

**Grade 8 MATHEMATICS**

RATIONALE:

**Grade 8** students are required to take increasing responsibility for planning and executing their work and for organizing their personal time to include systematic private study as well as homework.

The grade 8 Mathematics curriculum extends their calculation skills; students begin to apply algebraic symbols and techniques confidently; the progress from a simple understanding of shape and measure to using definitions and reasoning to understand geometry; they study handling data through practical activities and are introduced to probability.

Grade 8 students are encouraged to develop positive attitudes towards mathematics, and to apply critical reasoning skills with increasing confidence and flexibility to solve mathematical problems.

REQUIRED TEXT:

Mathematics for the International Student 8 (MYP3) by Volmar, Haese, et al.

**OR**

New National Framework Mathematics 8 – M.J. Tipler & K.M. Vickers

REQUIRED MATERIAL FOR CLASS:

Notebooks, folder paper, graph paper, letter size folder to store worksheets, 30cm ruler, geometry set, pens, and pencils.

The Casio fx-82MS calculator is used throughout the Grade 8 Mathematics Programme.

ASSESSMENT:

In addition to tests, homework, and classwork, students will be assessed through projects, presentations and problem solving investigations.

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| **TERM 1** | |
| **TOPIC** | **OBJECTIVES** |
| Algebra and Inequalities | * **Review:** * Simplify algebraic expressions using the order of operations- including brackets and exponents. * Simplify, using the distributive property, a single term over a bracket, i.e. monomial times a polynomial, including fractional forms and variable with exponents. * Calculating the numerical value of algebraic expressions by substitution - positive and negative integers into formulae, linear expressions and expressions involving powers; example: or * **Students should be able to:** * identify laws on indices * expand terms in order to simplify * use the laws of indices to simplify an expression * Construct linear expressions and simple formulae from worded questions * Simplify algebraic fractions * Factorise expressions involving powers and fractions. * Solve linear equations and formulae including algebraic fractions. * Construct and solve linear equations from worded questions (unknown on either or both sides, with or without brackets.) * Change the subject for the indicated variable (transposition) * Identify and use inequality signs. * Construct inequalities from worded questions. * Solve inequalities and represent answers on a number line and Cartesian Plane. |
| Fractions, Decimals, Percentages, Ratio and Proportion | * **Review:** Calculate simple interest. * Solve real life problems involving percentages and simple interest. * Ratio: definition, comparison, division * **Students should be able to:** * Calculate and solve problems involving percentages or quantities. * Find the percentage increase and decrease. * Calculate original amount * Calculate compound and reverse percentages. * review unitary and ratio method to solve problems * identify quantities that are in direct proportion * identify quantities that are inversely related * find unknown quantities that are directly and inversely related * use ratio and unitary method to calculate unknown * solve worded problem on ratio and proportion using different   methods-unitary, ratio, algebraic method |
| Shape, Construction and Loci | * **Students should be able to:** * Know that 2D shapes are congruent, corresponding sides and angles are equal. * Know and use the angle properties of triangles, quadrilaterals, and polygons – including diagonal properties where necessary. * Identify all the symmetries of 2D shapes – line and order of rotational symmetry. * Use a ruler and a pair of compasses to construct: * Perpendicular line from an external point to a line and from a point on the line – both end point and anywhere on the line. * Bisector of an angle. * A parallel line to a given line through a given point. * 30o, 60o, 90o, 45o, 120o angles. * A triangle, given a right angle, hypotenuse and one side (RHS). * Quadrilaterals – square, rectangle, parallelogram. * Use the following loci and the method of intersecting loci for sets of points in two dimensions: * which are at a given distance from a given point * which are at a given distance from a given straight line * which are equidistant from two given points * which are equidistant from two given intersecting straight lines. |
| **TERM 2** | |
| Geometry, Lines and Angles | * **Students should be able to:** * Identify alternate, corresponding, and co-interior angles made with transversal and parallel lines. * Solve geometrical problems using properties of angles, or parallel and intersecting lines, and of triangles and special quadrilaterals – explaining reasoning with diagrams. * Find the sum of interior and exterior angles regular polygons. * Find the size of each interior and exterior angles of regular polygons. |
| Coordinate Geometry | * **Students should be able to:** * Recognise and draw the equations of lines in the form * Write equations of straight line graphs – point-slope form and slope intercept form. * Recognize and draw the equation of lines parallel to the x-axis or y-axis. * Find equation of lines given its graph * Draw and interpret distance time graphs. * Find the equation of parallel and perpendicular lines * Given a point find a line parallel and perpendicular to etc… |
| Measurement | * **Revise:** metric conversions,Calculate perimeter and area of 2D shapes * **Students should be able to:** * Derive and use the formulae for the area of a parallelogram, trapeziums. * Name the parts of a circle; know and use the formulae for the circumference and area of a circle. * Calculate the area of a sector and the length of the arc. * Calculate perimeter and area of **compound** 2D shapes * Calculate the volume of cubes, cuboids, cylinders and prisms. * Draw and use simple nets of solids to work out the surface area of cubes, cuboids, cylinders, and prisms. * Calculate the volume of Pyramids and Sphere |
| Transformational Geometry | * **Students should be able to:** * Transform 2D shapes by rotation, reflection and translation – about the origin / different points * define a translation * translate figures using co-ordinates * identify co-ordinate of image * identify translation vector given an object and its image * define reflection * identify lines of symmetry * reflect shapes in given lines: x-axis, y-axis, , * state relation between an object and its image in a plane when reflected in a line in that plane * identify image of object reflected * find image of points rotated about the origin in a clockwise or anti-clockwise direction * find image of a point rotated about other centres * Transform combinations of these transformations. |
| **TERM 3** | |
| Probability | * **Students should be able to:** * Define a sample space * Write the sample space for a given event * Identify complementary events * Use grids and tree diagrams to find probabilities * Calculate the expectation of an event occurring |
| Sequences | * **Students should be able to:** * Indentify special sequences (arithmetic, geometric, and Fibonacci) * Derive (using formula) expressions for the general term for arithmetic and geometric sequences * Recognise and describe linear and quadratic sequences. * Write the nth term of linear and quadratic sequences. |
| The Right Angled Triangle | * **Students should be able to:** * State the theorem of Pythagoras * Recall Pythagorean triples * Solve problems using Pythagoras |