

Maths calculations policy

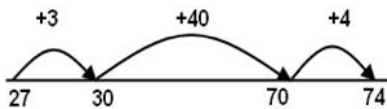
Addition and subtraction

Prior knowledge expected from KS1 teaching:

- Link partitioning to the process of column addition

$$\begin{array}{r} 32 \text{ (30 + 2)} \\ + 26 \text{ (20 + 6)} \\ \hline 58 \text{ (50 + 8)} \end{array}$$

- Use of the number line –partitioning the second number only. When counting on or back, for example, three places on from 27 to 30, ten places to 40, and another three to 43, making $3 + 10 + 3 = 16$.



Y3

Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.

789 + 642 becomes

$$\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \hline 1 \quad 1 \end{array}$$

Answer: 1431

874 - 523 becomes

$$\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$$

Answer: 351

932 - 457 becomes

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$$

Answer: 475

932 - 457 becomes

$$\begin{array}{r} 1 \quad 1 \\ 932 \\ - 457 \\ \hline 5 \quad 6 \\ 475 \end{array}$$

Answer: 475

(Include decimals, i.e. Money) In year 3 number lines and concrete apparatus should be on the tables at all times to support addition and subtraction.

Y4

Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.

To include decimals up to 2dp link to measure, i.e. length weight and money.

Y5

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).

To include decimals up to 3dp.

Y6

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Multiplication and division

Prior knowledge expected from KS1 teaching:

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 $20 \div 5 = 4$).

Y3

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.

Step 1	Step 2	Step 3
24x6 becomes (20x6) + (4x6) 120 + 24 144	$\begin{array}{r} 24 \\ \times 6 \\ \hline 24 \quad (6 \times 4) \\ 120 \quad (6 \times 20) \\ \hline 144 \end{array}$	24 x 6 becomes $\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$ Answer: 144

Step 1	Step 2
20 ÷ ? = 5 Missing number using known tables.	98 ÷ 7 becomes $\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$ Answer: 14 Using known tables as divisor.

Y4

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

342 x 7 becomes $\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 2 \quad 1 \end{array}$ Answer: 2394	Include decimals to 2dp x by single digit, link to money	Short division up to 3 digits ÷ 1 digit with an exact answer (no remainders), using known tables. $\begin{array}{r} 49 \\ 7 \overline{) 343} \end{array}$
---	--	--

Y5

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.

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.

Short multiplication (Include decimals):

2741 × 6 becomes

$$\begin{array}{r} 2741 \\ \times \quad 6 \\ \hline 16446 \\ \hline \end{array}$$

Answer: 16 446

Long multiplication (Include decimals):

24 × 16 becomes

$$\begin{array}{r} 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

Answer: 384

124 × 26 becomes

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline \end{array}$$

Answer: 3224

124 × 26 becomes

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \\ \hline \end{array}$$

Answer: 3224

Short division, up to 4 digits (including decimals) and to interpret remainders:

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer: $45 \frac{1}{11}$

Y6

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

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

Long multiplication (include decimals):

24×16 becomes

$$\begin{array}{r} ^2 \\ 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

Answer: 384

124×26 becomes

$$\begin{array}{r} ^1 ^2 \\ 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline 1 \end{array}$$

Answer: 3224

124×26 becomes

$$\begin{array}{r} ^1 ^2 \\ 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \\ \hline 1 \end{array}$$

Answer: 3224

Short division:

$98 \div 7$ becomes

$$\begin{array}{r} ^1 ^4 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Answer: 14

$432 \div 5$ becomes

$$\begin{array}{r} ^8 ^6 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{5} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

$496 \div 11$ becomes

$$\begin{array}{r} ^4 ^5 \text{ r } 1 \\ 11 \overline{) 496} \\ \underline{11} \\ 39 \\ \underline{33} \\ 6 \end{array}$$

Answer: $45\frac{1}{11}$

Long division (where appropriate):

$432 \div 15$ becomes

$$\begin{array}{r} ^2 ^8 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

$432 \div 15$ becomes

$$\begin{array}{r} ^2 ^8 \\ 15 \overline{) 432} \\ \underline{30} \quad 15 \times 20 \\ 132 \\ \underline{120} \quad 15 \times 8 \\ 12 \end{array}$$

$$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$$

Answer: $28\frac{4}{5}$

$432 \div 15$ becomes

$$\begin{array}{r} ^2 ^8 \cdot 8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8