
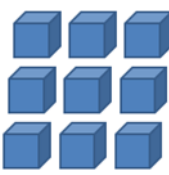
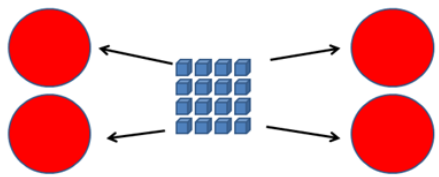
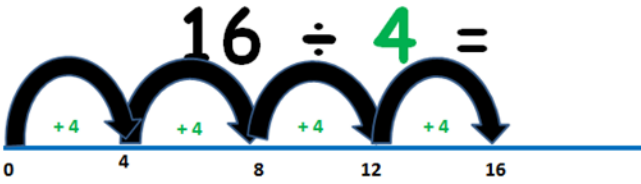


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MULTIPLICATION

DIVISION

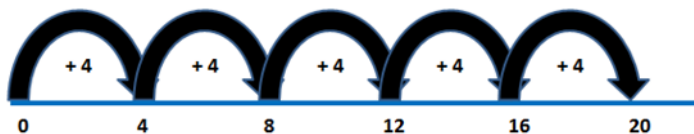
Progression		
KS1	<p><u>Repeated addition and sets</u></p> <p style="text-align: center;">$3 \times 3 = 9$</p> <p style="text-align: center;">$3 + 3 + 3 = 9$</p>  <p>Use repeated addition to find the answer. Use sets of objects or numicon to visualise the number sentence.</p> <p><u>Multiplication - 'Lots of ...', arrays and simple multiplication</u></p> <p style="text-align: center;">$3 \times 3 = 9$</p> <p style="text-align: center;">$3 \text{ lots of } 3 = 9$</p>  <p>Visualise the multiplication number sentence as 'lots of ...' objects. This can then be drawn as an array, eventually becoming basic multiplication.</p>	<p><u>Division Sharing</u></p> <p style="text-align: center;">$16 \div 4 =$</p>  <p>Use the divisor to share out the objects into equal sets. Count the number of objects in each set to find your answer.</p> <p><u>Division using grouping on a blank number line</u></p>  <p>Start at 0. Repeatedly add the divisor until you reach the larger number. Count the number of jumps to find your answer.</p>

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MULTIPLICATION

Multiplication using a blank number line

$$5 \times 4 = 20$$



Start at 0, on the left hand end of the number line. Repeatedly add the second factor, the number of times the first tell you. The answer is the final number you land on.

Multiplication using the grid method

$$10 \times 11 = 110$$

	10	1	
10	100	10	

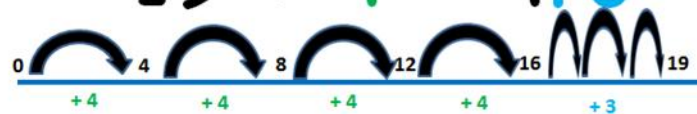
$$100 + 10 = 110$$

Partition the numbers and write the partitioned numbers around the grid. Multiply the numbers around the grid. You should end up with four answers. Add your answers together to get the multiplication answer.

DIVISION

Division using grouping on a blank number line - leaving a remainder

$$19 \div 4 = 4r3$$

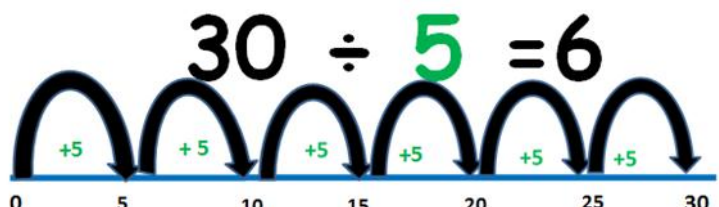


Start at 0. Repeatedly add the divisor until you get to the nearest multiple of the divisor. Your answer is the number of jumps you need, along with the remaining number to get to the larger number.

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MULTIPLICATION

DIVISION

Lower KS2	<p><u>Children are taught to understand that multiplication is based on repeated addition and as an array</u></p> <p><u>Mental methods</u> <u>Partitioning</u></p> <p>$18 \times 4 = 72$ \downarrow $10 \times 4 = 40$ $8 \times 4 = 32$</p> <p>Moving onto : $24 \times 2 = (20 \times 2) + (4 \times 2) = 48$ $40 + 8$</p> <p><u>Written Methods</u> In the early stages of KS2 children may use the number line for multiplication (see KS1 multiplication above)</p> <p><u>Grid method</u></p> <p><u>Step 1</u> 23 x 7 is:</p> <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">20</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">7</td> <td style="padding: 5px;">140</td> <td style="padding: 5px;">21</td> </tr> </table> ➔ <p><u>Step 2</u> HTU</p> <table style="margin-left: 100px;"> <tr><td>140</td></tr> <tr><td>+21</td></tr> <tr><td><u>161</u></td></tr> </table>	x	20	3	7	140	21	140	+21	<u>161</u>	<p><u>Children are taught to understand division as "sharing" or "grouping."</u></p> <p><u>Mental methods</u> Children should be encouraged to recall related division facts If $4 \times 5 = 20$ then $20 \div 5 = 4$</p> <p><u>Written methods</u></p> <p><u>Division using a number line</u> $30 \div 5$ can be modelled as: Grouping - How many 5's make 30?</p> <div style="text-align: center;">  <p style="font-size: 1.5em; font-weight: bold; margin: 0;">$30 \div 5 = 6$</p> </div> <p>Draw jumps of 5 along a number line. Children to count the number of jumps they have made. This shows you need 6 jumps of 5 to reach 30.</p>
x	20	3									
7	140	21									
140											
+21											
<u>161</u>											

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MULTIPLICATION

Short Multiplication (compact)

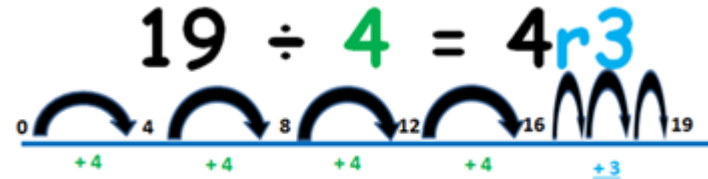
$$24 \times 6 = 144$$

		2	4
x			6
	1	4	4
		2	

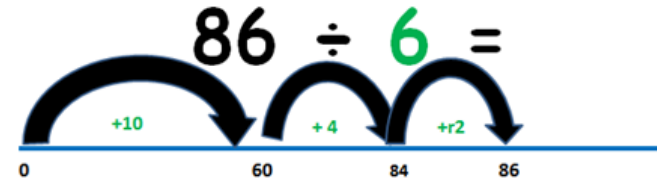
- 1) $4 \times 6 = 24$ (carry the 2 tens over to tens column)
- 2) $2 \times 6 = 12$. Add the 2 (carried over) = 14.

DIVISION

Division with remainders



Development



It would take a long time to jump in 6's to 86 so children can jump in bigger jumps using their tables facts to help them. A jump of 10 lots of 6 takes you to 60. A jump of 4 lots of 6 takes you to 84 with a remainder of 2. Altogether that is 14 (10 + 4) jumps of 6 remainder 2.

Once secure move to compact method of division.

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MULTIPLICATION

DIVISION

		<p><u>Short division (compact method)</u></p> <p>$367 \div 4 = 91 \text{ r } 3$</p> <div style="background-color: yellow; padding: 5px; display: inline-block;"> $\begin{array}{r} 091 \text{ r } 3 \\ 4 \overline{) 367} \end{array}$ </div>
Upper KS2	<p><u>Mental Methods</u></p> <p><u>Use and Apply multiplication facts</u> Utilise tables and knowledge of place value to derive other facts.</p> <p style="padding-left: 40px;">If I know $3 \times 7 = 21$, what else do I know?</p> <p style="padding-left: 40px;">$30 \times 7 = 210$ $300 \times 7 = 2100$ $3000 \times 7 = 21000$ $0.3 \times 7 = 2.1$</p> <p><u>Multiplying by 10, 100 and 1000</u> Children to know the effect of multiplying by 10, 100 or 1000 (the digits move one, two or three places to the left and a zero used as a place holder).</p> <p><u>Partitioning</u> $38 \times 7 = (30 \times 7) + (8 \times 7) = 266$</p>	<p><u>Mental methods</u></p> <p><u>Use and recall related division facts</u> If $4 \times 5 = 20$ then $20 \div 5 = 4$</p> <p><u>Dividing by 10, 100 or 1000</u></p> <p>Children to know the effect of dividing by 10, 100 or 1000 (the digits move one, two or three places to the right and a zero used as a place holder)</p>

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MULTIPLICATION

DIVISION

210 56

Written Methods

If children not secure with grid method, continue to use this method (see LKS2)

Short multiplication

		2	4
x			6
	1	4	4
		2	

24 x 6 becomes

Answer: 144

2741 x 6 becomes

	2	7	4	1
x				6
	1	6	4	4
		4	2	

Answer: 16 446

Written Methods

Short division (compact method)

$$367 \div 4 = 91 \text{ r } 3$$

$$\begin{array}{r} 091 \text{ r } 3 \\ 4 \overline{) 367} \end{array}$$

Expressing remainders as a decimal or fraction.

Expressing as a decimal 59 ÷ 4 = 14.75

$$\begin{array}{r} 14.75 \\ 4 \overline{) 59.30} \end{array} \quad \text{For explanation see parents guide}$$

Expressing as a fraction

$$\begin{array}{r} 13 \frac{1}{5} \\ 5 \overline{) 66} \end{array} \quad \text{This time children would be taught to use the remainders as a numerator and the divisor as a denominator, make } 1/5 \text{ (one fifth).}$$

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MULTIPLICATION

Multiplying decimals

		4.	8	
	x	7		
		3	3.	6
			5	

Children will use short multiplication (compact) to multiply decimal numbers.

Long multiplication (multiplying by a 2 digit number)

$$124 \times 26 = 2224$$

	H	T	U
	¹ 1	² 2	4
X		2	6
	7	4	4
	2	4	8
	3	2	2
	1	1	

See parents' guide for explanation.

DIVISION

Short division with decimal numbers

$$34.2 \div 6 = 5.7$$

$$\begin{array}{r} 5.7 \\ 6 \overline{) 34.2} \\ \underline{30} \\ 42 \\ \underline{42} \\ 0 \end{array}$$

Long Division with a remainder

$$432 \div 15 \text{ becomes}$$

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

See parents' guide for explanation.

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MULTIPLICATION

DIVISION