

- **Stage 4**

Using number facts and relationships

- use powers and understand the importance of powers of 10
- use known facts to derive others, including those that involve division
- show awareness of the need for standard form and its representation on a calculator
- express repeated multiplications as powers, *e.g.* $7 \times 7 \times 7 \times 7 \times 7 \times 7 = 7^6$
- write a number as a product of its prime factors in index form
- multiply, divide and use brackets with powers

Fractions, decimals, percentages and ratio

- use equivalence of fractions, decimals, percentages and ratio to select the most appropriate for a calculation
- use and interpret different representations of fractions, *e.g. mixed numbers and improper fractions*
- express one quantity as a percentage of another
- calculate a percentage increase or decrease
- use ratio and proportion to calculate quantities, including cases where the 'total' is not given
- calculate with different representations of fractions

Probability

- use the sum of all probabilities is 1 – simple cases, *e.g. rolling a dice P (not 6)*
- recognise that practice is different from theory and that repeated experiments may give different results
- understand that reliability/stability increases with a greater number of trials
- Construct a sample space diagram and a two way table.

Shape

- recognise similar shapes and calculate the size of missing sides with whole number scale factor
- explore properties of shapes that tessellate

Expressions and formulae

- show and use rules that involve the multiplication, division and use of brackets with index variables
- simplify expressions including expansion of a single bracket, including $a(b + c) + d(e + f)$, and double brackets
- factorise algebraic expressions of two or more terms into a single bracket where there is one common factor
- rearrange formulae involving two or more variables

Money

- calculate using foreign money and exchange rates
- understand the risks involved in different ways of saving and investing
- describe why insurance is important and understand the impact of not being insured

Time

- use timetables and time zones to plan a journey

Area and Volume

- find areas of circles
- calculate surface areas of cubes and cuboids
- calculate volumes of prisms constructed from cuboids

Equations and Inequalities

- solve equations by trial and improvement, and justify the solution
- solve linear simultaneous equations with matching coefficients
- draw inferences from distance–time graphs

Estimate and check

- make and justify estimates and approximations of calculations
- choose the appropriate degree of accuracy to present answers

Present and Analyse

- construct and interpret graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing an appropriate scale
- select and justify statistics most appropriate to the problem considering extreme values (outliers)
- examine results critically, select and justify choice of statistics recognising the limitations of any assumptions and their effect on the conclusions drawn
- use appropriate mathematical instruments and methods to construct accurate drawings
- find the mean, median, mode and range from grouped frequency tables and explain why it is an estimate

Number Sequences

- use the n th term rule to determine whether a number is in a sequence
- determine the position number of a given term
- distinguish between a linear and non-linear sequence

Movement

- rotate shapes about the origin
- describe rotations about the origin
- enlarge a shape around a centre where the scale factor is positive
- explore locus where the path is a given distance from a point, line or shape

Angle and Position

- calculate angles on parallel lines
- calculate interior and exterior angles of polygons
- draw the relative position of objects given the bearing of one from the other
- apply understanding of bearings and scale to interpret maps and plans, and to create plans and drawings to scale

Construction

- select and use appropriate equipment to draw triangles when given sufficient angles and sides