Mathematics 10

The table below lists the correspondence between the general outcomes of the Nova Scotia Mathematics Grade 10 curriculum and the CEMC Grade 9/10/11 courseware.

Each section of the table is labelled with a dark heading containing a Mathematics 10 general outcome. The left-hand entries in a section are corresponding CEMC Grade 9/10/11 courseware strands and units. The right-hand side entries are all relevant courseware lessons within this courseware strand and unit.

The CEMC Grade 9/10/11 courseware has been designed with curricula from across Canada in mind. It is not an exact match to the current curriculum in any specific jurisdiction. In order to help teachers and students determine any discrepancies relevant to them, the table below also includes all of the courseware lesson goals for any cited courseware lesson. Additionally, some italicized notes point out topics that are not covered by the courseware or covered in an earlier or later part of the CEMC courseware suite.

Measurement: Develop spatial sense and proportional reasoning.	
Linear Relations and Analytic Geometry *Unit 1: Linear Equations*	Lesson 4: Solving Problems with Rate, Ratio, Proportion, and Percent • Review the terms rate, ratio, proportion and percent. • Solve problems involving rate, ratio, proportion and percent using cross-multiplication. • Solve application problems involving rate, ratio, proportion and percent.
Measurement, Geometry and Trigonometry *Unit 1: The Pythagorean Theorem, Measurement, and Optimization*	Lesson 3: Surface Area of Pyramids and Cones • Visualize the surface area of a pyramid or a cone. • Calculate the surface areas of pyramids and cones. • Solve problems involving the surface area of pyramids and cones.
	Lesson 4: Volume of Pyramids and Cones • Connect the volume of pyramids and cones to their corresponding prisms and cylinders. • Calculate the volume of pyramids and cones. • Solve application problems involving pyramids, cones and unit conversions.
	Lesson 5: Volume and Surface Area of Spheres • Calculate the volume and surface area of spheres. • Solve word problems involving applications of spheres.
Measurement, Geometry, and Trigonometry *Unit 3: Trigonometry*	Lesson 3: Tangent Ratio • Compute the tangent ratio for an acute angle in a right-angled triangle given the side lengths. • Use the tangent ratio to solve for an unknown side length in a right-angled triangle. • Use the inverse tangent operation on your calculator to solve for an interior angle in a right-angled triangle.
	Lesson 4: Sine and Cosine Ratios • Compute the sine and cosine ratio for an acute angle in a right-angled triangle given the side lengths. • Solve for an unknown side length in a right-angled triangle using the sine or cosine ratio. • Solve for an interior angle in a right-angled triangle using the inverse sine and cosine operations on your calculator.
Linear measurement and estimation and conversions between SI and Imperial - This isn't covered by the CEMC courseware.	

Algebra and Number: Develop algebraic reasoning and number sense.	
Number Sense and Algebraic Expressions Unit 4: Prime Factorization	Lesson 1: Prime Factorization • Define prime and composite numbers. • Identify the factors of a composite number. • Write a composite number as a product of its prime factors using powers.
	Lesson 2: Using Prime Factorization to Determine the GCF and LCM • Use prime factorization to determine the Greatest Common Factor (GCF) and the Least Common Multiple (LCM) of two or more integers. • Solve word problems involving GCFs and LCMs.
Number Sense and Algebraic Expressions Unit 3: Radicals and Rational Functions	Lesson 1: Introduction to Radicals • Simplify and order radicals involving integers and rational numbers. • Use technology to estimate the value of a radical. • Recognize the difference between exact and approximate values.
Number Sense and Algebraic Expressions Unit 1: Exponents	Lesson 4: Negative Bases and Integer Exponents • Examine powers with positive and negative integer bases. • Explore the exponent rule for an exponent of zero. • Examine powers with a negative integer exponent.
	Lesson 5: Rational Exponents – Part 1 • Define the principal nth root of a number. • Explore rational exponents of the form $\frac{1}{n}$.
	Lesson 6: Rational Exponents – Part 2 • Simplify and evaluate positive rational exponents of the form $\frac{a}{n}$. • Simplify and evaluate negative rational exponents of the form $\frac{-a}{n}$.
Number Sense and Algebraic Expressions Unit 2: Manipulating Algebraic Expressions	Lesson 3: Multiplying a Polynomial by a Monomial • Multiply a polynomial by a monomial using the distributive property.
	Lesson 4: Multiplying a Polynomial by a Polynomial • Apply the distributive property to multiply a polynomial by a polynomial.
Quadratic Relations Unit 3: Algebraic Skills	Lesson 1: Expanding and Simplifying • Review the distributive property in the context of quadratic relations. • Expand an expression by multiplying or squaring binomials. • Expand and simplify equations of quadratic relations so that they are in standard form. • Extend the distributive property beyond multiplying two binomials. *(Parts of this lesson may be beyond the scope of this course.)*
	Lesson 2: Factoring – Common and Trinomials • Factor an expression using common factoring. • Factor a trinomial of the form $x^2 + bx + c$. • Factor a trinomial of the form $y = ax^2 + bx + c$ with $a \neq 1$ by decomposition or by inspection.
	Lesson 3: Factoring – Difference of Squares and Perfect Squares • Factor differences of squares. • Factor perfect squares. • Determine which type of factoring applies to a given expression. • Factor expressions requiring more than one type of factoring. *(Parts of this lesson may be beyond the scope of this course.)*

Relations and Functions: Develop algebraic and graphical reasoning through the study of relations.	
Linear Relations and Analytic Geometry *Unit 2: Characteristics of Linear Relations*	Lesson 4: Slope and the y-intercept • Define the terms y-intercept and slope. • Identify or calculate the y-intercept and slope of a linear relation given a graph, table of values, or an equation. • Explore linear families.
	Lesson 5: Graphing Linear Relations • Graph linear relations by hand using a table of values. • Graph linear relations by hand using the x- and y-intercepts. • Graph linear relations by hand using the slope and y-intercept.
Linear Relations and Analytic Geometry *Unit 3: Connecting Various Representations of Linear Relations*	Lesson 2: Connecting Various Forms of a Linear Relation • Identify equivalent representations of a linear relation. • Connect the table, graph, and equation of a linear relation using the slope and y-intercept.
Linear Relations and Analytic Geometry *Unit 4: Properties of Slope*	Lesson 1: The Slope Formula • Develop the slope formula for a linear relation. • Use the slope formula to answer questions about a given linear relation.
	Lesson 2: Working with y=mx+b • Determine algebraically the equation of a line in the form y=mx+b.
	Lesson 3: Parallel and Perpendicular Lines • Investigate the properties of slope for both parallel and perpendicular lines. • Using the properties of slope, solve problems involving parallel and perpendicular lines.
	Lesson 4: Horizontal and Vertical Lines • Investigate the properties of slope for both horizontal and vertical lines. • Using the properties of slope, solve problems involving horizontal and vertical lines.
Linear Relations and Analytic Geometry *Unit 5: Equations of Linear Relations and Problem Solving*	Lesson 1: Alternate Forms of an Equation of a Line • Identify various forms of an equation of a line. • Rearrange a given equation of a line from one form to another. • Solve problems involving the various forms of an equation of a line.
	Lesson 3: Applications of Linear Relations • Solve problems involving linear relations represented in different forms. • Determine a point of intersection graphically, and explain the meaning within a given context. • Identify and explain restrictions on variables within a given context.
	Lesson 4: Interpreting Stories and Graphs • Given a detailed description of an event, create a corresponding story graph and understand the importance of labeling each axis. • Given a story graph, create a detailed description of the event. • Given a story graph that represents a distance vs. time scenario, use slope calculations to determine average speed of the objects or people in question. • Understand when a graphical representation cannot represent a distance vs. time scenario.

Introduction to Functions *Unit 1: Representing Functions*	Lesson 1: Introduction to Functions • Represent relations in a variety of ways, including mapping diagrams, equations, sets of ordered pairs, and graphs. • Represent relations whose graphs are circles, by using equations, tables, and graphs. • Identify when a relation is a function, by using the definition of a function or the Vertical Line Test.
	Lesson 2: Function Notation • Describe functions using function notation. • Analyze linear functions using function notation. • Analyze quadratic functions using function notation. *(Parts of this lesson may be beyond the scope of this course.)*
	Lesson 3: Domain and Range • Determine the domain and range of a function containing only a few points. • Use set notation to describe the domain and range of a given function. • Determine the domain and range of quadratic functions. *(Parts of this lesson may be beyond the scope of this course.)*
Linear Relations and Analytic Geometry *Unit 6: Solving Linear Systems of Equations*	Lesson 1: Solving Linear Systems of Equations Graphically • Define systems of equations and understand what it means to “solve” one. • Identify the various ways a system of two linear equations can intersect. • Solve linear systems of equations involving two variables graphically.
	Lesson 2: Solving Systems of Equations Algebraically • Solve systems of two equations involving two variables using substitution. • Solve systems of two equations involving two variables using elimination. • Understand the result when algebraic methods are used to solve linear systems with no solution or systems with infinite solutions.
	Lesson 3: Applications of Linear Systems • Given a description in words, create a linear system of equations to model the scenario. • Solve a linear system to answer a problem using a variety of methods and interpret the meaning of the solution within the given context.
Financial Mathematics: Students will be expected to demonstrate number sense and critical thinking skills.	
Linear Relations and Analytic Geometry *Unit 1: Linear Equations*	Lesson 4: Solving Problems with Rate, Ratio, Proportion, and Percent • Review the terms rate, ratio, proportion, and percent. • Solve problems involving rate, ratio, proportion, and percent using cross-multiplication. • Solve application problems involving rate, ratio, proportion, and percent.
Sequences, Series, and Financial Literacy *Unit 2: Arithmetic and Geometric Sequences and Series and Financial Applications*	Lesson 9: Other Financial Topics • Define different types of employment income (i.e., salary, hourly wages, commission and piece rates) and make calculations relating to each of these. • Identify common Canadian deductions (such as income tax, EI, and CPP), calculate the amounts of these deductions based on earnings, and calculate net pay. • Compare the advantages and disadvantages of buying, renting, or leasing for major expenses such as housing and vehicles.