



Providence English Pvt. School

مدرسة العناية الانجليزية الخاصة

## Mathematics

### Number

#### Integers, powers and roots

7Ni.01 Estimate, add and subtract integers, recognising generalisations.

7Ni.02 Understand that brackets, positive indices and operations follow a particular order.

7Ni.03 Estimate, multiply and divide integers including where one integer is negative.

7Ni.04 Understand lowest common multiple and highest common factor (numbers less than 100).

7Ni.05 Use knowledge of tests of divisibility to find factors of numbers greater than 100.

7Ni.06 Understand the relationship between squares and corresponding square roots, and cubes and corresponding cube roots.

#### Place value, ordering and rounding

7Np.01 Use knowledge of place value to multiply and divide whole numbers and decimals by any positive power of 10.

7Np.02 Round numbers to a given number of decimal places.

#### Fractions, decimals, percentages, ratio and proportion

7Nf.01 Recognise that fractions, terminating decimals and percentages have equivalent values.

7Nf.02 Estimate and add mixed numbers, and write the answer as a mixed number in its simplest form.

7Nf.03 Estimate, multiply and divide proper fractions.

7Nf.04 Use knowledge of common factors, laws of arithmetic and order of operations to simplify calculations containing decimals or fractions.

7Nf.05 Recognise percentages of shapes and whole numbers, including percentages less than 1 or greater than 100.

7Nf.06 Understand the relative size of quantities to compare and order decimals and fractions, using the symbols =,  $\neq$ ,  $>$  and  $<$ .

7Nf.07 Estimate, add and subtract positive and negative numbers with the same or different number of decimal places.

7Nf.08 Estimate, multiply and divide decimals by whole numbers.

7Nf.09 Understand and use the unitary method to solve problems involving ratio and direct proportion in a range of contexts.

7Nf.10 Use knowledge of equivalence to simplify and compare ratios (same units).

7Nf.11 Understand how ratios are used to compare quantities to divide an amount into a given ratio with two parts.

### Algebra

#### Expressions, equations and formulae

7Ae.01 Understand that letters can be used to represent unknown numbers, variables or constants.

7Ae.02 Understand that the laws of arithmetic and order of operations apply to algebraic terms and expressions (four operations).

7Ae.03 Understand how to manipulate algebraic expressions including:

- collecting like terms

- applying the distributive law with a constant.

7Ae.04 Understand that a situation can be represented either in words or as an algebraic expression, and move between the two representations (linear with integer coefficients).

7Ae.05 Understand that a situation can be represented either in words or as a formula (single operation), and move between the two representations.

7Ae.06 Understand that a situation can be represented either in words or as an equation. Move between the two representations and solve the equation (integer coefficients, unknown on one side).

7Ae.07 Understand that letters can represent an open interval (one term).

### **Sequences, functions and graphs**

7As.01 Understand term-to-term rules, and generate sequences from numerical and spatial patterns (linear and integers).

7As.02 Understand and describe nth term rules algebraically (in the form  $n \pm a$ ,  $a \times n$  where  $a$  is a whole number).

7As.03 Understand that a function is a relationship where each input has a single output. Generate outputs from a given function and identify inputs from a given output by considering inverse operations (linear and integers).

7As.04 Understand that a situation can be represented either in words or as a linear function in two variables (of the form  $y = x + c$  or  $y = mx$ ), and move between the two representations.

7As.05 Use knowledge of coordinate pairs to construct tables of values and plot the graphs of linear functions, where  $y$  is given explicitly in terms of  $x$  ( $y = x + c$  or  $y = mx$ ).

7As.06 Recognise straight-line graphs parallel to the  $x$ - or  $y$ -axis.

7As.07 Read and interpret graphs related to rates of change. Explain why they have a specific shape.

### **Geometry and Measure**

#### **Geometrical reasoning, shapes and measurements**

7Gg.01 Identify, describe and sketch regular polygons, including reference to sides, angles and symmetrical properties.

7Gg.02 Understand that if two 2D shapes are congruent, corresponding sides and angles are equal.

7Gg.03 Know the parts of a circle:

- centre
- radius
- diameter
- circumference
- chord
- tangent.

7Gg.04 Understand the relationships and convert between metric units of area, including hectares (ha), square metres ( $m^2$ ), square centimetres ( $cm^2$ ) and square millimetres ( $mm^2$ ).

7Gg.05 Derive and know the formula for the area of a triangle. Use the formula to calculate the area of triangles and compound shapes made from rectangles and triangles.

7Gg.06 Identify and describe the combination of properties that determine a specific 3D shape.

7Gg.07 Derive and use a formula for the volume of a cube or cuboid. Use the formula to calculate the volume of compound shapes made from cuboids, in cubic metres ( $m^3$ ), cubic centimetres ( $cm^3$ ) and cubic millimetres ( $mm^3$ ).

7Gg.08 Visualise and represent front, side and top view of 3D shapes.

7Gg.09 Use knowledge of area, and properties of cubes and cuboids to calculate their surface area.

7Gg.10 Identify reflective symmetry and order of rotational symmetry of 2D shapes and patterns.

7Gg.11 Derive the property that the sum of the angles in a quadrilateral is  $360^\circ$ , and use this to calculate missing angles.

7Gg.12 Know that the sum of the angles around a point is  $360^\circ$ , and use this to calculate missing angles.

7Gg.13 Recognise the properties of angles on:

- parallel lines and transversals
- perpendicular lines
- intersecting lines.

7Gg.14 Draw parallel and perpendicular lines, and quadrilaterals.

### **Position and transformations**

7Gp.01 Use knowledge of scaling to interpret maps and plans.

7Gp.02 Use knowledge of 2D shapes and coordinates to find the distance between two coordinates that have the same x or y coordinate (without the aid of a grid).

7Gp.03 Use knowledge of translation of 2D shapes to identify the corresponding points between the original and the translated image, without the use of a grid.

7Gp.04 Reflect 2D shapes on coordinate grids, in a given mirror line (x- or y-axis), recognising that the image is congruent to the object after a reflection.

7Gp.05 Rotate shapes  $90^\circ$  and  $180^\circ$  around a centre of rotation, recognising that the image is congruent to the object after a rotation.

7Gp.06 Understand that the image is mathematically similar to the object after enlargement. Use positive integer scale factors to perform and identify enlargements.

### **Statistics and Probability**

#### **Statistics**

7Ss.01 Select and trial data collection and sampling methods to investigate predictions for a set of related statistical questions, considering what data to collect (categorical, discrete and continuous data).

7Ss.02 Understand the effect of sample size on data collection and analysis.

7Ss.03 Record, organise and represent categorical, discrete and continuous data. Choose and explain which representation to use in a given situation:

- Venn and Carroll diagrams
- tally charts, frequency tables and two-way tables
- dual and compound bar charts
- waffle diagrams and pie charts
- frequency diagrams for continuous data
- line graphs
- scatter graphs
- infographics.

7Ss.04 Use knowledge of mode, median, mean and range to describe and summarise large data sets. Choose and explain which one is the most appropriate for the context.

7Ss.05 Interpret data, identifying patterns, within and between data sets, to answer statistical questions. Discuss conclusions, considering the sources of variation, including sampling, and check predictions.

#### **Probability**

7Sp.01 Use the language associated with probability and proportion to describe, compare, order and interpret the likelihood of outcomes.

7Sp.02 Understand and explain that probabilities range from 0 to 1, and can be represented as proper fractions, decimals and percentages.

7Sp.03 Identify all the possible mutually exclusive outcomes of a single event, and recognise when they are equally likely to happen.

7Sp.04 Understand how to find the theoretical probabilities of equally likely outcomes.

7Sp.05 Design and conduct chance experiments or simulations, using small and large numbers of trials. Analyse the frequency of outcomes to calculate experimental probabilities.