



Mathematics Curriculum for IDAT Concise

STAGE 1	SKILL	IDAT OUTCOMES
1	2D & 3D Geometry M1.1.1	Student can describe the features of two-dimensional and three-dimensional objects including number of sides, faces and line of symmetry in a vertical line.
	Measurement - Time M1.1.2	Student can tell time to the half-hour.
	Measurement - Length M1.1.3	Student can tell time to the quarter-hour, using the contextual language of 'past' and 'to'.
	Patterns - Number & Place Value M1.1.4	Student can order three objects by length; compare the lengths of two objects indirectly by using a third object.
	Addition & Subtraction M1.1.5	Student can investigate number sequences, initially those increasing and decreasing by twos, threes, fives and tens from any starting point, then progressing onto other sequences.
	Fractions & Decimals M1.1.6	Student can read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
	Statistics M1.1.7	Students can solve statistical problems with addition and subtraction.
STAGE 2	SKILL	IDAT OUTCOMES
2	Problem-Solving M2.1.1	Student can solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
	2D Geometry M2.1.2	Student can identify lines of symmetry in 2D shapes presented in different orientations, and complete a simple symmetric figure with respect to a specific line of symmetry. Student can compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
	Angles M2.1.3	Student can compare various angles, using concrete materials and pictorial representations, and identify angles as 'bigger than', 'smaller than', or 'about the same as' other angles (e.g., "Two of the angles on the red pattern block are bigger than all the angles on the green pattern block.")
	Measurement - Length, Mass & Volume M2.1.4	Student can measure, compare, add and subtract in the following types of measurement: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).
	Measurement - Time M2.1.5	Student can tell and write time to the nearest minute and measure time intervals in minutes. Student can solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
	Addition & Subtraction M2.1.6	Student can represent, compare, and order whole numbers to 1000, using a variety of tools (e.g., base ten materials or drawings of them, number lines with increments of 100, or other appropriate amounts). Student can read and represent the word forms of whole numbers to one hundred, in meaningful contexts (e.g., books, speed limit signs). Student can identify and represent the value of a digit in a number according to its position within the number (e.g., use base ten materials to show that the 3 in 324 represents 3 hundreds).
	Multiplication & Division M2.1.7	Student can calculate mathematical statements for multiplication and division using the multiplication tables that they know, including those for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
	Fractions & Decimals M2.1.8	Student can add and subtract fractions with the same denominator within one whole [for example, $+ =$]
STAGE 3	SKILL	IDAT OUTCOMES
3	3D Geometry M3.1.1	Student can recognise simple 3D shapes, including nets. Student can identify 3D shapes, including cubes and other cuboids, from 2D representations.
	2D Geometry M3.1.2	Student can distinguish among polygons, regular polygons, and other 2D shapes. Student can identify triangles (i.e., acute, right, obtuse, scalene, isosceles, equilateral) and classify them according to angle and side properties.
	Angles M3.1.3	Student can estimate, measure and compare angles using degrees.
	Measurement - Length & Space M3.1.4	Student can convert different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step practical problems.
	Numbers - Place Value M3.1.5	Student can identify properties of prime, composite, square and triangular numbers. Student can recognise that the place value system can be extended beyond hundredths.
	Addition & Subtraction M3.1.6	Student can fluently add and subtract multi-digit decimals using the standard algorithm for each operation.
	Multiplication & Division M3.1.7	Student can multiply two-digit whole numbers by two-digit whole numbers, using estimation, student-generated algorithms, and standard algorithms. Student can divide three-digit whole numbers by one-digit whole numbers, using concrete materials, estimation, student-generated algorithms, and standard algorithms.
	Fractions M3.1.8	Student can compare and order fractions whose denominators are all multiples of the same number. Student can add and subtract fractions with the same denominator, and denominators that are multiples of the same number.
	Decimals M3.1.9	Student can compare, order and represent decimals. Student can multiply and divide decimals by powers of 10. Student can make connections between equivalent fractions, decimals and percentages. Student can add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers.
STAGE 4	SKILL	IDAT OUTCOMES
4	Addition M4.1.1	Student can demonstrate an understanding of addition of fractions and integers, and apply a variety of computational strategies to solve problems involving whole numbers and decimal numbers.
	Division M4.1.2	Student can apply and extend previous understanding of division of fractions and rational numbers.
	Algebra M4.1.3	Student can translate phrases describing simple mathematical relationships into algebraic expressions. Student can extend and apply the laws and properties of arithmetic to algebraic terms and expressions.
	Integers- Ordering M4.1.4	Student can represent, compare, and order numbers, including integers.

	Decimals M4.1.5	Student can use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, either positive or negative.
	Fractions M4.1.6	Student can connect fractions, decimals and percentages and carry out simple conversions. Student can solve problems involving addition and subtraction of fractions, including those with unrelated denominators.
	Subtraction M4.1.7	Student can demonstrate an understanding of subtraction of fractions and integers, and apply a variety of computational strategies to solve problems involving whole numbers and decimal numbers.
	Multiplication M4.1.8	Student can divide fractions and decimals using efficient written strategies and digital technologies.
	Problem-Solving M4.1.9	Student can solve everyday and mathematical problems involving the four operations with rational numbers.
	Measurement & Geometry M4.1.10	Student can derive and apply formulae to calculate and solve problems involving perimeter, area and angle sum of triangles, quadrilaterals, parallelograms, and trapezia; and volume of cuboids (including cubes) and other prisms.
STAGE 5	SKILL	IDAT OUTCOMES
5	Equations M5.1.1	Student can use the form $y = mx + c$ to identify parallel {and perpendicular} lines, find the equation of the line through two given points, or through one point with a given gradient.
	Patterns & Algebra M5.1.2	Student can apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate.
	Lines & Polygons M5.1.3	Student can apply the concepts of congruence and similarity, including the relationships between lengths, {areas and volumes} in similar figures.
	Transformation M5.1.4	Given two figures, student can use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity the transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
	Chance, Rates, Ratios M5.1.5	Student can calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams. Student can solve problems using ratio and scale factors in similar figures.
	Fractions & Decimals M5.1.6	Student can apply the four operations to simple algebraic fractions with numerical denominators.
	Algebraic Fractions M5.1.7	Student can apply the four operations to simple algebraic fractions with numerical denominators. Student can simplify and manipulate algebraic expressions (using those involving surds {and algebraic functions}).
	Whole Numbers M5.1.8	Student can substitute values into formulas to determine an unknown.
	Areas & Volume M5.1.9	Student can calculate surface areas and volumes of spheres, pyramids, cones and composite solids. Student can use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Time & Scale M5.1.10	Student can solve problems using ratio and scale factors in similar figures. Student can investigate bivariate numerical data where the independent variable is time.
	Mean, Graphs & Tables M5.1.11	Student can interpret, analyse and compare the distributions of data sets through appropriate measures of central tendency (including modal class) and spread {including quartiles and inter-quartile range}
STAGE 6	SKILL	IDAT OUTCOMES
6	Trigonometry: Pythagoras' Theorem & Right-angled Triangles M6.1.1	Student can use trigonometric ratios and the Pythagorean theorem to solve right triangles in applied problems.
	Trigonometry: Sine & Cosine Rules M6.1.2	Student can apply the law of sines and law of cosines to find unknown measurements in right and non-right triangles.
	Area of a Triangles M6.1.2	Student can determine the area of a triangle given two sides and an included angle by using the rule $\text{Area} = \frac{1}{2}ab\sin C$, or given three sides by using Heron's rule, and solve related practical problems.
	Arithmetic Sequence M6.1.3	Student can use the formula for the n th term and for the sum of the first n terms to solve problems involving arithmetic or geometric progressions.
	Geometric Sequence M6.1.4	Student can use the formula for the n th term and for the sum of the first n terms to solve problems involving arithmetic or geometric progressions.
	Trigonometric Sequence M6.1.5	Student can understand the definition of a radian and use the relationship between radians and degrees. Student can recognise the radian as an alternative unit to the degree for angle measurement, define the radian measure of an angle as the length of the arc that subtends this angle at the centre of a unit circle, and develop and apply the relationship between radian and degree measure.
	Binomial Theorem M6.1.6	Student can apply the Binomial theorem for the expansion of $(x+y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's triangle.
	Real & Complex Numbers: Imaginary M6.1.7	Student can prove and apply the factor theorem and the remainder theorem for polynomials.
	Conjugate Complex Numbers M6.1.8	Student can determine and use complex conjugates.
	Operations of Complex Numbers M6.1.9	Student can carry out operations of addition, subtraction, multiplication and division of two complex numbers expressed in Cartesian form $x + iy$. Student can represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.
	Matrices M6.1.10	Student can use the general solution and determine linear factors of real quadratic polynomials. Student can work with 2×2 matrices as a transformation of the plane, and interpret the absolute value of the determinant in terms of area.
	Probability M6.1.11	Student can determine whether two events are independent or dependent and whether one event is conditional of another event, and solve related probability problems [e.g., calculate $P(A \text{ and } B)$, $P(A \text{ or } B)$, $P(A \text{ given } B)$] using a variety of strategies (e.g., tree diagrams, lists, formulas). Student can apply the general multiplication rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$, and interpret the answer in terms of the model.