

## Primary Stage6 Math for Year6

As in Stage 5, it is important that learners become confident users of calculators. They need to recognise that the calculator is a tool of which they are in control and to understand how it can help them to develop their mathematics. Learners can be taught how to use a calculator effectively and to recognise how and when it is appropriate to do so; by first deciding if mental and pencil-and-paper methods are quicker or more reliable. Note that to use a calculator effectively requires a secure knowledge of number, which has to be the prime aim.

## N Number

### Nn Numbers and the number system

- **6Nn1** Count on and back in fractions and decimals, e.g.  $\frac{1}{3}$ s, 0.1s, and repeated steps of whole numbers (and through zero).
- **6Nn2** Know what each digit represents in whole numbers up to a million.
- **6Nn3** Know what each digit represents in one- and two-place decimal numbers.
- **6Nn4** Multiply and divide any whole number from 1 to 10 000 by 10, 100 or 1000 and explain the effect.
- **6Nn5** Multiply and divide decimals by 10 or 100 (answers up to two decimal places for division).
- **6Nn6** Find factors of two-digit numbers.
- **6Nn7** Find some common multiples, e.g. for 4 and 5.
- **6Nn8** Round whole numbers to the nearest 10, 100 or 1000.
- **6Nn9** Round a number with two decimal places to the nearest tenth or to the nearest whole number.
- **6Nn10** Make and justify estimates and approximations of large numbers.
- **6Nn11** Order and compare positive numbers to one million, and negative integers to an appropriate level.
- **6Nn12** Use the  $>$ ,  $<$  and  $=$  signs correctly.
- **6Nn13** Estimate where four-digit numbers lie on an empty 0– 10 000 line.
- **6Nn14** Order numbers with up to two decimal places (including different numbers of places).
- **6Nn15** Recognise and extend number sequences.
- **6Nn16** Recognise and use decimals with up to three places in the context of measurement.
- **6Nn17** Recognise odd and even numbers and multiples of 5, 10, 25, 50 and 100 up to 1000.
- **6Nn18** Make general statements about sums, differences and multiples of odd and even numbers.
- **6Nn19** Recognise prime numbers up to 20 and find all prime numbers less than 100.

- **6Nn20** Recognise the historical origins of our number system and begin to understand how it developed.
- **6Nn21** Compare fractions with the same denominator and related denominators, e.g.  $\frac{3}{4}$  with  $\frac{7}{8}$ .

## N Number (continued)

### Nn Numbers and the number system (continued) • 6Nn22

Recognise equivalence between fractions, e.g. between  $\frac{1}{100}$ s,  $\frac{1}{10}$ s and  $\frac{1}{2}$ s. • **6Nn23** Recognise and use the equivalence between decimal

and fraction forms. • **6Nn24** Order mixed numbers and place between whole numbers on a number line.

- **6Nn25** Change an improper fraction to a mixed number, e.g.  $\frac{17}{8}$  to  $2\frac{1}{8}$ .
- **6Nn26** Reduce fractions to their simplest form, where this is  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  or a number of fifths or tenths.
- **6Nn27** Begin to convert a vulgar fraction to a decimal fraction using division.
- **6Nn28** Understand percentage as parts in every 100 and express  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{3}$ ,  $\frac{1}{10}$ ,  $\frac{1}{100}$  as percentages.
- **6Nn29** Find simple percentages of shapes and whole numbers.
- **6Nn30** Solve simple problems involving ratio and direct proportion.

## Nc Calculation

### Mental strategies

- **6Nc1** Recall addition and subtraction facts for numbers to 20 and pairs of one-place decimals with a total of 1, e.g.  $0.4 + 0.6$ . • **6Nc2** Derive quickly pairs of one-place decimals totalling 10, e.g. 7.8 and 2.2, and two-place decimals totalling 1, e.g.  $0.78 + 0.22$ .

**6Nc3** Know and apply tests of divisibility by 2, 4, 5, 10, 25 and 100. • **6Nc4** Use place value and number facts to add or subtract two-digit whole numbers and to add or subtract three-digit multiples of 10 and pairs of decimals, e.g.  $560 + 270$ ;  $2.6 + 2.7$ ;  $0.78 + 0.23$ . • **6Nc5** Add/subtract near multiples of one when adding numbers with one decimal place, e.g.  $5.6 + 2.9$ ;  $13.5 - 2.1$ .

- **6Nc6** Add/subtract a near multiple of 10, 100 or 1000, or a near whole unit of money, and adjust, e.g.  $3127 + 4998$ ;  $5678 - 1996$ . • **6Nc7** Use place value and multiplication facts to multiply/divide mentally, e.g.  $0.8 \times 7$ ;  $4.8 \div 6$ . • **6Nc8** Multiply pairs of multiples of 10, e.g.  $30 \times 40$ , or multiples of 10 and 100, e.g.  $600 \times 40$ .
- **6Nc9** Double quickly any two-digit number, e.g. 78, 7.8, 0.78 and derive the corresponding halves.
- **6Nc10** Divide two-digit numbers by single-digit numbers, including leaving a remainder.

*Addition and subtraction*

- **6Nc11** Add two- and three-digit numbers with the same or different numbers of digits/decimal places.
- **6Nc12** Add or subtract numbers with the same and different numbers of decimal places, including amounts of money. •  
**6Nc13** Find the difference between a positive and negative integer, and between two negative integers in a context such as temperature or on a number line.

**N Number (continued)****Nc Calculation (continued)***Multiplication and division*

- **6Nc14** Multiply pairs of multiples of 10, e.g.  $30 \times 40$ , or multiples of 10 and 100, e.g.  $600 \times 40$ .
- **6Nc15** Multiply near multiples of 10 by multiplying by the multiple of 10 and adjusting. • **6Nc16** Multiply by halving one number and doubling the other, e.g. calculate  $35 \times 16$  with  $70 \times 8$ . • **6Nc17** Use number facts to generate new multiplication facts, e.g. the  $17 \times$  table from  $10 \times + 7 \times$  tables.
- **6Nc18** Multiply two-, three- or four-digit numbers (including sums of money) by a single-digit number and two- or three-digit numbers by two-digit numbers.
- **6Nc19** Divide three-digit numbers by single-digit numbers, including those leaving a remainder and divide three-digit numbers by two-digit numbers (no remainder) including sums of

money. • **6Nc20** Give an answer to division as a mixed number, and a decimal (with divisors of 2, 4, 5, 10 or 100).

- **6Nc21** Relate finding fractions to division and use them as operators to find fractions including several tenths and hundredths of quantities.
- **6Nc22** Know and apply the arithmetic laws as they apply to multiplication (without necessarily using the terms commutative, associative or distributive).

**G Geometry****Gs Shapes and geometric reasoning**

- **6Gs1** Classify different polygons and understand whether a 2D shape is a polygon or not.
- **6Gs2** Visualise and describe the properties of 3D shapes, e.g. faces, edges and vertices.
- **6Gs3** Identify and describe properties of quadrilaterals (including the parallelogram, rhombus and trapezium), and classify using parallel sides, equal sides, equal angles.
- **6Gs4** Recognise and make 2D representations of 3D shapes including nets.
- **6Gs5** Estimate, recognise and draw acute and obtuse angles and use a protractor to measure to the nearest degree. • **6Gs6** Check that the sum of the angles in a triangle is  $180^\circ$ , for example, by measuring or paper folding; calculate angles in a triangle or around a point.

**Gp Position and movement**

- **6Gp1** Read and plot co-ordinates in all four quadrants.
- **6Gp2** Predict where a polygon will be after one reflection, where the sides of the shape are not parallel or perpendicular to the mirror line, after one translation or after a rotation through  $90^\circ$  about one of its vertices.

## G Measure

### GI Length, mass and capacity

- 6GI1 • 6MI1** Select and use standard units of measure. Read and write to two or three decimal places.
- 6GI2 • 6MI2** Convert between units of measurement (kg and g, *l* and mL, km, m, cm and mm), using decimals to three places, e.g. recognising that 1.245 m is 1 m 24.5 cm.
- 6GI3 • 6MI3** Interpret readings on different scales, using a range of measuring instruments.
- 6GI4 • 6MI4** Draw and measure lines to the nearest centimetre and millimetre.
- 6GI5 • 6MI5** Know imperial units still in common use, e.g. the mile, and approximate metric equivalents.

### Gt Time

- 6Gt1 • 6Mt1** Recognise and understand the units for measuring time (seconds, minutes, hours, days, weeks, months, years, decades and centuries); convert one unit of time into another.
- 6Gt2 • 6Mt2** Tell the time using digital and analogue clocks using the 24-hour clock. **6Gt3 • 6Mt3** Compare times on digital and analogue clocks, e.g.

realise quarter to four is later than 3:40.

- 6Gt4 • 6Mt4** Read and use timetables using the 24-hour clock.
- 6Gt5 • 6Mt5** Calculate time intervals using digital and analogue times.
- 6Gt6 • 6Mt6** Use a calendar to calculate time intervals in days, weeks or months.
- 6Gt7 • 6Mt7** Calculate time intervals in days, months or years.
- 6Gt8 • 6Mt8** Appreciate how the time is different in different time zones around the world.

### Ga Area and perimeter

- 6Ga1 • 6Ma1** Measure and calculate the perimeter and area of rectilinear shapes.
- 6Ga2 • 6Ma2** Estimate the area of an irregular shape by counting squares.
- 6Ga3 • 6Ma3** Calculate perimeter and area of simple compound shapes that can be split into rectangles.

## D Handling data

- Dh Organising, categorising and representing data • 6Dh1** Solve a problem by representing, extracting and interpreting data in tables, graphs, charts and diagrams, e.g. line graphs for distance and time; a price 'ready-reckoner' for currency conversion; frequency tables

and bar charts with grouped discrete data. • **6Dh2** Find the mode and range of a set of data from relevant situations, e.g. scientific experiments.

- **6Dh3** Begin to find the median and mean of a set of data.
- **6Dh4** Explore how statistics are used in everyday life.

## D Handling data (continued)

### Db Probability

- **6Db1** Use the language associated with probability to discuss events, to assess likelihood and risk, including those with equally likely outcomes.

## Problem solving

### Using techniques and skills in solving mathematical problems •

**6Pt1** Choose appropriate and efficient mental or written strategies to carry out a calculation involving addition, subtraction, multiplication or division.

- **6Pt2** Understand everyday systems of measurement in length, weight, capacity, temperature and time and use these to perform simple calculations.
- **6Pt3** Check addition with a different order when adding a long list of numbers; check when subtracting by using the inverse. •

**6Pt4** Recognise 2D and 3D shapes and their relationships, e.g. a cuboid has a rectangular cross-section.

- **6Pt5** Estimate and approximate when calculating, e.g. use rounding, and check working.

### Using understanding and strategies in solving problems •

**6Ps1** Explain why they chose a particular method to perform a calculation and show working.

- **6Ps2** Deduce new information from existing information and realise the effect that one piece of information has on another. •
- **6Ps3** Use logical reasoning to explore and solve number problems and mathematical puzzles.
- **6Ps4** Use ordered lists or tables to help solve problems systematically.
- **6Ps5** Identify relationships between numbers and make generalised statements using words, then symbols and letters, e.g. the second number is twice the first number plus 5 ( $n, 2n + 5$ ); all the numbers are multiples of 3 minus 1 ( $3n - 1$ ); the sum of angles in a triangle is  $180^\circ$ .
- **6Ps6** Make sense of and solve word problems, single and multi-step (all four operations), and represent them, e.g. with diagrams or on a number line; use brackets to show the series of calculations necessary.

- **6Ps7** Solve simple word problems involving ratio and direct proportion.
- **6Ps8** Solve simple word problems involving percentages, e.g. find discounted prices.
- **6Ps9** Make, test and refine hypotheses, explain and justify methods, reasoning, strategies, results or conclusions orally



