Grade 8 Math

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September 2022

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new) CEQ: ● **WHAT IS THE LANGUAGE OF ALGEBRA?** ● **HOW ARE FUNCTIONS USED?** ● **HOW CAN ALGEBRA BE USED TO SOLVE REAL WORLD SITUATIONS?** UEQ: ● *How can you represent quantities, patterns, and relationships?*	**Foundations of Algebra** 1a. Distinguish between variable and constant quantities 1b. Model relationships with equations and expressions 2a. Simplify expressions involving exponents 2b. Use the order of operations to evaluate expressions 3a. Classify , graph and compare real numbers 3b. Find and estimate square roots 3c. Find sums and differences of real numbers	**Foundations of Algebra** **LT1. I can classify real numbers (rational, irrational, integer, whole, natural)** LT **2. I can use the order of operations (PEMDAS).** LT **3. I can write an algebraic expression or function rule (equation) using variables.** LT **4. I can order/compare real numbers.** LT **5. I can identify and apply the properties I use when simplifying an expression.** LT **6. I can add, subtract, multiply and divide rational numbers.** LT **7. I can simplify and estimate square roots.** LT **8. I can identify solutions of a two variable equation using tables, graphs and equations.** **LT 9. I can evaluate expressions containing square roots, absolute value and variables.**	**8.1.1.1** **8.1.1.2** **8.1.1.3** **8.2.3.1** **8.2.3.2** **8.2.4.9**	**Foundations of Algebra** **CFA** **CSA**	**Foundations of Algebra** Prentice Hall Algebra 1, Chapter 1 http://www.phschool.com **Key Vocabulary (new text)** expression (1-1) variable (1-1) evaluate (1-2) simplify exponent (1-2) base (1-2) square root rational (1-3) irrational (1-3) integer (1-3) whole number (1-3) perfect square (1-3) commutative property (1-4) associative property (1-4) absolute value (1-5) reciprocal (1-6) distributive property (1-7)

• *How are properties related to algebra?* • • **Foundations for Algebra** 1.Variables 2.Order of Operations 3.Real Numbers 4.Properties of Numbers 5.Patterns, Equations and Graphs	3d. Find products and quotients of real numbers 4a. Identify, apply and examine properties of real numbers 5a. Solve equations using tables and mental math 5b. Use tables, equations and graphs to describe relationships				like terms (1-7) coefficient (1-7) constant term (1-7) equation (1-8) solution (1-8)

September/October

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new)UEQ: ● *How are multi-step equations, including those with variables on both sides, solved when using the properties of equality?* ● ● **Solving Equations** 1. Equations 2. Proportionality	● **Solving Equations** 1a Solve one-step equations 1b Solve two-step equations 1c Solve multi-step equations 1d Solve equations with variables on both sides 1e Identify equations that are identities or no solutions 1f Rewrite and use literal equations and formulas 1g Solve problems using the	● **Solving Equations** **LT1, I can solve one-step and multi-step equations with one variable.** **LT2. I can solve problems involving right triangles using the Pythagorean Theorem** **LT3. I can write and solve a proportion and apply it to real world situation** **LT4. I can model a real world problem with an algebraic equation and solve it.** **LT5. I can find a unit rate.** **LT6. I can find percent of**	**8.2.3.1** **8.2.4.2** **8.3.1.1**	● **Solving Equations** CFA CSA	● **Solving Equations** **Key Vocabulary (new text chapter 2))** isolate (2-1) inverse operations (2-1) identity (2-4) no solution (2-4) formula (2-5) **pythagorean theorem ((10-1)** **hypotenuse (10-1)** leg **(10-1)** **distance**

	Pythagorean Theorem (lesson 10-1) 2a Find ratios and rates 2b Convert units and rates 2c Solve and apply proportions 2d Find missing lengths in similar figures 2e Solve percent problems using proportions and percent equation 2f Find percent change 2e Find relative/percent error	**change and describe as increase or decrease** **LT7. I can find the percent error of a measurement.**			**formula(concept byte)** **midpoint formula (concept byte)** **ratio (2-6)** **unit rate (2-6)** **proportion (2-7)** **cross products/multiplication (2-7)** **similar figures (2-8)** **scale model (2-8)** **percent (2-9)** **interest (2-9)** **percent change (2-10)** **percent error (2-10)**

October/November

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new)UEQ: ● *How can equations and inequalities that involve absolute value be solved?* ● *How do you represent relationships between quantities that are not equal?* ● *How can you solve inequalities?* **Solving Inequalities** 1 Inequalities	**Solving Inequalities** **1a. Write, graph and identify solutions of inequalities.** **1b. Use addition or subtraction to solve inequalities.** **1c. Use multiplication or division to solve inequalities.** **1d. Solve multi-step inequalities.** **2a. Solve and graph inequalities containing the word *and*** **2b. Solve and graph inequalities containing the word *or*** **3a. Solve equations and inequalities involving absolute value.**	**Solving Inequalities** LT1. I can graph a linear inequality on a number line. LT2. I can solve linear inequalities. LT3. I can solve equations involving absolute value. LT4. I can solve inequalities involving absolute value. LT5. I can graph absolute value inequalities on a number line. LT6. I can write an inequality to model a real world situation.	**8.2.4.4** **8.2.4.5** **8.2.4.6**	**Solving Inequalities** **CFA** **CSA**	**Solving Inequalities** **Key Vocabulary (new text ch 3)** **solution of inequality (3-1)** **compound inequality and/or(3-6)**

2. Compound Inequalities 3. Absolute Value Equations and Inequalities					

December

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new)UEQ: ● *How can you represent and describe functions?*	**Introduction to Functions** **1a. Represent mathematical relationships using graphs.** **2a. Identify and**	**Introduction to Functions** **LT1. I know what function notation is.** **LT2. I can evaluate functions given input values (domain).** **LT3. I can use a linear function to find terms in**	**8.2.1.1** **8.2.1.2** **8.2.1.3**	**Introduction to Functions** **CFA** **CSA**	**Introduction to Functions** **Key Vocabulary (new text chapter 4)** dependent variable (4-2) independent variable (4-2)

• *Can functions describe real-world situations?* **Introduction to Functions** 1. Using graphs to relate two quantities. 2. Patterns and functions 3. Graphing a function rule 4. Writing a function rule 5. Function notation and sequences	**represent patterns that describe linear functions.** **2b. Identify and represent patterns that describe non-linear functions.** **3a. Graph equations that represent functions.** **4a. Write equations that represent functions.** **4b. Determine whether a relation is a function.** **4c. Find a domain and range and use function notation.** **5a. Identify and extend patterns in sequences.** **5b. Represent arithmetic sequences using function notation.**	**an arithmetic sequence.** **LT4. I can model functions using rules, tables and graphs.** **LT5. I can match a function rule to its graph/or table.**	**8.2.1.4** **8.2.2.1** **8.2.2.4**		input (4-2) output (4-2) linear function (4-2) function (4-2) non linear function (4-3) continuous graph (4-4) discrete graph (4-4) domain (4-6) range (4-6) function notation (4-6) common difference (4-7) arithmetic sequence (4-7)

January

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new) UEQ: ● What does the slope of a line indicate about a line. ● What information does the equation of a line give you? ● How can you make predictions based on a scatter plot? **LINEAR FUNCTIONS** 1. Rate of Change and Slope 2. Forms of Linear Equations. 3. Scatter Plots and Trend Lines	**LINEAR FUNCTIONS** **1a. Find the rates of change from tables.** **1b. Find slope.** **1c. Determine whether lines are parallel, perpendicular or neither.** **1d. Write equations of parallel lines and perpendicular lines.** **2a. Write and graph an equation of a direct variation (y = mx).** **2b. Write linear equations using Slope-Intercept Form.** **2c. Graph linear equations using Slope-Intercept Form.** **2d. Write and graph linear equations using Point-Slope form.** **2e. Graph linear equations using intercepts.** **2f. Write linear equations in Standard Form.** **3a. Write an equation of a trend line and of a line of best fit.** **3b. Use a trend line and a line of best fit to make predictions.** **4a. Graph an absolute**	**LINEAR FUNCTIONS** **LT1. I can find the rate of change/ slope from a table, graph and equation.** **LT2. I can find the slope using 2 points** **LT3. I can write and graph linear relationships using stand form, slope-intercept and point-slope form.** **LT4. I can write an equation, create a table and make a graph from a word problem.** **LT5. I can change linear equations from one form to another.** **LT6. I can determine if lines are parallel or perpendicular and write equations for these lines.** **LT7. I understand what trend lines and lines of best fit are and how to use them.** **LT8. I can write an absolute value equation for a translation (slide) of a parent function and graph these translations.** **LT9. I can find the distance between 2**	**8.2.2.1** **8.2.2.2** **8.2.2.3** **8.2.4.1** **8.2.4.3** **8.3.2.1** **8.3.2.2** **8.3.2.3** **8.4.1.1** **8.4.1.2** **8.4.1.3**	**LINEAR FUNCTIONS** **CFA** **CSA**	**LINEAR FUNCTIONS** **Key Vocabulary (chapter 5 new text)** rate of change (5-1) slope (5-1) direct variation/proportional y= mx (5-2) constant of variation/slope (5-2) linear equation (5-3) y-intercept (5-3) slope intercept form (5-3) point slope form (5-4) standard form (5-5) x-intercept (5-5) parallel lines (5-6) perpendicular lines (5-6) scatter plot (5-7) trend line (5-7) positive correlation (5-7) negative correlation (5-7) no correlation (5-7) line of best fit (5-7) correlation coefficient (5-7) translation (5-8)

4. Absolute Value Functions 5. Distance Formula and Mid-point Formula	**value function.** **4b. Translate the graph of an absolute value function.** **5a. Use the distance formula to find the distance between 2 points on a graph.** **5b. Determine the mid-point of a line.**	**points on a line.** **LT 10. I know that a linear function is proportional if the y-intercept is zero.**			

February

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new) UEQ: ● *How can you solve a system of equations or inequalities?* ● *Can systems of equations model real-world situations?* **Systems of Equations and Inequalities** 1. Solving Systems of Equations. 2. Linear Inequalities 3. Applying Linear Systems	**Systems of Equations and Inequalities** 1a. Solve systems of equations by graphing. 1b. Analyze special systems. 1c. Solve systems of equations using substitution. 1d. Solve systems by adding or subtracting to eliminate a variable. 1e. Choose the best method for solving a system of linear equations. 2a. Graph linear inequalities in two variables. 2b. Use linear inequalities when modeling real-world solutions. 2c. Solve systems of linear inequalities by graphing. 3a. Model real-	**Systems of Equations and Inequalities** **LT1. I can solve a system of equations by graphing.** **LT2. I can solve a system of equations using substitution.** **LT3. I can solve a system of equations using elimination.** **LT4. I understand what it means for a system to have infinite solutions or no solution.** **LT5. I can write a system of linear equations for a word problem.** **LT6. I can model, write and graph linear inequalities.** **LT7. I can model, write and graph systems of linear inequalities.**		**Systems of Equations and Inequalities** **CFA** ☒ ☒ **CSA** ☒	**Systems of Equations and Inequalities** **Key Vocabulary (chapter 6 new text)** systems of linear equations (6-1) solution of a system of linear equations (6-1) infinitely many solutions (6-1) no solution (6-1) substitution method (6 -2) elimination method (6-3) linear inequality (6-5) solution of linear inequality (6-5) systems of linear inequality (6-6) solution of a system of linear inequality (6-6)

	world situations using systems of linear inequalities.				

March

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
(new)UEQ: ● *How can you represent very large and very small numbers?*	**Exponents and Exponential Functions** **1a. Simplify expressions involving zero and negative exponents.** **2a. Write numbers in scientific and standard**	**Exponents and Exponential Functions** **LT1. I can evaluate and simplify exponents** **LT2. I can change between scientific and standard notation.** **LT3. I can represent real**	**8.2.2.1** **8.2.4.4** **8.2.4.7** **8.2.4.8**	**Exponents and Exponential Functions** **CFA** **CSA**	**Exponents and Exponential Functions** **Key Vocabulary (chapter 7 new text)** scientific notation (7-2) standard notation (7-2)

• *How can you simplify expressions involving exponents.* • *What are the characteristics of exponential functions?* **Exponents and Exponential Functions** 1. Zero and Negative Exponents 2. Scientific Notation 3. Properties of Exponents 4. Exponential Functions and Geometric Sequences. 5. Exponential Growth and Decay	**notation.** **2b. Compare and order numbers using scientific notation.** **3a. Multiply powers with the same base.** **3b. Raise a power to a power.** **3c. Raise a product to a power.** **3d. Divide powers with the same base.** **3e. Raise a quotient to a power.** **4a. Evaluate and graph exponential functions.** **4b. Find rules for geometric sequences and extend geometric sequences.** **5a. Model exponential growth and decay.**	**world situations using scientific notation.** **LT4. I can use the geometric sequence rule to find any term (nth)** **LT5. I can evaluate and model exponential functions.**			exponential functions (7-6) geometric sequences (concept byte) exponential growth(7-7) exponential decay (7-7) growth factor (7-7) decay factor (7-7) compound interest*optional (7-7)

April

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology
UEQ: ● Can two algebraic expressions that appear to be different be equivalent? ● How are the properties of real numbers related to polynomials? **Polynomials and Factoring** 1. Adding and Subtracting Polynomials	**Polynomials and Factoring** **1a. Classify, add and subtract polynomials** **2a. Multiply a monomial by a polynomial** **2b. Factor a monomial from a polynomial** **2c. Multiply two binomials or a binomial by a trinomial.** **2d. Find the square of a binomial and to find the product of a sum and difference.** **3a. Factor trinomials of the form $x^2 + bx + c$** **3b. Factor trinomials of the form $ax^2 + bx + c$** **3c. Factor perfect-square trinomials and the differences of two squares.** **4a. Factor higher-degree polynomials by grouping.**	**Polynomials and Factoring** **LT1. I can classify polynomials by degree and by number of terms** **LT2. I can simplify polynomials using addition, subtraction and multiplication including the distributive property (FOIL)** **LT3. I can factor polynomials.**		**Polynomials and Factoring** **CFA** **CSA**	**Polynomials and Factoring** Key Vocabulary monomial (8-1) degree of a polynomial (8-1) polynomial (8-1) standard form of polynomial (8-1) binomial (8-1) trinomial (8-1) factor (8-2) FOIL (8-3)

2. Multiplying Binomials and Special Cases 3. Factoring Trinomials and Special Cases 4. Factoring by Grouping					

May

May

Content	Skills	Learning Targets	MN State Standards	Assessment	Resources & Technology

UEQ: What are the characteristics of quadratic functions? How can you solve a quadratic equation? How can you use functions to model real-world situations? **Quadratic Functions and Equations** 1.Graphing Quadratic Functions 2.Solving Quadratic Equations 3.Systems of Linear and Quadratic Equations. 4.Choosing a Model	**A.Quadratic Models** A1. Graph quadratic functions and inequalities **B. Solving Quadratic Equations** B1. Solve quadratic equations by graphing B2.Solve quadratic equations using square roots B3.Solve quadratic equations by factoring B4. Solve quadratic equations by completing the square B5. Solve quadratic equations by using the quadratic formula B6. Find the number of solutions by using the discriminant **C. Models for Data**	1.I can graph quadratic functions and inequalities. 2.I can solve quadratic equations in the following ways: graphing using square roots, factoring, completing the square and using the quadratic formula 3.I can find the number of solutions of a quadratic function by using the discriminant 4.I can determine whether a function is linear, exponential or quadratic.	8.1.1.4 8.1.1.5 8.2.1.5 8.2.2.5	**A.Quadratic Models** **B. Solving Quadratic Equations.** A-B1. Check point Quiz #1 (10-1 to 10-3), 10 open response questions. A-B2. Check point Quiz #2 (10-4 to 10-7), 12 open response questions. **C. Models for Data** C1. Choosing a linear, quadratic or exponential model for data CA. Chapter 10 Test 23 open response questions CA Final Exam, Chapter 1-10, 100 multiple choice questions	**A.Quadratic Models** **B. Solving Quadratic Equations.** **C. Models for Data** A-C1. Prentice hall Algebra 1, Chapter 10 A-C2. http://www.phschool.com A-C3. https://www.desmos.com/calculator and graphing calculator

	C1. choose a linear, quadratic or exponential model for data				