>Represent the relationship between the $\times 9$ table and the $\times 10$ table.</p> <div data-bbox="943 798 1279 919" style="border: 1px solid black; height: 76px; width: 150px; margin: 10px 0;"></div> <p>Represent the $\times 11$ table and $\times 12$ tables in relation to the $\times 10$ table.</p> <div data-bbox="943 1023 1503 1110" style="border: 1px solid black; height: 55px; width: 250px; margin: 10px 0;"></div> <p>$2 \times 11 = 20 + 2$ $3 \times 11 = 30 + 3$ $4 \times 11 = 40 + 4$</p> <div data-bbox="943 1278 1099 1358" style="border: 1px solid black; height: 50px; width: 70px; margin: 10px 0;"></div> <p>$4 \times 12 = 40 + 8$</p>	<p>Understand how times-tables relate to counting patterns.</p> <p>Understand links between the $\times 3$ table, $\times 6$ table and $\times 9$ table <i>5×6 is double 5×3</i></p> <p>$\times 5$ table and $\times 6$ table <i>I know that $7 \times 5 = 35$ so I know that $7 \times 6 = 35 + 7$.</i></p> <p>$\times 5$ table and $\times 7$ table $3 \times 7 = 3 \times 5 + 3 \times 2$</p> <div data-bbox="1541 1134 1697 1270" style="border: 1px solid black; height: 85px; width: 70px; margin: 10px 0;"></div> <p>$\times 9$ table and $\times 10$ table $6 \times 10 = 60$ $6 \times 9 = 60 - 6$</p>

<p>Understanding and using partitioning in multiplication</p>	<p>Make multiplications by partitioning.</p> <p><i>4 × 12 is 4 groups of 10 and 4 groups of 2.</i></p>  <p><i>4 × 12 = 40 + 8</i></p>	<p>Understand how multiplication and partitioning are related through addition.</p>  <p><i>4 × 3 = 12</i> <i>4 × 5 = 20</i> <i>12 + 20 = 32</i></p> <p><i>4 × 8 = 32</i></p>	<p>Use partitioning to multiply 2-digit numbers by a single digit.</p> <p><i>18 × 6 = ?</i></p>  <p><i>18 × 6 = 10 × 6 + 8 × 6</i> <i>= 60 + 48</i> <i>= 108</i></p>
<p>Column multiplication for 2- and 3-digit numbers multiplied by a single digit</p>	<p>Use place value equipment to make multiplications.</p> <p><i>Make 4 × 136 using equipment.</i></p>  <p><i>I can work out how many 1s, 10s and 100s.</i></p> <p><i>There are 4 × 6 ones... 24 ones</i> <i>There are 4 × 3 tens ... 12 tens</i> <i>There are 4 × 1 hundreds ... 4 hundreds</i></p> <p><i>24 + 120 + 400 = 544</i></p>	<p>Use place value equipment alongside a column method for multiplication of up to 3-digit numbers by a single digit.</p> 	<p>Use the formal column method for up to 3-digit numbers multiplied by a single digit.</p>  <p>Understand how the expanded column method is related to the formal column method and understand how any exchanges are related to place value at each stage of the calculation.</p> 

<p>Multiplying more than two numbers</p>	<p>Represent situations by multiplying three numbers together.</p>  <p><i>Each sheet has 2 x 5 stickers. There are 3 sheets.</i></p> <p><i>There are 5 x 2 x 3 stickers in total.</i></p> 	<p>Understand that commutativity can be used to multiply in different orders.</p>  <p>$2 \times 6 \times 10 = 120$ $12 \times 10 = 120$</p> <p>$10 \times 6 \times 2 = 120$ $60 \times 2 = 120$</p>	<p>Use knowledge of factors to simplify some multiplications.</p> <p>$24 \times 5 = 12 \times 2 \times 5$</p> 
<p>Year 4 Division</p>			
<p>Understanding the relationship between multiplication and division, including times-tables</p>	<p>Use objects to explore families of multiplication and division facts.</p>  <p>$4 \times 6 = 24$ <i>24 is 6 groups of 4. 24 is 4 groups of 6.</i></p> <p><i>24 divided by 6 is 4. 24 divided by 4 is 6.</i></p>	<p>Represent divisions using an array.</p> 	<p>Understand families of related multiplication and division facts.</p> <p><i>I know that $5 \times 7 = 35$</i></p> <p><i>so I know all these facts:</i></p> <p>$5 \times 7 = 35$ $7 \times 5 = 35$ $35 = 5 \times 7$ $35 = 7 \times 5$ $35 \div 5 = 7$ $35 \div 7 = 5$ $7 = 35 \div 5$ $5 = 35 \div 7$</p>

<p>Dividing multiples of 10 and 100 by a single digit</p>	<p>Use place value equipment to understand how to use unitising to divide.</p>  <p><i>8 ones divided into 2 equal groups 4 ones in each group</i></p> <p><i>8 tens divided into 2 equal groups 4 tens in each group</i></p> <p><i>8 hundreds divided into 2 equal groups 4 hundreds in each group</i></p>	<p>Represent divisions using place value equipment.</p>  <p>$9 \div 3 = 3$</p> <p><i>9 tens divided by 3 is 3 tens. 9 hundreds divided by 3 is 3 hundreds.</i></p>	<p>Use known facts to divide 10s and 100s by a single digit.</p> <p>$15 \div 3 = 5$</p> <p>$150 \div 3 = 50$</p> <p>$1500 \div 3 = 500$</p>
<p>Dividing 2-digit and 3-digit numbers by a single digit by partitioning into 100s, 10s and 1s</p>	<p>Partition into 10s and 1s to divide where appropriate.</p> <p>$39 \div 3 = ?$</p>  <p>$39 = 30 + 9$</p> <p>$30 \div 3 = 10$</p> <p>$9 \div 3 = 3$</p> <p>$39 \div 3 = 13$</p>	<p>Partition into 100s, 10s and 1s using Base 10 equipment to divide where appropriate.</p> <p>$39 \div 3 = ?$</p>  <p>$39 = 30 + 9$</p> <p>$30 \div 3 = 10$</p> <p>$9 \div 3 = 3$</p> <p>$39 \div 3 = 13$</p>	<p>Partition into 100s, 10s and 1s using a part-whole model to divide where appropriate.</p> <p>$142 \div 2 = ?$</p>  <p>$100 \div 2 = 50$</p> <p>$40 \div 2 = 20$</p> <p>$6 \div 2 = 3$</p> <p>$50 + 20 + 3 = 73$</p> <p>$142 \div 2 = 73$</p>

<p>Dividing 2-digit and 3-digit numbers by a single digit, using flexible partitioning</p>	<p>Use place value equipment to explore why different partitions are needed.</p> <p>$42 \div 3 = ?$</p> <p><i>I will split it into 30 and 12, so that I can divide by 3 more easily.</i></p> <div data-bbox="338 454 589 595" style="border: 1px solid black; height: 88px; width: 112px;"></div>	<p>Represent how to partition flexibly where needed.</p> <p>$84 \div 7 = ?$</p> <p><i>I will partition into 70 and 14 because I am dividing by 7.</i></p> <div data-bbox="938 454 1478 639" style="border: 1px solid black; height: 116px; width: 241px;"></div>	<p>Make decisions about appropriate partitioning based on the division required.</p> <div data-bbox="1538 280 2067 421" style="border: 1px solid black; height: 88px; width: 236px;"></div> <p>Understand that different partitions can be used to complete the same division.</p> <div data-bbox="1538 523 1850 924" style="border: 1px solid black; height: 251px; width: 139px;"></div>
<p>Understanding remainders</p>	<p>Use place value equipment to find remainders.</p> <p><i>85 shared into 4 equal groups</i></p> <p><i>There are 24, and 1 that cannot be shared.</i></p> <div data-bbox="338 1174 788 1327" style="border: 1px solid black; height: 96px; width: 201px;"></div>	<p>Represent the remainder as the part that cannot be shared equally.</p> <div data-bbox="938 1043 1337 1174" style="border: 1px solid black; height: 82px; width: 178px;"></div> <p>$72 \div 5 = 14 \text{ remainder } 2$</p>	<p>Understand how partitioning can reveal remainders of divisions.</p> <div data-bbox="1538 1011 1682 1163" style="border: 1px solid black; height: 95px; width: 64px;"></div> <p>$80 \div 4 = 20$ $12 \div 4 = 3$</p> <p>$95 \div 4 = 23 \text{ remainder } 3$</p>