Grade 9/10/11 Courseware Lessons

This is a complete list of all the CEMC Grade 9/10/111 mathematics courseware lessons. There are a total of 144 lessons divided into 29 units across the 7 strands. The lesson titles are hyperlinks.

### Number Sense and Algebraic Expressions

**Unit 1 - Exponents**
- Lesson 1: An Introduction to Exponents
- Lesson 2: Multiplying and Dividing Monomials
- Lesson 3: Power of a Power Exponent Rule
- Lesson 4: Negative Bases and Integer Exponents
- Lesson 5: Rational Exponents - Part 1
- Lesson 6: Rational Exponents - Part 2
- Lesson 7: Exponent Laws All Together

**Unit 2 - Manipulating Algebraic Expressions**
- Lesson 1: An Introduction to Polynomials
- Lesson 2: Adding and Subtracting Polynomials
- Lesson 3: Multiplying a Polynomial by a Monomial
- Lesson 4: Multiplying a Polynomial by a Polynomial
- Lesson 5: Simplifying Polynomials

**Unit 3 - Radicals and Rational Functions**
- Lesson 1: Introduction to Radicals
- Lesson 2: Operations With Radicals
- Lesson 3: Solving Radical Equations
- Lesson 4: Introduction to Rational Expressions
- Lesson 5: Multiplying and Dividing Rational Expressions
- Lesson 6: Adding and Subtracting Rational Expressions

**Unit 4 - Prime Factorization**
- Lesson 1: Prime Factorization
- Lesson 2: Using Prime Factorization to Determine the GCF and LCM

### Linear Relations and Analytic Geometry

**Unit 1 - Linear Equations**
- Lesson 1: Solving One- and Two-Step Equations
- Lesson 2: Solving Multi-Step Linear Equations
- Lesson 3: Applications of Solving Linear Equations
- Lesson 4: Solving Problems With Rate, Ratio, Proportion, and Percent
- Lesson 5: Rearranging Equations and Formulas
- Lesson 6: Solving Linear Inequalities

**Unit 2 - Characteristics of Linear Relations**
- Lesson 1: Introduction to Linear Relations - Part 1
- Lesson 2: Introduction to Linear Relations - Part 2
- Lesson 3: Linear Relations - Direct and Partial Variation
- Lesson 4: Slope and the y-Intercept
- Lesson 5: Graphing Linear Relations
Unit 3 - Connecting Various Representations of Linear Relations
Lesson 1: Finding Missing Values in a Linear Relation
Lesson 2: Connecting Various Forms of a Linear Relation
Lesson 3: Changing the Properties of a Linear Relation

Unit 4 - Properties of Slope
Lesson 1: The Slope Formula
Lesson 2: Working With $y = mx + b$
Lesson 3: Parallel and Perpendicular Lines
Lesson 4: Horizontal and Vertical Lines

Unit 5 - Equations of Linear Relations and Problem Solving
Lesson 1: Alternate Forms of an Equation of a Line
Lesson 2: Comparing Linear and Non-Linear Relations
Lesson 3: Applications of Linear Relations
Lesson 4: Interpreting Stories and Graphs

Unit 6 - Solving Linear Systems
Lesson 1: Solving Linear Systems of Equations Graphically
Lesson 2: Solving Systems of Equations Algebraically
Lesson 3: Applications of Linear Systems

Unit 7 - Properties of Line Segments and Using Analytic Geometry to Verify Geometric Properties
Lesson 1: Determining the Midpoint and Length of a Line Segment
Lesson 2: Problem Solving With Slopes, Lengths, and Midpoints
Lesson 3: Investigating and Verifying Properties of Quadrilaterals
Lesson 4: Equation of a Circle

Unit 8 - Data Management and Statistics
Lesson 1: Scatter Plots and Lines or Curves of Best Fit
Lesson 2: Investigating Relationships Between Two Variables
Lesson 3: Collecting Data, Sampling Bias, and Techniques
Lesson 4: Display of Data and Representation Bias
Lesson 5: Probability in Society

Measurement, Geometry, and Trigonometry

Unit 1 - Pythagorean Theorem, Measurement, and Optimization
Lesson 1: The Pythagorean Theorem
Lesson 2: Perimeter and Area of Composite Shapes
Lesson 3: Surface Area of Pyramids and Cones
Lesson 4: Volume of Pyramids and Cones
Lesson 5: Volume and Surface Area of Spheres
Lesson 6: Maximizing Area of Rectangles With Fixed Perimeter
Lesson 7: Determining the Optimal Perimeter of Rectangles
Lesson 8: Optimizing Surface Area of Cylinders and Square-Based Prisms
Lesson 9: Maximizing the Volume of Cylinders and Square-Based Prisms
Unit 2 - Geometric Relationships
Lesson 1: Review of Basic Angle Properties
Lesson 2: Angle Properties of Triangles
Lesson 3: Angle Properties of Quadrilaterals and Other Polygons
Lesson 4: Midpoints and Diagonals of Triangles, Quadrilaterals, and Other Polygons
Lesson 5: Chords of Circles
Lesson 6: Inscribed and Central Angles of Circles
Lesson 7: Tangents to Circles

Unit 3 - Trigonometry
Lesson 1: Similarity and Congruence
Lesson 2: Similar Triangles
Lesson 3: Tangent Ratio
Lesson 4: Sine and Cosine Ratios
Lesson 5: The Sine Law
Lesson 6: The Cosine Law
Lesson 7: Applications With Acute Triangles
Lesson 8: Oblique Triangles
Lesson 9: Applications in Three-Dimensional Settings

Unit 4 - Angles in Standard Position and Trigonometric Identities
Lesson 1: Trigonometric Ratios of Angles in Standard Position
Lesson 2: Related and Coterminal Angles
Lesson 3: Trigonometric Ratios of Special Angles
Lesson 4: Reciprocal Trigonometric Ratios
Lesson 5: Trigonometric Identities

Quadratic Relations

Unit 1 - Basic Properties of Quadratic Relations
Lesson 1: Recognizing Quadratic Relations From Tables of Values
Lesson 2: Exploring Second Differences
Lesson 3: Properties of Parabolas
Lesson 4: Comparing $y = x^2$ and $y = 2^x$

Unit 2 - Algebraic Representations of Quadratic Relations
Lesson 1: Introduction to Standard, Factored, and Vertex Forms
Lesson 2: Exploring Factored Form
Lesson 3: Exploring Vertex Form

Unit 3 - Algebraic Skills
Lesson 1: Expanding and Simplifying
Lesson 2: Factoring - Common and Trinomials
Lesson 3: Factoring - Difference of Squares and Perfect Squares
Lesson 4: Completing the Square

Unit 4 - Graphing Quadratic Relations
Lesson 1: Transformations of $y = x^2$
Lesson 2: Graphing and Equations in Vertex Form
Lesson 3: Graphing and Equations in Factored Form
Lesson 4: Graphing and Equations in Standard Form
### Unit 5 - Solving Problems Involving Quadratic Relations

- **Lesson 1**: Solving Quadratic Equations
- **Lesson 2**: Introduction to the Quadratic Formula
- **Lesson 3**: The Number of Zeros of a Quadratic Relation
- **Lesson 4**: Intersections of Linear and Quadratic Relations
- **Lesson 5**: Applications

### Introduction to Functions

#### Unit 1 - Representing Functions

- **Lesson 1**: Introduction to Functions
- **Lesson 2**: Function Notation
- **Lesson 3**: Domain and Range
- **Lesson 4**: Domain and Range of Two New Functions

#### Unit 2 - Transforming and Graphing Functions

- **Lesson 1**: Graphing Three Common Functions
- **Lesson 2**: Functions and Translations
- **Lesson 3**: Horizontal Stretches, Compressions, and Reflections
- **Lesson 4**: Vertical Stretches, Compressions, and Reflections
- **Lesson 5**: Combining Transformations

#### Unit 3 - Inverses of Functions

- **Lesson 1**: Introduction to Inverses
- **Lesson 2**: Determining Inverses of Linear Functions Algebraically
- **Lesson 3**: Inverses of Quadratic Functions

#### Unit 4 - Inequalities, Absolute Values, and Reciprocals

- **Lesson 1**: Solving Single-Variable Inequalities
- **Lesson 2**: Inequalities in Two Variables
- **Lesson 3**: Graphing Reciprocal Functions
- **Lesson 4**: Graphing Absolute Value Functions
- **Lesson 5**: Solving Absolute Value Equations

### Sequences, Series and Financial Literacy

#### Unit 1 - Representing Sequences

- **Lesson 1**: Introducing Sequences
- **Lesson 2**: Pascal’s Triangle and Binomial Expansions

#### Unit 2 - Arithmetic and Geometric Sequences and Series and Financial Applications

- **Lesson 1**: Arithmetic Sequences
- **Lesson 2**: Banking and Simple Interest
- **Lesson 3**: Geometric Sequences
- **Lesson 4**: Compound Interest
- **Lesson 5**: Arithmetic Series
- **Lesson 6**: Geometric Series
- **Lesson 7**: Solving Annuity Problems as Geometric Series
- **Lesson 8**: Solving Annuity Problems With Technology
- **Lesson 9**: Other Financial Topics
### Exponential and Trigonometric Functions

#### Unit 1 - Exponential Functions
- **Lesson 1:** Introduction to Exponential Functions
- **Lesson 2:** Properties of Basic Exponential Functions
- **Lesson 3:** Identifying Exponential Functions
- **Lesson 4:** Transformations of Exponential Functions
- **Lesson 5:** Comparing Exponential Functions
- **Lesson 6:** Modelling With Exponential Functions

#### Unit 2 - Sinusoidal Functions
- **Lesson 1:** Periodic Functions
- **Lesson 2:** The Sine and Cosine Functions
- **Lesson 3:** Investigate Transformations of Sinusoidal Functions
- **Lesson 4:** Graphing Sinusoidal Functions
- **Lesson 5:** Modelling Periodic Behaviour
- **Lesson 6:** Applications of Sinusoidal Functions