

Year 6 Maths Curriculum Information

Maths (and maths homework) are often talking points at home! Below are key extracts taken from the 2020 DfE Guidance issued in July (hyperlinked on the right).

Mathematics guidance: key stages 1 and 2

Non-statutory guidance for the national curriculum in England

This information is aimed at teachers but will support you at home by explaining the key methods. Fluency is our aim for a mathematician working at the 'end of year expectation'. Each individual will be at a different stage during the academic year but will be exposed to each of the methods shared in this document. The end of Key Stage 2 Tests ("SATs") will require children to use these methods, either overtly in the arithmetic paper or to apply them in problem solving and reasoning contexts.

Calculation and fluency

Number, place value and number facts: 6NPV-1 and 6NPV-2

- **6NPV-1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
- **6NPV-2** Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.

Pupils should develop fluency in multiplying numbers by 10, 100 and 1,000 to give products with up to 7 digits, and dividing up to 7-digit numbers by 10, 100 and 1,000.

Pupils should be able to carry out calculations based on their understanding of place-value as well as non-standard partitioning, for example:

$$4,000 + 30,000 + 0.2 + 5,000,000 = \boxed{}$$

$$381,920 - 900 = \boxed{}$$

$$518.32 + 30 = \boxed{}$$

$$381,920 - 60,000 = \boxed{}$$

Pupils should also be able to apply their place-value knowledge for larger numbers to known additive and multiplicative number facts, including scaling both factors of a multiplication calculation, for example:

$$8 + 6 = 14$$

$$800,000 + 600,000 = 1,400,000$$

$$3 \times 4 = 12$$

$$3 \times 40,000 = 120,000$$

$$300 \times 400 = 120,000$$

Addition and subtraction: formal written methods

Pupils should continue to practise adding whole numbers with up to 4 digits, and numbers with up to 2 decimal places, using columnar addition. This should include calculations with more than 2 addends, and calculations with addends that have different numbers of digits.

$$\begin{array}{r}
 6, 5 \ 8 \ 4 \\
 + 2, 7 \ 3 \ 9 \\
 \hline
 9, 3 \ 2 \ 3 \\
 1 \ 1 \ 1
 \end{array}
 \qquad
 \begin{array}{r}
 1, 6 \ 4 \ 9 \\
 3, 1 \ 0 \ 4 \\
 + 5 \ 1 \ 6 \\
 \hline
 5, 2 \ 6 \ 9 \\
 1 \quad 1
 \end{array}
 \qquad
 \begin{array}{r}
 4 \ 7 \cdot 5 \ 2 \\
 + 8 \ 1 \cdot 7 \\
 \hline
 1 \ 2 \ 9 \cdot 2 \ 2 \\
 1
 \end{array}$$

Figure 32: range of columnar addition calculations

For calculations with more than 2 addends, pupils should add the digits within a column in the most efficient order. For the second example above, efficient choices could include:

- beginning by making 10 in the ones column
- making double-6 in the hundreds column

Pupils should continue to practise using columnar subtraction for numbers with up to 4 digits, and numbers with up to 2 decimal places. This should include calculations where the minuend and subtrahend have a different numbers of digits or decimal places, and those involving exchange through 0.

$$\begin{array}{r}
 2, 7 \ 9 \ 6 \\
 - 4 \ 8 \ 5 \\
 \hline
 2, 3 \ 1 \ 1
 \end{array}
 \qquad
 \begin{array}{r}
 8, \overset{3}{\cancel{4}} \overset{9}{\cancel{0}} \overset{1}{\cancel{3}} \\
 - 2, 1 \ 7 \ 6 \\
 \hline
 6, 2 \ 2 \ 7
 \end{array}
 \qquad
 \begin{array}{r}
 21.8 - 9.29 \\
 \overset{1}{\cancel{2}} \overset{1}{\cancel{1}} \cdot \overset{7}{\cancel{8}} \overset{1}{\cancel{0}} \\
 - 9 \cdot 2 \ 9 \\
 \hline
 1 \ 2 \cdot 5 \ 1
 \end{array}$$

Pupils should make sensible decisions about how and when to use columnar methods. For example, when subtracting a decimal fraction from a whole number, pupils may be able to use their knowledge of complements, avoiding the need to exchange through zeroes. For example, to calculate $8 - 4.85$ pupils should be able to work out that the decimal complement to 5 from 4.85 is 0.15, and that the total difference is therefore 3.15.

Multiplication: extending 5MD–3

In year 5, pupils learnt to multiply any whole number with up to 4 digits by any 1-digit number using short multiplication (**5MD–3**). They should continue to practise this in year 6. Pupils should also learn to use short multiplication to multiply decimal numbers by 1-digit numbers, and use this to solve contextual measures problems, including those involving money.

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}$$
$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2,394 \\ 21 \end{array}$$
$$\begin{array}{r} 5.35 \\ \times 4 \\ \hline 21.40 \\ 12 \end{array}$$

Figure 34: range of short multiplication calculations

Pupils should be able to multiply a whole number with up to 4 digits by a 2-digit whole number by applying the distributive property of multiplication (**4MD–3**). This results in multiplication by a multiple of 10 (which they can carry out by writing the multiple of 10 as a product of 2 factors (**5MD–3**) and multiplication by a one-digit number.

$$\begin{aligned} 124 \times 26 &= 124 \times 20 + 124 \times 6 \\ &= 124 \times 2 \times 10 + 124 \times 6 \\ &= 2,480 + 744 \\ &= 3,224 \end{aligned}$$

Pupils should be able to represent this using the formal written method of long multiplication, and explain the connection to the partial products resulting from application of the distributive law.

$$\begin{array}{r} 12 \\ 124 \\ \times 26 \\ \hline 744 \\ 2,480 \\ \hline 3,224 \\ 11 \end{array}$$

Figure 35: long multiplication calculation

Pupils should be fluent in interpreting contextual problems to decide when multiplication is the appropriate operation to use, including as part of multi-step problems. Pupils should use short or long multiplication as appropriate to solve these calculations.

Pupils should learn to check their short and long multiplication calculations with a calculator so that they know how to use one. This will help pupils when they progress to key stage 3.

Division: extending 5MD–4

In year 5, pupils learnt to divide any whole number with up to 4 digits by a 1-digit number using short division, including with remainders (**5MD–4**). They should continue to practise this in year 6. Pupils should also learn to use short division to express remainders as a decimal fraction.

$$\begin{array}{r} 86r2 \\ 5 \overline{) 4332} \end{array} \qquad \begin{array}{r} 619 \\ 8 \overline{) 4952} \end{array} \qquad \begin{array}{r} 27.25 \\ 4 \overline{) 1029.00} \end{array}$$

Figure 36: range of short division calculations

For contextual problems, pupils must be able to interpret remainders appropriately as they learnt to do in year 4 (**4NF–2**). This should be extended to making an appropriate decision about how to represent the remainder. Consider the question “4 friends equally share the cost of a £109 meal. How much does each of them pay?” Pupils should recognise that an answer of £27 remainder 1 is not helpful in this context, and that they need to express the answer as a decimal fraction (£27.25) to provide a sufficient answer to the question.

Pupils should also be able to divide any whole number with up to 4 digits by a 2-digit number, recording using either short or long division. Pupils are likely to need to write out multiples of the divisor to carry out these calculations and can do this efficiently using a ratio table – they can write out all multiples up to $10 \times$ (working in the most efficient order) or write out multiples as needed

	$\times 17$
1	17
2	34
3	51
4	68
5	85
6	
7	
8	136

$$\begin{array}{r} 483 \\ 17 \overline{) 8211} \\ \underline{68} \\ 141 \\ \underline{136} \\ 51 \end{array}$$

Figure 37: long division calculation ($8,211 \div 17$)

Pupils should be fluent in interpreting contextual problems to decide when division is the appropriate operation to use, including as part of multi-step problems. Pupils should use short or long division as appropriate to solve these calculations.

Pupils should learn to check their short and long division calculations with a calculator so that they know how to use one. This will help pupils when they progress to key stage 3.