Park Hill School District

Building Successful Futures • Each Student • Every Day

Middle School Algebra I Curriculum

Course Description: This is a rigorous course offered in the eighth grade which provides a formal development of the algebraic skills and concepts necessary for students to succeed in advanced courses. In particular, the instructional program in this course provides for the use of algebraic skills in a wide range of real-world problem-solving situations. The concept of function is emphasized throughout the course. Units include Solving Linear Equations, Solving Linear Inequalities, Graphing Linear Equations, Writing Linear Functions, Solving Systems of Linear Equations, Exponential Functions, Polynomial Equations and Factoring, Graphing Quadratic Functions, Solving Quadratic Equations, Data Analysis and Displays, Sequences, and EOC Review.

Scope and Sequence:

Time Frame (blocks)	Unit
8	Solving Linear Equations
7	Solving Linear Inequalities
7	Graphing Linear Equations
7	Writing Linear Functions
8	Solving Systems of Linear Equations
6	Exponential Functions

8.5	Polynomial Equations and Factoring
8	Graphing Quadratic Functions
6	Solving Quadratic Equations
7	Data Analysis and Displays, Sequences
Remainder	EOC Review

Curriculum Revision Tracking

Spring, 2022

- Adopted DESE Priority Standards
- Included Learning Targets and Success Criteria
- Updated units from:
    - Unit 1: Linear Equations and Functions
    - Unit 2: Inequality and Systems
    - Unit 3: Exponentials
    - Unit 4: Polynomials
    - Unit 5: Data, Formulas and Patterns
    - Unit 6: Radicals

  to

    - Unit 1: Solving Linear Equations
    - Unit 2: Solving Linear Inequalities
    - Unit 3: Graphing Linear Equations
    - Unit 4: Writing Linear Functions
    - Unit 5: Solving Systems of Linear Equations
    - Unit 6: Exponential Functions
    - Unit 7: Polynomial Equations and Factoring
    - Unit 8: Graphing Quadratic Functions
    - Unit 9: Solving Quadratic Equations
    - Unit 10: Data Analysis and Displays, Sequences
- Updated scope, sequence and pacing to match newly updated units

Fall 2019

- Revised Scope and Sequence to align to block scheduling

Unit 1: Solving Linear Equations

Subject: Algebra I
Grade: 8
Name of Unit: Solving Linear Equations
Length of Unit: 8 blocks (6 for learning, 2 for review and assessment)
Overview of Unit: Unit 1 presents the foundational skills related to solving linear equations and the connected skills of solving absolute value equations and rewriting equations and formulas.

Priority Standards for unit:
- A1.CED.A.1 Create equations and inequalities in one variable and use them to model and/or solve problems.

Supporting Standards for unit:
- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
    a)Identify, label and use appropriate units of measure within a problem.
    b)Convert units and rates.
    c)Use units within problems.
    d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.NQ.B.4 Define and use appropriate quantities for representing a given context or problem.
- A1.NQ.B.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- A1.CED.A.4 Solve literal equations and formulas for a specified variable that highlights a quantity of interest.
- A1.REI.A.1 Explain how each step taken when solving an equation or inequality in one variable creates an equivalent equation or inequality that has the same solution(s) as the original.

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.CED.A.1	equations and inequalities in one variable	Create	Create	4
A1.CED.A.1	equations and inequalities in one variable to model and/or solve problems.	Use	Apply	2

Essential Questions:

1. How do you represent relationships between quantities?
2. Can equations that appear to be different be equivalent?
3. How can you solve equations?

Enduring Understanding/Big Ideas:

1. Any algebraic equation can be represented using symbols in an infinite number of ways, where each representation has the same solution.
2. Properties of numbers and equality can transform an equation into equivalent simpler equations. This process is used to find solutions.
3. Quantities are used to form expressions, and equations. An expression refers to a quantity but does not make a statement about it. An equation is a statement about the quantities in mentions. Using variables in place of numbers in equations allows the statement or relationships among numbers that are unknown or unspecified.
4. A single quantity may be represented by many different expressions. The facts about a quantity may be expressed by many different equations.
5. Solving an equation is the process of rewriting the equation to make what it says about its variables as simple as possible. Properties of numbers and equality can be used to transform an equation into equivalent, simpler equations in order to find solutions. Useful information about equations can be found by analyzing graphs or tables. The numbers and types of solutions vary predictably, based on the type of equation.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
expression equal equation variable inequality compound inequality greater than less than like terms	isolate variable(s) properties of equality identity property of equality inverse property of equality commutative property of addition/multiplication associative property of addition/multiplication distributive property

Big Ideas Chapter 1: Solving Linear Equations

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.NQ.B.3, **A1.CED.A.1**, A1.REI.A.1	1.1 Solving Simple Equations	0.5	Write and solve one-step linear equations.	• I can apply properties of equality to produce equivalent equations. • I can solve linear equations using addition, subtraction, multiplication, or division. • I can write linear equations that model real-life situations.
A1.NQ.B.3, **A1.CED.A.1**, A1.REI.A.1	1.2 Solving Multi-Step Equations	1	Write and solve multi-step linear equations.	• I can apply more than one property of equality to produce equivalent equations. • I can solve multi-step linear equations using inverse operations. • I can write multi-step linear equations that model real-life situations.
A1.NQ.B.3, A1.NQ.B.4, A1.NQ.B.5, **A1.CED.A.1**	1.3 Modeling Quantities	0.5	Use proportional reasoning and analyze units when solving problems.	• I can use ratios to solve real-life problems. • I can use rates to solve real-life problems. • I can convert units and rates.
A1.NQ.B.3, A1.REI.A.1	1.5 Solving Equations with Variables on Both Sides	1	Write and solve equations with variables on both sides.	• I can apply properties of equality using variable terms. • I can solve equations with variables on both sides. • I can recognize when an equation has zero, one, or infinitely many solutions.
A1.CED.A.1, A1.REI.A.1	1.6 Solving Absolute Value Equations	2	Write and solve equations involving absolute value.	• I can write the two linear equations related to a given absolute value equation. • I can solve equations involving one or two absolute values. • I can identify special solutions of absolute value equations.

A1.CED.A.1, A1.CED.A.4	1.7 Rewriting Equations and Formulas	1	Solve literal equations for given variables.	• I can identify a literal equation. • I can use properties of equality to rewrite literal equations. • I can use rewritten formulas to solve problems.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

- Performance Task found in the Big Ideas Assessment Book (accessible in the physical Assessment Book, or the digital version in the Assess area of the Featured Chapter Resources after selecting the appropriate Chapter).
- Performance Task found at the end of the chapter in Big Ideas.
- Performance Task found in the Teach area of the Featured Chapter Resources after selecting the appropriate Chapter.

Unit 2: Solving Linear Inequalities

Subject: Algebra I
Grade: 8
Name of Unit: Solving Linear Inequalities
Length of Unit: 7 blocks (5 for learning, 2 for review and assessment)
Overview of Unit: Unit 2 presents the skills and understanding related to solving linear inequalities, and the connected skills of solving absolute value inequalities.

Priority Standards for unit:

- A1.CED.A.1 Create equations and inequalities in one variable and use them to model and/or solve problems.
- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting Standards for unit:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
  - a)Identify, label and use appropriate units of measure within a problem.
  - b)Convert units and rates.
  - c)Use units within problems.
  - d)Choose and interpret the scale and the origin in graphs and data displays."

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.CED.A.1	equations and inequalities in one variable	Create	Create	4
A1.CED.A.1	equations and inequalities in one variable to model and/or solve problems.	Use	Apply	2
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2

Essential Questions:

1. How do you represent relationships between quantities that are not equal?
2. Can inequalities that appear to be different be equivalent?
3. How can you solve inequalities?

Enduring Understanding/Big Ideas:

1. Any algebraic inequality can be represented using symbols in an infinite number of ways, where each representation has the same solution.
2. Properties of numbers and equality can transform an equation into equivalent simpler equations. This process is used to find solutions.
3. Quantities are used to form expressions, and equations. An expression refers to a quantity but does not make a statement about it. An equation is a statement about the quantities in mentions. Using variables in place of numbers in equations allows the statement or relationships among numbers that are unknown or unspecified.
4. A single quantity may be represented by many different expressions. The facts about a quantity may be expressed by many different inequalities.
5. Solving an inequality is the process of rewriting the equation to make what it says about its variables as simple as possible. Properties of numbers and equality can be used to transform an equation into equivalent, simpler equations in order to find solutions. Useful information about equations can be found by analyzing graphs or tables. The numbers and types of solutions vary predictably, based on the type of inequality.

Unit Vocabulary:

Academic Cross-Curricular Words	**Content/Domain Specific**
expression equal equation variable inequality compound inequality greater than less than like terms	isolate variable(s) properties of equality identity property of equality inverse property of equality commutative property of addition/multiplication associative property of addition/multiplication distributive property

Big Ideas Chapter 2: Solving Linear Inequalities

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.SSE.A.1, **A1.CED.A.1**	2.1 Writing and Graphing Inequalities	1	Write inequalities and represent solutions of inequalities on number lines.	● I can write word sentences as inequalities ● I can determine whether a value is a solution of an inequality. ● I can graph and interpret inequalities.
A1.NQ.B.3, **A1.CED.A.1**	2.2&3 Solving Inequalities Using Addition, Subtraction, Multiplication or Division	1	Write and solve inequalities using addition, subtraction, multiplication	● I can apply the Addition and Subtraction Properties of Inequality to produce equivalent inequalities. ● I can solve inequalities using addition or subtraction. ● I can use inequalities to model real-life problems. ● I can apply the Multiplication and Division Properties of Inequality to produce equivalent inequalities. ● I can solve inequalities using multiplication or division. ● I can recognize when to reverse an inequality symbol while solving an inequality."
A1.NQ.B.3	2.4 Solving Multi-Step Inequalities	1	Write and solve multi-step inequalities.	● I can use more than one property of inequality to generate equivalent inequalities. ● I can solve multi-step inequalities using inverse operations. ● I can apply multi-step inequalities to solve real-life problems.

A1.NQ.B.3	2.5 Solving Compound Inequalities	1	Write and solve compound inequalities.	● I can write word sentences as compound inequalities. ● I can solve compound inequalities. ● I can graph solutions of compound inequalities.
A1.NQ.B.3	2.6 Solving Absolute Value Inequalities	1	Write and solve inequalities involving absolute value.	● I can write a compound inequality related to a given absolute value inequality. ● I can solve absolute value inequalities. ● I can use absolute value inequalities to solve real-life problems.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

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- Performance Task found in the Teach area of the Featured Chapter Resources after selecting the appropriate Chapter.

Unit 3: Graphing Linear Functions

Subject: Algebra I
Grade: 8
Name of Unit: Graphing Linear Functions
Length of Unit: 7 blocks (5 blocks for learning, 2 blocks for review and assessment)
Overview of Unit: Students may remember a "function machine" in which an input value is entered, a rule is applied, and the output value is obtained. There is a pairing of the input and output, and each input is associated with exactly one output. Unit 3 extends this introductory understanding so that functions are seen as describing situations in which one quantity determines another. Function notation and characteristics of functions are also studied, often in the context of graphing linear functions.

Priority Standards for unit:

- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.REI.C.6 Explain that the graph of an equation in two variables is the set of all its solutions plotted in the Cartesian coordinate plane.
- A1.IF.B.3 Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- A1.IF.C.7 Graph functions expressed symbolically and identify and interpret key features of the graph.
- A1.BF.A.1 Analyze the effect of translations and scale changes on functions.

Supporting Standards for unit:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
    - a)Identify, label and use appropriate units of measure within a problem.
    - b)Convert units and rates.
    - c)Use units within problems.
    - d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.IF.A.1 "Understand that a function from one set (domain) to another set (range) assigns to each element of the domain exactly one element of the range.
    - a) Represent a function using function notation.
    - b) Understand that the graph of a function labeled f is the set of all ordered pairs (x, y) that satisfy the equation y=f (x)."
- A1.IF.B.4 Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
- A1.IF.B.6 Interpret the parameters of a linear or exponential function in terms of the context.

- A1.LQE.A.1 "Distinguish between situations that can be modeled with linear or exponential functions.
    - a) Determine that linear functions change by equal differences over equal intervals.
    - b) Recognize exponential situations in which a quantity grows or decays by a constant percent rate per unit interval."
    -

Priority Standard	**Unwrapped Concepts (Students need to know)**	**Unwrapped Skills (Students need to be able to do)**	**Bloom's Taxonomy Levels**	**Webb's DoK**
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.REI.C.6	that the graph of an equation in two variables is the set of all its solutions plotted in the Cartesian coordinate plane.	Explain	Understand	2
A1.IF.B.3	key characteristics of a function that models the relationship between two quantities.	Interpret	Understand	3
A1.IF.C.7	functions expressed symbolically and	Graph	Apply	2
A1.IF.C.7	key features of the graph.	Identify	Remember	1
A1.IF.C.7	key features of the graph.	Interpret	Understand	2
A1.BF.A.1	the effect of translation and scale changes on functions.	Analyze	Analyze	4

Essential Questions:

1. What does the slope of a line indicate about the line?
2. What information does the equation of a line give you?
3. How can functions represent relationships we see in our everyday world?

Enduring Understanding/Big Ideas:

1. Ratios can be used to show relationships between changing quantities, such as vertical and horizontal change.
2. Graphs of linear equations are used to model predictable relationships.
3. The relationship between two lines can be determined by comparing the slopes and Y-intercepts.
4. Linear relationships are algebraic functions that allow us to organize data and make predictions.
5. Real-life situations can be modeled with linear equations.

Unit Vocabulary:

Academic Cross-Curricular Words	**Content/Domain Specific**
Linear Non-linear Dependent variable Independent variable	Average rate of change Slope Intercepts (x and y) Horizontal lines Vertical lines Slope-intercept form Standard form Intervals Table of values Correlation coefficient

Big Ideas Chapter 3: Graphing Linear Functions

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.IF.A.1, **A1.IF.B.3** A1.IF.B.4	3.1 Functions	1	Understand the concept of a function.	• I can determine whether a relation is a function. • I can find the domain and range of a function. • I can distinguish between independent and dependent variables.
A1.IF.A.1, **A1.IF.B.3**, A1.IF.B.4, A1.IF.B.6, A1.LQE.A.1	3.3 Linear Functions	1	Identify and graph linear functions.	• I can identify linear functions using graphs, tables, and equations. • I can graph linear functions with discrete and continuous domains. • I can write real-life problems that correspond to discrete or continuous data.
A1.NQ.B.3, A1.IF.A.1, A1.IF.A.2	3.4 Function Notation		Understand and use function notation.	• I can evaluate functions using function notation. • I can interpret statements that use function notation. • I can graph functions represented using function notation.
A1.NQ.B.3, **A1.REI.C.6**, **A1.IF.B.3**, **A1.IF.C.7**	3.5 Graphing Linear Equations in Standard Form	1	Graph and interpret linear equations written in standard form.	• I can graph equations of horizontal and vertical lines. • I can graph linear equations written in standard form using intercepts. • I can solve real-life problems using linear equations in standard form.

A1.NQ.B.3, **A1.SSE.A.1**, **A1.REI.C.6**, **A1.IF.B.3**, A1.IF.B.4, A1.IF.B.6, **A1.IF.C.7**, A1.LQE.A.1	3.6 Graphing Linear Equations in Slope-Intercept Form	1	Find the slope of a line and use slope-intercept form.	● I can find the slope of a line. ● I can use the slope-intercept form of a linear equation. ● I can solve real-life problems using slopes and y-intercepts.
A1.IF.B.3, A1.IF.B.4, **A1.IF.C.7**, **A1.BF.A.1**	3.8 Graphing Absolute Value Functions	1	Graph absolute value functions.	● I can graph absolute value functions. ● I can find the domain and range of absolute value functions. ● I can describe transformations of graphs of absolute value functions.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

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- Performance Task found in the Teach area of the Featured Chapter Resources after selecting the appropriate Chapter.

Unit 4: Writing Linear Functions

Subject: Algebra I
Grade: 8
Name of Unit: Writing Linear Functions
Length of Unit: 7 blocks (5 for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is writing linear functions. Students create equations in two variables to represent relationships between quantities. Information may be given in the form of data, a context, or a graph and students are asked to write a linear function. Understanding that the information represents a linear function is incorporated in the learning.

Priority Standards for unit:

- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.LQE.A.3 Construct linear, quadratic and exponential equations given graphs, verbal descriptions or tables.

Supporting Standards:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
    - a)Identify, label and use appropriate units of measure within a problem.
    - b)Convert units and rates.
    - c)Use units within problems.
    - d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.CED.A.2 Create and graph linear, quadratic and exponential equations in two variables.
- A1.IF.B.6 Interpret the parameters of a linear or exponential function in terms of the context.
- A1.IF.C.8 Translate between different but equivalent forms of a function to reveal and explain properties of the function and interpret these in terms of a context.
- A1.LQE.A.1 "Distinguish between situations that can be modeled with linear or exponential functions.
    - a) Determine that linear functions change by equal differences over equal intervals.
    - b) Recognize exponential situations in which a quantity grows or decays by a constant percent rate per unit interval."
- A1.LQE.B.5 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the set of integers.

- A1.DS.A.5 "Construct a scatter plot of bivariate quantitative data describing how the variables are related; determine and use a function that models the relationship.

    - a) Construct a linear function to model bivariate data represented on a scatter plot that minimizes residuals.
    - b) Construct an exponential function to model bivariate data represented on a scatter plot that minimizes residuals."
- A1.DS.A.6 Interpret the slope (rate of change) and the y-intercept (constant term) of a linear model in the context of the data.

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.LQE.A.3	linear, quadratic and exponential equations given graphs, verbal descriptions or tables.	Construct	Create	3

Essential Questions:

1. What does the slope of a line indicate about the line?
2. What information does the equation of a line give you?
3. How can functions represent relationships we see in our everyday world?

Enduring Understanding/Big Ideas:

1. Ratios can be used to show relationships between changing quantities, such as vertical and horizontal change.
2. Graphs of linear equations are used to model predictable relationships.
3. The relationship between two lines can be determined by comparing the slopes and Y-intercepts.
4. Linear relationships are algebraic functions that allow us to organize data and make predictions.
5. Real-life situations can be modeled with linear equations.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Linear Non-linear Dependent variable Independent variable Correlation Causation	Average rate of change Slope Intercepts (x and y) Slope-intercept form Standard form Intervals Table of values Correlation coefficient Line of best fit Scatter Plot

Big Ideas Chapter 4: Writing Linear Functions

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.NQ.B.3, A1.CED.A.2, A1.IF.C.8, A1.LQE.A.1, **A1.LQE.A.3**, A1.DS.A.6	4.1 Writing Equations in Slope-Intercept Form	1	Write equations of lines in slope-intercept form.	● I can find the slope and the y-intercept of a line. ● I can use the slope and the y-intercept to write an equation of a line. ● I can write equations in slope-intercept form to solve real-life problems.
A1.NQ.B.3, A1.CED.A.2, A1.IF.C.8, A1.LQE.A.1, **A1.LQE.A.3**, A1.DS.A.6	4.2 Writing Equations in Point-Slope Form	1	Write equations of lines in point-slope form.	● I can use a point on a line and the slope to write an equation of the line. ● I can use any two points to write an equation of a line. ● I can write a linear function using any two function values.
A1.IF.C.8, **A1.LQE.A.3**, A1.DS.A.6	4.3 Writing Equations of Parallel and Perpendicular Lines	1	Recognize and write equations of parallel and perpendicular lines.	● I can identify parallel and perpendicular lines from their equations. ● I can write equations of parallel lines. ● I can write equations of perpendicular lines.
A1.NQ.B.3, A1.CED.A.2, A1.IF.B.6, A1.DS.A.5, A1.DS.A.6, A1.DS.A.7, A1.DS.A.8	4.4&5 Scatter Plots and Analyzing Lines of Fit	2	Use scatter plots and lines of fit to describe relationships between data, and analyze lines of fit and find lines of best fit.	● I can read and interpret scatter plots. ● I can identify correlations between data. ● I can write and interpret an equation of a line of fit. ● I can use residuals to determine how well lines fit model data. ● I can use technology to find lines of best fit. ● I can distinguish between correlation and causation.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

- Performance Task found in the Big Ideas Assessment Book (accessible in the physical Assessment Book, or the digital version in the Assess area of the Featured Chapter Resources after selecting the appropriate Chapter).
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- Performance Task found in the Teach area of the Featured Chapter Resources after selecting the appropriate Chapter.

Unit 5: Solving Systems of Linear Equations

Subject: Algebra I
Grade: 8
Name of Unit: Solving Systems of Linear Equations
Length of Unit: 8 blocks (6 for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is writing and solving systems of linear equations and inequalities. The big understanding for students is that a solution of a system must satisfy every equation or inequality in the system. Many of the applications in this unit require students to write a system to represent a context, which is an essential skill for modeling with mathematics

Priority Standards for unit:

- A1.REI.C.8 Solve problems involving a system of linear inequalities.
- A1.IF.C.7 Graph functions expressed symbolically and identify and interpret key features of the graph.

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.REI.C.8	problems involving a system of linear inequalities.	Solve	Apply	2
A1.IF.C.7	functions expressed symbolically	Graph	Apply	2
A1.IF.C.7	key features of the graph.	Identify	Apply	2
A1.IF.C.7	key features of the graph.	Interpret	Apply	2

<u>Essential Questions</u>:

1. How can you solve a system of equations or inequalities?
2. How can systems of equations model real-world situations?

Enduring Understanding/Big Ideas:

1. Solve an equation is the process of rewriting the equation to make what it says about its variable(s) as simple as possible. Properties of numbers and equality can be used to transform an equation (or inequality) into equivalent, simpler equations (or inequalities) in order to finish solutions. Useful information about equations and inequalities (including solutions) can be found by analyzing graphs or tables. The number and types of solutions vary predictable, based on the type of equation.
2. Many real-world mathematical problems can be represented algebraically. These representations can lead to algebraic solutions. A function that models a real-world situation can then be used to make estimates or predictions about future occurrences

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
consistent dependent inconsistent independent constraints	solutions of an inequality elimination method linear inequality solutions of a system of linear equations solutions of a system of linear inequalities substitution method system of linear equations systems of linear inequalities

Big Ideas Chapter 5: Solving Systems of Linear Equations

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.NQ.B.3, A1.CED.A.3, **A1.REI.B.3, A1.IF.C.7**	5.1 Solving Systems of Linear Equations by Graphing	1	Solve linear systems by graphing.	• I can determine whether an ordered pair is a solution of a system. • I can graph a linear system. • I can approximate the solution of a linear system using a graph.
A1.NQ.B.3, A1.CED.A.3, **A1.REI.B.3**	5.2 Solving Systems of Linear Equations by Substitution	1	Solve linear systems by substitution.	• I can solve a system of linear equations by substitution. • I can solve a linear equation in two variables for either variable. • I can solve real-life problems using substitution.
A1.NQ.B.3, A1.CED.A.3, **A1.REI.B.3**, A1.REI.B.5	5.3 Solving Systems of Linear Equations by Elimination	1	Solve linear systems by elimination.	• I can add or subtract linear equations. • I can solve a system of linear equations by elimination. • I can explain why the elimination method produces a valid solution. • I can solve real-life problems using elimination.
A1.NQ.B.3, A1.CED.A.3, A1.REI.B.3	5.4 Solving Special Systems of Linear Equations	1	Solve linear systems with different numbers of solutions.	• I can determine the number of solutions of a system. • I can solve a system of linear equations with any number of solutions.
A1.IF.C.7, **A1.REI.B.3**, A1.NQ.B.3, A1.NQ.B.4	Application Problems	1	Solve real-life problems using linear systems.	• I can write equations to represent a linear system given a real-life situation. • I can solve a linear system of equations and check my solution graphically and algebraically. • I can interpret my solutions, with respect to real world scenarios.

A1.NQ.B.3, A1.CED.A.3, A1.REI.C.7, **A1.IF.C.7**	5.6 Graphing Linear Inequalities in Two Variables	0.5	Graph linear inequalities in two variables.	• I can determine whether an ordered pair is a solution of a linear inequality in two variables. • I can graph linear inequalities in two variables. • I can interpret solutions of a linear inequality in two variables in a real-life situation.
A1.NQ.B.3, **A1.REI.C.8**, **A1.IF.C.7**	5.7 Systems of Linear Inequalities	0.5	Graph and write systems of linear inequalities.	• I can determine whether an ordered pair is a solution of a system of linear inequalities. • I can graph systems of linear inequalities. • I can write systems of linear inequalities from a graph. • I can solve real-life problems using systems of linear inequalities.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

- Performance Task found in the Big Ideas Assessment Book (accessible in the physical Assessment Book, or the digital version in the Assess area of the Featured Chapter Resources after selecting the appropriate Chapter).
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Unit 6: Exponential Functions

Subject: Algebra I
Grade: 8
Name of Unit: Exponential Functions
Length of Unit: 6 blocks (4 for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is understanding exponential functions. Students will extend the properties of integer exponents, introduced in middle school, to rational exponents. This leads to an introduction of exponential functions.

Priority Standards for unit:
- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.CED.A.1 Create equations and inequalities in one variable and use them to model and/or solve problems.
- A1.IF.B.3 Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- A1.IF.C.7 Graph functions expressed symbolically and identify and interpret key features of the graph.
- A1.BF.A.1 Analyze the effect of translations and scale changes on functions.
- A1.LQE.A.3 Construct linear, quadratic and exponential equations given graphs, verbal descriptions or tables.

Priority Standard	**Unwrapped Concepts (Students need to know)**	**Unwrapped Skills (Students need to be able to do)**	**Bloom's Taxonomy Levels**	**Webb's DOK**
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.CED.A.1	equations and inequalities in one variable	Create	Create	4

A1.CED.A.1	equations and inequalities in one variable to model and/or solve problems.	Use	Apply	2
A1.IF.B.3	key characteristics of a function that models the relationship between two quantities.	Interpret	Understand	3
A1.IF.C.7	functions expressed symbolically and	Graph	Apply	2
A1.IF.C.7	key features of the graph.	Identify	Remember	1
A1.IF.C.7	key features of the graph.	Interpret	Understand	2
A1.BF.A.1	the effect of translation and scale changes on functions.	Analyze	Analyze	4
A1.LQE.A.3	linear, quadratic and exponential equations given graphs, verbal descriptions or tables.	Construct	Create	3

Essential Questions:

1. How can you represent numbers less than one using exponents?
2. How can you simplify expressions involving exponents?
3. What are the characteristics of exponential functions?
4. How are exponential functions used to solve real-world problems?

Enduring Understanding/Big Ideas:

1. The idea of exponents can be extended to include zero and negative exponents.
2. Properties of exponents make it easier to simplify products or quotients of powers with the same base or powers raised to a power or products raised to a power.
3. You can use rational exponents to represent radicals.
4. The parent of the family of exponential functions is $y=ab^x$. The independent variable is an exponent. This family of functions can model growth or decay of an initial amount.
5. Exponential functions are important because they can be used to describe real-world situations involving population growth, decay of radioactive materials (half-life), and compound interest.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
domain range	base exponent power rational exponent index exponential function compound interest decay factor growth factor exponential decay exponential growth

Big Ideas Chapter 6: Exponential Functions

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.NQ.A.1, A1.NQ.A.2, A1.NQ.B.3, **A1.SSE.A.1**	6.1 Properties of Exponents	2	Write equivalent expressions involving powers.	• I can explain the meaning of zero and negative exponents. • I can evaluate and simplify expressions involving zero and negative exponents. • I can simplify expressions using properties of exponents.
A1.NQ.B.3, **A1.CED.A.1**, A1.CED.A.2, **A1.IF.B.3**, A1.IF.B.4, A1.IF.B.6, **A1.IF.C.7**, A1.IF.C.8, **A1.BF.A.1**, A1.LQE.A.1, **A1.LQE.A.3**	6.3 Exponential Functions	1	Graph and write exponential functions.	• I can identify an exponential function. • I can evaluate and graph an exponential function. • I can write exponential functions. • I can model real-life problems using exponential functions.
A1.SSE.A.1, **A1.CED.A.1**, A1.CED.A.2, **A1.IF.B.3**, A1.IF.B.4, A1.IF.B.6, **A1.IF.C.7**, A1.IF.C.8, A1.LQE.A.1, **A1.LQE.A.3**	6.4 Exponential Growth and Decay	1	Write and graph exponential growth and decay functions.	• I can determine whether data represent exponential growth or exponential decay. • I can write exponential growth functions and exponential decay functions. • I can solve real-life problems using exponential growth and decay functions.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

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Unit 7: Polynomial Equations and Factoring

Subject: Algebra I
Grade: 8
Name of Unit: Polynomial Equations and Factoring
Length of Unit: 8.5 blocks (6.5 blocks for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is performing operations with polynomials and factoring polynomials to solve equations and reveal roots of polynomials.

Priority Standards for unit:

- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.SSE.A.2 Analyze the structure of polynomials to create equivalent expressions or equations.
- A1.APR.A.1 Add, subtract and multiply polynomials, and understand that polynomials follow the same general rules of arithmetic and are closed under these operations.
- A1.APR.A.2 Divide polynomials by monomials.

Supporting Standards for unit:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
    - a)Identify, label and use appropriate units of measure within a problem.
    - b)Convert units and rates.
    - c)Use units within problems.
    - d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.SSE.A.3 "Choose and produce equivalent forms of a quadratic expression or equations to reveal and explain properties.
    - a) Find the zeros of a quadratic function by rewriting it in factored form.
    - b) Find the maximum or minimum value of a quadratic function by completing the square."

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.SSE.A.2	the structure of polynomials to create equivalent express	Analyze	Analyze	4
A1.APR.A.1	polynomials.	Add, Subtract, Multiply	Understand	2
A1.APR.A.1	polynomials follow the same general rules of arithmetic and are closed under these operations.	Understand	Understand	2
A1.APR.A.2	polynomials by monomials	Divide	Understand	2

Essential Questions:

1. How can two algebraic expressions that appear to be different be equivalent?
2. How are the properties of real numbers related to polynomials?

Enduring Understanding/Big Ideas:

1. Monomials can be used to form larger expressions called polynomials. Polynomials can be added and subtracted.
2. There are several ways to find the product of two binomials, including models, algebra, and tables.
3. Some quadratic trinomials and some polynomials of degree greater than 2 can be factored to equivalent forms which are the product of two binomials.

4. The properties of real numbers can be used to multiply a monomial by a polynomial or simplify the product of binomials.
5. The properties of real numbers are the basis of the laws of algebra. You can apply properties of real numbers, such as the Distributive Property, to polynomials.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	binomial degree of monomial degree of a polynomial difference of two squares factoring by grouping monomial trinomial perfect-square trinomial polynomials standard form of a polynomial

Big Ideas Chapter 7: Polynomial Equations and Factoring

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.NQ.B.3, **A1.SSE.A.1**, **A1.APR.A.1**	7.1 Adding and Subtracting Polynomials	0.5	Add and subtract polynomials.	• I can classify polynomials. • I can add and subtract polynomials. • I can model real-life situations using sums and differences of polynomials.
A1.APR.A.1, **A1.APR.A.2**	7.2 Multiplying and Dividing Polynomials	0.5	Multiply and divide polynomials.	• I can multiply and divide polynomials by monomials. • I can multiply binomials using the Distributive Property. • I can multiply binomials using the FOIL Method. • I can multiply binomials and trinomials.
A1.NQ.B.3, **A1.SSE.A.1**, **A1.APR.A.1**	7.3 Special Products of Polynomials	0.5	Use patterns to find products of polynomials.	• I can use the square of a binomial pattern. • I can multiply binomials using the sum and difference pattern. • I can solve problems using special product patterns.
A1.SSE.A.1, A1.SSE.A.3	7.4 Solving Polynomial Equations in Factored Form	0.5	Solve polynomial equations in factored form.	• I can use the Zero-Product Property to solve polynomial equations in factored form. • I can factor polynomials using the greatest common factor. • I can solve polynomial equations by rewriting them in factored form.
A1.NQ.B.3, **A1.SSE.A.2**, A1.SSE.A.3	7.6 Factoring ax2 + bx + c	1	Factor polynomials of the form ax^2 + bx + c.	• I can factor a polynomial using the GCF of the terms of the polynomial. • I can factor polynomials of the form ax^2 + bx + c. • I can explain how to use a, b, and c to find binomial factors of a polynomial ax^2 + bx + c.

A1.NQ.B.3, **A1.SSE.A.2**, A1.SSE.A.3	7.5 Factoring x2 + bx + c	1	Factor polynomials of the form x^2 + bx + c.	• I can identify the three terms of a trinomial. • I can factor polynomials of the form x^2 + bx + c. • I can explain how to use b and c to find binomial factors of a polynomial x^2 + bx + c.
A1.NQ.B.3, **A1.SSE.A.2**, A1.SSE.A.3	7.7 Factoring Special Products	0.5	Recognize and factor special products.	• I can factor the difference of two squares. • I can factor perfect square trinomials. • I can solve real-life problems by factoring using special product patterns.
A1.NQ.B.3, **A1.SSE.A.2**, A1.SSE.A.3	7.8 Factoring Polynomials Completely	2	Factor a polynomial by grouping and recognize when a polynomial is factored completely.	• I can factor polynomials by grouping. • I can factor polynomials completely. • I can solve real-life problems by factoring.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

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Unit 8: Graphing Quadratic Functions

Subject: Algebra I
Grade: 8
Name of Unit: Graphing Quadratic Functions
Length of Unit: 8 blocks (6 blocks for learning, 2 for review and assessment)
Overview of Unit: The major focus of this unit is graphing quadratic functions. Students will analyze different forms of quadratic functions to identify characteristics. Standard form and vertex form are developed by transforming the parent function $f(x) = x^2$. Intercept form is developed from identifying the x-intercepts of the graph.

Priority Standards for unit:

- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.IF.B.3 Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- A1.IF.C.7 Graph functions expressed symbolically and identify and interpret key features of the graph.
- A1.BF.A.1 Analyze the effect of translations and scale changes on functions.
- A1.LQE.A.3 Construct linear, quadratic and exponential equations given graphs, verbal descriptions or tables.

Supporting Standards for unit:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
    - a)Identify, label and use appropriate units of measure within a problem.
    - b)Convert units and rates.
    - c)Use units within problems.
    - d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.SSE.A.3 "Choose and produce equivalent forms of a quadratic expression or equations to reveal and explain properties.
    - a) Find the zeros of a quadratic function by rewriting it in factored form.
    - b) Find the maximum or minimum value of a quadratic function by completing the square."
- A1.IF.B.4 Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
- A1.IF.C.8 Translate between different but equivalent forms of a function to reveal and explain properties of the function and interpret these in terms of a context.

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.IF.B.3	key characteristics of a function that models the relationship between two quantities.	Interpret	Understand	3
A1.IF.C.7	functions expressed symbolically	Graph	Apply	2
A1.IF.C.7	key features of the graph.	Identify	Remember	1
A1.IF.C.7	key features of the graph.	Interpret	Understand	2
A1.BF.A.1	the effect of translation and scale changes on functions.	Analyze	Analyze	4
A1.LQE.A.3	linear, quadratic and exponential equations given graphs, verbal descriptions or tables.	Construct	Create	3

Essential Questions:

1. What real-world situations can be modeled using quadratic equations to make predictions?
2. Why do parabolic graphs help me understand the significance of two solutions to quadratic equations?

Enduring Understanding/Big Ideas:

1. Quadratic equations are important because they can be used to describe real-world situations involving gravity, area, and volume. They can be used for situations involving minimums and maximums.
2. Parabolas help visualize the concept of there being two possible solutions to a given situation.

Unit Vocabulary:

Academic Cross-Curricular Words	**Content/Domain Specific**
	quadratic intercepts vertex Standard form axis of symmetry discriminant Domain Vertex form range completing the square root zero Parabola

Big Ideas Chapter 8: Graphing Quadratic Functions

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.IF.B.3, A1.IF.B.4, **A1.IF.C.7**, **A1.BF.A.1**, **A1.LQE.A.3**	8.1 Graphing f(x) = ax2	0.5	Graph and describe functions of the form f(x) = ax^2.	• I can identify characteristics of quadratic functions and their graphs. • I can graph quadratic functions of the form f(x) = ax^2. • I can compare the graph of f(x) = ax^2 to the graph of the parent quadratic function f(x) = x^2.
A1.NQ.B.3, **A1.IF.B.3**, **A1.IF.C.7**, **A1.BF.A.1**, **A1.LQE.A.3**	8.2 Graphing f(x) = ax2 + c	0.5	Graph and describe functions of the form f(x) = ax^2 + c.	• I can graph quadratic functions of the form f(x) = ax^2 + c. • I can compare the graph of f(x) = ax2 + c to the graph of the parent quadratic function. • I can describe translations of the graph of f(x) = ax^2 + c. • I can find zeros of f(x) = ax^2 + c.
A1.IF.B.3, A1.IF.B.4, **A1.IF.C.7**, **A1.BF.A.1**, **A1.LQE.A.3**	8.3 Graphing f(x) = ax2 + bx + c	1	Graph and describe functions of the form f(x) = ax^2 + bx + c.	• I can find the axis of symmetry and vertex of a quadratic function. • I can graph quadratic functions of the form f(x) = ax^2 + bx + c. • I can determine a maximum or minimum value of a quadratic function.
A1.IF.B.3, A1.IF.B.4, **A1.IF.C.7**, **A1.BF.A.1**, **A1.LQE.A.3**	8.4 Graphing f(x) = a(x – h)2 + k	2	Graph and describe functions of the form f(x) = a(x – h)^2 + k.	• I can identify even and odd functions. • I can graph quadratic functions of the form f(x) = a(x – h)^2 + k. • I can compare the graph of f(x) = a(x – h)^2 to the graph of the parent quadratic function. • I can compare the graph of f(x) = a(x – h)^2 + k to the graph of the parent quadratic function.

A1.SSE.A.1, A1.SSE.A.3, **A1.IF.B.3**, A1.IF.B.4, **A1.IF.C.7**, A1.IF.C.8, **A1.BF.A.1**, **A1.LQE.A.3**	8.5 Using Intercept Form	2	Graph and use functions in intercept form.	● I can use characteristics to graph and write quadratic functions and cubic functions.

Engaging Scenarios

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Unit 9: Solving Quadratic Functions

Subject: Algebra I
Grade: 8
Name of Unit: Solving Quadratic Functions
Length of Unit: 8 blocks (6 blocks for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is solving quadratic equations using a variety of methods: graphing, using square roots, completing the square, and using the Quadratic Formula. Students will consider which method is most efficient as they learn new methods. Students will also solve nonlinear systems of equations.

Priority Standards for unit:

- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- A1.CED.A.1 Create equations and inequalities in one variable and use them to model and/or solve problems.
- A1.REI.A.2 "Solve problems involving quadratic equations.
  - c) Analyze different methods of solving quadratic equations."

Supporting Standards for unit:

- A1.NQ.B.3 "Use units of measure as a way to understand and solve problems involving quantities.
  - a)Identify, label and use appropriate units of measure within a problem.
  - b)Convert units and rates.
  - c)Use units within problems.
  - d)Choose and interpret the scale and the origin in graphs and data displays."
- A1.SSE.A.3 "Choose and produce equivalent forms of a quadratic expression or equations to reveal and explain properties.
  - a) Find the zeros of a quadratic function by rewriting it in factored form.
  - b) Find the maximum or minimum value of a quadratic function by completing the square."
- A1.IF.C.8 Translate between different but equivalent forms of a function to reveal and explain properties of the function and interpret these in terms of a context.

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Understand	2
A1.CED.A.1	equations and inequalities in one variable	Create	Create	4
A1.CED.A.1	equations and inequalities in one variable to model and/or solve problems.	Use	Apply	2
A1.REI.A.2c	methods of solving quadratic equations	Analyze	Analyze	3

Essential Questions:

1. What real-world situations can be modeled using quadratic equations to make predictions?
2. How do I know which process to use to solve a quadratic equation?
3. Why would I use each method of process?

Enduring Understanding/Big Ideas:

1. Quadratic equations are important because they can be used to describe real-world situation involving gravity, area, and volume. They can be used for situations involving minimums and maximums.
2. They can solve quadratic equations by graphing, factoring, using the quadratic formula, using square roots, and using technology.
3. Quadratic equations have similar attributes to other functions such as linear and exponential, but they also have several key differences.
4. Quadratic equations will be used to describe other shapes that are a critical part to the everyday world.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
	quadratic intercepts vertex Standard form axis of symmetry discriminant Domain Vertex form range completing the square root zero Parabola

Big Ideas Chapter 9: Solving Quadratic Equations

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.CED.A.1, **A1.REI.A.2**	9.2 Solving Quadratic Equations by Graphing	1	Use graphs to solve quadratic equations and find zeros of functions.	● I can solve quadratic equations by graphing. ● I can use graphs to find and approximate zeros of functions. ● I can use technology to find a quadratic model for a set of data.
A1.CED.A.1, **A1.REI.A.2**	9.3 Solving Quadratic Equations Using Square Roots	1	Solve quadratic equations using square roots.	● I can find the square roots of a number. ● I can solve quadratic equations using square roots. ● I can approximate solutions of quadratic equations.
A1.NQ.B.3, **A1.SSE.A.1**, A1.SSE.A.3, **A1.CED.A.1**, **A1.REI.A.2**, A1.IF.C.8	9.4 Solving Quadratic Equations by Completing the Square	1	Solve quadratic equations and find maximum and minimum values of quadratic functions by completing the square.	● I can complete the square for an expression of the form x2 + bx. ● I can solve quadratic equations by completing the square. ● I can find maximum and minimum values of quadratic functions by completing the square.
A1.CED.A.1, **A1.REI.A.2**	9.5 Solving Quadratic Equations Using the Quadratic Formula	1	Use the Quadratic Formula and its discriminant to solve and analyze quadratic equations.	● I can solve quadratic equations using the Quadratic Formula. ● I can find and interpret the discriminant of an equation. ● I can choose an efficient method for solving a quadratic equation and explain my choice of method.

Engaging Scenarios

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Unit 11: Data Analysis and Displays

Subject: Algebra I
Grade: 8
Name of Unit: Data Analysis and Displays
Length of Unit: 7 blocks (5 blocks of learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is interpreting qualitative and quantitative data. This includes summarizing, representing, interpreting, and analyzing data, noting any patterns or deviations from patterns. The center and spread of a data set are important, along with knowing which statistics to compare, which data display to use, and what the results of a comparison might mean.

Priority Standards for unit:
- A1.DS.A.1:Analyze and interpret graphical displays of data.

Supporting Standards for unit:
- A1.IF.B.3:Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- A1.NQ.B.3a Use units of measure as a way to understand and solve problems involving quantities.(Identify, label and use appropriate units of measure within a problem.)
- A1.NQ.B.3b Use units of measure as a way to understand and solve problems involving quantities.(Convert units and rates.)
- A1.NQ.B.3c Use units of measure as a way to understand and solve problems involving quantities.(Use units within problems.)
- A1.NQ.B.3d Use units of measure as a way to understand and solve problems involving quantities.(Choose and interpret the scale and the origin in graphs and data displays.)
- A1.DS.A.2:Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.
- A1.DS.A.3:Interpret differences in shape, center and spreads in the context of the data sets, accounting for possible effects of outliers.
- A1.DS.A.4a Summarize data in two-way frequency tables.(Interpret relative frequencies in the context of the data.
- A1.DS.A.4b Summarize data in two-way frequency tables.(Recognize possible associations and trends in the data.)

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
A1.DS.A.1	graphical displays of data	Analyze, Interpret	Analyze	4

Essential Questions:

1. How can collecting and analyzing data help you make decisions or predictions?
2. How can you make and interpret different representations of data?
3. How is probability related to real-world events?

Enduring Understanding/Big Ideas:

1. Sampling techniques are used to gather data from real-world situations. If the data are representative or the larger population, inferences can be made about that population. Biased sampling techniques yield data unlikely to be representative of the larger population. Sets of numerical data are described using measures of central tendency and dispersion.
2. The most appropriate data representation depends on the type of data-quantitative or qualitative, and univariate or bivariate. Line plots, box plots, and histograms are different ways to show distribution of data over a possible range of values.
3. Probability expresses the likelihood that a particular event will occur. Data can be used to calculate an experimental probability, and mathematical properties can be used to determine a theoretical probability. Either experimental or theoretical probability can be used to make predictions or decisions about future events. Various counting methods can be used to develop theoretical probabilities.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Analyze Interpret Representative Predictions	Mean Median Interquartile Range Standard Deviation Shape Measure of Central Tendency Outlier Spread Frequency Table Two-way Frequency Table Quartile Sample Space Dot Plot Histogram Box Plot

Big Ideas Chapter 11: Data Analysis and Displays

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.DS.A.3	11.1 Measures of Center and Variation	1 block	Find measures of center and variation of a data set.	● I can find and compare the measures of center of a data set. ● I can find measures of variation of a data set. ● I can describe effects of data transformations.
A1.NQ.B.3 A1.DS.A.1 A1.DS.A.3	11.2 Box-and-Whisker Plots	1 block	Make and interpret box-and-whisker plots for data sets.	● I can make box-and-whisker plots to represent data sets. ● I can interpret box-and-whisker plots. ● I can use box-and-whisker plots to compare data sets. ● I can explain how to identify outliers in a data set.
A1.NQ.B.3 A1.DS.A.1 A1.DS.A.2 A1.DS.A.3	11.3 Shapes of Distributions	1 block	Describe and compare shapes of distributions.	● I can describe the shape of a distribution. ● I can determine which measures of center and variation best represent a data set. ● I can compare data sets.
A1.NQ.B.3 A1.DS.A.1 A1.DS.A.3 A1.DS.A.4	11.4 Two-Way Tables	1 block	Use two-way tables to represent data.	● I can find and interpret marginal frequencies. ● I can make two-way tables. ● I can find and interpret relative frequencies and conditional relative frequencies. ● I can recognize associations and trends in data using two-way tables.

A1.NQ.B.3 A1.DS.A.1	11.5 Choosing a Data Display	1 block	Use appropriate data displays to represent situations.	• I can classify data as qualitative or quantitative. • I can create an appropriate data display and explain the choice of display. • I can identify misleading data displays.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

- Performance Task found in the Big Ideas Assessment Book (accessible in the physical Assessment Book, or the digital version in the Assess area of the Featured Chapter Resources after selecting the appropriate Chapter).
- Performance Task found at the end of the chapter in Big Ideas.
- Performance Task found in the Teach area of the Featured Chapter Resources after selecting the appropriate Chapter.

Unit 12: Sequences Unit

Subject: Algebra I
Grade: 8
Name of Unit: Sequences
Length of Unit: 5 blocks (3 for learning, 2 for review and assessment)
Overview of Unit: The major work of this unit is to identify, write, and graph arithmetic, geometric and recursively defined sequences.

Priority Standards for unit:

- A1.LQE.A.3 Construct linear, quadratic and exponential equations given graphs, verbal descriptions or tables.
- A1.LQE.B.4 Write arithmetic and geometric sequences in recursive and explicit forms, and use them to model situations and translate between the two forms.
- A1.SSE.A.1 Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

Supporting Standards for unit:

- A1.IF.B.4 Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
- A1.LQE.B.5:Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the set of integers.
- A1.LQE.B.6:Find the terms of sequences given an explicit or recursive formula.

Priority Standard	**Unwrapped Concepts (Students need to know)**	**Unwrapped Skills (Students need to be able to do)**	**Bloom's Taxonomy Levels**	**Webb's DOK**
A1.LQE.A.3	linear, quadratic and exponential equations given graphs, verbal descriptions or tables	Construct	Create	4
A1.LQE.B.4	arithmetic and geometric sequences in recursive and explicit forms, and use them to model situations and translate between the two forms	Write and Apply	Analyze	3

A1.SSE.A.1	the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions	Interpret	Analyze	4

Essential Questions:

1. Why is a sequence a function?
2. How can you write a rule for an arithmetic sequence?
3. How can you write a rule for a geometric sequence?
4. How can you use sequences and series to solve real life problems?
5. How can patterns be represented?
6. What are the advantages and disadvantages of a recursive rule compared to an explicit rule?

Enduring Understanding/Big Ideas:

1. Some sequences can be modeled with a function rule that you can use to find any term of the sequence.
2. In a geometric sequence, the ratio of any term to its preceding term is a constant value.
3. When you can identify a pattern in a sequence, you can use it to extend the sequence.
4. Sequences and series can be used to model real-life situations.
5. Sequences and series provide the foundation for upper-level mathematics, especially calculus.
6. Sequences and series are a direct result of finding patterns.

Unit Vocabulary:

Academic Cross-Curricular Words	**Content/Domain Specific**
Identify Evaluate Model Solve Compare	Sequence Series Summation notation, sigma Common difference/ratio Partial sum Explicit/recursive rule

Big Ideas Chapter 4 & 6: Sequences

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.SSE.A.1 A1.LQE.A.3A1.LQE.B.4 A1.LQE.B.5 A1.LQE.B.6	4.6 Arithmetic Sequences	1 Block	Understand the concept of arithmetic sequences.	• I can write the terms of arithmetic sequences. • I can graph arithmetic sequences. • I can identify arithmetic sequences. • I can write arithmetic sequences as functions.
A1.IF.B.4 A1.LQE.A.3A1.LQE.B.4 A1.LQE.B.5 A1.LQE.B.6	6.6 Geometric Sequences	1 Block	Identify, extend, and graph geometric sequences.	• I can determine whether a sequence is arithmetic, geometric, or neither. • I can write and graph the terms of geometric sequences. • I can write geometric sequences as functions.
A1.SSE.A.1 A1.LQE.A.3 A1.LQE.B.5 A1.LQE.B.6	6.7 Recursively Defined Sequences	1 Block	Write terms of recursively defined sequences and write recursive rules for sequences.	• I can write terms of recursively defined sequences. • I can write recursive rules for sequences. • I can translate between recursive rules and explicit rules.

Engaging Scenarios

Engaging Scenarios: There are several options for engaging scenarios for this unit. They may be appropriate as a means for introducing concepts in the unit, as a unit-long project for attaching learning to, or as a culminating experience at the end of the unit.

- Performance Task found in the Big Ideas Assessment Book (accessible in the physical Assessment Book, or the digital version in the Assess area of the Featured Chapter Resources after selecting the appropriate Chapter).
- Performance Task found at the end of the chapter in Big Ideas.
- Performance Task found in the Teach area of the Featured Chapter Resources after
- selecting the appropriate Chapter.

Unit 13: EOC Review

Subject: Algebra I
Grade: 8
Name of Unit: EOC Review
Length of Unit: Remainder of time before EOC
Overview of Unit: The major work of this unit is to review Algebra 1 concepts in preparation for the EOC. The one topic moved into this unit specifically is the comparison of linear, exponential, and quadratic functions. Other topics may be reviewed as needed in preparation for the End of Course exam, and the unit will last varying lengths of time depending on the length of the semester and where the test falls in the EOC testing window.

Priority Standards for unit:
- A1.LQE.A.3 Construct linear, quadratic and exponential equations given graphs, verbal descriptions or tables.
- A1.IF.B.3 Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- A1.IF.C.7 Graph functions expressed symbolically and identify and interpret key features of the graph.

Supporting Standards for unit:
- A1.IF.B.5 Determine the average rate of change of a function over a specified interval and interpret the meaning.
- A1.IF.B.6 Interpret the parameters of a linear or exponential function in terms of the context.
- A1.IF.C.9 Compare the properties of two functions given different representations.
- A1.LQE.A.1 "Distinguish between situations that can be modeled with linear or exponential functions.
    - a) Determine that linear functions change by equal differences over equal intervals.
    - b) Recognize exponential situations in which a quantity grows or decays by a constant percent rate per unit interval."
- A1.LQE.A.2 Describe, using graphs and tables, that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.

Priority Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom’s Taxonomy Levels	Webb's DOK
A1.LQE.A.3	linear, quadratic and exponential equations given graphs, verbal descriptions or tables	Construct	Create	4
A1.IF.B.3	key characteristics of a function that models the relationship between two quantities.	Interpret	Understand	3
A1.IF.C.7	functions expressed symbolically and	Graph	Apply	2
A1.IF.C.7	key features of the graph.	Identify	Remember	1
A1.IF.C.7	key features of the graph.	Interpret	Understand	2

OC Review

Standard	Topic & Section	Suggested # of Days	Learning Target	Success Criteria
A1.IF.B.3, A1.IF.B.5, A1.IF.B.6, **A1.IF.C.7**, A1.IF.C.9, A1.LQE.A.1, A1.LQE.A.2, **A1.LQE.A.3**	8.6 Comparing Linear, Exponential, and Quadratic Functions	2	Compare the characteristics of linear, exponential, and quadratic functions.	· I can determine whether data can be represented by a linear, exponential, or quadratic function. · I can write functions to model data. · I can compare functions using average rates of change.

Other possible topics for review include: Function Transformations, Line of Best Fit, Correlation, Rational Exponents, Desmos Review, Data (2-way, box & whisker, central tendency, etc), Performance Event, EOC Practice Test

Unit of Study Terminology

Appendices: All Appendices and supporting material can be found in this course's shell course in the District's Learning Management System.

Assessment Leveling Guide: A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

Big Ideas/Enduring Understandings: Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

Engaging Experience: Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

Engaging Scenario: This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

Essential Questions: Engaging, open-ended questions that teachers can use to engage students in the learning.

Priority Standards: What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

Supporting Standards: Additional standards that support the learning within the unit.

Topic: These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

Unit of Study: Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

Unit Vocabulary: Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.