Progression of Numeracy Development –Nutshell Statements

Level A	Add and skip count numbers less than 20. Recognise 2D shapes.
Level B	Recognise place values and common fractions. Read common graph types. Use +, -, and x. Use appropriate volume units.
Level C	Simple money calculations. Convert between standard length units. Identify unlikely events.
Level D	Add and subtract fractions. Use percentages, congruence, plans and nets.
Level E	Identify number patterns and solve simple equations. Use Cartesian plane.
Level F	Add and convert fractions. Use scale to calculate distance on the maps.
Level G	Calculate perimeter and volume, averages, probabilities and equations of a straight line. Convert between fractions and percentages.
Level H	Analyse problem and apply strategies to find solution. Calculate area and volume of 3D objects. Equivalent fractions.
Level I	Solve linear equations. Apply angle facts for triangle. Calculate using rational and real numbers.
Level J	Interpret trends in charts and data. Apply algebra to solve measurement problems.
Level K	Use Pythagoras in 3D application. Calculate probability of multiple events.
Level L	Use factorisation to simplify quadratic equations. Find function domain and intercept with the axes, minimum, maximum and turning point. Use logarithmic and exponential functions.

Progression of Numeracy Development: Number

Level A	Add and skip count numbers less than 20. Match number names with numerals. Recognise numeric patterns (skip count forward 2s, 4s and 5s). Carry out single digit addition and multiplication as repeated addition.
Level B	Classify numbers as odd and even. Understand meaning of base 10. Read and write numbers using base 10 numerals. Count within 1000 (skip count by 5, 10 and 100). Addition/subtraction of two digit numbers without trading. Extend numeric and symbolic patterns.
Level C	Perform addition and subtraction operations on whole digit numbers with and without trading. Multiply by 10. Knowledge of place value (units, tens and hundreds). Solve one step addition and subtraction word problems. Find unknown single digit number in addition or subtraction equation.
Level D	Add and subtract with whole digit numbers up to 1000 using knowledge of place value, properties of operations and relationship between addition and subtraction. Represent and solve word problems involving multiplication and division. Recognise fractions (1/2, 1/3, 1/4, 1/5) as a part of a whole.
Level E	Use properties of operations as strategies to multiply and divide. Round numbers using the knowledge of place value. On a number line represent whole number, understand concept of unit segment and find segment length. Recognise unit fractions in both numerical and geometrical form (express area of a part of a shape as a fraction). Compare fractions with same denominator or numerator. Describe and extend geometric and numeric patterns.
Level F	Represent fractions on number line. Recognise and generate equivalent fractions (denominator 2, 3, 4, 6, 8). Add and subtract fractions with same denominator. Use decimal notation for fractions (convert between decimals and fractions). Use four operations and their properties to solve word problems involving calculations with distances, money and time.
Level G	Use properties of equivalent fractions to add and subtract fractions. Compare fractions with different numerators and denominators. Multiply and divide fractions. Understand the concept of unit rate and use ratio reasoning to solve problems. Rates and percentages (find a percent as a rate over 100). Apply properties of operations to generate equivalent expressions. Estimate and calculate absolute and relative error of rounding.
Level H	Use proportional relationship to solve problems, including discounts, taxes and interest rates. Represent, analyse, and generalise different patterns using tables, graphs and symbolic rules. Relate and compare different forms of representation for a relationship. Solve an inequality involving fractions.
Level I	Use algebraic notation to represent and solve quantitative relations between dependent and independent variables. Calculate using rational and real numbers. Use properties of arithmetic operations to generate equivalent expressions. Compare rational numbers and find prime factors. Calculate with integer exponents.
Level J	Use linear equations and systems of linear equation to represent and solve both mathematical and real life problems. Generate tables, graphs, rules, expressions and equations to model real-world situation. Construct a function to model a linear relationship between two quantities. Classify function as linear or non-linear.
Level K	Generalise patterns using explicitly and recursively defined functions. Perform arithmetic operations on polynomials. Use factorisation to simplify quadratic equations. Analyse function using different representations. Extend properties of integer exponent to rational exponent.
Level L	Use polynomial identities and properties of exponents to simplify algebraic expressions. Use exponential and logarithmic functions. Find function domain and intercepts with the axes, minimum, maximum and turning point. Calculate with exponential, polynomial, rational, logarithmic and periodic functions.

Progression of Numeracy Development: Geometry

Level A	Name basic shapes (e.g., circle, square, rectangle, triangle). Distinguish between defining properties (e.g., triangles are closed and three-sided) versus non-defining properties (e.g., colour, size, orientation). Draw basic 2D shapes correctly recording the defining features.
Level B	Classify shapes by number of corners or sides. Name shapes such as: diamonds, ovals, rectangles, pentagons and hexagons. Describe position of an object in a space (e.g., top, right, bottom, left) using grid. Recognise line of symmetry for a 2D shape.
Level C	Classify different shapes and identify their parts (i.e., vertices, edges, angles) and spatial relationship between the parts (e.g., sides of the rectangle are parallel and perpendicular). Name basic 3D shapes and identify their defining properties. Use coordinates to locate an object in a grid and describe its position. Identify pairs of parallel lines.
Level D	Compare shapes according to their geometric properties (i.e., shape, length, angle). Identify and draw points, perpendicular and parallel lines, line segments, rays and angles in two dimensional figures. Classify and measure angles (e.g., right, acute, obtuse).
Level E	Define and use coordinate system as two perpendicular lines with the intersection at the origin. Use coordinates (ordered pairs of numbers) to locate point in the plane. Recognise and draw all lines of symmetry for two-dimensional figures. Draw angles (i.e., right, obtuse, acute).
Level F	Apply rotational and line symmetry (e.g., flip, slide, reflecting and turn). Recognise and identify right-angled triangle as a special category amongst other triangles. Represent three-dimensional figures using nets. Use the nets to find the surface area of these figures by counting unit squares. Draw angles in whole-number degrees using protractor.
Level G	Find the area of right-angled triangles, regular triangles, regular quadrilaterals, and regular polygons (e.g., pentagon, hexagon, octagon) by composing into rectangles or decomposing into triangles or other familiar shapes. Identify similar and congruent shapes. Draw rectangles/triangles in the coordinate plane, given coordinates for the vertices.
Level H	Identify parts of similar and congruent shapes and use proportional relationship to find missing measures. Identify and use different properties of quadrilaterals. Classify 2D shapes in hierarchical order based on their geometrical properties. Reflect, translate and rotate figures by using appropriate tools and methods.
Level I	Name and classify different polygons. Use formulas for the area and circumference of a circle. Solve problems involving scale drawings of geometric figures requiring computing their actual lengths and areas from a scale drawing.
Level J	Solve simultaneous linear equations graphically and algebraically. Apply Pythagoras to find distance between two points on the plane. Describe the two-dimensional figures that result from slicing three-dimensional figures.
Level K	Solve inequalities graphically. Calculate the length of an arc of a circle and area of a corresponding section. Use formulas for volume of cylinder, cone and sphere to solve both mathematical and real life problems. Apply Pythagoras in both 2D and 3D to determine unknown length.
Level L	Use coordinates and absolute value to find distance between points in the plane. Equation of the line and interpretation of slope as a constant rate of change. Describe geometric shape using equations. Find/visualise solution to set of equations in a form of geometric curve.

Progression of Numeracy Development: Measurement

Level A	Count objects in sets and report result associated with the unit (e.g., three apples, two pies). Compare and order length of shapes using direct comparison and informal measurements. Tell time in hours and half hours.
Level B	Use ruler to measure and estimate length. Select appropriate unit (i.e., cm, m, km) to report, compare or estimate length. Read digital and analogue time to the nearest minute.
Level C	Use ruler to compare objects of different lengths and express the difference in appropriate units. Add length to find perimeter of regular 2D shapes. Measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.
Level D	Understand concept of scale and the measurement units. Use number and unit to report result of measurement of directly measurable quantities such as weight, length and time.
Level E	Estimate size/length of an object and express result in appropriate metric units. Convert between standard length units (larger to smaller). Add and subtract times and calculate elapsed time. Recognise area as an attribute of plane figures and understand concepts of area measurement.
Level F	Apply mental math and estimation strategies using whole numbers, decimals and fractions when estimating size of measurable property of an object. Distinguish between linear, area and volume measurement. Measure area and volume by counting unit squares/cubes.
Level G	Relate measurement of area and volume to the operations of multiplication and addition. Interpret the effects of rounding on the accuracy of measurements. Measure and compare different angles in whole-number degrees using a protractor. Recognise that angle measure is additive.
Level H	Use multiplication by whole number or fraction to solve scaling problems. Convert measurement units within given measurement system. Report a measurement result as a value that lies within a given interval of measurement error. Make judgments about acceptable or reasonable error in a measurement context.
Level I	Apply angle rules for parallel lines and triangles to determine unknown angle size. Solve real world and mathematical problems involving finding an unknown side length given the perimeter and area. Find area and perimeter of complex shapes.
Level J	Calculate measures that are derived or composed from other measures such as density, which is composed of mass and volume. Use appropriate units in formulas.
Level K	Use radian to measure/calculate arc of a circle. Convert between radians and degrees. Use Pythagoras theorem and trigonometric ratios (i.e., sine, cosine and tangent) to find unknown lengths of sides, unknown angles or the area of right-angled triangles.
Level L	Distinguish between scalar and vector measure (e.g., recognise that to specify velocity or force you need to define both direction and magnitude). Solve problems involving calculation of average relative speed and distance. Use units as a way to understand problems and to guide the solution of multi-step problems.

Progression of Numeracy Development: Chance and Data

Level A	Classify objects (up to 10) according to colour, shape or size. Compare number of items in each category and determine which category has more or less items. Read and interpret pictograms where there is 1:1 correspondence.
Level B	Classify objects according to properties such as shape, colour, size or some other observable property and present results using tally table.
Level C	Distinguish between likely and unlikely events based on day to day experience. Make predictions about likelihood of the events, e.g. what is possible and what is not. Collect data related to their own activities and represent with appropriate labelling.
Level D	Order events from least likely to happen to most likely to happen (e.g., events arising from everyday situations). Collect categorical and numerical data and represent results using column graphs (to represent frequencies).
Level E	List all possible outcomes of familiar events involving chance (e.g., tossing a coin or rolling a die). Make predictions and justify conclusions based on collected data. Describe fairness of events in qualitative terms. Match graphical and tabular representations of different types of data.
Level F	Interpret and display data using column graphs, line plots, and stem and leaf graphs. Select appropriate graphs for a given data set and its context. Evaluate inferences and predictions based on data. Compare likelihood of chance events.
Level G	Use invented strategies to systematically list outcomes of compound events. Use numerical representations to compare the likelihood of events. Distinguish between categorical, discrete and continuous data and select the representation that would maximise the transfer of information.
Level H	Use ratios to compare probabilities. Make predictions based on probabilities. Find mean, median, mode and range for data. Formulate research questions that can be answered by collecting data.
Level I	Use mean, median, interquartile range and range to summarise and describe numerical data. Use box and whisker plots to interpret and compare distributions. Identify possible causes of variation in the data. Select the most appropriate way to represent, analyse and interpret collected data.
Level J	Specify sample (event) spaces for single and straightforward compound events. Analyse, interpret and make inferences from data presented in double column graphs, stem and leaf plots, and box plots. Find and interpret relationships among variables in the data.
Level K	Use relative frequencies and sample size to explain difference between theoretical and experimental probabilities. Use measures of centre and of spread obtained from random samples to draw inferences about two populations.
Level L	Analyse scatter plots for outliers and positive or negative association. Interpret the effect of the outliers on measures of centre. Investigate sample population to explain or detect any bias in statistical inferences. Critically analyse statistical reports in media.