MATHEMATICS

SUBJECT OVERVIEW

GRADE 7 (YEAR 2)

Unit title	Key Concepts	Related Concepts	Global Context	Statement of inquiry	MYP Objectives	ATL Skills	Content	
1. What's next?	Logic	Generalization Quantity	Scientific and Technical Innovation	Mathematical logic helps us to find general rules in quantities and relationships and to make exciting, innovative discoveries.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**- Communication **D**- Application in real-world contexts	Communication Creative thinking	• Types of numbers • Negative numbers • Highest common factor • Lowest common multiple • Operations with positive and negative numbers • Order of operations (BEDMAS)	
2. What really makes the world go round?	Relationships	Change Simplification	Globalization and sustainability	Financial, personal and economic change can be understood and simplified using proportional relationships like ratios and percentages.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**- Communication **D**- Application in real-world contexts	Thinking Communication Transfer	• Addition & subtraction of fractions. • Multiplication and division of fractions • Conversions across fractions, decimals and percentages. • Calculating a fraction and percentage of a quantity. • Simplification of ratios. • Sharing using ratios.	

							• Dividing quantities into ratios • Proportional reasoning and logic	
3. How can we bring things together?	Relationships	Patterns Simplification	Identities and Relationships	Identifying and using patterns and rules is the key to simplifying relationships, in life and in algebra.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Critical thinking Self-management	• Classify like terms. • Identify variables, constants, and coefficients. • Summarise expressions by simplifying them. • Factorisation of terms • Expansion of terms	
4. Fact or fiction, truth or lies?	Form	Systems, Patterns	Fairness and development	Fair forms of communication help us to reveal patterns and improve our truth-telling systems.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Collaboration Critical-Thinking	• Defining and explaining statistical terms • Primary & secondary data sources • Collecting and organising data • Tabulating results • Classifying and ordering data • Data representation: • Histogram • Line graph • Pictogram • Dot and bubble plots • Scatterplot • Stem and Leaf • Bar chart	

							• Pie chart • Creative visualisations. • Grouping and classifying data • Infographics and Data visualisations • Analysing data • Using data to perform text analysis. • Bias and fairness in data • Sampling	
5. Should we cross the bridge or keep everything in balance?	Logic	Change Models	Personal and Cultural Expression	Unknowns and variables can be modelled and solved using algebraic logic, which can be expressed in different personal and cultural ways.	**A**- Knowing and Understanding **B-**Investigating Patterns **C-** Communication **D-** Application in real-world contexts	Transfer skill Communication	• Construct algebraic expressions and equations that represent real-life situations. • Solve one-step equations. • Apply algebraic models to solve real-life problems. • Select appropriate variables for their models. • Select a method for solving equations. • Verify that equations are valid through substitution. • Some students could • Solve equations with multiple operations,	

							fractions, negative numbers, decimals and brackets.	
6. How do we measure up?	Form	Space Measurement	Orientation in Space and Time	Measurement is expressed in various forms to communicate the space around or within an object.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Communication Creative thinking	• Measure lengths using a ruler or compass and angles using a protractor. • Estimate distances, lengths and angles. • Select the most appropriate unit for a given measurement. • Sketch and label scale diagrams • Calculate metric conversions, area and perimeter. • Identify types of angles and triangles, and properties of polygons and circles • Recognize the shapes that make up composite figures. • Calculate the area and perimeter of composite figures containing missing shapes.	

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SUBJECT OVERVIEW

GRADE 8 (YEAR 3)

Unit title	Key Concepts	Related Concepts	Global Context	Statement of inquiry	MYP Objectives	ATL Skills	Content	Summative assessment
1. How can we travel between dimensions?	Logic	Measurement Generalisation	Scientific and technical innovation	The general properties of shapes and our spatial environment can be measured by logic and manipulated and created by technology.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Affective skills Collaboration	• Metric conversions • Types of angles • Angles at a point, line & parallel lines. • Types of polygons • Interior & exterior angles of a polygon • Perimeter and area of 2D shapes • Total surface area and volume of 3D shapes. • Nets and surface areas	
2. How do we make choices?	Form	Equivalence Representation	Fairness and development	Real-life problems can be represented by different forms of mathematics which will yield equal results and a fair solution.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Organisation skills Communication skills	• Identify points on a Cartesian plane using ordered pairs • Sketch polygons on a Cartesian plane as well as their transformations • Explore relationships between x- and y-coordinates and come up with an equation to represent them. • Linear relations • How to model relationships using algebra, tables of values, and graphs	

							• Developing linear equations and graphs • Drawing straight line graphs • Finding gradient and y-intercept	
3.. Fact or fiction, truth or lies?	Form	Systems, Patterns	Fairness and development	Fair forms of communication help us to reveal patterns and improve our truth-telling systems.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Collaboration Critical-Thinking	• Defining and explaining statistical terms • Primary & secondary data sources • Collecting and organising data • Tabulating results • Classifying and ordering data • Data representation: • Histogram • Line graph • Pictogram • Dot and bubble plots • Scatterplot • Stem and Leaf • Bar chart • Pie chart • Creative visualisations. • Grouping and classifying data • Infographics and Data visualisations • Analysing data • Using data to perform text analysis. • Bias and fairness in data • Sampling	

4. Where's the proof?	Relationships	Simplification Systems	Scientific and technical innovation	Finding relationships in closed systems can help us simplify and solve problems, using technology or otherwise.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Transfer skills Communication	• Angles and lengths • Revision of triangle types • Introduction to trigonometry • Pythagoras' theorem Trigonometric ratios	
5. Where do conclusions come from?	Logic	Patterns Quantity	Identities and relationships	Relationships between variables form patterns which often justify important logical conclusions.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Communication Critical thinking	• Recall what the three measures of central tendencies are and how to calculate them. • Present quartile data in box-and-whisker plots. • Comment on the strength and type of correlation being observed, and on possible reasons for the outcomes in question. • Select the appropriate measure of central tendency based on the context and on the types of numbers being examined. • Explore how the correlation coefficient changes as data moves closer to and farther from the LOBF. • Justify the reasons behind patterns that are present in the data.	

6. What are the chances?	Relationship	Generalization Patterns	Personal and cultural expression	Patterns found in relationships can be generalized to help us make predictions for personal gain.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Communication Thinking	• Calculate simple probabilities. • Different ways to visualize outcomes. • Probability diagrams • Mutually exclusive • Independent events • Dependent events • Sets and Venn diagrams	Chance carnival

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SUBJECT OVERVIEW

GRADE 9 (YEAR 4)

Unit title	Key Concepts	Related Concepts	Global Context	Statement of inquiry	MYP Objectives	ATL Skills	Content	Summative assessment
1. In how many different ways can we express the same thing?	Form	Patterns	Globalization and sustainability	Numbers in different forms give us a variety of ways to predict patterns and think about problems of global significance.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Communication Creative thinking	• Number sets. • Standard form. • Radicals and exponents.	Criterion A
2. Why does algebra look so clever?	Relationships	Simplification	Identities and relationships	Finding and expressing things in common helps us to simplify and improve relationships.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Organisational Communication	• Expansion • Factorisation • Substitution • Linear equations • Rearranging formulae • Quadratics	Criterion A
3. Can you walk the line?	Logic	Equivalence	Orientation in space and time	Mathematical knowledge is built through logical structures, developed over time and transferred to equivalent situations	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Organisational Transfer	• Simplify, substitute into and solve equations, • Plot points on an x-y grid (Cartesian plane), • The difference between constants, coefficients and variables. • Gradient and y-intercept.	Criterion A Descartes day Criterion C & D

							• Simultaneous equations	
4. How is technical innovation changing our ideas of public and private space?	Relationships	Models	Scientific and technical innovation	Modelling allows us to solve new spatial relationship problems arising from technical innovation.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Collaboration Information literacy	• Revision and development of Pythagoras' Theorem. • Using theorem to find lengths in abstract and real-world situations. • Trigonometric ratios: • Using relationships to find values of angles or sides, including inverses. • Finding values on GDC or App. Extended Mathematics content: • sine rule, • cosine rule, • radians, including simple conversion and definition.	
5. How can we move in space?	Logic	Space	Personal and cultural expression	Applying mathematical logic to spatial dimensions can open personal, cultural and social entrepreneurship opportunities	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Communication Critical-thinking	• Length of a line segment • Midpoint of 2 points • Equations of vertical & horizontal lines. • Parallel & perpendicular lines • Vectors	The mobile app (GRASPS) Criterion D
6. How well do data reflect reality?	Relationships	Change	Fairness and development	We must take care to ask the right questions and to measure the correct data to understand	**A**- Knowing and Understanding **B**-Investigating Patterns	Communication Transfer	• Types of data • Data collection • Data representation • Data analysis • Cumulative frequency • Correlation	Santo Andreo High School Criterion A & D

				relationships so we can use information to make the world and better and fairer place.	**C**-Communication **D**- Application in real-world contexts		• Standard deviation	

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GRADE 10 (YEAR 5)

Unit title	Key Concepts	Related Concepts	Global Context	Statement of inquiry	MYP Objectives	ATL Skills	Content	Summative assessment
1. Making the world a fairer and more equal place?	Logic	Quantity	Fairness and development	The difference between quantities can be represented by inequalities, which allow us to solve and logically address inequality in Mathematics and life.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Affective skills Communication skills	• Inequalities • Representing inequalities • Solving inequalities • Linear programming • Arithmetic Sequences • General rule for sequences • Number patterns in images • Geometric sequences • Fibonacci numbers	Multiplication grid Criterion A & B
2. How many forms has a quadratic?	Relationships	Representations	Globalization and sustainability	Representing relationships visually and algebraically can allow us to find and optimize 'best case scenarios and sustainable solutions.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Reflection skills Information literacy	• Parts of a quadratic curve • Graphing quadratic functions • Shapes of quadratic curves • Functions transformations • Solving quadratic equations by factorisation • Solving by completing the square • Solving by quadratic formula.	Criterion A Criterion C: Backdrop
3. How do functions function?	Form	Generalization	Identities and relationships	Relationships can be identified by generalizing data into various	**A**- Knowing and Understanding	Organisation Communication	• Linear functions • Domain & range	Finding information from a model : Criterion A & D

				models and forms, which allows us to solve and predict these real-world relationships.	**B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts		• Using functions to find values. • Quadratic function • Cubic function • Exponential functions	
4. 'What do I get by learning these things?'	Form	Justification	Orientation in space and time	Statements about the spaces and shapes around us can be justified to show they are invariant through space and time.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Reflection Media-literacy	• Parts of a circle • Circle theorems **i)** angles subtended by the same arc **ii)** central-angle theorem **iii)** angles subtended by diameter **iv)** cyclic quadrilaterals • Trigonometric functions in quadrants of a circle • Trigonometric identities	Proofs: Criterion C & D Criterion A
5. The only sure thing?	Logic	Measurements	Personal and cultural expressions	An individual's understanding of risk and chance is highly dependent on both logic and their personal experience.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Collaboration Reflection	• Definition of probability. • How can probabilities change. • Where does probability come from? • Probability diagrams • Mutually exclusive events • Independent events • Dependent events • Permutations & combinations	Fact checking: Criterion D Criterion A

6. Am I ready?	Relationships	Systems	Scientific and technical innovation	Your future relationship with mathematics will be determined by your understanding of both traditional and innovative systems.	**A**- Knowing and Understanding **B**-Investigating Patterns **C**-Communication **D**- Application in real-world contexts	Self-management Critical thinking	In this unit you will: • Find out how much you've learned and where you need to revise or refresh. • Explore the most appropriate course in Diploma Programme Mathematics for you. • Take action by considering ethical, moral and social implications of mathematics. • Practise 'slow judgement' rather than 'no judgement' as a good preparation for Theory of Knowledge (TOK). • Revision of simultaneous equations. • Transformation of trigonometric functions. • Revision of algebraic equations. • Quadratic functions, vertices and intercepts. • Numbers and number sets. • Probability – combinations and permutations. • Geometry, factals. • Data collection and probability.	Criterion A, B, C & D

							• Data representation. • Trigonometric ratios & Pythagoras. • Angle & polygon construction and measurement.	