

Crowmoor School



Y3 Calculations Policy

2017

Addition Year 3

Focus: Adding with numbers up to 3 digits

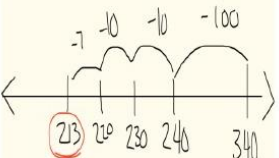
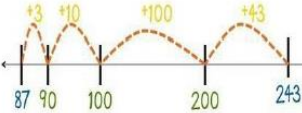
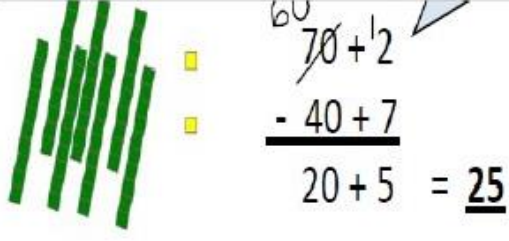
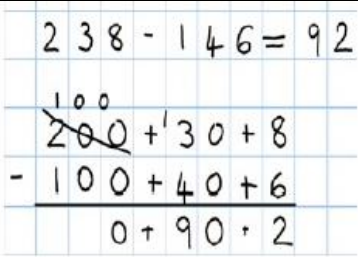
In year 3 we will move to the traditional column method and to support this, children will first apply their partitioning skills to the partitioning column method.

$246+132$ $200+40+6$ $\underline{100+30+2}$ $300+70+8 = 378$	<p>Introduce the partitioning column method with numbers that do not bridge so children become confident with the method itself.</p> <p>Please Note: Start by adding the units first.</p>
$337+188= 525$ $300+ 30+ 7$ $\underline{100+ 80+ 8}$ $400+110+15 = 525$	<p>Once confident, children can start using the partitioning column method to solve problems that bridge the tens and hundreds boundaries.</p>
$\begin{array}{r} 343 \\ + 116 \\ \hline 400 \\ 50 \\ + \underline{9} \\ \hline 459 \end{array}$	<p>Children can use the expanded column method for addition.</p>
$116+343=459$ $\begin{array}{r} 343 \\ + 116 \\ \hline 459 \end{array}$	<p>Now children are ready to move on to the traditional column methods. Introduce this initially with numbers that do not bridge any boundaries. It is important children remember that it is three hundred add one hundred, NOT 3 + 1!</p>
$245+84=329$ $\begin{array}{r} 245 \\ + \underline{84} \\ \hline 329 \\ 1 \end{array}$	<p>Once the method is secure children are now ready to be introduced to 'carrying' which happens when bridging in the column method. Make sure children add the units first and 'carry' numbers under the bottom line.</p>
<p>Key Vocabulary Add, more, plus, and, make, altogether, total, equal to, equals, the same as, double, most, count on, number line, sum, tens, units/ones, partition, addition, column, tens boundary, <i>hundreds boundary</i>, <i>increase</i>, <i>vertical</i>, <i>carry</i>, <i>expanded</i>, <i>compact</i></p>	

Subtraction Year 3

Focus: Subtracting with 2 and 3 digit numbers

Children will consolidate their knowledge of counting back and counting on using a blank Number line to subtract. They will use these methods both written and mentally. Once children become fully confident they will be ready to move on to the partitioning column method of subtraction.

 <p>A number line starting at 213 and ending at 347. Tick marks are at 213, 220, 230, 240, and 347. Arrows indicate jumps: -7 from 213 to 220, -10 from 220 to 230, -10 from 230 to 240, and -100 from 240 to 340. The final result is 347.</p>	<p>Children will continue to subtract on number line using efficient jumps and now apply these to 3 digit number problems. Here is an efficient example of $340 - 127 =$</p>
 <p>A number line starting at 87 and ending at 243. Tick marks are at 87, 90, 100, 200, and 243. Arrows indicate jumps: +3 from 87 to 90, +10 from 90 to 100, +100 from 100 to 200, and +43 from 200 to 243.</p>	<p>Counting on will also be used for problems greater than 100 using efficient jumps, the use of 100 square can support children's understanding of this method.</p>
$\begin{array}{r} 80 + 9 \\ - 30 + 5 \\ \hline 50 + 4 \end{array}$	<p>Children will now have the mental skills required to approach the partitioning column method of subtraction. At first they should attempt this where no exchanging is required. Here is an example for $89 - 35 = 54$</p>
 <p>Base 10 blocks representing 72 (7 tens rods and 2 units cubes). A partitioning diagram shows 70 + 2, then 40 + 7, and the result 20 + 5 = 25.</p>	<p>Through practical subtraction children should be introduced to exchanging. Base 10 is a vital tool here as is a solid grounding with partitioning in different ways. It is important children realize that the value has not changed, we have just partitioned in a different way. As you can see here for $72 - 47$, before subtracting 7 units, a tens row will need to be exchanged for 10 units</p>
 <p>A grid showing the partitioning column method for $238 - 146 = 92$. The calculation is shown as $200 + 30 + 8 - 100 + 40 + 6 = 0 + 90 + 2 = 92$.</p>	<p>Children who are secure with the concept of 'exchanging' should now be able to use the partitioning column method to subtract any 2</p>
<p>Key Vocabulary Equal to, take, take away, less, minus, subtract, leaves, distance between, difference between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is_?, count on, strategy, partition, tens, units/ones, <i>exchange</i>, <i>decrease</i>, <i>hundreds</i>, <i>value</i>, <i>digit</i></p>	

Multiplication Year 3

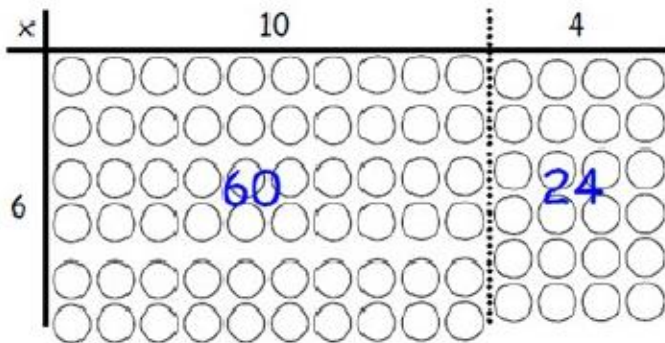
Focus: Multiplying 2 digit numbers by 1 digit numbers

In year 3 children will move on from arrays and start using the grid method of multiplication.

It is essential that before children move onto the grid method they are completely confident with all previous methods and have a solid grounding with mental methods and partitioning.

Before moving on to the grid multiplication, children need to be able to....

- Partition numbers into tens and ones
- Multiply single digits by multiples of 10 ($3 \times 10 = 30$)
- Quickly recall multiplication facts for the 2,3,4,5,6 and 10 x table



x	30	5
7	210	35

$$210 + 35 = 245$$

The grid method should be introduced using an arrays model such as the one to the left for 14×6 . Children need to use their partitioning skills to partition the two digit number and then use their existing knowledge of arrays to come to an answer with minimal support.

Multiplication grid method requires good organization but also a solid understanding of partitioning and multiplication facts, as you can see in the example to the left for 35×7 . The children need to remember that once they have multiplied the partitioned parts of the number, they then need to add the two

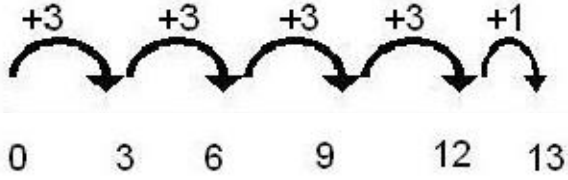
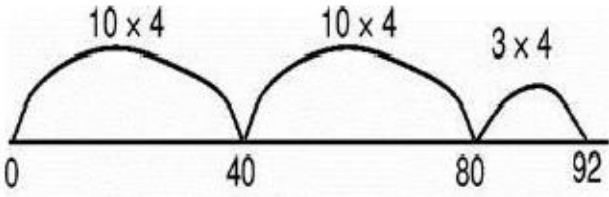
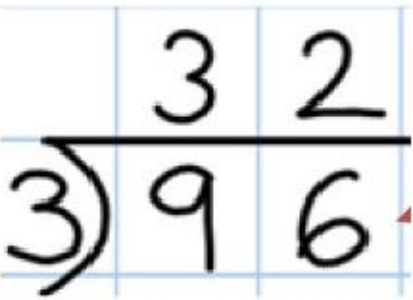
Key Vocabulary

Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, *partition, grid method, multiple, product, tens, units/ones, value*

Division Year 3

Focus: Dividing 2 digit numbers by 1 digit numbers moving from number line methods to short division

Children in year 3 will continue to use a number line to solve division problems and will begin to jump more than one step at a time in the style of 'chunking'. Once confident they will move on to short division without any remainders.

 <p>A number line starting at 0 and ending at 13. There are five curved arrows pointing right. The first four arrows are labeled '+3' and connect the numbers 0 to 3, 3 to 6, 6 to 9, and 9 to 12. The fifth arrow is labeled '+1' and connects 12 to 13.</p>	<p>Children will begin to use the grouping Number line method to solve problems with remainders. They will start on zero and write the dividend at the end of their number line. They will jump in steps of the divisor until they get as close to the end as possible. Whatever is left over is the remainder. Using cubes or arrays alongside the number line will consolidate understanding.</p>
 <p>A number line starting at 0 and ending at 92. There are three large curved arcs. The first arc is labeled '10 x 4' and connects 0 to 40. The second arc is also labeled '10 x 4' and connects 40 to 80. The third arc is labeled '3 x 4' and connects 80 to 92.</p>	<p>Once confident children will begin to solve problems on a grouping number line involving bigger numbers. To solve this effectively they will need to subtract chunks of the divisor. As you can see in the image for $92 \div 4$, a step of 10 groups of 4 has been jumped, followed by another step of 10 jumps, and finally followed by a step of 3 jumps of 4. This means that in total 4 was jumped 23 times making 23 the answer.</p>
 <p>A short division calculation for $96 \div 3$. The divisor '3' is written to the left of a vertical line. The dividend '96' is written to the right of the vertical line. A horizontal line is drawn above the '96'. The quotient '32' is written above the horizontal line. A small red arrow points to the right of the '6' in the dividend.</p>	<p>Once children are confident with Number line methods then they should start work on short division. First of all arrays should be used to show a division calculation, the same calculation should then be shown in the short multiplication method. Place value should be regularly discussed so children realize that they are partitioning the dividend and dividing the units then then tens by the divisor. Please Note: Initially children will start with simple problems where each digit is a multiple of the divisor.</p>

Key Vocabulary

Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, *inverse*, *short division*, *carry*, *remainder*, *multiple*