IB Subject Group: Mathematics   **Course: Algebra I**   **Year: 4**

Unit title	Key concept	Related concept(s)	Global context	Statement of Inquiry	Objectives	ATL skills	Content
Solving Multi-Step Inequalities	Logic	Representation Justification	Personal & Cultural Expressions	Logic provides justification to develop a proper representation for inequalities that model entrepreneurship.	C: Communication: Students develop fluency and master writing, interpreting, and translating inequalities in one variable. D: Applying Mathematics in Real-Life context They will then use these inequalities to solve problems and make decisions in the context of real-world scenarios.	Critical-Thinking Communication	SMP 1 Make sense of problems and persevere in solving them. SMP 3 Construct viable arguments and critique the reasoning of others. SMP 6 Attend to precision. SMP 7 Look for and make use of structure. A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented. A.CED.1 Create equations and inequalities in one variable and use them to solve problems.
Characteristics of Functions	Communication	Representation Model Generalization	Personal and Cultural Expression	Communication through mathematical notations that model the representation of a real world problem allows students to explore entrepreneurship.	A: Knowing and Understanding Students apply their knowledge of characteristics of functions and their notation. C: Communication: Students develop skills to communicate properties of functions using proper notation (i.e. f(x), representing domain and range	Critical-Thinking-Students will be expected to create a function to model the relationship between total cost and quantity of a chosen clothing item. Communication-Students express their business model using proper function notation, as well as describe the characteristics of their function using mathematical vocabulary, such as	8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). F.IF.2 Use function notation, evaluate functions for inputs in their domains, and

					using inequalities, etc.) D: Applying Mathematics in Real-Life context	domain, range, independent/dependent variables, etc.	interpret statements that use function notation in terms of a context.
Quadratic Relationships	Creativity	Representation, Generalization	Personal and Cultural Expression	People use creativity to explore quadratic relationships and to generalize characteristics of quadratics through personal and cultural expression.	A: Knowing and Understanding Students apply their knowledge of characteristics of quadratic functions, including their notation and solving. C: Communication: Students develop skills to communicate properties of quadratic functions using proper notation (i.e. f(x), representing domain and range using inequalities, etc.) and communicate solutions of quadratic functions using proper vocabulary (i.e. roots, zeros, solutions, etc.) D: Applying Mathematics in Real-Life context	Critical-Thinking- Students will be expected to create a song, rap, poem, book, etc. describing the characteristics of a quadratic functions and how to solve them. Communication- Students express their understanding using their culture and creativity..	8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Statistics	Connections	Measurement, Model	Identities and Relationships	Using statistics to make connections of the measures of central tendency and models in the real world to explore statistical relationships with real world data.	A: Knowing and Understanding	Critical-Thinking-	8.F.5 Describe
					They will interpret graphical representations of solutions to quadratic functions.		
Statistics	Connections	Measurement, Model	Identities and Relationships	Using statistics to make connections of the measures of central tendency and models in the real world to explore statistical relationships with real world data.	A: Knowing and Understanding Students apply their knowledge of the measures of central tendency to describe a set of data. C: Communication: Students develop skills to communicate next steps for the M&M D: Applying Mathematics in Real-Life context	Critical-Thinking- Students will complete a Stats Lab with M&Ms to find the measures of central tendency and use this information to describe the data. Communication- Using the results of the lab, students will reflect on the results individually to determine next steps for the M&M company.	8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

IB Subject Group: Mathematics   Course: Geometry   Year: 4/5

Unit title	Key concept	Related concept(s)	Global context	Statement of Inquiry	Objectives	ATL skills	Content
Constructions, Congruence, and Transformations	Aesthetics	Generalization Justification Space	Orientation of time and space	Students will explore aesthetics and logic in order to generalize and justify the representations and use of constructions, congruence, and transformations in space.	Criterion A (All strands) Criterion D (All strands)	Thinking Skills IV. Critical Thinking • Use prioritization and order of precedence in problem-solving Communication Skills I. Communication • Organise and interpret data using mathematical tools (compasses)	• Geometry vocabulary • Constructions • Transformations • Triangle Congruence
Similarity, right triangles and trigonometry	Form	Congruence Similarity	Identity and Relationships	The relationships between forms produce examples of congruence and similarity.	Criteria B (All strands) Criterion C (All strands)	Thinking Skills IV.Critical Thinking • Use prioritization and order of precedence in problem-solving	Dilations Similarity Pythagorean theorem Right triangle trigonometry Law of sines/cosines
Area and Volume	Relationships	Justification Representation Simplification	Scientific and technological innovation	Students will analyze and interpret the relationship between two dimensional and three dimensional figures.	Criteria B and C	Thinking Skills • Critical Thinking Use prioritization and order of precedence in problem-solving Communication • Communication	Area/perimeter of 2D shapes Area of composite shapes Cross sections-- 2D→ 3D figures Volume of 3D figures Volume of composite 3D figures Volume application problems

| Circles, Coordinate Geometry and Conic Sections | Relationships | Justification Representation Simplification | Scientific and technological innovation | Students will analyze and interpret the relationship between arcs and the angles the intercept, as well as the relationship between points of concurrency and their respective triangles and circles. | Criteria A and D | Thinking Skills

● Critical Thinking

Use prioritization and order of precedence in problem-solving

Communication

● Communication

Organize and interpret data using mathematical tools (compasses) | Circles, arcs and angles

Points of concurrency

Coordinate geometry

Conic sections |

IB Subject Group: Mathematics   Course: Algebra II   Year: 5

Unit title	Key concept	Related concept(s)	Global context	Statement of Inquiry	Objectives	ATL skills	Content
Functions and Their Inverses	Change	Representation Pattern Model	Scientific & Technological Innovation	Representations, patterns, and models can be used to transform functions through an inquiry into scientific and technological innovation.	Criterion C all	SELF-MANAGEMENT III. Organisation ● Given a function, identify the key features in order to graph it. COMMUNICATION I. Communication ● Students will represent a function using words, graphs and equations.	Graph exponential functions expressed symbolically and show key features of the graph. Determine an equation for an exponential or logarithmic function from a table of values. Apply knowledge of exponential and logarithmic functions to a contextual situation

Polynomial and Rational Functions	Global interaction	Justification and Modeling	Fairness and Development	Students will create and justify a model that fosters fairness and development through global interaction.	Criterion A i - ii B: i - iii D: i - v	RESEARCH VI. Information Literacy ● Make connections between scientific research and related moral, ethical, social, economic, political, cultural or environmental factors VIII. Media Literacy ● Use a variety of technologies and media platforms, including social media and online networks, to source information	-Investigate charitable organizations to find one that supports your values -Compare your chosen charity to other with a similar goal. -Justify your choice based on your personal values -Apply knowledge of interest to choose the best funding mechanism
Trigonometric Functions	Relationships	Model/Change	Scientific and Technical Innovation	Modeling the scientific relationships between length, torque and angular placement can demonstrate the resulting change in force.	Criterion A: All strands Criterion D: All strands		F-TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. SLT 9: Use the sine and cosine functions to model real-world phenomena
Statistics and Mathematical Modeling	Logic	Pattern	Scientific and Technical Innovation	Establishing patterns in the natural world can help in	OBJECTIVE B: INVESTIGATI	COMMUNICATION: Communication Skills THINKING: Critical-thinking Skills	-Investigate different phenomena in nature to identify normal distributions -Compare normal distributions to non-normal.

				understanding relationships	NG PATTERNS OBJECTIVE C: COMMUNICATING		-Justify your analysis of distributions -Apply this analysis to determine what to do if a distribution isn't normal.