

St John the Baptist, Progression in multiplication

MULTIPLICATION

Prerequisite skills and knowledge

Understanding of place value

Counting on and back in multiples of numbers

Multiplication as repeated addition.

Reversing order of numbers makes no difference to the answer:

$$2 \times 3 = 3 \times 2$$

(Commutative Law)

Multiplying by 0 = 0

Times tables facts
Build up from
2, 5 and 10; then
3, 4 and 6;
7, 8 and 9; finally 11 &
12

Partitioning of numbers

Repeated addition
Factors
Multiples
Square numbers
Squares of multiples:
60 x 60

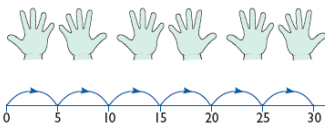
Understand principle of moving columns when x and ÷ by 10, 100, 1000

Key vocabulary:

Multiply, lots of, groups of, times, product, multiplied by, multiple of, once...twice..., double, repeated addition, array, place holder

Visual models and prompts

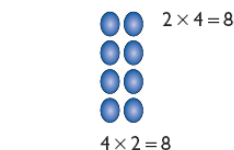
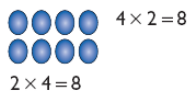
Drawing groups of objects



Counting stick to emphasise counting patterns

Using hands to represent multiples

Arrays:



Recording number patterns

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

$$10 \times 2 = 20$$

Using the inverse to calculate missing number problems

$$9 \times \square = 18$$

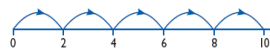
$$18 \div 9 = 2$$

Models and images to support mental calculations

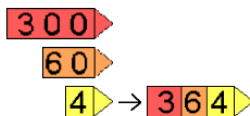
Jumps along a number line:



2 + 2 + 2 + 2 = 10
5 x 2 = 10
2 multiplied by 5
5 pairs
5 hops of 2



Place value columns for multiplying by 10, 100 and 1000.



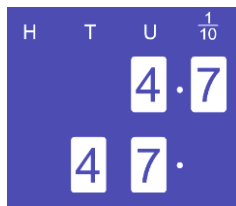
| | | | |
|----|---|---|---|
| Th | H | T | U |
| | | 3 | 5 |
| | 3 | 5 | 0 |
| | 2 | 7 | 0 |

This shows that 35 x 10 = 350

This shows that 27 x 100 = 2700

Place value columns for decimals

$$4.7 \times 10 =$$



Expanded written methods (grid method)

Grid method:

$$34 \times 6$$

| | | |
|---|-----|----|
| x | 30 | 4 |
| 6 | 180 | 24 |

Then add

$$\begin{array}{r} 180 \\ + 24 \\ \hline 204 \end{array}$$

$$257 \times 6$$

| | | | |
|---|------|-----|----|
| x | 200 | 50 | 7 |
| 6 | 1200 | 300 | 42 |

Then add

$$\begin{array}{r} 1200 \\ + 300 \\ + 42 \\ \hline 1542 \end{array}$$

$$45 \times 78$$

| | | |
|----|------|-----|
| x | 40 | 5 |
| 70 | 2800 | 350 |
| 8 | 320 | 40 |

Then add

$$\begin{array}{r} 2800 \\ + 350 \\ + 320 \\ + 40 \\ \hline 3510 \end{array}$$

Progression:

- TU x U / HTU x U
- TU x TU / HTU x TU
- Extend to decimals
U. + x U
TU. + x U

Compact, most efficient method

Long multiplication (expanded method):

$$\begin{array}{r} 72 \\ \times 38 \\ \hline 16 \quad (8 \times 2) \\ 560 \quad (8 \times 70) \\ + 60 \quad (30 \times 2) \\ \hline 2100 \quad (30 \times 70) \\ 2736 \\ 1 \end{array}$$

Short multiplication (compact method):

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

Emphasise the importance of estimating the answer first.

40 x 7 = 280
Answer is approximately 280

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

Then calculate formally. Use your estimation to check your answer.

Long multiplication (compact)

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