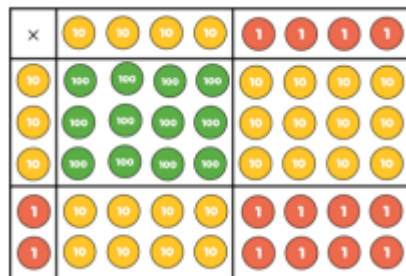


YEAR 5		Multiplication																																														
Vocabulary: product, lots of, groups of, times, as much, factor, common factors, multiple, prime, prime number, prime factors, composite numbers, square, cube (see previous year groups)																																																
Concrete		Pictorial	Abstract																																													
X10, X100 and x1000: (as year 4 but extend to decimals to 2 places) Use place value chart with counters if needed (see year 4)		X10, X100 and x1000: e.g. 23.05 x 100 <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>ths</th><th>hths</th></tr><tr><td></td><td></td><td>2</td><td>3</td><td>0</td><td>5</td></tr><tr><td>2</td><td>3</td><td>0</td><td>5</td><td></td><td></td></tr></table>	Th	H	T	O	ths	hths			2	3	0	5	2	3	0	5			X10, X100 and x1000: No written method - leads to a mental method.																											
Th	H	T	O	ths	hths																																											
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Up to 4 digit numbers x 1 digit: (start with no exchanging leading to exchanging) 1325 x 4 <table><tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td>  </td><td> </td><td>    </td></tr><tr><td></td><td>  </td><td> </td><td>    </td></tr><tr><td></td><td>  </td><td> </td><td>    </td></tr><tr><td></td><td>  </td><td> </td><td>    </td></tr></table> (if needed)		Thousands	Hundreds	Tens	Ones		  	 	    		  	 	    		  	 	    		  	 	    	Up to 4 digit numbers x 1 digit: No jottings	Up to 4 digit numbers x 1 digit: <table><tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>1</td><td>3</td><td>2</td><td>5</td></tr><tr><td>X</td><td></td><td></td><td></td><td>4</td></tr><tr><td></td><td>5</td><td>3</td><td>0</td><td>0</td></tr><tr><td></td><td>1</td><td>1</td><td>2</td><td></td></tr></table>		Th	H	T	O		1	3	2	5	X				4		5	3	0	0		1	1	2	
Thousands	Hundreds	Tens	Ones																																													
	  	 	    																																													
	  	 	    																																													
	  	 	    																																													
	  	 	    																																													
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2 digit x 2 digit (area model)

LINKS TO GRID MODEL IF NEEDED

$$44 \times 32 = 1408$$



2 digit x 2 digit (area model)

No jottings

2 digit x 2 digit (area model)

x	40	4
30	1,200	120
2	80	8

$$\begin{array}{r} 1200 \\ 120 \\ 80 \\ + 8 \\ \hline 1408 \\ 1 \end{array}$$

WRITTEN METHODS (not area model)

Progressive - start with no or limited exchanging leading to exchanging.

2 digit x 2 digit numbers:

Expanded

$$\begin{array}{r} 31 \\ \times 25 \\ \hline 5 \text{ (} 5 \times 1 \text{)} \\ 150 \text{ (} 5 \times 30 \text{)} \\ 20 \text{ (} 20 \times 1 \text{)} \\ 600 \text{ (} 20 \times 30 \text{)} \\ \hline 775 \end{array}$$

Compacted

$$\begin{array}{r} 31 \\ \times 25 \\ \hline 155 \\ 620 \\ \hline 775 \end{array}$$

Initially, some children may need to break this down further:

$$\begin{array}{r} 31 \\ \times 5 \\ \hline 155 \end{array} \quad \begin{array}{r} 31 \\ \times 20 \\ \hline 620 \end{array} \quad + 620$$

3 digit x 2 digit numbers:

Th H T O

$$\begin{array}{r} 132 \\ \times 13 \\ \hline 396 \text{ (} 132 \times 3 \text{)} \\ 1320 \text{ (} 132 \times 10 \text{)} \\ \hline 1716 \\ 1 \end{array}$$

4 digit x 2 digit numbers:

TTh Th H T O

$$\begin{array}{r} 3250 \\ \times 26 \\ \hline 19500 \text{ (} 3250 \times 6 \text{)} \\ 13 \text{ } 3 \text{ } \\ 65000 \text{ (} 3250 \times 20 \text{)} \\ \hline 1 \\ 84500 \\ 1 \end{array}$$

Multiply numbers with up to one decimal place by one-digit whole number.

Exchanging:

$$2.3 \times 4$$

Ones	Tenths
1 1	0.1 0.1 0.1
1 1	0.1 0.1 0.1
1 1	0.1 0.1 0.1
1 1	0.1 0.1 0.1

1

Start with no exchanging leading onto exchanging.

Multiply numbers with up to one decimal place by one-digit whole number.

No jottings

Multiply numbers with up to one decimal place by one-digit whole number.

$$\begin{array}{r} 2.3 \\ \times 4 \\ \hline 1.2 \\ 8.0 \\ \hline 9.2 \end{array}$$

Alternative grid method:

X	4
2.0	8.0
0.3	1.2

$$8.0 + 1.2 = 9.2$$

Leads on to a mental method (see below)

Mental Methods

Number facts:

Continue to recall multiplication facts for multiplication tables up to 12×12 .

Derive and use related facts.

7 groups of 8 multiply 12 by 9
the product of 80 and 40 0.6 multiplied by 4

Use knowledge of counting in multiples to count in decimals steps (one decimal place)

0.6, 1.2, 1.8, 2.4 ...

8.4, 7.7, 7, 6.3 ...

Doubling and halving:

Derive doubles of decimals (to one decimal place) using knowledge of place value

$$\text{Double } 0.4 = 0.7 \times 2 =$$

$$\text{Double } 3.8 = 5.6 + 5.6 =$$

3.7×4 (double and double again)

Double 3.7 is 7.4, double 7.4 is 14.8

76×50 (multiply by 100 and halve)

$$76 \times 100 = 7600$$

Half of 7600 is 3800

Partitioning:

$$1.2 \times 7 = 8.4$$

$$1 \times 7 = 7$$

$$0.2 \times 7 = 1.4$$

$$7 + 1.4 = 8.4$$

$$3.5 \times 7$$

$$3 \times 7 = 21$$

$$0.5 \times 7 = 3.5$$

$$21 + 3.5 = 24.5$$

Estimating and checking:

Check 86×9 by using an equivalent calculation.

<u>X10, x 100 and x1000:</u> Multiply whole and decimal numbers by 10, 100 and 1000 where the answers are up to 2 decimal places. <u>Using Known facts and place value</u> 13×19 $13 \times 20 = 260$ so $13 \times 19 = 247$ (subtract 26 from 260) 3×14 recognise 3×14 is equivalent to 6×7	<u>Using factors</u> $25 \times 12 = 25 \times 2 \times 6$ $25 \times 2 = 50$ $50 \times 6 = 300$	Multiply by 10 and adjust ($860 - 86$) or partition (80×9 added to 6×9)
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