Subject Overview

MYP Mathematics

Grade 6

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – Travelling with numbers 6 weeks - 18 hours	Logic	Quantity and Representation	Orientation in space and time Exploration: Scale	Being able to represent different forms of quantities has helped humans explore and describe our planet	Self Management – Reflection skills: Identify strengths and weaknesses of personal learning strategies (Self assessment) Thinking - Transfer skills: • Apply skills and knowledge in unfamiliar situations. **Learner Profile** Reflective	**Place value – Ten millions and decimal value** **Identify quantities and represent them in different forms – Number system** **INTEGERS** **Represent** the integers in a number line. **Define** and **evaluate** the absolute value of a number **Investigate** multiplication and division of negative numbers **Perform** the operations of multiplications, division, addition and subtraction with integers. **Apply** BEDMAS for solving multiple operations involving integers. **Coordinate Geometry-** **Investigate** and identify the quadrants in a Cartesian plane **Identify** the positive and negative Coordinates **Plot** points from a table of values **Graph** Straight Lines, Horizontal and Vertical Lines Some students could: From scatter plot to Cartesian plane Turning a table into a graph Investigating the gradient / slope Different ways of rotating a figure Service Learning: Designing creative art using reflections and translations that could be printed on a mosaic or quilt and used for community purposes.	**Summative**: Treasure Hunt – Create a map using coordinates. Criterion C Communicating Criterion D Applying Mathematics in real life contexts

Unit 2 – Patterns around us 4 weeks = 13.5	Relationships	Generalization, Patterns	Scientific and technical innovation Exploration: Models, systems, mathematical puzzles	Relationships in a logical process helps to model and generalize patterns in the natural world	Thinking – Creative thinking skills: Practise visible thinking strategies and techniques **Learner Profile** **Risktaker**	**Analyze** patterns and sequences. **Investigate** and represent patterns in different forms, diagrams, sequences, labels, words. **Generalize** a mathematical pattern using algebra and solving applications involving patterns. **Representing** patterns as functions using function machines. <u>Some students could</u>: **Research**: What is a linear pattern. Explain with examples. **Create** a magic Math machine in which you input a number and get a transformed output using the **rule** which you created **Service Learning** Promote a mathematician who shares identities and prove to the community how online 'mystical mind-reading' tricks work using mathematical logic.	**Summative:** Discovering the pattern in nature Criterion B Investigating Patterns
TERM 2 Unit 3 – Should we cross the bridge or keep everything in balance? 5 weeks = 17 hours	Form	Simplification, Models	Scientific and technical innovation Exploration: Models and methods	Models in a simplified forms can help to clarify, solve and create puzzles.	Communication - Communication skills: • Make inferences and draw conclusions Social skills – Collaborative skills: • Manage and resolve conflict and work collaboratively in teams. **Learner Profile** Balanced	**ALGEBRA** **Define** algebraic expressions based on the number of terms **Differentiate** the like and unlike terms **Identify** the types of expressions and the degree of polynomial **Simplify** algebraic expressions using addition and subtraction Differentiate between algebraic expressions and equations. <u>Some students could</u>: **Research**: learnalberta.ca. Choose English as your language. Under the Find resources heading, select Mathematics, Grade 6 and enter the keyword ' Exploring Patterns'. Click on the Exploring Patterns link on the right of the screen to open the resource 'It's a Bit Nutty!'. Follow the instructions and complete the activities. **Service Learning** Advocacy on implementing a balance routine in daily life.	**Summative:** Perimeter magic triangle Criterion A Knowing and Understanding

Unit 4 – How do we measure up? 6 weeks = 21 hours	Form	Space, Approximation	Personal and cultural expression. Exploration Artistry, Craft, creation, beauty	Artistry and creativity are enhanced through an understanding of measurement that defines form.	Research – Media Literacy skills: • Seek a range of perspectives from multiple and varied sources Thinking – Creative thinking skills: • Create original works and ideas: use existing work and ideas in new ways. **Learner Profile** Open minded (Appreciating other's perspective)	Name and **classify** different geometric elements (point, ray, line, segment) **Classify** different types of lines. Name and classify the different types of an angle. **Construct** and measure angles using protractor. **Solve** problems using the various angle properties, including the angles in triangles. **Differentiate** the types of triangles. **Investigate** the perimeter and area of compound shapes **Generalize** the relationship between the area and perimeter of a rectangle, and between the areas of a triangle and a rectangle. **Calculate** the volume and surface area of regular 3D shapes – cube and cuboid. Create 3D shapes using the nets <u>Some students could</u>: Investigate the interior angles of a triangle by visiting mathisfun.com/geometry/protractor-using.html, and scroll down to 'Have Go Yourself' **Service Learning:** Collect different pictures of tiles still intact at ancient Roman baths and appreciate the geometric measures	**Summative:** Angle sum theorem Criterion B Investigating Patterns Project – Area and perimeter – designing a blueprint of a theme park.(Cost and budget) Criterion D Applying Mathematics in real life contexts FA – Designing an art using geometry
Term 3 Unit 5 - Is fairness always equal? 6 weeks = 18.75 hours	Relationships	Equivalence, Systems	Identities and Relationships Exploration: Health and wellbeing, lifestyle choices	Life style decisions becomes easy by understanding the systems and their relationships	Communication - Communication skills: • Give and receive meaningful feedback Thinking - Transfer skills: • Apply skills and knowledge in unfamiliar situations. **Learner Profile** Knowledgable	**Investigate** the sieve of Eratosthenes in identifying the prime and composite numbers **Investigate** the divisibility rules **Demonstrate** the understanding of Factors and multiples **Define and Differentiate** the Greatest common factors (GCF) and least common multiples (LCM). **Fractions/ Decimals/ Percentage** **Represent and compare** fractions in different forms (**Simplify** different forms of fractions (Review) Solve addition and subtraction of fractions (Review) **Investigate** multiplication and division of fractions **Apply** different operations in fractions **Solve** using the rules of order of operations **Apply** mathematical strategies to solve problems involving fractions.(Word problems) **Define** and **simplify** ratios **Investigate** the equivalent ratios. **Divide** a quantity in a given ratio **Convert** fractions to decimals (Review – 10,100,1000) Decimal place value – Review ***Multiply and divide decimals – upto two decimal points*** **Solve** decimal sums using multi operations. **Investigate** key percentages	**Summative**: A special recipe - Fractions in cooking Create a recipe that reflects your culture, your heritage and family tradition and prepare a monthly budget for rent, food, transportation, living expenses, clothes and other expenses. Criterion A Knowing and Understanding

						Represent a number in different forms - fractions, decimals and percentages **Convert** between equivalent forms of numbers - fractions, decimals and percentages. Finding the % of a quantity <u>Some students could:</u> **Research** the other forms used to represent quantities, Base 10 and base 60. Numbers in Braille have their own representation. **Interpret** a code using 'Braille' and decipher it. **Create** an acronym or a simple way to remember the order of operations. Try the Sushi Fractions activity on the Mr Nussbaum website at mrnussbaum.com/sushi-fractions. Divide the sushi between tuna, avocado and shrimp to match the fractions you are given. Go to mathplayground.com. Scroll down and click on Fraction Decimal Games. Scroll down and under the Percent and Ratio heading, click on Problem Solving – and solve problems on Percent. **Service Learning** Create an awareness to the public as to how their consumer choices affect global communities.	
Unit 6 – How can data help us save the world? 4 weeks = 14.25 hours	Logic	Representation Validity	Fairness and Development Explorations: Inequality, difference and inclusion.	Logical representation of data that can validate hypothesis and arrive at conclusions.	Research skills – Information Literacy skills: • Collect, record and verify data Thinking – Critical thinking skills: • Interpret data **Learner Profile** Thinker	**Collect, classify** and represent data **Investigate** the types of data **Analyze** different graphs **Construct and interpret** bar graphs, pie charts and line graphs. **Determine** the best type of graphs to use to represent given data. Read**, interpret** and **draw conclusion**s from primary and secondary sources of data. **Calculate** measures of central tendency and measures of depression. **Investigate** and determine the mean, median and mode **Calculate** the mean, median, mode and range <u>Some students could</u>: **Create** a one-page poster that highlights a particular community issue. **Service Learning:** **Research** a variety of community issues, collect the data, display, analyze and draw conclusions of the data collected.	**Summative:** Prove your conjecture Collect, display, analyze and reflect the collected data Criterion C Communicating

MYP Mathematics

Grade 7

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – What really makes the world go around? 6 weeks - 22.5 hours	Relationships	Representation, Simplification	Globalization and sustainability Exploration: Markets, commodities and commercialization	Personal and economic transactions can be represented and simplified using proportional relationships.	Thinking skills – Transfer skills – • Apply skills and knowledge in unfamiliar situations (progression from Grade 6 – recipe making) Social skills – Collaboration skills: Manage and resolve conflict, and work collaboratively in teams. **Learner Profile** Knowledgeable	**Find** the factors, multiples, HCF and LCM and its application in daily life. **Relationship of HCF and LCM** **Factorize** - prime factorization **FRACTIONS/ DECIMALS** **Convert fractions to decimals** **Solve** word Problems using multiplication and division of decimals. Rounding of decimal numbers **PERCENTAGES** **Convert** Percentages into Fractions & Decimals **Express** One quantity as a percentage of another and comparing two different quantities **Calculate** percentage increase and decrease **Apply** mathematical strategies to solve problems involving percentages. Rates: Define rate, unit rate, discount rates Converting between different units of measurement and currencies Some students could: **Research and investigate:** In some sport activities, there is speculation that taller competitors have an advantage in short, fast paced events. Do you think this is true? Justify your answer with two examples. Use the link www.altitude.nu and find the altitude of any location on Earth Service Learning: Raise an awareness for healthier choices by finding the difference in the high and low levels in certain types of nutrients. Calculate how much each food item contributes as a percentage of your daily allowance of each food group.	**Summative**: Holiday Trip Criterion C: Communicating Criterion D: Applying mathematics in real-life contexts.
Unit 2 – Decode the algebraic mystery 6 weeks	Logic	Quantity, Validity	Scientific and technical Innovation Explorations:	Logical processes can help explore, simplify and establish the rules between the quantities.	Thinking- Critical thinking skills: Draw reasonable conclusions and generalizations	**INTEGERS** **Represent** the integers in a number line. **Define** and **evaluate** the absolute value of a number	**Summative**: Criterion A : Knowing and Understanding (Integers) Criterion B: Investigating patterns

- 22.5 hours			Mathematical puzzles, principles and discoveries.		Self-Management – Organization skills: Plan short- and long-term assignments; meet deadlines **Learner Profile** Risktakers	**Investigate** multiplication and division of negative numbers **Perform** the operations of multiplications, division, addition and subtraction with integers. **Apply** BEDMAS for solving multiple operations involving integers. **ALGEBRA** Indices - Rules of indices **Define** algebraic expressions based on the number of terms **Differentiate** the like and unlike terms **Identify** the types of expressions and the degree of polynomial **Simplify** and manipulate algebraic expressions and maintain equivalence by collecting like terms, taking out common factors, etc. **Simplify** algebraic expressions using addition and subtraction. **Multiplication of algebraic expressions.** **Calculate** the product by removing brackets (a+b)(c+d) **Substitute** numerical values into formulae and expressions, including scientific formulae Some students could: **Research and investigate:** Multiply and divide is an interactive activity on the Learn Alberta.Ca website. You can consolidate your understanding of the patterns and rules for multiplying and dividing integers. **Create** your own puzzle or trick that can be justified using algebra	(Algebra) Summative : Simple pattern a(b+c) Complex pattern (a+b)(c+d)
Unit 3 – Can mathematics be beautiful? 6 weeks - 22.5 hours	Forms	Space, Systems	Personal and cultural expression Exploration: Artistry, craft, creation, beauty	Artistry and creativity are enhanced through an understanding of how systems and available space to define forms.	Thinking skills – Creative thinking skills: Create original works and ideas: use existing works and ideas in new ways. Communication skills : • Make inferences and draw conclusions. **Learner Profile**	Name and classify the different types of angles and triangles. **Review of parallel lines, perpendicular bisector, angle bisector (no construction)** **Construct** angles and triangles using protractor. Identify various pairs of angles in a transversal. **Solve** problems using the various angle properties, including the angles in triangles. **Prove** that the exterior angle of a triangle is equal in size to the sum of its interior opposite angles. **Investigate** the sum of the angles of a quadrilateral, properties of a quadrilateral. (area and perimeter of	Turning mathematics into fine art. (Kandinsky's art) Criterion B: Investigating Patterns.

					Openminded	quadrilateral). **Investigate** the area and circumference of a circle. Area and perimeter of a circle. <u>Some students could</u>: Investigate the interior angles of a triangle by visiting mathisfun.com/geometry/protractor-using.html, and scroll down to 'Have Go Yourself' From scatter plot to Cartesian plane Turning a table into a graph Investigating the gradient / slope Different ways of rotating a figure <u>Service Learning:</u> Designing creative art using reflections and translations that could be printed on a mosaic or quilt and used for community purposes.	
Unit 4 – Where do conclusions come from? 6 weeks - 22.5 hours	Logic	Representation, Generalization	Identities and relationships Exploration: Human nature and human dignity; moral reasoning and ethical judgment	Reading and generalizing information is easy when represented in a logically appropriate format.	Thinking skills – Critical thinking skills: Draw reasonable conclusions and generalizations. Reflection skills: Develop new skills, techniques and strategies for effective learning **Learner Profile** Reflective	**Investigate** the types of data **Analyze** different graphs **Interpret** bar graphs, pie charts and line graphs and d**etermine** the best type of graphs to use to represent given data. **Apply** mathematical strategies to solve problems involving statistics. **Represent** data using stem and leaf plots. **Calculate** measures of central tendency and measures of depression (graphical data) **Calculate** the mean, median, mode and range - application **Identify** the best method to represent data Probability: Representing the likelihood of an event as fraction, decimal and percentage Modeling sample spaces in organized lists, tables and tree diagrams Service Learning: Document the probabilities (Eg rolling a die) based on human intuition and reasoning and prove them using theoretical and experimental probability. <u>Some students could</u>: Explore what does a small or low inter quartile range indicates? Explain. **Research** a variety of community issues, collect the data, display, analyze and draw conclusions of the data collected.	**Summative**: Raising awareness about the Great Barrier Reef. Criterion C: Communicating Criterion D: Applying mathematics in real-life contexts.

						<u>Service Learning:</u> **Create** a one-page poster that highlights a particular community issue.	
Unit 5 - A better choice 5 weeks 18.75 hours	Relationship	Change, Models	Fairness and development Exploration: Inequality, difference and inclusion.	Modelling the constant and varying factors helps in understanding their relationship and making informed decisions.	Research skills – Information and literacy skills- Collect and analyze data to identify solutions and make informed decisions. **Learner Profile** Caring	Equations, Inequalities and formulae Translate algebraic expressions from verbal and vice versa Write and solve linear algebraic equations Graph simple linear equations Applying mathematical strategies to solve real life problems involving linear equations. Write and solve linear inequalities Framing simple formulae Change of subject	Case Study: Study the equations or graphs to select the best option. Criterion A: Knowing and Understanding
Unit 6 – How can we travel between dimensions? 5 weeks 18.75 hours	Form	Patterns, Generalization	Scientific and technical innovation Exploration: Mathematical puzzles, principles and discoveries.	The forms in our spatial environment can be explored by investigating the patterns in their properties.	Social – Collaboration skills: Listen actively to other's perspectives and ideas. Thinking skills: Formulate factual, topical, conceptual and debatable questions. **Learner Profile** Thinkers	**Investigate** the area of regular polygons. **Calculate** the perimeter and area of two-dimensional shapes including trapezoids. **List** the formulae for finding the area and perimeter of different shapes. **Calculate** the surface area and volume of 3 dimensional shapes, including prisms. **Solving** real world problems involving 2d and 3D shapes. <u>Some students could</u>: **Research and investigate** a honeycomb and find the volume of honey that can fit in a single cell. <u>Service Learning:</u> Design a blueprint of a guest house for refugees.	**Summative**: Explore the properties of polygons using knowledge of triangles and quadrilaterals Criterion B: Investigating Patterns.

MYP Mathematics

Grade 8

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – Let's conserve 5 weeks 19 hours	Form	Quantity, space	Globalization and Sustainability Possible exploration: Consumption, conservation, scarcity	Knowledge of quantities and space can help us conserve resources.	Organization skills- Managing time and tasks effectively: Keep and use a weekly planner for assignments Reflection skills- considering the process of learning: Consider ethical, cultural and environmental implications **Learner Profile** Caring	Review number systems Express numbers in a standard form/ scientific form Identify significant numbers Define rational numbers – Recurring and non-recurring Express numbers in rounded form Define irrational numbers Express exponential numbers in form of surds Application of surds - Pythagoras Theorem Review 3-D shapes and nets – cube/cuboid/prisms Review SA and Volume Study Metric conversions Degree of accuracy	**Summative**: Let's Conserve Optimization of space and material Criterion C: Communicating Criterion D: Applying mathematics in real-life contexts.
Unit 2 – Journey towards the straight path 5 weeks 19 hours	Logic	Models, Equivalence	Scientific and technical innovations Explorations: Systems, models, methods.	Real-life problems can be modelled using equivalent forms for easy interpretation	Social-Collaboration: Manage and resolve conflicts, and work collaboratively in teams Communication skills: Make inferences and draw conclusions **Learner Profile** Knowledgeable	Review basics of algebra, operations on expressions Factorize expressions Explore identities $(a+b)^2$, $(a-b)^2$, $a^2- b^2$ Solve linear equations Plot linear equations on graph- straight line Slope/gradient of straight line Application of linear and quadratic equations (speed, distance, time, acceleration) Intro to quadratic equations Factorizing quadratic equations	**Summative**: Generalize the patterns Criterion B: Investigating patterns Criterion A: Knowing and Understanding
Unit 3 – How does a network work? 6 weeks 22.5 hours	Relationship	Systems, Change	Orientation in space and time	Study of systems is necessary to understand the dynamic trends.	Research- Information literacy skills: Present information in a variety of formats and platforms Thinking –Transfer skills: Apply skills and knowledge in unfamiliar situation	Ratio and proportion Percentages –commission/tax Simple interest Compound interest Currency conversion with graphs	**Summative**: Solve a real-life problem Criterion D: Application in real life context

					Learner Profile Inquirer		
Unit 4 – 7 weeks 26.25 hours	Form	space, Patterns	Scientific and technical innovation Mathematical puzzles, principles and discoveries	The transformation of a form can be explained by studying the pattern of its components	Communication skills: Take effective notes in class Thinking – Critical thinking skills: Practice observing carefully in order to recognize problems **Learner Profile** Thinker	**Discuss** congruence and similarity of triangles Explore symmetry **Reflect** shapes on $y = \pm x$ **Rotate** an object about a point **Enlarge** shapes by a positive/fractional scale factor from a center Investigate nets and properties of 3d shapes- pyramids, cylinders, sphere **Calculate** the surface area and volume of 3 dimensional shapes.	**Summative**: Investigate the properties of geometric entities. Criterion B- Investigating patterns
Unit 5 – How does a network work? 8 weeks 30 hours	Logic	Models, Change	Fairness and development Exploration: Human capability and development; social entrepreneurs	A logical model is useful in mapping the change, which is essential to make decision.	Communication skills: Understand and use mathematical notations Thinking- Critical thinking: Identify trends and forecast possibilities **Learner Profile** Communicator	Set Theory and notations Venn diagrams Probability of simple events using Venn and tree diagrams and sample space Mutually exclusive/Independent events/combined events Draw and compare box plots, scatter plot, Find median/median/mode class from a discrete/grouped frequency table Calculate the central tendencies from discrete/grouped data Measures of dispersion-Range with outliers Draw and interpret cumulative frequency curves Limitation and context in statistical enquiry- analysis Misleading graphs	**Summative**: Case study Criterion A: Knowing and Understanding Criterion C: Communicating

MYP Mathematics

Grade 9 - Standard

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – In how many different ways can we express the same thing? 6 weeks	Form	Patterns	Globalization and sustainability Exploration: Markets, commodities and commercialization	Numbers in different forms give us a variety of ways to predict patterns and think about problems of global significance.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols • Understand and use mathematical notations. Thinking – Creative thinking skills: • Generating novel ideas and considering new perspectives; Use brainstorming and visual diagrams to generate new ideas and inquiries. **Learner Profile** Communicator	To classify the natural numbers, Integers, rational, real numbers, range, irrational numbers. Identify the element of a set Convert fractions to decimals Round decimals to significant figures. Represent the standard form of huge numbers Identify the radicals or surds Solve the numerical surds. Expand and simplify brackets involving numerical surds Find the fractional exponents Sets – Representing 3 sets using a Venn diagram. Investigate the properties of sets. Sets, including notation and operations up to three sets Identify the laws of indices. Solve problems based on Direct and inverse proportions.	Summative: Can rounding help or hinder decision making? Criterion A: Knowing and Understanding Criterion B: Investigating Patterns.
Unit 2 – Why does algebra look so clever? 6 weeks	Relationships	Simplification	Identities and relationships Exploration: Moral reasoning and ethical judgment	Finding and expressing things in common helps us to simplify and improve relationships.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols Self management – Affective skills: • Practise analysing and attributing causes for failure. • Use appropriate strategies for organizing complex information. **Learner Profile** Thinker	Algebraic rules Linear equations BEDMAS Expanding expressions Binomial expansions Perfect square, identities. Factorizing quadratic expressions Solving quadratic equations Changing the subject of an equation	Summative: Expand and simplify Criterion A: Knowing and Understanding. Criterion C: Communicating.
Unit 3 - Can you walk the line? 6 weeks	Logic	Equivalence	Orientation in space and time Exploration: Scale, and variability	Mathematical knowledge is built through logical structures, developed over time and transferred to equivalent situations.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols • Make effective summary notes for studying; Organize and depict information logically. Thinking – Critical thinking skills: • Use mathematical communications to explore systems and	Standard: Linear equation on graph Gradients Quadrants Extrapolate, interpolate graphs Algebra in real-life Simultaneous equations Complex equations Simulltaneous equations on graphs.	Summative: Finding an equation in different scenarios and plotting them. Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts

					issues. **Learner Profile** **Reflective**		
Unit 4 - How is technical innovation changing our ideas of public and private space? 6 weeks	Relationships	Models	Scientific and technical innovation Exploration: Modernization, industrialization and engineering	Modelling allows us to solve new spatial relationship problems arising from technical innovation.	Social – Collaboration skills: • Listen actively to other perspectives and ideas. Thinking – Critical thinking skills: • Evaluate evidence and arguments. • Gather and organize relevant information to formulate an argument. **Learner Profile** Principled	Standard: Pythagoras theorem Triangle properties Trigonometric ratios in right angled triangles. Trigonometry – SOHCAHTOA, Application of Sine rule, cosine rule, and tangent rule.	Summative: Creative uses for Drones Criterion A: Knowing and Understanding. Criterion B: Investigating Patterns.
Unit 5 - How can move in space? 6 weeks	Logic	Space	Personal and cultural expression Exploration: Products, systems and institutions	Applying mathematical logic to spatial dimensions can open personal, cultural and social entrepreneurship opportunities.	Social – Collaboration skills: • Giving and receiving meaningful feedback. Thinking – Creative thinking skills: • Create original works and ideas; use existing works and ideas in new ways. Thinking – Critical thinking skills: • Analyse mathematical concepts and synthesize and ethically use information from a variety of sources and media. **Learner Profile** Communicator	Standard: Plotting points in cartesian plane. Connecting dots and Pythagoras theorm. Midpoint on graphs, Curves from lines, Gradient y = mx +c, Parallel lines, perpendicular lines, Equations on graphs, Construction of perpendicular lines, 3D vectors. Metric conversions Volume of regular polyhedra Movement on a plane— isometric transformations, enlargements and tessellations	Summative: Create an idea for a mobile app Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts
Unit 6 – How well do data reflect reality? 6 weeks	Relationships	Change	Fairness and Development Exploration: Inequality, difference and inclusion	We must take care to ask the right questions and to measure the correct data to understand relationships so we can use information to make the world a better and fairer place.	Communication skills: • Understand and use mathematical notation • Organize and depict information logically. Thinking – Critical thinking skills: • Evaluate evidence and arguments. • Test generalizations and conclusions. Research – Information Literacy skills: • Finding, interpreting, judging, and creating information. **Learner Profile** Caring Openminded	Standard: Differentiate Datum and data, univariate and bivariate data. Types of data, Tally chart and cumulative frequency, Measures of spread(averages), mode, median, mean, Data representation using Pie chart, bar graph, line graph, scatter plots, pictograms, stem and leaf, box plots. Interpretation of graphs Use of cumulative frequency Standard deviation.	Summative: Anti-bullying campaign Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts

MYP Mathematics

Grade 9 - Extended

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – In how many different ways can we express the same thing? 6 weeks	Form	Patterns	Globalization and sustainability Exploration: Markets, commodities and commercialization	Numbers in different forms give us a variety of ways to predict patterns and think about problems of global significance.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols • Understand and use mathematical notations. Thinking – Creative thinking skills: • Generating novel ideas and considering new perspectives; Use brainstorming and visual diagrams to generate new ideas and inquiries. **Learner Profile** Communicator	Extended: Conditional probability involving Tree diagrams Application of knowledge in unfamiliar and complex situations linked with previously covered units Laws of logarithms Simplify numerical expressions involving logarithms Solve equations involving Indices Applications of fractions, decimals, ratios and percentages Cross curricular applications Application of knowledge in unfamiliar and complex situations linked with previously covered units.	Summative: Spinning Averages Criterion B: Investigating Patterns. Criterion C: Communicating.
Unit 2 – Why does algebra look so clever? 6 weeks	Relationships	Simplification	Identities and relationships Exploration: moral reasoning and ethical judgment	Finding and expressing things in common helps us to simplify and improve relationships.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols Self management – Affective skills: • Practise analysing and attributing causes for failure. Self management – Organization skills: • Use appropriate strategies for organizing complex information. **Learner Profile** Thinker	Extended: Rationalising the denominator in the form $\frac{a}{\sqrt{b}\pm k\sqrt{c}}$ Performing operations with numbers in different bases Application of knowledge in unfamiliar and complex situations Draw reciprocal/power curves from equations Sketch quadratics Solving equations involving algebraic fractions with quadratic factors in the denominator Solve quadratic inequalities Algebraic proof Solve quadratic equations in the form $ax^2+bx+c=0$ where $a\neq1$ (Completing the square) quadratic/cubic/reciprocal/power graphs	Summative: Identifying Patterns Criterion A: Knowing and Understanding. Criterion C: Communicating.
Unit 3 - Can you walk the line? 6 weeks	Logic	Equivalence	Orientation in space and time Exploration: Scale, and variability	Mathematical knowledge is built through logical structures, developed over time and transferred to equivalent situations.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols • Make effective summary notes for studying; Organize and depict information logically. Thinking – Critical thinking skills: • Use mathematical communications to explore systems and issues.	Extended: Graphical representation of linear inequalities in any form Linear programming Domain and range of linear/quadratic/ exponential/reciprocal/sine/cosine/log functions Solving non linear simultaneous equations Solving equations from	Summative: Descartes and the fly Finding an equation in different scenarios and plotting them. Criterion A: Knowing and Understanding. Criterion C: Communicating.

					Learner Profile **Reflective**		
Unit 4 - How is technical innovation changing our ideas of public and private space? 6 weeks	Relationships	Models	Scientific and technical innovation Exploration: Modernization, industrialization and engineering	Modelling allows us to solve new spatial relationship problems arising from technical innovation.	Social – Collaboration skills: • Listen actively to other perspectives and ideas. Thinking – Critical thinking skills: • Evaluate evidence and arguments. • Gather and organize relevant information to formulate an argument. **Learner Profile** Principled	Extended: Trigonometry in context including angle of elevation/depression/bearings Solve 3D problems involving right angled triangles Transformations of linear/quadratic/ exponential/reciprocal/sine/cosine/log functions (Translations/Reflections/Stretches) Describing transformations in the form, for example, $y = a(x-h)^2 + k \; and \; y = \text{asin}(bx-c) + d$ Use algebra to solve problems in context Application of knowledge in unfamiliar and complex situations linked with previously covered units	Summative: Transformations Criterion B: Investigating Patterns. Criterion C: Communicating.
Unit 5 - How can move in space? 6 weeks	Logic	Space	Personal and cultural expression Exploration: Products, systems and institutions	Applying mathematical logic to spatial dimensions can open personal, cultural and social entrepreneurship opportunities.	Social – Collaboration skills: • Giving and receiving meaningful feedback. Thinking – Creative thinking skills: • Create original works and ideas; use existing works and ideas in new ways. Thinking – Critical thinking skills: • Analyse mathematical concepts and synthesize and ethically use information from a variety of sources and media. Communication skills: • Understand and use mathematical notation **Learner Profile** Communicator	Extended: Circle theorems involving cyclic quadrilaterals Opposite angles are supplementary Exterior angle = Opposite interior angle Area/Perimeter of sectors and segments Calculate the surface area of compound solids including cylinders/cones/ spheres/ pyramids Introduction – Radians Vector geometry	Summative: Tetrahedrons and Octahedrons Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts
Unit 6 – How well do data reflect reality? 6 weeks	Relationships	Change	Fairness and Development Exploration: Inequality, difference and inclusion	We must take care to ask the right questions and to measure the correct data to understand relationships so we can use information to make the world a better and fairer place.	Communication skills: • Understand and use mathematical notation • Organize and depict information logically. Thinking – Critical thinking skills: • Evaluate evidence and arguments. Research – Information Literacy skills: • Finding, interpreting, judging, and creating information. Thinking – Critical thinking skills: • Test generalizations and	Extended: Draw and use histograms with unequal class intervals Calculate limits of compound measures (inequality form) Calculations involving upper and lower bounds	Summative: Anti-bullying campaign represented on graphs Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts

					conclusions. **Learner Profile** Caring Openminded		

MYP Mathematics

Grade 10- Standard

Unit title	**Key Concept**	**Related concept(s)**	**Global context**	**Statement of Inquiry**	**ATL Skills and Learner Profile**	**Content and Service Learning**	**Summative Assessment & MYP Objectives**
Unit 1 – Making the world a fairer ad more equal place? 6 weeks	Logic	Quantity	Fairness and Development Exploration: Inequality, difference and inclusion	The differences between quantities can be represented by inequalities, which allows us to solve and logically address inequality in Mathematics and in life.	Communication skills: • Understand and use mathematical notation • Use and interpret a range of discipline-specific terms and symbols. Thinking – Transfer skills: • Inquire in different contexts to gain a different perspective. Self management – Affective skills: • Resilience practice 'bouncing back' after adversity, mistakes and failures; Practise 'failing well'. **Learner Profile** Caring	Standard: Solve algebraic inequalities in one variable using a combination of the properties of inequality. Represent inequalities on a number line. Solve absolute value inequalities in one variable using the Properties of Inequality. Develop inequalities to represent real world situations and use them to solve problems. Represent inequalities using graphs. Find the nth term of a linear sequence. Identify the geometric sequence Prove the Fibonacci sequence Absolute values Representing and solving inequalities, including compound and double inequalities Irrational numbers Surds, roots and radicals, including simplifying Standard form (scientific notation) Number systems notation Number sequences (prediction, description)	**Summative**: Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts
Unit 2 – How many forms has a quadratic?	Relationships	Representation	Globalization and sustainability	Representing relationships visually and algebraically can	Self management – Reflection skills: • Consider the process of	Standard: Identify the quadratic equation Identify the standard form of a quadratic equation	**Summative**: Solving using quadratic formula

6 weeks			Exploration: Data-driven decision-making	allow us to find and optimize 'best case scenarios' and sustainable solutions	learning; choosing and using ATL skills. Communication skills: • Give and receive meaningful feedback. Research – Information Literacy skills: • Finding, interpreting, judging, and creating information. **Learner Profile** Openminded Principled	Find the value of the discriminant and find the nature of the roots. Frame the quadratic equation for the given roots Solve the quadratic equation graphically Solve the quadratic equation by factorization.	Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts
Unit 3 – How do functions function? 6 weeks	Form	Generalization	Identities and relationships Exploration: Competition and cooperation; teams, affiliation and leadership	Relationships can be identified by generalizing data into various models and forms, which allows us to solve and predict these real-world relationships.	Self management – Reflection skills: • Considering the process of learning; choosing and using ATL skills: • Identify strengths and weaknesses of personal learning strategies (self – assessment) Communication skills: • Make effective summary notes for studying. Self management – Organization skills: • Use appropriate strategies for organizing complex information. **Learner Profile** **Inquirer**	Standard: Identify function from relations Evaluate a fumction Represent real-life situations using functions, including piece wise functions Investigate the Quintic – power of 5 Solve the exponential equations Identify different forms of function Evaluate Moore's law Mappings Function notation Linear functions y = mx + c (see also spatial reasoning) Parallel and perpendicular lines (see also spatial reasoning) Systems of equations/ simultaneous equations Quadratic functions Algorithms	**Summative**: Finding the functional relations Criterion C: Communicating. Criterion B: Investigating Patterns.
Unit 4 – 'What do I get by learning these things?' 6 weeks	Form	Validity	Orientation in space and time Exploration: Scale, duration, frequency and variability	Statements about the spaces and shapes around us can be validated to show they are invariant through space and time.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols. Thinking – Critical thinking skills: • Gather and organize relevant information to formulate an argument. • Analyse complex concepts and projects into their constituent parts and synthesize them to create new understanding.	Standard: Identify the parts of a circle Investigate the angle in a semi circle Investigate the angles in the same segment Investigate cyclic quadrilaterals Identify the angle between tangent and radius and tangent kite Prove and use the alternate segment theorem. Identify the circle wave Prove $Tan\ x\ = \frac{sin\ x}{cos\ x}$, Similarity and congruence Coordinate geometry, including distance, midpoint and gradient formula Gradients and intercepts (see also functions and models) Gradient of parallel lines	**Summative**: Proofs Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts

					Research – Media Literacy skills: • Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media. **Learner Profile** Thinker	Circle geometry Rotation around a given point	
Unit 5 – The only sure thing? 6 weeks	Logic	Measurement	Personal and cultural expression Exploration: Metacognition and abstract thinking	An individual's understanding of risk and chance is highly dependent on both logic and their personal experiences.	Thinking – Critical thinking skills: • Consider ideas from multiple perspectives Social – Collaboration skills: • Delegate and share responsibility for decision making. **Learner Profile** Risk taker Balanced	Standard: Identify Chance Identify the probabilities change Investigate the complementary events Investigate the theory of probability Formulate the laws of probability Differentiate the theoretical and experimental probability Represent probability as a probability tree Investigate the combinations vs permutations Sampling techniques Data manipulation and misinterpretation Lines of best fit Data processing: quartiles and percentiles Measures of dispersion: interquartile range Correlation, qualitative handling Relative frequency Response rates Probability with Venn diagrams, tree diagrams and sample spaces Mutually exclusive events Combined event	**Summative**: Wheel of fortune Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts
Unit 6 – Am I ready? 6 weeks	Relationships	Systems	Scientific and technical innovation Exploration: Opportunity, risk, consequences and responsibility	Your future relationship with mathematics will be determined by your understanding of both traditional and innovative systems.	Communication skills: • Organize and depict information logically. Thinking – Critical thinking skills: • Evaluate evidence and arguments. **Learner Profile** Knowledgeable	Standard: Getting ready for DP Solve Linear and simultaneous equations, Calculate the trigonometric values Solve quadratic equations Investigate the sieve of Eratosthenes, Represent the parabolas, Calculate the angles of polygons, Prove the Pythagorean theorem Constructions.	**Summative**: Create a beginner's guide to careful construction. Criterion A: Knowing and Understanding. Criterion B: Investigating Patterns.

MYP Mathematics

Grade 10- Extended

Unit title	Key Concept	Related concept(s)	Global context	Statement of Inquiry	ATL Skills and Learner Profile	Content and Service Learning	Summative Assessment & MYP Objectives
Unit 1 – Making the world a fairer and more equal place? 6 weeks	Logic	Quantity	Fairness and Development Exploration: Inequality, difference and inclusion	The differences between quantities can be represented by inequalities, which allows us to solve and logically address inequality in Mathematics and in life.	Communication skills: • Understand and use mathematical notation • Use and interpret a range of discipline-specific terms and symbols. Thinking – Transfer skills: • Inquire in different contexts to gain a different perspective. Self management – Affective skills: • Resilience practice 'bouncing back' after adversity, mistakes and failures; Practise 'failing well'. **Learner Profile** Caring	Extended: Ratio and Proportion Percentage change Indices Indices application Compound interest Simplify surds Combine like surds Rationalize radical expressions	**Summative**: Proving the surds Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts
Unit 2 – How many forms has a quadratic? 6 weeks	Relationships	Representation	Globalization and sustainability Exploration: Data-driven decision-making	Representing relationships visually and algebraically can allow us to find and optimize 'best case scenarios' and sustainable solutions	Self management – Reflection skills: • Consider the process of learning; choosing and using ATL skills. Communication skills: • Give and receive meaningful feedback. Research – Information Literacy skills: • Finding, interpreting, judging, and creating information. **Learner Profile** Openminded Principled	Extended: Solve quadratic equation by using three different methods. Factorization Complete square and Quadratic formula; Solve simple exponential equations by using indices rules; Multiply polynomials; Divide polynomials by longdivision and Synthetic division; Using Remainder theorem and Factor theorem; Solve polynomial equations	**Summative**: Solving using quadratic formula Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts
Unit 3 – How do functions function? 6 weeks	Form	Generalization	Identities and relationships Exploration: Competition and cooperation; teams, affiliation and leadership	Relationships can be identified by generalizing data into various models and forms, which allows us to solve and predict these real-world relationships.	Self management – Reflection skills: • Considering the process of learning; choosing and using ATL skills: • Identify strengths and weaknesses of personal learning	Extended: Finding standard deviation by definition or by GDC; Know the basic rule of Normal distribution; Find the probability of a certain set by using normal distribution; Inverse Normal distribution by using GDC	**Summative**: Functional functions Criterion C: Communicating. Criterion B: Investigating Patterns.

					strategies (self – assessment) Communication skills: • Make effective summary notes for studying. Self management – Organization skills: • Use appropriate strategies for organizing complex information. **Learner Profile** **Inquirer**		
Unit 4 – 'What do I get by learning these things?' 6 weeks	Form	Validity	Orientation in space and time Exploration: Scale, duration, frequency and variability	Statements about the spaces and shapes around us can be validated to show they are invariant through space and time.	Communication skills: • Use and interpret a range of discipline-specific terms and symbols. Thinking – Critical thinking skills: • Gather and organize relevant information to formulate an argument. • Analyse complex concepts and projects into their constituent parts and synthesize them to create new understanding. Research – Media Literacy skills: • Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media. **Learner Profile** Thinker	Extended: Find the surface area and volume of pyramid; Find the surface area and volume of cones; Find the surface area and volume of spheres; Find the ratio of area or volume between similar solids when the ratio of sides are given;	**Summative**: Can I validate my measure? Criterion A: Knowing and Understanding. Criterion D: Applying mathematics in real-life contexts
Unit 5 – The only sure thing? 6 weeks	Logic	Measurement	Personal and cultural expression Exploration: Metacognition and abstract thinking	An individual's understanding of risk and chance is highly dependent on both logic and their personal experiences.	Thinking – Critical thinking skills: • Consider ideas from multiple perspectives Social – Collaboration skills: • Delegate and share responsibility for decision making. **Learner Profile** Risk taker Balanced	Extended: Evaluate logarithm by using definition; Solve exponential equation by using logarithm; Solve logarithmic equation; Various function graphs; Transformation of function graphs; Rate of change of a function; Idea of Limit; Derivative by using First Principle	**Summative**: Logical graph Criterion C: Communicating. Criterion D: Applying mathematics in real-life contexts

Unit 6 – Am I ready? 6 weeks	Relationships	Systems	Scientific and technical innovation Exploration: Opportunity, risk, consequences and responsibility	Your future relationship with mathematics will be determined by your understanding of both traditional and innovative systems.	Communication skills: • Organize and depict information logically. Thinking – Critical thinking skills: • Evaluate evidence and arguments. **Learner Profile** Knowledgeable	Extended: Convert degree to radian; Define trigonometric ratio of all angles by using unit circle; Know the trigonometric relationship with reference angles; Find missing angles or sides by using Sine Rule; Find missing angles and sides by using cosine rule; Find the area by using sine value; Properties of sine and cosine function graph; Modelling real-life situation by using trigonometric graphs.	**Summative**: Create a beginner's guide to careful construction. Criterion A: Knowing and Understanding. Criterion B: Investigating Patterns.