

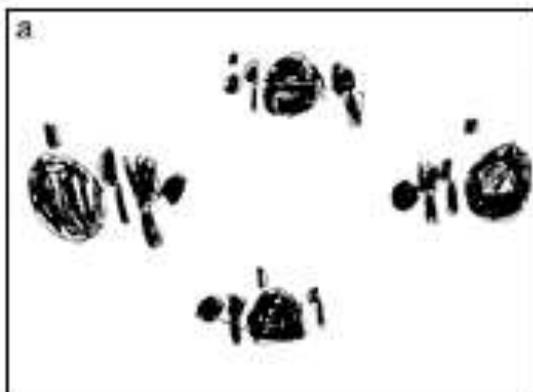


EYFS

What will multiplication look like?

Children will experience equal groups of objects and will count in 2s and 10s and begin to count in 5s. They will work on practical problem solving activities involving equal sets or groups:

- Jumping along number lines in steps of...
- 100 square to look at patterns of multiples.
- Grouping- counting in equal sized groups.



Year 1

What will multiplication look like?

Pupils solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Guidance

They make connections between arrays, number patterns, and counting in twos, fives and tens.

Year 2

What will multiplication look like?



PROGRESSION IN MULTIPLICATION



Pupils calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs

$$2 \times 5 = 10$$

$$12 = 4 \times 3$$

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts, e.g.

A screenshot of a Microsoft Word document. At the top, there is a number line with three jumps, each labeled '+5'. Below the number line, the text reads: $5 \times 3 =$ "5 multiplied by three" or "5 times 3" or "5, three times". Underneath this, the word "Arrays" is written. Below "Arrays", there is a 3x5 grid of green squares. To the right of the grid is a box containing 5×3 , and below the grid is a box containing 3×5 .

3 friends have 5 pencils each. How many pencils do they have altogether?

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$$5 \times 3$$

Guidance

- Pupils use a variety of language to describe multiplication and division.
- Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.
- Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$).

Year 3

What will multiplication look like?

Pupils build on their understanding of repeated addition and arrays to multiply two digits by one digit using tables they know, e.g. 13×3

The screenshot shows a software interface for multiplication. At the top, there is a title bar and a menu bar. Below that, a number line is displayed with markings at 0, 30, and 39. An arrow labeled 10×3 points from 0 to 30. A second arrow labeled 3×3 points from 30 to 39. Below the number line, there is a text box that says "Children to move onto grid method when appropriate. (See Year 4)". To the right of the number line, there is a box with the text "-----Wri correct." and "Level 3". At the bottom of the interface, the word "Multiplication" is written in a large, bold font.

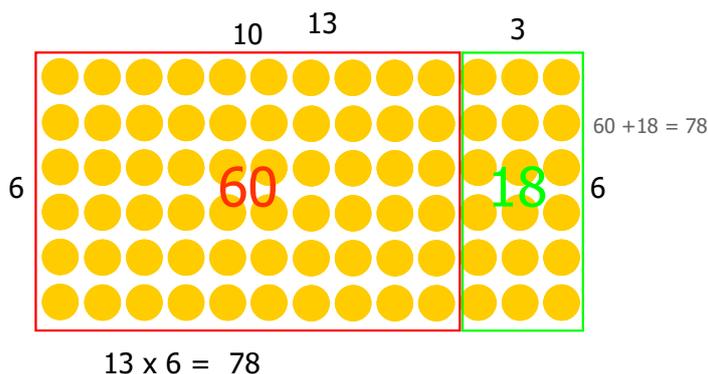


Informal recording of partitioned numbers,
 $15 \times 5 = 10 \times 5$ and 5×5 or $10 \times 5 + 5 \times 5$

Link arrays to introduce grid multiplication to multiply TU by U e.g. 13×6

Examples for x

- Grid method of multiplication



entrust

Use grid method to multiply TU by U, progressing to formal written methods when appropriate (see Year 4)

= 92

x	20	3
4	80	12

Guidance

- Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.
- Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example,



PROGRESSION IN MULTIPLICATION



using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).

- Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.
- Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?)

Year 4

What will multiplication look like?

Pupils multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

HTU \times U using grid method, e.g. 136×5

x	100	30	6
5			

Progressing to the expanded short multiplication method (least significant digit first)

$$\begin{array}{r}
 136 \\
 \times 5 \\
 \hline
 30 \\
 150 \\
 \hline
 500 \\
 \hline
 680
 \end{array}$$

Moving to the formal written method.

$$\begin{array}{r}
 136 \\
 \times 5 \\
 \hline
 \end{array}$$



PROGRESSION IN MULTIPLICATION



680

13

Guidance

- Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency.
- Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).
- Pupils practise to become fluent in the formal written method of short multiplication.
- Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$.

Year 5

What will multiplication look like?

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.

Multiply ThHTU \times U using the formal written method, e.g. 1345×6

1345

$\times 6$

8070

223

Multiply TU \times TU using the grid method, e.g. 38×72

x	30	8	
70	2100	560	= 2660 +
2	60	16	= 76
			2736



PROGRESSION IN MULTIPLICATION



Progressing to the expanded written form for TU x TU

$$\begin{array}{r} 72 \\ \times 38 \\ \hline 576 \quad (2 \times 72) \\ 2160 \quad (30 \times 72) \\ \hline 2736 \end{array}$$

Extending to the formal written method of long multiplication (see Year 6).

Guidance

- Pupils practise and extend their use of the formal written methods of short multiplication. They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.
- They use and understand the terms factor, multiple and prime, square and cube numbers.
- Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.

Year 6

What will multiplication look like?

Pupils multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.



PROGRESSION IN MULTIPLICATION



The screenshot displays a webpage titled "Mathematics – key stages 1 and 2". It is divided into two main sections: "Long multiplication" and "Short division".

Long multiplication:

- 24×16 becomes:
$$\begin{array}{r} 24 \\ \times 16 \\ \hline 144 \\ 240 \\ \hline 384 \end{array}$$

Answer: 384
- 124×26 becomes:
$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$$

Answer: 3224
- 124×26 becomes:
$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$$

Answer: 3224

Short division:

- $98 \div 7$ becomes:
$$\begin{array}{r} 14 \\ 7 \overline{)98} \end{array}$$
- $432 \div 5$ becomes:
$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{)432} \end{array}$$
- $496 \div 11$ becomes:
$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{)496} \end{array}$$

Guidance

- Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication
- They undertake mental calculations with increasingly large numbers and more complex calculations.
- Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.

Additional Notes

Children should not be made to go onto the next stage if:

- 1) they are not ready.
- 2) they are not confident.

Children should be encouraged to approximate their answers before calculating.



PROGRESSION IN MULTIPLICATION



Children should be encouraged to check their answers after calculation using an appropriate strategy.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.