

Grade 7 Mathematics

Units of Study

UNIT 1:	Trust your numbers	Start: August	Duration: 4 Weeks
<ul style="list-style-type: none"> ● Concepts: Logic, Quantity and Representation. ● Subject Specific Skills: Review operations with fractions; Converting between fractions, decimals, and percentages; Percentage increase and decrease; Finding amounts of quantities; Solving application questions involving fractions and percentages. ● Learning Experiences: In this unit, students will explore how logic can support making informed decisions. Students will also use models to represent different relationships, which will further support their decision-making processes. Students will apply their skills to a variety of situations involving decision-making around vacation planning and budgeting. 			
UNIT 2:	Stay in shape	Start: September	Duration: 6 Weeks
<ul style="list-style-type: none"> ● Concepts: Relationships, Generalization and Measurement ● Subject Specific Skills: Converting measurements; Area of a trapezium; Area of regular polygons; Circumference and area of circles; Surface area of regular prisms; Volume of rectangular prisms and Volume of other prisms. ● Learning Experiences: In this unit, students will look at how human and natural landscapes are based on geometry. They will see how Architects use geometry to study and divide space as well as draft detailed building plans and see how land is naturally divided into geometrical shapes. 			
UNIT 3:	What's my sign?	Start: November	Duration: 5 Weeks
<ul style="list-style-type: none"> ● Concepts: Form, Representation and Quantity. ● Subject Specific Skills: What is an integer?; Absolute value; The coordinate grid; Multiplication and division of integers; Addition and subtraction and Multiple operations with integers. ● 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. 			
UNIT 4:	Healthy Competition	Start: January	Duration: 6 Weeks
<ul style="list-style-type: none"> ● Concepts: Relationships, Equivalence, Quantity, Simplification. ● Subject Specific Skills: defining and simplifying ratios, proportion and demonstrating proportional relationships, dividing a quantity in a given ratio, solve problems using proportional reasoning, defining rate and unit rate, solve problems using rates and unit rates ● Learning Experiences: In this unit, students will see that being able to manipulate quantities, simplify them and represent them in a variety of ways is one tool that can be used to uncover everything from far-off galaxies to the tiniest of environments. 			
UNIT 5:	Class rules	Start: March	Duration: 5 Weeks
<ul style="list-style-type: none"> ● Concepts: Form, Pattern and Justification. ● Subject Specific Skills: Classifying algebraic expressions; Simplifying expressions; Writing expressions; Solving equations; Writing equations; Application of equations; Representing inequalities and Solving inequalities. ● Learning Experiences: In this unit, students will look at a variety of patterns and puzzles, and learn how to justify the relationships they discover. 			

UNIT 6:	Will it happen?	Start: April	Duration: 4 Weeks
<ul style="list-style-type: none"> ● Concepts: Logic, Representation and Model ● Subject Specific Skills: Events and outcomes; Representing the sample space; Defining and representing probability; Calculating probability; Complementary event; Theoretical versus experimental probability and Simulations. ● 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 simple events. 			

UNIT 7:	Is it equal?	Start: May	Duration: 4 Weeks
<ul style="list-style-type: none"> ● Concepts: Relationships, Representation and Justification. ● Subject Specific Skills: Stem-and-leaf plots; Measures of central tendency (mean, median, mode); The effect of outliers; Measures of dispersion (range and quartiles) and Box and whisker plots. ● Learning Experiences: In this unit, students will learn to analyse univariate data provided by government sources, to determine whether equal pay or equal opportunities are being enforced by major companies. They will use statistical diagrams and calculations to think critically, but fairly. 			

Grade 7 Mathematics

Unit 1: Trust your Numbers

Start: August

Duration: 4 Weeks

LEARNING EXPERIENCES: In this unit, students will explore how logic can support making informed decisions. Students will also use models to represent different relationships, which will further support their decision-making processes. Students will apply their skills to a variety of situations involving decision-making around vacation planning and budgeting.

KEY CONCEPT: Logic

Related Concepts / Subject Specific: Quantity and Representation.

STATEMENT OF INQUIRY:

Decision-making can be improved by using a model to represent relationships.

INQUIRY QUESTIONS:

Factual:

What is a percentage? How do we perform operations with fractions?

Conceptual:

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

Debatable:

What makes for healthy and fair competition?
Which is more about being equal, competition or cooperation? Explain.

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:

Self-Management: organizational skills & Research: information & literacy skills.

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: Knowledge and Understanding
2. Criteria C & D. Real-life application: plan a budget for a holiday trip.

Grade 7 Mathematics

Unit 2: Probability

Start: September

Duration: 5 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 simple events.

KEY CONCEPT: Relationships Related Concepts: Justification and Representation.

STATEMENT OF INQUIRY: Statistical representations can be used to describe and justify relationships.

INQUIRY QUESTIONS:

Factual:

What are the measures of central tendency and how are they calculated?
What are the different ways of representing a sample space?
How do you calculate the probability of an event?

Conceptual:

How can the measures of central tendency be used to describe and analyse data?
What are the advantages and disadvantages of the different probability representations?

Debatable:

Can the method of collecting data affect the outcome of the analysis?
Does randomness affect the decisions we make?

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: Research

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: Communicating.
2. Criterion D: Applying Mathematics in real-life contexts.

Grade 7 Mathematics

Unit 2: Stay in Shape

Start: September

Duration: 6 Weeks

LEARNING EXPERIENCES: In this unit, students will look at how human and natural landscapes are based on geometry. They will see how architects use geometry to study and divide space as well as draft detailed building plans and see how land is naturally divided into geometrical shapes.

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 area, perimeter, diameter and circumference?
Are all triangles created equal? How do we measure what is inside a shape?

Conceptual:

How do area and perimeter relate to one another? How do basic geometric principles allow us to combine form and function in art and architecture? What difference does a degree make? How are circles different from polygons? What general rules can we find for objects?

Debatable:

Can everything be broken down into basic shapes? In designing buildings or outdoor spaces, should maximising area always be the primary consideration? Do we need to understand shapes to innovate?

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: collaborative skills.

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: Communicating.
2. Criterion D: Applying Mathematics in real-life contexts.

Grade 7 Mathematics

Unit 3: Integers

Start: November

Duration: 5 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 something less than zero?

Conceptual:

How do we visually represent negative numbers?
How are different quantities represented?

Debatable:

Are real numbers commonly whole numbers?

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

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.
2. Criterion B: Investigating pattern.
3. Criterion C: Communicating.

Grade 7 Mathematics

Unit 4: Ratios & Proportion - Healthy Competition

Start: January

Duration: 6 Weeks

LEARNING EXPERIENCES: In this unit, students will see that being able to manipulate quantities, simplify them and represent them in a variety of ways is one tool that can be used to uncover everything from far-off galaxies to the tiniest of environments.

KEY CONCEPT:
Relationships

Related Concepts: Equivalence, Quantity, Simplification.

STATEMENT OF INQUIRY:

Simplifying quantities and understanding equivalent relationships between different forms of representations can help me make logical decisions.

INQUIRY QUESTIONS:

Factual:

What is a ratio? What is a proportion?
What is a rate? What does it mean to be equivalent?

Conceptual:

How can you establish equivalence? How are simplification and equivalence related?
What does it mean to simplify?

Debatable:

What makes for healthy and fair competition?
Which is more about being equal, competition or cooperation?
How are relationships of equivalence established?

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

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: Knowing and understanding.
2. Criterion B: Investigating patterns.

Grade 7 Mathematics

Unit 6: Class Rules

Start: March

Duration: 5 Weeks

LEARNING EXPERIENCES: In this unit, students will look at how human-made systems are interconnected through rates. They will see how humans use exchange rates to trade goods and services.

KEY CONCEPT: Form

Related Concepts: Equivalence, Simplification.

STATEMENT OF INQUIRY:

Producing equivalent forms through simplification can help to clarify, 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:

Do you have to simplify an equation before solving it?
Does every puzzle have a solution? Can every trick be explained?

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:

Social

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: Knowledge & Understanding.
2. Criterion B & C: Finding patterns in a 10 x 10 number square.

Grade 7 Mathematics

Unit 7: Univariate Data

Start: April

Duration: 5 Weeks

LEARNING EXPERIENCES: In this unit, students will learn to analyse univariate data provided by government sources, to determine whether equal pay or equal opportunities are being enforced by major companies. They will use statistical diagrams and calculations to think critically, but fairly.

KEY CONCEPT:
Relationships

Related Concepts: Representation and Justification.

STATEMENT OF INQUIRY:

Representing data visually helps to identify relationships that can justify global decisions.

INQUIRY QUESTIONS:

Factual:

How are statistical variables different from algebraic variables?

Conceptual:

Who needs data?
Is data just a list of numbers?
What sort of stories can the data tell us?

Debatable:

Can everyone understand data?
Can data provide answers to global problems?
Can graphs lie?

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:

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: Communicating.