

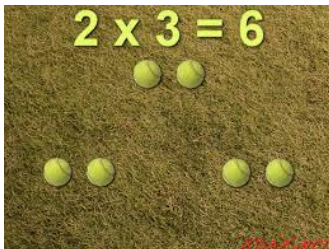
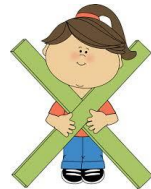


**The Linden Academy**

**Maths Information**

**Booklet 3**

# Multiplication



## Stage 1: Mental multiplication using partitioning

Informal recording in Year 4 might be:

$$\begin{array}{r} 43 \\ 40 + 3 \\ \downarrow \quad \downarrow \\ 240 + 18 = 258 \end{array} \times 6$$

Also record mental multiplication using partitioning:

$$\begin{aligned} 14 \times 3 &= (10 + 4) \times 3 \\ &= (10 \times 3) + (4 \times 3) = 30 + 12 = 42 \end{aligned}$$

$$\begin{aligned} 43 \times 6 &= (40 + 3) \times 6 \\ &= (40 \times 6) + (3 \times 6) = 240 + 18 = 258 \end{aligned}$$

Note: These methods are based on the distributive law. Children should be introduced to the principle of this law (not its name) in Years 2 and 3, for example when they use their knowledge of the 2, 5 and 10 times-tables to work out multiples of 7:



$$7 \times 3 = (5 + 2) \times 3 = (5 \times 3) + (2 \times 3) = 15 + 6 = 21$$

## Stage 2: The grid method

$$38 \times 7 = (30 \times 7) + (8 \times 7) = 210 + 56 = 266$$

×	7
30	210
8	56
	266

**The next step is to move the number being multiplied (38 in the example shown) to an extra row at the top.**

	30 + 8
×	7
	210
	56
	266

### Stage 3: Expanded short multiplication

$$\begin{array}{r} 30 + 8 \\ \times \quad 7 \\ \hline 210 \\ \quad 56 \\ \hline 266 \end{array}$$

$$\begin{array}{l} 30 \times 7 = 210 \\ 8 \times 7 = 56 \end{array}$$

$$\begin{array}{r} 38 \\ \times \quad 7 \\ \hline 210 \\ \quad 56 \\ \hline 266 \end{array}$$

### Stage 4: Short multiplication

$$\begin{array}{r} 38 \\ \times \quad 7 \\ \hline 266 \\ \quad 5 \end{array}$$

### Stage 5: Two-digit by two-digit products

Extend to TU × TU, asking children to estimate first.

$56 \times 27$  is approximately  $60 \times 30 = 1800$ .

					50	6	
×	20	7		×	20	7	
50	1000	350	1350		1000	350	1350
6	120	42	162		120	42	162
			1512				1512
			1				1

**Reduce the recording, showing the links to the grid method.**

$$\begin{array}{r}
 56 \\
 \times 27 \\
 \hline
 1000 \\
 120 \\
 350 \\
 \underline{42} \\
 1512 \\
 1
 \end{array}
 \quad
 \begin{array}{l}
 50 \times 20 = 1000 \\
 6 \times 20 = 120 \\
 50 \times 7 = 350 \\
 6 \times 7 = 42
 \end{array}$$

**Reduce the recording further.**

$$\begin{array}{r}
 56 \\
 \times 27 \\
 \hline
 1120 \\
 \underline{392} \\
 1512 \\
 1
 \end{array}
 \quad
 \begin{array}{l}
 56 \times 20 \\
 56 \times 7
 \end{array}$$

### Stage 6: Three-digit by two-digit products

Extend to HTU  $\times$  TU asking children to estimate first.  
Start with the grid method

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

$\times$	20	9	
200	4000	1800	5800
80	1600	720	2320
6	120	54	174
			8294
			1

**Reduce the recording, showing the links to the grid method**

$$\begin{array}{r} 286 \\ \times 29 \\ \hline 4000 \quad 200 \times 20 = 4000 \\ 1600 \quad 80 \times 20 = 1600 \\ 120 \quad 6 \times 20 = 120 \\ 1800 \quad 200 \times 9 = 1800 \\ 720 \quad 80 \times 9 = 720 \\ 54 \quad 6 \times 9 = 54 \\ \hline 8294 \\ 1 \end{array}$$

## Stage 6: Three-digit by two-digit products

Reduce the recording further.

$$\begin{array}{r} 286 \\ \times 29 \\ \hline 5720 \\ 2574 \\ \hline 8294 \\ 1 \end{array}$$

