

## **Stage 5: List of Topics Covered this Year**

### **Using number facts and relationships**

- use and interpret numbers in standard form within calculations
- convert to and from standard form
- find the lowest common multiples and highest common factor using prime factors

### **Fractions, decimals, percentages and ratio**

- use multipliers as an efficient method when working with percentages, *e.g. multiply by 1.2 to increase an amount by 20%*
- calculate the outcome of a given repeated proportional change  $\frac{a}{b}$
- calculate with direct and inverse proportion
- use calculations with different representations of fractions

### **Probability**

- know that the sum of probabilities is 1 and use this to find missing probabilities in fraction or decimal form, including where there are two equal probabilities missing
- compare an estimated probability from experimental results with a theoretical probability
- identify when to construct sample space diagrams or two way tables to solve a problem
- use a two way table and sample space diagram to calculate the probability of simple compound events
- use a two way table to calculate simple cases of  $x$  given  $y$ , *e.g. find the probability that a girl travels by bus*
- estimate the number of successes where probability is expressed as a fraction or decimal.

### **Shape**

- recognise similar shapes and calculate the size of missing sides
- use the terms arc, sector, segment, chord, tangent

### **Expressions and formulae**

- manipulate indices, *e.g.  $(2a^2)^3$*
- show and use rules of indices where the power is 0 or a fraction with numerator 1
- substitute into a variety of expressions, including those involving powers and brackets
- multiply out double brackets
- factorise algebraic expressions of two or more terms into a single bracket, including those where there is more than one common factor
- rearrange formulae including whole number powers and brackets
- distinguish between equations, formulae and expressions

### Managing Money

- understand and demonstrate the real-life process of foreign exchange
- consider best value of an item priced in two or more different currencies
- calculate compound interest
- make comparisons between financial products that involve short-term borrowing and investments
- calculate with money, including household bills
- make informed decisions relating to household budgeting
- understand and calculate income tax

### Time

- use timetables and time zones to plan a multi-stage journey
- plan the optimum route from a selection of timetables

### Area and Volume

- apply proportional change to 2-dimensional designs
- find areas of halves and quarters of circles, including cases that require a solution expressed in terms of  $\pi$
- calculate volumes of prisms and cylinders

### 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

- define upper and lower bounds of a number that has been given to a specified degree of accuracy

### Present and Analyse

- construct and interpret graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing the most appropriate representation, including frequency polygons and lines of best fit on scatter diagrams
- calculate the upper quartile, lower quartile and inter-quartile range of a set of discrete data and use them to describe a data set
- use a scatter diagram to make predictions about the data from a line of best fit drawn by eye
- understand the effects of extrapolation and interpolation on reliability
- use the mean, median, mode and range from grouped frequency tables to compare distributions

### Number Sequences

- generate non-linear sequences given the  $n$ th term rule
- Generate the  $n$ th term of a linear sequence

### Movement

- reflect shapes in horizontal and vertical lines
- describe reflection in horizontal or vertical lines
- rotate shapes about a point
- describe rotations and find the centre of rotation
- translate a shape by a vector
- describe a translation using vectors
- enlarge a shape from a centre where the scale factor is 0.5

### Angle and Position

- calculate an angle in a right angled triangle using trigonometry
- find the distance between two points from their coordinates
- find the midpoint of a line
- find locations given sets of bearings and/or distances
- use trigonometry and Pythagoras' theorem to calculate the length of a side in a right angled triangle

### Construction

- draw plans and elevations of any 3D solid
- construct perpendicular bisectors, the perpendicular from a point to a line, angles of  $60^\circ$  and  $90^\circ$ , and the bisector of an angle
- shade a region defined by up to two conditions