

Unit title	Key concept	Related concepts	Global context	Statement inquiry	Objectives	ATL skills	Content
Unit 1 Numbers and Algebra Ch: 1,2,4, 6 September, October, November 12 weeks	Relationships	Simplification Equivalence Models Generalization	Scientific and technical innovation: the natural world and its law	Relationships in natural world can be simplified by algebraic models.	A i, ii, iii B i, ii C i, ii, iii, iv	<ul style="list-style-type: none"> Communication skills (understand, use and interpret mathematical notation in algebra/algebraic expressions; make inferences and draw conclusions solving problems written literally) Social- collaboration (manage and resolve conflict and work collaboratively in teams; listen actively to others; negotiate ideas with peers and teacher concerning equivalence) Self-management - reflection skills (consider content, develop new skills, techniques and strategies for effective learning) Thinking - critical thinking skills (recognize and evaluate propositions for number patterns, draw reasonable conclusions and generalizations and test them: evaluate evidence and arguments concerning equivalence) Thinking - transfer (apply skills in unfamiliar situations) 	<p>Topics:</p> <ul style="list-style-type: none"> - Forms of numbers - Number lines - Operations with algebraic expressions - Integer exponents - Linear equations and inequalities - Absolute value (extended) <p><u>Knowing and understanding:</u></p> <ul style="list-style-type: none"> - Expanding, simplifying and factoring algebraic expressions - Using substitution for evaluation and simplification of an expression/equation - Solving equations, inequalities algebraically and graphically - Using the laws of exponents <p><u>Investigating patterns:</u></p> <ul style="list-style-type: none"> - Discovering last digit of numbers written as product - Determining the general rule that represents numerical patterns <p><u>Communicating:</u></p> <ul style="list-style-type: none"> - Using different forms of numbers: integers, fractions, decimals, exponents, standard form, scientific notation - Translating sentences into algebraic expressions and vice versa - Solving problems written literally

<p>Unit 2</p> <p>Coordinate Geometry and Simultaneous Equations</p> <p>Ch: 8,19</p> <p>December, January, February</p> <p>8 weeks</p>	Relationships	Representation Models	Scientific and technical innovation- the impact of scientific and technological advances on communities and environments	Patterns between variables and relationships can be represented visually	<p>A i, ii, iii</p> <p>C i, ii, iii</p> <p>D i, ii, iii, iv</p>	<ul style="list-style-type: none"> • Communication skills (Take effective notes in class; make inferences and draw conclusions relating equations of lines) • Social-collaboration (work collaboratively in teams during group work) • Self-management- organisation skills (bring necessary equipment and supplies: rulers) • Thinking-critical thinking skills (use models and simulations to explore complex systems and issues: equations of lines, applying in real-life contexts) 	<p><u>Topics:</u></p> <ul style="list-style-type: none"> - The Cartesian plane - The distance formula - The midpoint formula - Equations of lines - Simultaneous equations - Simultaneous inequalities (extended) <p><u>Knowing and understanding:</u></p> <ul style="list-style-type: none"> - Calculating the distance between two points - Calculating the midpoint of a segment - Finding the equation of a straight line - Solving systems of equations algebraically and graphically <p><u>Communicating:</u></p> <ul style="list-style-type: none"> - Using coordinate system to present and inspect information <p><u>Applying mathematics in real-life contexts:</u></p> <ul style="list-style-type: none"> - Using equations of lines in real-life situations
<p>Unit 3</p> <p>Trigonometry and Transformation Geometry</p> <p>Ch: 13,16</p> <p>February, March</p> <p>5 weeks</p>	Form	Patterns Space	Orientation in space and time- the relationships between, and the interconnectdness of, individuals and civilizations, from personal, local and	Form in everyday life can be explored using geometry and trigonometry	<p>A i, ii, iii</p> <p>C i, ii, iii</p> <p>D i, ii, iii, iv</p>	<ul style="list-style-type: none"> • Communication skills (use and interpret a range of discipline-specific terms and symbols; trigonometric ratios, transformations) • Social-collaboration (exercise leadership and take on a variety of roles within groups) • Self-management- organisation skills (bring necessary equipment and supplies to class; calculators) 	<p><u>Topics:</u></p> <ul style="list-style-type: none"> - Trigonometric ratios in right-angled triangles - Simple isometric transformations - Identical representation of transformations (extended) <p><u>Knowing and understanding:</u></p> <ul style="list-style-type: none"> - Using sine, cosine and tangent to relate angles and sides of right-angled triangles - Transforming figures by rotation, reflection, translation and enlarging

			global perspectives			<ul style="list-style-type: none"> ● Reflection (identify strengths and weaknesses of personal learning strategies) ● Research-Information literacy (use memory techniques to develop long term memory; trigonometric ratios) ● Thinking-critical thinking skills (Identify obstacles and challenges) ● Thinking-research (make connections between subject groups and disciplines) 	<u>Communicating:</u> <ul style="list-style-type: none"> - Using and interpreting trigonometric ratios - Making connections between different forms of a same object <u>Applying mathematics in real-life contexts:</u> <ul style="list-style-type: none"> - Solving real-life situations using trigonometry - Designing geometrical patterns
Unit 4 Further Algebra and Quadratic Equation Ch: 9,11,18 March, April, May 8 weeks	Logic	Generalization Simplification	Identities and relationships- identity; beliefs and values	Discovering mathematical identities and relationship leads to effective action	A i, ii, iii B i, ii, iii D i, ii, iii, v	<ul style="list-style-type: none"> ● Communication skills (organize and depict information logically; give and receive meaningful feedback) ● Self-management- organisation skills (keep an organized and logical system of information files/notebooks) ● Self-management- reflection (develop new skills, techniques and strategies for effective learning) ● Affective skills (practice analysing and attributing causes for failure) ● Thinking-critical thinking skills (test generalizations and conclusions, propose and evaluate a variety of solutions; select appropriate solutions) 	<u>Topics:</u> <ul style="list-style-type: none"> - Factorization of algebraic expressions - Further factorization (extended) - Algebraic fractions - Quadratic equations <u>Knowing and understanding:</u> <ul style="list-style-type: none"> - Solving quadratic equations by formula - Performing operations with algebraic fractions - Factoring algebraic expressions <u>Investigating patterns:</u> <ul style="list-style-type: none"> - Discovering relations between coefficients of quadratic equations and their solutions <u>Applying mathematics in real-life contexts:</u> <ul style="list-style-type: none"> - Applying quadratic equations in geometry, physics and other real-life contexts
Unit 5 Statistics	Relationships	Patterns Quantity Models	Scientific and technical innovation-	Statistics are a powerful model	A i, ii, iii B i, ii, iii C i, ii, iii, v	<ul style="list-style-type: none"> ● Communication skills (use and interpret a range of 	<u>Topics:</u> <u>Knowing and understanding:</u>

Ch: 10 May, June 4 weeks			the impact of environments on human activity; how humans adapt environments to their needs	to develop global perspective	D i, ii, iii, v	<p>discipline-specific terms and symbols)</p> <ul style="list-style-type: none"> ● Self-management-organisation skills (use appropriate strategies for organizing complex information; Select and use technology effectively and productively) ● Research-Information literacy (collect and analyse data to identify solutions and/or make informed decisions) ● Thinking-critical thinking skills (revise understanding based on new information and evidence) 	<ul style="list-style-type: none"> - Collecting data, constructing and interpreting graphs, drawing the line of best fit - Calculating the mean, median and mode; choosing the best measure of central tendency - Calculating the standard deviation - Histograms for continuous fixed interval groups (extended) <p><u>Investigating patterns:</u></p> <ul style="list-style-type: none"> - Discovering Investigating how transformation of data influences measures of central tendency <p><u>Communicating:</u></p> <ul style="list-style-type: none"> - Presenting data using pie charts, histograms, line graphs, scatter plots, box-and whisker-plots - Discussing and interpreting data using mean, mode, median, quartile, percentile <p><u>Applying mathematics in real-life contexts:</u></p> <ul style="list-style-type: none"> - Analysing real-life situations statistically - Using a line of best fit to discover relationships between phenomena
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