## MULTIPLICATION GUIDELINES

<table>
<thead>
<tr>
<th>Year One</th>
<th>Year Two</th>
<th>Year Three</th>
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</thead>
</table>
| **Recall and use multiplication facts for 2, 5 and 10 multiplication table.**<br>**Relate to odd and even numbers.**<br>**x = signs and missing numbers**<br>7 x 2 = <br>7 x = 14<br>x 2 = 14<br>x x = 14 | **Recall and use multiplication facts for 3, 6, and 8**<br>**x = signs and missing numbers**<br>Continue using a range of equations as in Year 2 but with appropriate numbers.<br>Use commutativity and associativity<br>4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240 | **Doubling multiples of 5 up to 50**<br>35 x 2 = 70<br>(Partition)\[
\begin{array}{c|c|c}
\times & 30 & 5 \\
2 & 60 & 10 \\
\end{array}
\]
| **Arrays and repeated addition**<br>**Doubling multiples of 5 up to 50**<br>15 x 2 = 30<br>Relate to inverse operation for halving. | **Arrays and repeated addition**<br>Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2). | **Use the same method as above (partitioning), e.g.**<br>32 x 3 = 96<br>(Partition)\[
\begin{array}{c|c|c}
\times & 30 & 2 \\
3 & 90 & 6 \\
\end{array}
\] = 96 |
| **One step problems using concrete objects and pictorial representation**<br>Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: 6 = 5 + 1 so e.g. Double 6 is the same as double five add double one. | | **Progress to formal written method**<br>2-digit by 1 digit<br>24<br>\[
\begin{array}{c}
\times \\
6 \\
\hline
144 \\
\end{array}
\] |
| **Language – groups of, lots of, double** | | |

**Looking at columns**<br>2 + 2 + 2<br>3 groups of 2<br>**Looking at rows**<br>3 + 3<br>2 groups of 3

**Counting using a variety of practical resources**<br>Counting in 2s e.g. counting socks, shoes, animal’s legs…<br>Counting in 5s e.g. counting fingers, fingers in gloves, toes…<br>Counting in 10s e.g. fingers, toes…

**Pictures / marks**<br>There are 3 sweets in one bag. How many sweets are there in 5 bags?

**Arrays and repeated addition**<br>\[
\begin{array}{c}
\times \\
30 \\
2 \\
\hline
90 \\
6 \\
\end{array}
\]

**Doubling multiples of 5 up to 50**

**Partition**

**Use known facts and place value to carry out simple multiplications**

**Progress to formal written method**

2-digit by 1 digit

**2**

**4**

**4**

**4**
<table>
<thead>
<tr>
<th>20 + 10 = 30</th>
<th>Solve problems using multiplication, using materials, arrays, repeated addition, multiplication table facts, including problems in context.</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>10 5</td>
</tr>
<tr>
<td>2</td>
<td>20 10 = 30</td>
</tr>
<tr>
<td>20 + 10 = 30</td>
<td>Solve problems using multiplication including problems in context. Apples cost 26p each, how much will 8 cost</td>
</tr>
<tr>
<td>A plant measures 23cm tall. In three weeks its height trebles, how tall will it be?</td>
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</table>
### Year Four

**x = signs and missing numbers**  
Continue using a range of equations as in previous years but with appropriate numbers.

Recall and use multiplication facts to $12 \times 12$  
Including understanding of multiplying by 0 and 1

Use knowledge of table facts to find factor pairs to 144.

**Partition**  
Continue to use arrays:

![Array Image](36x362 to 161x408)

$18 \times 9 = 162$

$18 \times 9 = (10 \times 9) + (8 \times 9) = 162$

or

$47 \times 6 = 282$

$47 \times 6 = (40 \times 6) + (7 \times 6) = 282$

**Pencil and paper procedures**

Grid method:

$72 \times 38$ is approximately $70 \times 40 = 2800$

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<td>$x$</td>
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<td>2</td>
</tr>
<tr>
<td>30</td>
<td>2100</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>560</td>
<td>16</td>
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$2100 + 60 = 2160$

$560 + 16 = \underline{576}$

$2736$

Multiplication leading to formal method

$\begin{array}{ccc}
72 \\
\times 38 \\
\hline
576 (8 \times 72 = 576) \\
2160 (30 \times 72 = 2160) \\
2736 \\
\hline
\end{array}$

$11$

Children who are already secure with multiplication for TU $\times$ U and TU $\times$ TU should have little difficulty in using the same method for HTU $\times$ TU or applying decimals.

### Year Five

Recall and use multiplication facts to $12 \times 12$  
Including understanding of multiplying by 0 and 1

Use knowledge of table facts to find all factor pairs of a number.

Know all prime numbers to 100

Recognise and use square and cube numbers

Understand and use multiplying and dividing by 10, 100 and 1000, including decimals.

$0.125 \times 100 = 12.5$

( use to support work on converting between metric measures)

Multiply numbers up to 4 digits by 2 and 1 digit numbers using a formal method

**Partition**

Use the grid method of multiplication (as below) and lead to formal written methods

**Pencil and paper procedures**

Grid method:

$72 \times 38$ is approximately $70 \times 40 = 2800$

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$2100 + 60 = 2160$

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### Year Six

Recall and use multiplication facts to $12 \times 12$

Identify common factors, common multiples and prime numbers.

Use in relation to equivalent fractions and problem solving

Know and use knowledge of order of operations when carrying out calculations involving 4 operations including use of brackets.

$2 + 1 \times 3 = 5$

$(2 + 1) \times 3 = 9$

Multiply numbers up to 4 digits by 2 digit numbers using the formal written method of long multiplications.

Use estimation to check answers to questions.

$286 \times 29$ is approximately $300 \times 30 = 9000$

Children who are already secure with multiplication for TU $\times$ U and TU $\times$ TU should have little difficulty in using the same method for HTU $\times$ TU or applying decimals.

**Multi step problems in context involving all four operations.**

Make decisions about which operation and method to use and why.

Make decisions regarding appropriate degree of accuracy.

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$2100 + 60 = 2160$

$560 + 16 = \underline{576}$

$2736$

$72$

$\begin{array}{ccc}
576 (8 \times 72 = 576) \\
2160 (30 \times 72 = 2160) \\
2736 \\
\hline
\end{array}$

$11$

Children who are already secure with multiplication for TU $\times$ U and TU $\times$ TU should have little difficulty in using the same method for HTU $\times$ TU or applying decimals.
Children should describe what they do by referring to the actual values of the digits in the columns. For example, the first step in $38 \times 7$ is ‘thirty multiplied by seven’, not ‘three times seven’, although the relationship $3 \times 7$ should be stressed.

\[
\begin{align*}
30 + 8 & \quad 38 \\
x \quad 7 & \quad x \quad 7 \\
56 & \quad (8 \times 7 = 56) \\
210 & \quad (30 \times 7 = 210) \\
266 & \quad 266 \\
\end{align*}
\]

Solve problems using multiplication including problems in context.

A box of sweets holds 124 sweets, I buy 4 boxes, how many sweets will I have.

A cake weighs 250g, how much will 6 cakes weigh?

\[
\begin{align*}
5720 & \quad (20 \times 286 = 5720) \\
8294 & \\
1 & \\
\end{align*}
\]

Multi step problems in context

Make decisions about which operation and method to use and why.

Solve problems involving simple ratio.

Use knowledge of factors, multiples, squares and cubes to solve number problems.

\[4 \times 35 = 2 \times 2 \times 3 \times 7\]