

**Peppard CE Primary Calculation Policy 2017 onwards.
Year 5 - 6 Multiplication and Division.**

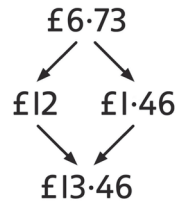
(Adapted from the Abacus maths scheme).

Year 5

Doubling and halving

Double amounts of money using partitioning

e.g. *double* £6.73



Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20

e.g. 58×5 is half of 58×10 (580) = 290

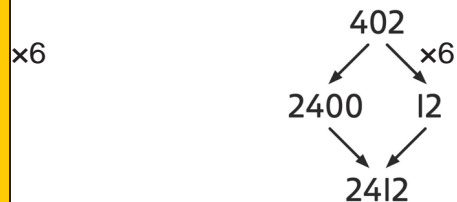
Grouping

Multiply whole numbers and decimals by 10, 100, 1000

e.g. $3.4 \times 100 = 340$

Use partitioning to multiply 'friendly' 2- and 3-digit numbers by 1-digit numbers

e.g. 402×6 as 400×6 (2400) and 2×6 (12) = 2412



Use partitioning to multiply decimal numbers by 1-digit numbers

e.g. 4.5×3 as 4×3 (12) and 0.5×3 (1.5) = 13.5

Multiply near multiples by rounding e.g. 32

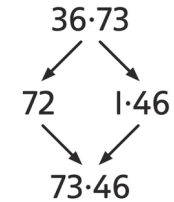
$\times 29$ as $(32 \times 30) - 32 = 928$

Year 6

Doubling and halving

Double decimal numbers with up to 2 places using partitioning

e.g. *double* 36.73



Use doubling and halving as strategies in mental multiplication

Grouping

Use partitioning as a strategy in mental multiplication, as appropriate

e.g. 3060×4 as 3000×4 (12 000) and 60×4 (240) = 12 240

e.g. 8.4×8 as 8×8 (64) and 0.4×8 (3.2) = 67.2

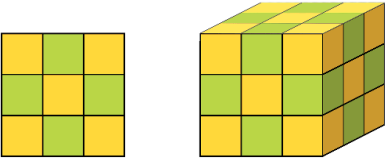
Use factors in mental multiplication

e.g. 421×6 as 421×3 (1263) doubled = 2526

e.g. 3.42×5 as half of $3.42 \times 10 = 17.1$

Multiply decimal numbers using near multiples by rounding

e.g. 4.3×19 as $(4.3 \times 20) - 4.3 = 81.7$

	Year 5	Year 6
Mental Multiplication	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 to multiply multiples of 10/100 of the multiplier e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$</p> <p>Use knowledge of factors and multiples in multiplication e.g. 43×6 is double 43×3 e.g. 28×50 is half of 28×100 (2800) = 1400</p> <p>Know square numbers and cube numbers</p> 	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 in mental multiplication of large numbers or numbers with up to 2 decimal places e.g. $6 \times 4 = 24$ and $0.06 \times 4 = 0.24$</p>
Written Multiplication	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 435×8</p> $\begin{array}{r} 435 \\ \times 8 \\ \hline 24 \\ \hline 3480 \end{array}$ <p>Long multiplication of 2-, 3- and 4-digit numbers by 'teen' numbers e.g. 48×16</p> $\begin{array}{r} 48 \\ \times 16 \\ \hline 480 \\ 288 \\ \hline 768 \end{array}$	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 3743×6</p> $\begin{array}{r} 3743 \\ \times 6 \\ \hline 421 \\ \hline 22458 \end{array}$ <p>Long multiplication of 2-, 3- and 4-digit numbers by 2-digit numbers e.g. 456×38</p> $\begin{array}{r} 456 \\ \times 38 \\ \hline 13680 \\ 3648 \\ \hline 17328 \end{array}$

Year 5

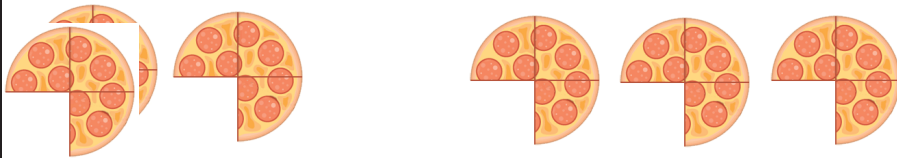
Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers

e.g. 1.34×6

x	1	0.3	0.04	
6	6	1.8	0.24	= 8.04

Multiply fractions by 1-digit numbers

e.g. $\frac{3}{4} \times 6 = \frac{18}{4} = 4 \frac{2}{4} = 4 \frac{1}{2}$



NB Grid multiplication provides a default method for ALL children

Year 6

Short multiplication of decimal numbers using $\times 100$ and $\div 100$ e.g.

13.72×6 as $(1372 \times 6) \div 100 = 82.32$

Short multiplication of money e.g.

£13.72 \times 6

$$\begin{array}{r}
 \text{£ } 13.72 \\
 \times \quad 6 \\
 \hline
 \text{£ } 82.32
 \end{array}$$

Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers

e.g. 6.76×4

x	6	0.7	0.06	
4	24	2.8	0.24	= 27.04

Multiply simple pairs of proper fractions

e.g. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$

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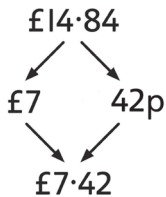
NB Grid multiplication provides a default method for ALL children

	Year 5	Year 6
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Mental Division

Doubling and halving

Halve amounts of money using partitioning
 e.g. *half of £14.84 is half of £14 (£7) plus half of 84p (42p)*



Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20
 e.g. $115 \div 5$ as *double 115* $(230) \div 10 = 23$

Grouping

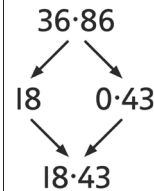
Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places
 e.g. $340 \div 100 = 3.4$
 Use the 10th, 20th, 30th ... multiple of the divisor to divide 'friendly' 2- and 3-digit numbers by 1-digit numbers
 e.g. $186 \div 6$ as 30×6 (180) and 1×6 (6)

$186 \div 6 = \square$

$\square \times 6 = 186$	$186 \div 6 = 31$
$30 \times 6 = 180$	
6	
$1 \times 6 = 6$	
0	
31	↑

Doubling and halving

Halve decimal numbers with up to 2 places using partitioning
 e.g. *half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)*



Use doubling and halving as strategies in mental division

Grouping

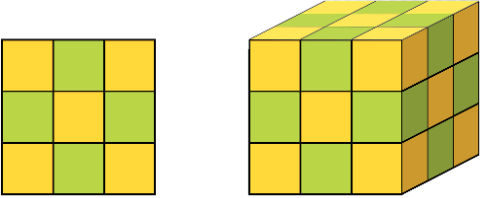
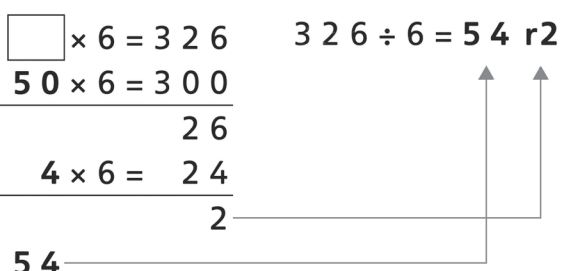
Use the 10th, 20th, 30th, ... or 100th, 200th, 300th ... multiples of the divisor to divide large numbers
 e.g. $378 \div 9$ as 40×9 (360) and 2×9 (18), remainder 2

$378 \div 9 = \square$

$\square \times 9 = 378$	$378 \div 9 = 42 \text{ r}2$
$40 \times 9 = 360$	
18	↑
$2 \times 9 = 18$	
2	↑
42	

Use tests for divisibility

e.g. 135 divides by 3, as $1 + 3 + 5 = 9$ and 9 is in the $\times 3$ table

	Year 5	Year 6
Mental Division	<p>Using number facts Use division facts from the times-tables up to 12×12 to divide multiples of powers of 10 of the divisor e.g. $3600 \div 9$ using $36 \div 9$ Know square numbers and cube numbers</p> 	<p>Using number facts Use division facts from the times-tables up to 12×12 to divide decimal numbers by 1-digit numbers e.g. $1.17 \div 3$ is $1/100$ of $117 \div 3$ (39) Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25</p>
Written Division	<p>Use a written version of a mental strategy to divide 3-digit numbers by 1-digit numbers e.g. $326 \div 6$ as 50×6 (300) and 4×6 (24), remainder 2</p> $326 \div 6 = \square$ $\square \times 6 = 326$ $50 \times 6 = 300$ <hr style="width: 100px; margin-left: 0;"/> $4 \times 6 = 24$ <hr style="width: 100px; margin-left: 0;"/> 54 $326 \div 6 = 54 \text{ r}2$ 	<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $\begin{array}{r} 46 \text{ r}1 \\ 3 \overline{) 139} \end{array}$ <p>Long division of 3- and 4-digit numbers by 2-digit numbers e.g. $4176 \div 13$</p> $4176 \div 13 = 321 \text{ r}3 \quad 300 + 20 + 1, \text{ r}3$ $\begin{array}{r} 13 \overline{) 4176} \\ \underline{-3900} \\ 276 \\ \underline{-260} \\ 16 \\ \underline{-13} \\ 3 \end{array}$

Written Division	Year 5	Year 6
	<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $\begin{array}{r} 46 \text{ r}1 \\ 3 \overline{) 139} \\ \underline{12} \\ 19 \\ \underline{18} \\ 1 \end{array}$ <p>Give remainders as whole numbers or as fractions Find unit and non-unit fractions of large amounts e.g. $\frac{3}{5}$ of 265 is $3 \times (265 \div 5) = 159$</p> <p>Turn improper fractions into mixed numbers and vice versa</p>	<p>Give remainders as whole numbers, fractions or decimals Use place value to divide 1- and 2-place decimals by numbers ≤ 12 e.g. $3.65 \div 5$ as $(365 \div 5) \div 100 = 0.73$ Divide proper fractions by whole numbers</p>