

Formal written methods + - x ÷



Before Year 3 practical, informal methods are used; using either concrete objects, pictorial images or number knowledge to support calculations.

After Year 2 children should go through the three steps

- 1) Can I do this in my head?
- 2) Shall I make jottings to support mental methods?
- 3) Can I use a formal written method?

	+ method	- method	x method	÷ method
Year 1				
Year 2				
Year 3	HTO Column addition	HTO Column subtraction	Grid method 2 digits by 1 digit Formal written	2 digits by 1 digit Formal written
Year 4	ThHTO Column addition	ThHTO Column subtraction	2/3-digit numbers x 1 digit Formal written (short multiplication)	2/3 digit by 1 digit Formal written (short division)
Year 5	More than 4 digits Column addition	More than 4 digits Column subtraction	Up to 4 digits by 1/2 digits Inc. long multiplication for 2 digits	Up to 4 digits by 1 digit and interpret remainders Short division
Year 6	Decimals	Decimals	Multi-digit numbers up to 4 by 2 digit using formal/long multiplication Decimals	Up to 4 digits by 2 digit whole number using formal/long division Decimals

Mathematics Appendix 1: Examples of formal written methods for addition, subtraction, multiplication and division.

This list is taken from the appendix of The National Curriculum 2014. It sets out examples of formal written methods for all four operations to illustrate a range of methods that could be taught. It is not intended to show progression in formal methods.

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

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

Answer: 475

932 - 457 becomes

$$\begin{array}{r} ^1 ^1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$$

Answer: 475

Short multiplication

24 × 6 becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$$

Answer: 144

342 × 7 becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 2 \quad 1 \end{array}$$

Answer: 2394

2741 × 6 becomes

$$\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ \hline 4 \quad 2 \end{array}$$

Answer: 16 446

Short division

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \hline ^2 \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \hline ^3 \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \hline ^5 \end{array}$$

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

Long multiplication

24 × 16 becomes

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

Answer: 384

124 × 26 becomes

$$\begin{array}{r} 12 \\ 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ 11 \end{array}$$

Answer: 3224

124 × 26 becomes

$$\begin{array}{r} 12 \\ 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \\ 11 \end{array}$$

Answer: 3224

Long division

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{300} \quad 15 \times 20 \\ \underline{132} \\ 120 \quad 15 \times 8 \\ \underline{120} \end{array}$$

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

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

432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{300} \quad \downarrow \\ \underline{132} \quad \downarrow \\ \underline{120} \quad \downarrow \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8