Course Title: Algebra 1 CBE

Competencies

C1: Mathematical Reasoning and Expression: Students will use mathematical reasoning to manipulate symbolic expressions in terms of a given context.

C2: Solving Problems with Number Systems and Complex Numbers: Students will solve problems using number systems and complex numbers.

C3: Reasoning with Computational Strategies: Students will use computational strategies and algorithms.

C4: Developing Mathematical Arguments: Students will develop mathematical arguments to justify and to support formal proofs.

C6: Analyzing Algebraic Functions, Patterns, and Relations: Students will analyze algebraic functions, in pure and applied situations, in order to support conjectures and conclusions.

C7: Solving Problems with Geometry: Students will solve problems involving geometry in pure/theoretical and authentic, applied contexts.

C8: Analyzing Data, Probability, and Statistics: Students will apply statistical methods and reasoning, as well as the rules of probability, to analyze categorical and quantitative data in both authentic and applied scenarios.

Standards: Michigan K-12 Mathematics Standards (Common Core State Standards - Mathematics)

A.APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

A.APR.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plottedin the coordinate plane, often forming a curve (which could be a line).
A.REI.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x)andy = g(x) intersect are the solutions of the equation f(x)= g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
A.REI.12 Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A.REI.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.4 Solve quadratic equations in one variable.
A.REI.4.a Solve quadratic equations in one variable. a.) Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form.
A.REI.4.b Solve quadratic equations in one variable. b.) Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
A.REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
A.SSE.1.a Interpret expressions that represent a quantity in terms of its context. a.) Interpret parts of an expression, such as terms, factors, and coefficients.
A.SSE.2 Use the structure of an expression to identify ways to rewrite it. For example, see x4– y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2– y2)(x2 + y2).

A.SSE.3.a Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a.) Factor a quadratic expression to reveal the zeros of the function it defines.
F.BF.1 Write a function that describes a relationship between two quantities.
F.BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); f ind the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.
F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
F.IF.7.a Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a.) Graph linear and quadratic functions and show intercepts, maxima, and minima.
F.IF.7.b Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. b.) Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F.IF.7.c Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. c.) Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
F.IF.7.e Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. e.) Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.
F.LE.1.a Distinguish between situations that can be modeled with linear functions and with exponential functions. a.) Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
F.LE.1.b Distinguish between situations that can be modeled with linear functions and with exponential functions. b.) Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
F.LE.1.c Distinguish between situations that can be modeled with linear functions and with exponential functions. c.) Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
F.LE.4 For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context.
N.CN.1 Know there is a complex number i such that i2 = –1, and every complex number has the form a + bi with a and b real.
N.CN.2 Use the relation i2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Unit 1:	**Essential Question:** **How do the properties of the real number system define and restrict how expressions are evaluated?** **When evaluating expressions, what is the relationship between a base and the power?**

	How do the commutative, associative, and distributive properties aid in evaluating expressions?		
Competencies	C1: Mathematical Reasoning and Expression: Students will use mathematical reasoning to manipulate symbolic expressions in terms of a given context. C2: Solving Problems with Number Systems and Complex Numbers: Students will solve problems using number systems and complex numbers. C3: Reasoning with Computational Strategies: Students will use computational strategies and algorithms. C4: Developing Mathematical Arguments: Students will develop mathematical arguments to justify and to support formal proofs. C6: Analyzing Algebraic Functions, Patterns, and Relations: Students will analyze algebraic functions, in pure and applied situations, in order to support conjectures and conclusions.		
Unit Objectives	● Provide self-rating for all Learning Focus Areas ● Set ambitious and well-defined goals ● Translate words into algebraic expressions ● Evaluate expressions ● Add real numbers ● Subtract real numbers ● Multiply and divide numbers ● Simplify expressions that contain exponents ● Write numbers as a power ● Evaluate expressions containing square roots ● Classify real numbers ● Use the order of operations to simplify expressions ● Combine like terms ● Use the Associative, Commutative, and Distributive properties ● Plot points and identify parts of the coordinate plane ● Graph functions by creating a table of values ● Provides self-rating for all Learning Focus Areas ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
A.CED.1 A.REI.1	Unit 1 Introduction	Provides self-rating for all Learning Focus Areas	Unit 1 Pre-Assessment

A.REI.10 F.IF.1 MP.1 MP.2 MP.3 MP.4 MP.6 MP.8		Set ambitious and well-defined goals	
	1.1: Variables and Expressions	Translate words into algebraic expressions Evaluate expressions	1.1 Quiz
	1.2: Adding Real Numbers	Add real numbers	1.2 Quiz
	1.3: Subtracting Real Numbers	Subtract real numbers	1.3 Quiz
	1.4: Multiplying and Dividing Real Numbers	Multiply and divide numbers	1.4 Quiz
	1.5: Powers and Exponents	Simplify expressions that contain exponents Write numbers as a power	1.5 Quiz
	1.6: Square Roots and Real Numbers	Evaluate expressions containing square roots Classify real numbers	1.6 Quiz
	1.7: Order of Operations	Use the order of operations to simplify expressions	1.7 Quiz
	No new content	Add real numbers Subtract real numbers Multiply and divide numbers Use the order of operations to simplify expressions	Unit 1 Assignment
	No new content	Add real numbers Subtract real numbers	Unit 1 Discussion

		Multiply and divide numbers Use the order of operations to simplify expressions	
	1.8: Simplifying Expressions	Combine like terms Use the Associative, Commutative, and Distributive properties	1.8 Quiz
	1.9: Introduction to Functions	Plot points and identify parts of the coordinate plane Graph functions by creating a table of values	1.9 Quiz
	End of Unit 1	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 1.1-1.9 Objectives	Unit 1 Self-Assessment Unit 1 Student-Teacher Conference Unit 1 Test
Unit 2:	**Essential Question:** **When solving, what are the ways in which equations and inequalities are the same and/or different?** **When are absolute value equations used in life?**		

	How are compound inequalities identified and solved?		
Course Objective	C1: Mathematical Reasoning and Expression C2: Solving Problems with Number Systems and Complex Numbers C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Set ambitious and well-defined goals ● Solve equations that have a variable on one side of the equal sign ● Solve equations that have variables on both sides of the equal sign ● Solve formulas for a given variable ● Solve an equation that contains two or more variables ● Solve equations that contain absolute value expressions ● Write and graph inequalities ● Find solutions for inequalities ● Solve inequalities by using addition ● Solve inequalities by using subtraction ● Solve inequalities by using multiplication ● Solve inequalities by using division ● Solve inequalities that contain more than one operation ● Solve inequalities that contain variables on both sides of the inequality sign ● Solve compound inequalities ● Graph solution sets of compound inequalities ● Solve inequalities that contain absolute value expressions ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
N.Q.1 A.CED.1 A.CED.4 A.REI.1 A.REI.3 MP.1	Unit 2 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goals	Unit 2 Pre-Assessment

MP.2 MP.3 MP.4 MP.6 MP.8	2.1: Solving Equations	Solve equations that have a variable on one side of the equal sign.	2.1 Quiz: Solving Equations
	2.2: Solving Equations with Variables on Both Sides	Solve equations that have variables on both sides of the equal sign	2.2 Quiz: Solving Equations with Variables on Both Sides
	2.3: Solving Formulas for Any Variable	Solve formulas for a given variable Solve an equation that contains two or more variables	2.3 Quiz: Solving Formulas for Any Variable
	2.4: Solving Absolute Value Equations	Solve equations that contain absolute value expressions	2.4 Quiz: Solving Absolute Value Equations
	2.5: Graphing and Writing Inequalities	Write and graph inequalities Find solutions for inequalities	2.5 Quiz: Graphing and Writing Inequalities
	2.6: Solving Inequalities by Adding or Subtracting	Solve inequalities by using addition Solve inequalities by using subtraction	2.6 Quiz: Solving Inequalities by Adding or Subtracting
	2.7: Solving Inequalities by Multiplying or Dividing	Solve inequalities by using multiplication Solve inequalities by using division	2.7 Quiz: Solving Inequalities by Multiplying or Dividing
	2.8: Solving Multi-Step Inequalities	Solve inequalities that contain more than one operation Solve inequalities that contain variables on both sides of the inequality sign	2.8 Quiz: Solving Multi-Step Inequalities
	No new content	Write and graph inequalities	Unit 2 Discussion: AND versus OR
	2.9: Solving Compound Inequalities	Solve compound inequalities Graph solution sets of compound inequalities	2.9 Quiz: Solving Compound Inequalities
	2.10: Solving Absolute Value Inequalities	Solve inequalities that contain absolute value expressions	2.10 Quiz: Solving Absolute Value Inequalities

	End of Unit 2	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 2.1-2.9 Objectives	Unit 2 Self-Assessment Unit 2 Student-Teacher Conference Unit 2 Test: Equations and Inequalities
Unit 3:	**Essential Question:** **How are functions represented (both graphically and symbolically) and what is their relationship between the equations (or inequalities) and their graphs?** **What is the difference between a relation and a function?** **What are the characteristics of linear functions and graphs?** **What are some areas where intercepts are used?**		
Course Objective	C1: Mathematical Reasoning and Expression C2: Solving Problems with Number Systems and Complex Numbers C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations C7: Solving Problems with Geometry		
Unit Objectives	● Provides self-rating for all Learning Focus Areas ● Set ambitious and well-defined goals ● Identify functions ● Find the domain and range of functions ● Identify independent and dependent variables ● Write an equation in function notation, f(x)= ● Graph functions by using their domain ● Graph functions using a table of values		

	● Identify linear functions and linear equations ● Use x- and y- intercepts to graph a line ● Find x- and y- intercepts and tell what they mean in real-world situations ● Find rates of change and slopes ● Relate a rate of change to the slope of a line ● Identify, write, and graph direct variation ● Write an equation in slope-intercept form ● Graph a line using slope-intercept form ● Write a linear equation given two points ● Write an equation in point-slope form ● Graph an equation using point-slope form ● Graph parallel and perpendicular lines ● Write equations to describe lines that are parallel or perpendicular to a given line ● Describe how changing the slope and y-intercept affect a graph ● Learn about families of functions and parent functions ● Graph absolute-value functions ● Identify characteristics of absolute value functions & their graphs ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
A.CED.2 A.CED.3 A.REI.10 F.IF.1 F.IF.2 F.IF.4 F.IF.6 F.IF.7 F.BF.1 F.BF.3 F.LE.1 F.LE.2	Unit 3 Introduction	Provides self-rating for all Learning Focus Areas Set ambitious and well-defined goals	Unit 3 Pre-Assessment
	3.1: Relations and Functions	Identify functions Find the domain and range of functions	3.1 Quiz
	3.2: Writing Functions	Identify independent and dependent variables	3.2 Quiz

G.GPE.5 MP.1 MP.2 MP.3 MP.4 MP.6 MP.7		Write an equation in function notation, f(x)=	
	3.3: Graphing Functions	Graph functions by using their domain Graph functions using a table of values	3.3 Quiz
	3.4: Identifying Linear Functions	Identify linear functions and linear equations	3.4 Quiz
	3.5: Using Intercepts	Use x- and y- intercepts to graph a line Find x- and y- intercepts and tell what they mean in real-world situations	3.5 Quiz
	3.6: Rate of Change and the Slope Formula	Find rates of change and slopes Relate a rate of change to the slope of a line	3.6 Quiz
	No new content	Relate a rate of change to the slope of a line	Unit 3 Discussion
	No new content	Find rates of change and slopes Relate a rate of change to the slope of a line	Unit 3 Project
	3.7: Direct Variation	Identify, write, and graph direct variation	3.7 Quiz
	3.8: Slope-Intercept Form	Write an equation in slope-intercept form Graph a line using slope-intercept form	3.8 Quiz
	3.9: Point-Slope Form	Write a linear equation given two points Write an equation in point-slope form	3.9 Quiz

		Graph an equation using point-slope form	
	3.10: Slopes of Parallel and Perpendicular Lines	Graph parallel and perpendicular lines Write equations to describe lines that are parallel or perpendicular to a given line	3.10 Quiz
	3.11: Transforming Linear Functions	Describe how changing the slope and y-intercept affect a graph Learn about families of functions and parent functions	3.11 Quiz
	3.12: Absolute Value Functions	Graph absolute-value functions Identify characteristics of absolute value functions & their graphs	3.12 Quiz
	End of Unit 3	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 3.1-3.12 Objectives	Unit 3 Self-Assessment Unit 3 Student-Teacher Conference Unit 3 Test
Unit 4:	**Essential Question:** **What are the various methods for identifying the point(s) of concurrency of systems of equations and inequalities?**		

	What is a system of equations and what does it mean to have a solution to a system?		
Course Objective	C1: Mathematical Reasoning and Expression C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Provides self-rating for all Learning Focus Areas. ● Set ambitious and well-defined goals ● Identify a system of linear equations and their solutions ● Solve systems of linear equations by graphing ● Solve systems of equations using the substitution method ● Solve systems of equations by using the elimination method ● Choose the appropriate method for solving systems of equations (graphing, substitution, or elimination) ● Solve special systems of equations ● Classify systems of equations and determine the number of solutions ● Graph and solve linear inequalities ● Graph systems of linear inequalities ● Solve systems of linear inequalities ● Solve systems of 3 linear equations with 3 unknowns ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
A.CED.2 A.CED.3 A.REI.3 A.REI.5 A.REI.6 A.REI.11 A.REI.12 MP.1 MP.2 MP.3	Unit 4 Introduction	Provides self-rating for all Learning Focus Areas Set ambitious and well-defined goals	Unit 4 Pre-Assessment
	4.1: Solving Systems by Graphing	Identify a system of linear equations and their solutions Solve systems of linear equations by graphing	4.1 Quiz

MP.4	4.2: Solving Systems by Substitution	Solve systems of equations using the substitution method	4.2 Quiz
	4.3: Solving Systems by Elimination	Solve systems of equations by using the elimination method Choose the appropriate method for solving systems of equations (graphing, substitution, or elimination)	4.3 Quiz
	4.4: Solving Special Systems	Solve special systems of equations Classify systems of equations and determine the number of solutions	4.4 Quiz
	4.5: Solving Linear Inequalities	Graph and solve linear inequalities	4.5 Quiz
	4.6: Solving Linear Systems of Inequalities	Graph systems of linear inequalities Solve systems of linear inequalities	4.6 Quiz
	No new content	Graph systems of linear inequalities	Unit 4 Discussion: Build a Shape Workshop
	4.7: Solving Systems with 3 Variables	Solve systems of 3 linear equations with 3 unknowns	4.7 Quiz
	End of Unit 4	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 4.1-4.7 Objectives	Unit 4 Self-Assessment Unit 4 Student-Teacher Conference Unit 4 Test
Unit 5:	**Essential Question:**		

	How can we organize bivariate data to make predictions and identify relationships? **How do we use scatter plots and trend lines to predict future events?**		
Course Objective	C1: Mathematical Reasoning and Expression C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C8: Analyzing Data, Probability, and Statistics		
Unit Objectives	● Provides self-rating for all Learning Focus Areas ● Set ambitious and well-defined goals ● Create and interpret scatter plots ● Use trend lines to make predictions ● Describe correlations from scatter plots ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
S.ID.6 S.ID.6.a S.ID.6.c S.ID.7 S.ID.8 S.ID.9 MP.1 MP.2 MP.3 MP.4	Unit 5 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goals	Unit 5 Pre-Assessment
	5.1: Scatter Plots and Trend Lines	Create and interpret scatter plots Use trend lines to make predictions Describe correlations from scatter plots	5.1 Quiz
	No new content	Create and interpret scatter plots Use trend lines to make predictions Describe correlations from scatter plots	Unit 5 Project: It's Cold Outside…or is it?
	No new content	Describe correlations from scatter plots	Unit 5 Discussion: Design Your Own Study

	End of Unit 5	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 5.1 Objectives	Unit 5 Self-Assessment Unit 5 Student-Teacher Conference Unit 5 Test
Unit 6:	**Essential Question:** **How do we work with polynomials and their terms with differing exponents?** **What is a scientific notation?** **How does one classify polynomials?** **What is FOIL and how is it used?**		
Course Objective	C1: Mathematical Reasoning and Expression C2: Solving Problems with Number Systems and Complex Numbers C3: Reasoning with Computational Strategies C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Provides self-rating for all Learning Focus Areas. ● Set ambitious and well-defined goals ● Evaluate expressions containing integer and zero exponents ● Simplify expressions containing integer and zero exponents ● Evaluate and multiply by powers of 10 ● Convert between standard notation and scientific notation ● Use multiplication properties of exponents to evaluate and simplify expressions ● Use division properties of exponents to evaluate and simplify expressions ● Classify polynomials ● Write polynomials in standard form ● Add and subtract polynomials ● Multiply polynomials		

	● Provides self-rating for all Learning Focus Areas. ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
N.RN.2 A.SSE.1.a A.APR.1 MP.1 MP.2 MP.6 MP.8	Unit 6 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goals	Unit 6 Pre-Assessment
	6.1: Integer Exponents	Evaluate expressions containing integer and zero exponents Simplify expressions containing integer and zero exponents	6.1 Quiz
	6.2: Powers of 10 and Scientific Notation	Evaluate and multiply by powers of 10 Convert between standard notation and scientific notation	6.2 Quiz
	No new content	Evaluate and multiply by powers of 10 Convert between standard notation and scientific notation	Unit 6 Discussion: Understanding Earthquakes and the Richter Scale
	6.3: Multiplication Properties of Exponents	Use multiplication properties of exponents to evaluate and simplify expressions	6.3 Quiz
	6.4: Division Properties of Exponents	Use division properties of exponents to evaluate and simplify expressions	6.4 Quiz
	6.5: Polynomials	Classify polynomials Write polynomials in standard form	6.5 Quiz

	6.6: Adding and Subtracting Polynomials	Add and subtract polynomials	6.6 Quiz
	6.7: Multiplying Polynomials	Multiply polynomials	6.7 Quiz
	End of Unit 6	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 6.1-6.7 Objectives	Unit 6 Self-Assessment Unit 6 Student-Teacher Conference Unit 6 Test
Unit 7:	**Essential Question:** **What are the different methods of factoring polynomials?** **What is a prime factorization?** **What is a perfect square?**		
Course Objective	C1: Mathematical Reasoning and Expression C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Provides self-rating for all Learning Focus Areas. ● Set ambitious and well-defined goals ● Write the prime factorization of numbers ● Find the GCF of monomials ● Factor polynomials by using the GCF ● Factor quadratics in the form x2 + bx + c ● Factor quadratics in the form ax2 + bx + c ● Factor perfect square trinomials ● Factor the difference of two squares		

	● Provides self-rating for all Learning Focus Areas. ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
A.SSE.2 A.SSE.3.a MP.1 MP.2 MP.4 MP.7 MP.8	Unit 7 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goals	Unit 7 Pre-Assessment
	7.1: Factors and the GCF	Write the prime factorization of numbers Find the GCF of monomials	7.1 Quiz
	7.2: Factoring Polynomials	Factor polynomials by using the GCF	7.2 Quiz
	7.3: Factoring Trinomials	Factor quadratics in the form x2 + bx + c	7.3 Quiz
	7.4: Factoring Trinomials with a Leading Coefficient	Factor quadratics in the form ax2 + bx + c	7.4 Quiz
	7.5: Factoring Special Products	Factor perfect square trinomials Factor the difference of two squares	7.5 Quiz
	No new content	Factor polynomials by using the GCF Factor quadratics in the form x2 + bx + c Factor quadratics in the form ax2 + bx + c	Unit 7 Project
	End of Unit 7	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes	Unit 7 Self-Assessment

		Communicate respectfully and appropriately Advocate for personal learning needs 7.1-7.5 Objectives	Unit 7 Student-Teacher Conference Unit 7 Test
Unit 8:	**Essential Question:** **What are the characteristics of quadratic functions, and what are the different methods for solving quadratic equations?** **What defines whether a quadratic equation has a maximum or a minimum?** **What is the discriminant?** **What are complex numbers?**		
Course Objective	C1: Mathematical Reasoning and Expression C2: Solving Problems with Number Systems and Complex Numbers C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Provides self-rating for all Learning Focus Areas. ● Set ambitious and well-defined goals ● Identify quadratic functions ● Determine whether quadratic functions have a maximum or minimum ● Graph a quadratic function ● Find the zeros of a quadratic function from its graph ● Find the axis of symmetry and the vertex of a parabola ● Graph and transform quadratic functions ● Solve quadratic equations by graphing ● Solve quadratic equations by factoring ● Solve quadratic equations by using square roots ● Solve quadratic equations by completing the square ● Identify the vertex of a quadratic equation in vertex form ● Solve quadratic equations by using the Quadratic Formula ● Determine the number of solutions to a quadratic equation by using the discriminant		

	● Know that the complex number i is one of two solutions to x2 = -1 ● Simplify roots of negative numbers with i ● Add, subtract, and multiply complex numbers ● Use the distributive property with complex numbers ● Provides self-rating for all Learning Focus Areas. ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
N.CN.1 N.CN.2 A.CED.3 A.REI.4 A.REI.4.a A.REI.4.b A.REI.10 F.IF.4 F.IF.7 F.IF.7.a F.IF.7.c F.BF.3 MP.1 MP.2 MP.4 MP.5 MP.6 MP.7	Unit 8 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goals	Unit 8 Pre-Assessment
	8.1: Identifying Quadratic Functions	Identify quadratic functions Determine whether quadratic functions have a maximum or minimum Graph a quadratic function	8.1 Quiz
	8.2: Characteristics of Quadratic Functions	Find the zeros of a quadratic function from its graph Find the axis of symmetry and the vertex of a parabola	8.2 Quiz
	8.3: Transforming Quadratic Functions	Graph and transform quadratic functions	8.3 Quiz
	8.4: Solving Quadratic Equations by Graphing	Solve quadratic equations by graphing	8.4 Quiz
	8.5: Solving Quadratic Equations by Factoring	Solve quadratic equations by factoring	8.5 Quiz
	8.6: Solving Quadratic Equations by Using Square Roots	Solve quadratic equations by using square roots	8.6 Quiz

	8.7: Completing the Square	Solve quadratic equations by completing the square Identify the vertex of a quadratic equation in vertex form	8.7 Quiz
	8.8: The Quadratic Formula and the Discriminant	Solve quadratic equations by using the Quadratic Formula Determine the number of solutions to a quadratic equation by using the discriminant	8.8 Quiz
		Solve quadratic equations by graphing Solve quadratic equations by factoring Solve quadratic equations by using square roots Solve quadratic equations by completing the square Solve quadratic equations by using the Quadratic Formula	Unit 8 Discussion: A Perfect Pair!
	8.9: Complex Numbers and Roots	Know that the complex number i is one of two solutions to x2 = -1 Simplify roots of negative numbers with i	8.9 Quiz
	8.10: Complex Number Operations	Add, subtract, and multiply complex numbers Use the distributive property with complex numbers	8.10 Quiz

	End of Unit 8	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 8.1-8.10 Objectives	Unit 8 Self-Assessment Unit 8 Student-Teacher Conference Unit 8 Test
Unit 9:	**Essential Question:** **What is the relationship between exponential and logarithmic functions, and how are these functions used in the world?** **What is exponential growth and decay?** **What is a radicand?** **What algebraic functions have to do with a roller coaster?**		
Course Objective	C1: Mathematical Reasoning and Expression C2: Solving Problems with Number Systems and Complex Numbers C3: Reasoning with Computational Strategies C4: Developing Mathematical Arguments C6: Analyzing Algebraic Functions, Patterns, and Relations		
Unit Objectives	● Provides self-rating for all Learning Focus Areas. ● Set ambitious and well-defined goal ● Evaluate exponential functions ● Identify and graph exponential functions ● Solve problems involving exponential growth and decay ● Identify and graph logarithmic functions ● Relate logarithmic functions to real life ● Identify square root functions and their domains and ranges ● Graph square root functions		

	● Simplify radical expressions ● Add and subtract radical expressions ● Multiply and divide radical expressions ● Solve radical equations ● Graph polynomial functions ● Determine the number of zeros of a polynomial function ● Understand how the degree, leading coefficient, and number of zeros affects a polynomial graph ● Provides self-rating for all Learning Focus Areas. ● Reflect on personal learning and learning processes ● Communicate respectfully and appropriately ● Advocate for personal learning needs		
Standards	**Instructional Materials/Activities**	**Lesson Objectives**	**Assessment**
N.RN.2 A.APR.1 A.APR.3 A.REI.2 F.IF.7 F.IF.7.b F.IF.7.c F.IF.7.e F.LE.1 F.LE.1.a F.LE.1.b F.LE.1.c F.LE.4 MP.1 MP.2 MP.4 MP.5 MP.6 MP.7 MP.8	Unit 9 Introduction	Provides self-rating for all Learning Focus Areas. Set ambitious and well-defined goal	Unit 9 Pre-Assessment
	9.1: Exponential Functions	Evaluate exponential functions Identify and graph exponential functions	9.1 Quiz
	9.2: Exponential Growth and Decay	Solve problems involving exponential growth and decay	9.2 Quiz
	No new content	Evaluate exponential functions Identify and graph exponential functions Solve problems involving exponential growth and decay	Unit 9 Project
	9.3: Logarithmic Functions	Identify and graph logarithmic functions Relate logarithmic functions to real life	9.3 Quiz

	9.4: Square Root Functions	Identify square root functions and their domains and ranges Graph square root functions	9.4 Quiz
	9.5: Radical Expressions	Simplify radical expressions	9.5 Quiz
	9.6: Adding and Subtracting Radical Expressions	Add and subtract radical expressions	9.6 Quiz
	9.7: Multiplying and Dividing Radical Expressions	Multiply and divide radical expressions	9.7 Quiz
	No new content	Add and subtract radical expressions Multiply and divide radical expressions	Unit 9 Discussion: You're the Teacher!
	9.8: Solving Radical Expressions	Solve radical equations	9.8 Quiz
	9.9: Polynomial Functions	Graph polynomial functions Determine the number of zeros of a polynomial function Understand how the degree, leading coefficient, and number of zeros affects a polynomial graph	9.9 Quiz
	End of Unit 9	Provides self-rating for all Learning Focus Areas. Reflect on personal learning and learning processes Communicate respectfully and appropriately Advocate for personal learning needs 9.1-9.9 Objectives	Unit 9 Self-Assessment Unit 9 Student-Teacher Conference Unit 9 Test