



Grade 7 General Stream (Reveal) Scheme of Work, Term 1, Academic Year 2022-2023

Purpose

- to define the **required** Elite Stream Mathematics Student Learning Outcomes to be covered during the term for this grade;
- to **recommend** the pace at which the Student Learning Outcomes are to be covered. The term's content is broken down into eleven teaching weeks, allowing the coverage of topics within each week to be flexible.

Assessment

- Assessment details for Term 1 will be communicated separately.

Teachers should incorporate the Standards for Mathematical Practice (SMPs) in their instruction when and where appropriate. The Standards for Mathematical Practice are

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Why are the Standards for Mathematical Practice important?

The Standards for Mathematical Practice set expectations for using mathematical language and representations to reason, solve problems, and model in preparation for careers and a wide range of college majors.

Week 1: Aug. 29 – Sept. 2, 2022

This week can be used to get to know your students, establish classroom routines, and finalize class lists. It is also an opportunity to review prerequisite concepts and skills which students will need for Grade 7 and to administer teacher-created diagnostics.

Week 2: Sept. 5 – 9, 2022

Module 1 – Proportional Relationships

Lessons	Student Learning Outcomes	Common Core State Standards
M1L1 – Unit Rates Involving Ratios of Fractions	<ul style="list-style-type: none">Find unit rates when one or both quantities are fractions.	7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
M1L2 – Understand Proportional Relationships	<ul style="list-style-type: none">Use models and ratio reasoning to understand how a proportional relationship can exist between quantities.	7.RP.2 Recognize and represent proportional relationships between quantities.
M1L3 – Tables of Proportional Relationships	<ul style="list-style-type: none">Determine whether two quantities shown in a table are in a proportional relationship by testing for equivalent ratios.	7.RP.2 Recognize and represent proportional relationships between quantities. 7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Week 3: Sept. 12 – 16, 2022

Lessons	Student Learning Outcomes	Common Core State Standards
M1L4 – Graphs of Proportional Relationships	<ul style="list-style-type: none"> Determine if a relationship is proportional by analyzing its graph. Explain what the points $(0,0)$ and $(1,r)$ mean on the graph of a proportional relationship. 	<p>7.RP.2 Recognize and represent proportional relationships between quantities.</p> <p>7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>7.RP.2d Explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0,0)$ and $(1,r)$ where r is the unit rate.</p>
M1L5 – Equations of Proportional Relationships	<ul style="list-style-type: none"> Write equations to represent proportional relationships. Identify the constant of proportionality in the equation representing a proportional relationship. 	<p>7.RP.2 Recognize and represent proportional relationships between quantities.</p> <p>7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>7.RP.2c Represent proportional relationships by equations.</p>

Week 4: Sept. 19 – 23, 2022		
Lessons	Student Learning Outcomes	Common Core State Standards
M1L6 – Solve Problems Involving Proportional Relationships	<ul style="list-style-type: none"> Solve problems involving proportional relationships by making a table, using a graph, or writing an equation. 	7.RP.2 Recognize and represent proportional relationships between quantities. 7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
Module 2 – Solve Percent Problems		
M2L1 – Percent of Change	<ul style="list-style-type: none"> Use proportional relationships to solve percent of change problems. 	7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Week 5: Sept. 26 – 30, 2022		
Lessons	Student Learning Outcomes	Common Core State Standards
M2L2 – Sales Tax	<ul style="list-style-type: none"> Use proportional relationships to find the amount of tax charged for an item. 	7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. 7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
M2L3 – Tips and Markups	<ul style="list-style-type: none"> Use proportional relationships to find the amount to pay for a tip and the amount of markup on items. 	

Week 6: Oct. 3 – 7, 2022		
Lessons	Student Learning Outcomes	Common Core State Standards
M2L4 – Discounts	<ul style="list-style-type: none"> Use proportional relationships to find the amount of discount or markdown. 	<p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</p> <p>7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</p>
M2L5 – Interest	<ul style="list-style-type: none"> Use the simple interest formula to find the amount of interest earned for a given principal, at a given interest rate, for a given period of time. 	<p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</p>

Week 7: Oct. 10 – 14, 2022		
Lessons	Student Learning Outcomes	Common Core State Standards
M2L6 – Commission and Fees	<ul style="list-style-type: none"> Use proportional relationships to find the amount of commission earned on sales and the amount of fees for certain services. 	<p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</p> <p>7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</p>
M2L7 – Percent Error	<ul style="list-style-type: none"> Use proportional relationships to solve percent error problems. 	<p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</p>
Module 3 – Operations with Integers		
M3L1 – Add Integers	<ul style="list-style-type: none"> Use different methods, including algebra tiles, number lines, or absolute value, to add integers. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1a Describe situations in which opposite quantities combine to make 0.</p> <p>7.NS.1b Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p>

Week 8: Oct. 17 – 21, 2022

Lessons	Student Learning Outcomes	Common Core State Standards
M3L2 – Subtract Integers	<ul style="list-style-type: none"> Use different methods, including algebra tiles, number lines, or the additive inverse, to subtract integers. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p>
M3L3 – Multiply Integers	<ul style="list-style-type: none"> Use number lines and mathematical properties to multiply integers. 	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>

Week 9: Oct. 24 – 28, 2022

Lessons	Student Learning Outcomes	Common Core State Standards
M3L4 – Divide Integers	<ul style="list-style-type: none"> Use a related multiplication sentence to divide integers. 	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>
M3L5 – Apply Integer Operations	<ul style="list-style-type: none"> Use the order of integer operations to evaluate expressions. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>

Week 10: Oct. 31 – Nov. 4, 2022

Module 4 – Real Numbers

Lessons	Student Learning Outcomes	Common Core State Standards
M4L1 – Rational Numbers	<ul style="list-style-type: none">• Divide rational numbers.• Convert fractions to decimal equivalents using division.	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>7.NS.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>

<p>M4L2 – Add Rational Numbers</p>	<ul style="list-style-type: none"> • Find the additive inverse of a rational number. • Add rational numbers. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1a Describe situations in which opposite quantities combine to make 0.</p> <p>7.NS.1b Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>
------------------------------------	--	---

Week 11: Nov. 7 – 11, 2022

Lessons	Student Learning Outcomes	Common Core State Standards
M4L3 – Subtract Rational Numbers	<ul style="list-style-type: none"> Subtract rational numbers by adding the additive inverse. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>
M4L4 – Multiply Rational Numbers	<ul style="list-style-type: none"> Use the rules for multiplying integers to multiply rational numbers. 	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>

Week 12: Nov. 14 – 18, 2022

Lessons	Student Learning Outcomes	Common Core State Standards
M4L5 – Divide Rational Numbers	<ul style="list-style-type: none"> Use the rules for dividing integers to divide rational numbers. 	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>
M4L6 – Apply Rational Numbers Operations	<ul style="list-style-type: none"> Add, subtract, multiply, and divide rational numbers. Use the four operations on rational numbers to solve real-world problems. 	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p>

Week 13: Nov. 21 – 25, 2022
Week 14: Nov. 28 – Dec. 2, 2022
Week 15: Dec. 5 – 9, 2022

Term 1 Revision and End-of-Term Exam
Exam date to be determined by the Assessment Directorate