

# Grade 7 Mathematics

## Units of Study

<b>UNIT 1:</b>	<b>Integers: What's my sign?</b>	<b>Start: August</b>	<b>Duration: 6 Weeks</b>
<ul style="list-style-type: none"> <li>● <b>Concepts:</b> Form, representation and quantity</li> <li>● <b>Subject Specific Skills:</b> Operations with integers; Using inverses to understand positive and negative numbers; Absolute values; The coordinate grid; Multiplication and division of integers; Addition and subtraction and Multiple operations with integers.</li> <li>● <b>Learning Experiences:</b> In this unit, students will look at how humans have explored the number system, specifically integers. They will ask questions that could be explored using Mathematics and apply strategies to real-life situations. They will communicate their ideas using mathematical terminology, notation, symbols, diagrams, texts and tables.</li> </ul>			
<b>UNIT 2:</b>	<b>Ratios, Rates, and Proportions: Healthy Competition</b>	<b>Start: October</b>	<b>Duration: 6 Weeks</b>
<ul style="list-style-type: none"> <li>● <b>Concepts:</b> Logic, equivalence, quantity and simplification</li> <li>● <b>Subject Specific Skills:</b> Computing ratios and unit rates; Exploring proportional relationships; Exploring proportional relationships on graphs; Identify the constant of proportionality; Represent proportional relationships with equations; Solve multi-step ratio and percentage problems; Use proportional relationships to understand linear equations.</li> <li>● <b>Learning Experiences:</b> In this unit, students will explore and analyze competitions using rates, ratios and proportions investigating the role of reasoning in mathematical relationships.</li> </ul>			
<b>UNIT 3:</b>	<b>Data: Is fair always equal?</b>	<b>Start: November</b>	<b>Duration: 4 Weeks</b>
<ul style="list-style-type: none"> <li>● <b>Concepts:</b> Form and validity</li> <li>● <b>Subject Specific Skills:</b> Sampling methods; Random sampling; Draw inferences about data; Measures of central tendency (mean, median, mode); The effect of outliers; Measures of dispersion (range and quartiles); Statistical inquiry; Types of data (discrete, continuous, numerical, ordinal); Data collection and generation; Using graphs and infographics to display and interpret data.</li> <li>● <b>Learning Experiences:</b> In this unit, students will learn to analyze data provided by various resources, to determine the difference between equality and equity. They will use statistical diagrams and calculations to think critically, but fairly.</li> </ul>			
<b>UNIT 4:</b>	<b>Geometrocity: Building a city with geometry</b>	<b>Start: January</b>	<b>Duration: 8 Weeks</b>
<ul style="list-style-type: none"> <li>● <b>Concepts:</b> Relationships and generalization</li> <li>● <b>Subject Specific Skills:</b> Area and circumference of circles; Area and perimeter of triangles and quadrilaterals; Volume and surface area of cubes and right prisms; Working with scale drawings; Construct triangles; Understand the relationship between slicing three-dimensional figures and two-dimensional figures; Angle facts (complementary, supplementary, vertical and adjacent)</li> <li>● <b>Learning Experiences:</b> In this project-based unit, students will explore human and natural landscapes, in order to design, measure and create their own three-dimensional city.</li> </ul>			
<b>UNIT 5:</b>	<b>Algebra: A piece of the puzzle</b>	<b>Start: March</b>	<b>Duration: 7 Weeks</b>
<ul style="list-style-type: none"> <li>● <b>Concepts:</b> Form, equivalence, and simplification</li> <li>● <b>Subject Specific Skills:</b> Classifying algebraic expressions; Simplifying expressions; Writing expressions; Solving equations; Linear relationships and patterns; Writing algebraic rules given patterns; Writing equations; Application of equations; Representing inequalities and Solving inequalities.</li> <li>● <b>Learning Experiences:</b> In this unit, students will look at a variety of patterns and puzzles, and learn how to justify the relationships they discover.</li> </ul>			

- **Concepts:** Logic, representation and systems
- **Subject Specific Skills:** Understanding the probability of an event; Representing the sample space using lists, two-way tables and tree diagrams; Defining and representing probability; Calculating probability; Complementary events; Theoretical versus experimental probability; Designing a probability simulation
- **Learning Experiences:** In this unit, students will look at how the world of games and play is based on probability. They will be able to solve probability problems involving both simple and compound events.

# Grade 7 Mathematics

## Unit 1: What's my sign?

**Start:** August

**Duration:** 6 Weeks

**LEARNING EXPERIENCES:** In this unit, students will look at how humans have explored the number system, specifically integers. They will ask questions that could be explored using Mathematics and apply strategies to real-life situations. They will communicate their ideas using mathematical terminology, notation, symbols, diagrams, texts and tables.

**KEY CONCEPT:** Form

Related Concepts: Representation and Quantity.

**STATEMENT OF INQUIRY:**

Being able to represent different forms of quantities has helped humans explore and describe our planet.

**INQUIRY QUESTIONS:**

**Factual:**

How can we represent a number less than zero on a number line?  
How do we add integers?

**Conceptual:**

How do we visually represent negative numbers?  
How are different forms of numbers represented?

**Debatable:**

Can something be worth less than zero?

**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**

Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.

**C: Communicating**

Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate 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. Describe whether a solution makes sense in the context of the authentic real-life situation.

**ATLs:**

Communication  
Thinking

### RESOURCES / LITERATURE OPTIONS:

- MYP Mathematics book 2. Chapter 3.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

### SUMMATIVE ASSESSMENT TASKS:

1. Criterion A: Knowing and understanding - unit test
2. Criterion B & C: Investigating patterns in integers

# Grade 7 Mathematics

## Unit 2: Healthy Competition

**Start:** October

**Duration:** 6 Weeks

**LEARNING EXPERIENCES:** In this unit, students will explore and analyze competitions using rates, ratios and proportions.

**KEY CONCEPT:** Logic

Related Concepts: Equivalence, Quantity, Simplification.

**STATEMENT OF INQUIRY:**

Using a logical process to simplify quantities and establish equivalence can help analyse competition and cooperation

**INQUIRY QUESTIONS:**

**Factual:**

What is a ratio?  
What is a proportion?  
What strategies can I use to show proportion?

**Conceptual:**

How can you establish equivalence?  
How are simplification and equivalence related?

**Debatable:**

What makes for fair and healthy competition?

**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**

Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.

**C: Communicating**

Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate 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. Describe whether a solution makes sense in the context of the authentic real-life situation.

**ATLs:**

Information literacy  
Critical thinking

### RESOURCES / LITERATURE OPTIONS:

- MYP Mathematics 2: Oxford University Press.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

### SUMMATIVE ASSESSMENT TASKS:

1. Criterion A: Knowing and understanding.
2. Criterion C & D: The Proportional Olympic Games

# Grade 7 Mathematics

## Unit 3: Is fair always equal?

**Start:** November

**Duration:** 4 Weeks

**LEARNING EXPERIENCES:** In this unit, students will learn to analyze data provided by various resources, to determine the differences between equality and equity. They will use statistical diagrams and calculations to think critically, but fairly.

<b>KEY CONCEPT:</b> Relationships	Related Concepts: representation and validity
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<b>STATEMENT OF INQUIRY:</b>	Different forms of representation can help provide valid conclusions regarding access to equal opportunities
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<b>INQUIRY QUESTIONS:</b>	
<b>Factual:</b>	How are averages of a data set calculated? How do we represent information? What strategies do we use to compare data sets?
<b>Conceptual:</b>	What makes a form of representation effective? What are the strengths and weaknesses of numerical data?
<b>Debatable:</b>	How can we use information to instigate change and make a difference?

<b>OBJECTIVES AND ASSESSMENT CRITERIA:</b>	
<b>A: Knowing and understanding</b>	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>B: Investigating patterns</b>	Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.
<b>C: Communicating</b>	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate coherent mathematical lines of reasoning. Organize information using a logical structure.
<b>D: Applying Mathematics in real-life contexts</b>	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. Describe whether a solution makes sense in the context of the authentic real-life situation.

<b>ATLs:</b>	Communication Information literacy Critical thinking
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**RESOURCES / LITERATURE OPTIONS:**

- MYP Mathematics 2: Oxford University Press.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

**SUMMATIVE ASSESSMENT TASKS:**

1. Criterion C & D: Dollar Street

# Grade 7 Mathematics

## Unit 4: Geometrocity

**Start:** January

**Duration:** 8 Weeks

**LEARNING EXPERIENCES:** In this project-based unit, students will explore human and natural landscapes, in order to design, measure and create their own three-dimensional city.

**KEY CONCEPT:**  
Relationships

Related Concepts: Measurement and Generalization.

**STATEMENT OF INQUIRY:**

Generalizing relationships between measurements can help explore the formations of human and natural landscapes.

**INQUIRY QUESTIONS:**

**Factual:**

How do we measure the area, circumference, surface area and volume of a figure?  
Are all triangles created equal?  
How do we measure composite shapes?

**Conceptual:**

How do basic geometric principles allow us to combine form and function in art and architecture?  
How do two-dimensional shapes relate to three-dimensional shapes?  
How are circles different from polygons?  
What general rules can we find for objects?

**Debatable:**

In designing buildings or outdoor spaces, should maximising area always be the primary consideration?

**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**

Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.

**C: Communicating**

Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate 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. Describe whether a solution makes sense in the context of the authentic real-life situation.

**ATLs:**

Organization  
Collaboration  
Thinking

### RESOURCES / LITERATURE OPTIONS:

- MYP Mathematics book 2. Chapter 5.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

### SUMMATIVE ASSESSMENT TASKS:

1. Criterion C & D: Geometrocity Project
2. Criterion A: Knowing and understanding

# Grade 7 Mathematics

## Unit 5: A piece of the puzzle

**Start:** March

**Duration:** 7 Weeks

**LEARNING EXPERIENCES:** In this unit, students will look at a variety of patterns and puzzles, and learn how to justify the relationships they discover.

**KEY CONCEPT:** Form      Related Concepts: equivalence, simplification, justification

**STATEMENT OF INQUIRY:** Producing equivalent forms through simplification can help to justify, solve and create puzzles and tricks.

**INQUIRY QUESTIONS:**

**Factual:**

What is a variable?  
How do you solve an algebraic equation?  
What does it mean to simplify?

**Conceptual:**

Why is there a logical system to simplify mathematical expressions?  
What does it mean to be equivalent?  
How does simplification produce equivalent forms?

**Debatable:**

Does every puzzle have a solution?

**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**

Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.

**C: Communicating**

Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate 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. Describe whether a solution makes sense in the context of the authentic real-life situation.

**ATLs:**

Communication  
Critical thinking

**RESOURCES / LITERATURE OPTIONS:**

- MYP Mathematics 2: Oxford University Press - Chapter 5.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

**SUMMATIVE ASSESSMENT TASKS:**

1. Criterion A: Knowing & understanding.
2. Criterion B & C: Investigating patterns in puzzles



# Grade 7 Mathematics

## Unit 6: Will it happen?

**Start:** May

**Duration:** 6 Weeks

**LEARNING EXPERIENCES:** In this unit, students will look at how the world of games and play is based on probability. They will be able to solve probability problems involving both simple and compound events.

**KEY CONCEPT:** Logic      Related Concepts: system and representation.

**STATEMENT OF INQUIRY:** A logical system of representation can help explore and analyze games that humans play

### INQUIRY QUESTIONS:

#### Factual:

What makes something logical?  
What are the different ways of representing a sample space?  
How do you calculate the probability of an event?

#### Conceptual:

How can logic be used with different representations?  
How can you represent the likelihood of an event occurring?  
What are the advantages and disadvantages of the different probability representations?

#### Debatable:

Can winning be calculated or is it luck?

### OBJECTIVES AND ASSESSMENT CRITERIA:

<b>A: Knowing and understanding</b>	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>B: Investigating patterns</b>	Apply mathematical problem-solving techniques to recognize patterns. Describe patterns as relationships or general rules consistent with correct findings. Verify whether the pattern works for other examples.
<b>C: Communicating</b>	Use appropriate mathematical language (notation, symbols and terminology) in both oral and written statements. Use different forms of mathematical representation to present information. Communicate coherent mathematical lines of reasoning. Organize information using a logical structure.
<b>D: Applying Mathematics in real-life contexts</b>	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. Describe whether a solution makes sense in the context of the authentic real-life situation.

#### ATLs:

Critical thinking  
Organization  
Communication

### RESOURCES / LITERATURE OPTIONS:

- MYP Mathematics 2: Oxford University Press.
- International Mathematics for the Middle Years 2: Pearson.
- Mathematics 7 for the International Student MYP 2: Haese & Harris.

### SUMMATIVE ASSESSMENT TASK:

1. Criterion C & D: Investigating the game of SKUNK