wGrade 8 Mathematics
Units of Study

UNIT 1:	Number: Discoveries and Developments	Start: August	Duration: 6 weeks

- **Concepts:** Form, representation, simplification, quantity
- **Subject Specific Skills**: Introduction to number classification, rational and irrational numbers, exponents, scientific notation
- **Learning Experiences**: Students will inquire into discoveries and developments in number. They will investigate how numbers are classified, select appropriate operations to solve problems involving integers, rational and irrational numbers and investigate how scientific notation is used to make numbers and quantities easier to comprehend.

UNIT 2:	Linear Relationships: Impact of Human Decision Making	Start: October	Duration: 6 weeks

- **Concepts:** Relationships, change, model, representation
- **Subject Specific Skills**: Introducing linear relationships, graphing linear relationships, algebraic representations of linear relationships
- **Learning Experiences**: Students will learn about linear relationships through inquiring into the impacts of human decision-making.

UNIT 3:	Geometric Transformations: Expressing beliefs and values	Start: December	Duration: 5 Weeks

- **Concepts:** Form, space, pattern
- **Subject Specific Skills**: Reflection, translation and rotation of points and shapes on a Cartesian plane, similarity, dilations
- **Learning Experiences**: Students will investigate the various types of transformations and what makes a pattern.

UNIT 4:	Expressions and Equations: Linear Systems	Start: February	Duration: 7 weeks

- **Concepts:** Relationships, model, representation
- **Subject Specific Skills**: Solving multi-step linear equations, solving systems of two linear equations
- **Learning Experiences**: Students will investigate systems of equations in real-world contexts, such as describing the break-even point of a business.

UNIT 5:	Geometry: Pythagoras and 3D shapes	Start: April	Duration: 5 weeks

- **Concepts:** Relationships, generalization, measurement
- **Subject Specific Skills**: Pythagorean Theorem, volume and surface area of prism, cylinders, spheres, cones, and pyramids
- **Learning Experiences**: Students will understand relationships between measurements and how it can help analyze logically and create products, processes, and solutions.

UNIT 6:	Bivariate Data: Uncovering Relationships	Start: May	Duration: 4 weeks

- **Concepts:** Relationships, quantity, model
- **Subject Specific Skills**: Scatter plots and lines of best fit, two-way tables for categorical data
- **Learning Experiences**: Students will learn about bivariate data, analysing bivariate data, scatter plots, and correlation through an inquiry about uncovering relationships.

Grade 8 Mathematics
Unit 1 - Number: Discovery and Developments

Start: August   **Duration:** 6 Weeks

LEARNING EXPERIENCES: Students will inquire into discoveries and developments in number. They will investigate how numbers are classified, select appropriate operations to solve problems involving integers, rational and irrational numbers and investigate how scientific notation is used to make numbers and quantities easier to comprehend.

KEY CONCEPT: Form	Related Concepts / Subject Specific: representation, simplification, quantity

STATEMENT OF INQUIRY:	Representing quantities in different forms can lead to remarkable discoveries and developments.

INQUIRY QUESTIONS:	
Factual:	What is a quantity? What are the laws of exponents?
Conceptual:	How are the quantities represented in different forms? How does simplification lead to equivalent forms?
Debatable:	What does it take to make the next great discovery? Are great discoveries planned or accidental?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: **Knowing and understanding**	Select appropriate mathematics when solving problems in both familiar and unfamiliar situations, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts
B: **Investigating patterns**	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: **Communicating**	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations, use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: **Applying mathematics in real-life contexts**	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	Self-management: Organization & Affective skills

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapter 1
- Haese & Harris, Grade 8. Chapter 1, 8 & 9

SUMMATIVE ASSESSMENT TASKS:
1. Criterion B : Investigating patterns in exponents

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Grade 8 Mathematics
Unit 2 - Linear Relationships: Impact of human decision-making

Start: October

Duration: 6 Weeks

LEARNING EXPERIENCES: Students will learn about linear relationships through inquiring into the impacts of human decision-making.

KEY CONCEPT: Relationships	Related Concepts / Subject Specific: Change, model, representation

STATEMENT OF INQUIRY:	Representing patterns of change as relationships can help determine the impact of human decision-making on the environment.

INQUIRY QUESTIONS:	
Factual:	What is a pattern? What is slope?
Conceptual:	How can you represent changing relationships? What makes a good representation?
Debatable:	How does human decision-making affect the environment? How are we held accountable for our decision?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: Knowing and understanding	Select appropriate mathematics when solving problems in both familiar and unfamiliar situations, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts.
B: Investigating patterns	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: Communicating	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written Explanations, use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: Applying mathematics in real-life contexts	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	Communication Skills: Information and literacy skills.

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapter 3
- Haese & Harris: Grade 8. Chapter 13

SUMMATIVE ASSESSMENT TASKS:
1. Criteria C & D. Report on a global issue using given data

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Grade 8 Mathematics
Unit 3 - Geometric Transformations: Expressing beliefs and values

Start: December   **Duration:** 5 Weeks

LEARNING EXPERIENCES: Students will investigate the various types of transformations and what makes a pattern.	

KEY CONCEPT: Form	**Related Concepts / Subject Specific:** Space, pattern

STATEMENT OF INQUIRY:	And understanding of patterns created by forms in space can enhance creativity and help express beliefs and values.

INQUIRY QUESTIONS:	
Factual:	What are the different types of transformations? What defines a pattern?
Conceptual:	How are patterns created by different forms in space?
Debatable:	What enhances creativity? How do we express culture, beliefs, and values?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: Knowing and understanding	Select appropriate mathematics when solving problems in both familiar and unfamiliar situations, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts.
B: Investigating patterns	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: Communicating	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations. Use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: Applying mathematics in real-life contexts	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	Research and Thinking skills: information literacy and critical thinking

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapters 2 and 6
- Haese & Harris: Grade 8. Chapter 16

SUMMATIVE ASSESSMENT TASKS:
1. Criterion A: Knowledge & Understanding

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Grade 8 Mathematics
Unit 4 - Expressions and Equations: Linear Systems

Start: February   **Duration:** 7 Weeks

LEARNING EXPERIENCES: Students will investigate systems of equations in real-world contexts, such as describing the break-even point of a business.

KEY CONCEPT: relationships	Related Concepts / Subject Specific: Model, representation

STATEMENT OF INQUIRY:	Representing relationships with models can support and promote social entrepreneurship.

INQUIRY QUESTIONS:	
Factual:	What is a linear system? What does it mean to break even?
Conceptual:	How are relationships represented with models?
Debatable:	What is our responsibility to those in our community and other communities?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: Knowing and understanding	Select appropriate mathematics when solving problems in both familiar and unfamiliar situations, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts.
B: Investigating patterns	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: Communicating	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written Explanations, use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: Applying mathematics in real-life contexts	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	TBC

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapter 7
- Haese & Harris: Grade 8. Chapters 2, 6, 11, 14

SUMMATIVE ASSESSMENT TASKS:
1. Criteria C & D. Analyze a real-world problem using systems of equations.

Grade 8 Mathematics
Unit 5 - Geometry: Pythagoras and 3D Shapes

Start: April

Duration: 5 Weeks

LEARNING EXPERIENCES: Students will understand relationships between measurements and how it can help analyze logically and create products, processes, and solutions.

KEY CONCEPT: Relationships	Generalization, Measurement

STATEMENT OF INQUIRY:	Understanding relationships between measurements can help analyze logically and create products, processes, and solutions.

INQUIRY QUESTIONS:	
Factual:	What is volume? What is surface area?
Conceptual:	How are surface area and volume related? How do we generalize relationships between measurements?
Debatable:	What makes for an ingenious solution? How can a product solve a problem?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: Knowing and understanding	Select appropriate mathematics when solving problems in both familiar and unfamiliar situations, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts.
B: Investigating patterns	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: Communicating	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written Explanations, use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: Applying mathematics in real-life contexts	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	Thinking: critical thinking and transfer skills

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapters 2 and 4

SUMMATIVE ASSESSMENT TASKS:
1. Criterion A: Knowledge & Understanding
2. Criterion B: Investigating Pythagorean Patterns

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Grade 8 Mathematics
Unit 6 - Bivariate Data: Uncovering Relationships

Start: May   **Duration:** 4 Weeks

LEARNING EXPERIENCES: Students will learn about bivariate data, analysing bivariate data, scatter plots, and correlation through an inquiry about uncovering relationships.

KEY CONCEPT: Relationships	Related Concepts / Subject Specific: Quantity, model

STATEMENT OF INQUIRY:	Modeling quantities can highlight the relationship between them.

INQUIRY QUESTIONS:	
Factual:	What is a model? What is correlation?
Conceptual:	How are relationships modelled? How does correlation relate to causation?
Debatable:	How can the human experience be quantified?

OBJECTIVES AND ASSESSMENT CRITERIA:	
A: Knowing and understanding	Select appropriate mathematics when solving problems in both familiar and unfamiliar situation, apply the selected mathematics successfully when solving problems, solve problems correctly in a variety of contexts
B: Investigating patterns	Select and apply mathematical problem-solving techniques to discover complex patterns, describe patterns as relationships and/or general rules consistent with findings, verify and justify relationships and/or general rules.
C: Communicating	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written Explanations, use appropriate forms of mathematical representation to present information, move between different forms of mathematical representation, communicate complete and coherent mathematical lines of reasoning, organize information using a logical structure.
D: Applying mathematics in real-life contexts	Identify relevant elements of authentic real-life situations, select appropriate mathematical strategies when solving authentic real-life situations, apply the selected mathematical strategies successfully to reach a solution, explain the degree of accuracy of a solution, explain whether a solution makes sense in the context of the authentic real-life situation.

ATLs:	TBC

RESOURCES / LITERATURE OPTIONS:
- MYP Mathematics: A Conceptual Approach, Book 3. Chapter 5

SUMMATIVE ASSESSMENT TASKS:
1. Criteria C & D: Relationships in sports and fitness