



# Park Hill School District

Building Successful Futures • Each Student • Every Day

## High School Pre-Algebra Curriculum

**Course Description:** The course is designed to prepare students for future coursework in mathematics, particularly Algebra 1A. This course will include simplifying expressions, graphing equations, simplifying radical and exponential expressions and using radicals to solve equations, polynomials, and solving for measures of central tendency.

### Scope and Sequence:

Timeframe	Unit	Instructional Topics
10 weeks	Linear Equations and Functions	Topic 1: Number Sense and Operations Topic 2: Solving Equations Topic 3: Graphing Equations Topic 4: Writing Equations Topic 5: Systems
1-2 weeks	Inequalities	Topic 1: Solving Multi-Step Inequalities/Graph on Number Line Topic 2: Word Problem with One-Variable
2 weeks	Exponentials	Topic 1: Radicals and Exponents
1-2 weeks	Polynomials	Topic 1: Polynomials
1 week	Data and Statistics	Topic 1: Measures of Central Tendency and Displays

# Unit 1: Linear Equations and Functions

**Subject:** Pre-Algebra

**Grade:** 9, 10

**Name of Unit:** Linear Equations and Functions

**Length of Unit:** 10 weeks

**Overview of Unit:** Students will simplify expressions. Students will write, solve and graph equations.

## Priority Standards for unit:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- Alg1.CED.A.2: Create and graph linear equations in two variables.
- Alg1.LQE.A.3: Construct linear equations given graphs, verbal descriptions or tables.
- Alg1.IF.C.1: Graph functions expressed symbolically and identify and interpret key features of the graph.
- Alg1.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.
- Alg1.REI.C.1: Explain that the graph of an equation in two variables is the set of all its solutions plotted in the Cartesian coordinate plane.
- Alg1.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.
- Alg1.REI.B.1: Solve a system of linear equations algebraically and/or graphically.
- Alg1.IF.B.1: Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- Alg1.CED.A.1: Create equations and inequalities in one variable and use them to model and/or solve problems.

## Supporting Standards for unit:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- Alg1.NQ.B.1: 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.
- Alg1.IF.B.2: Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.

- Alg1.IF.C.3: Compare the properties of two functions given different representations.
- Alg1.IF.B.3: Determine the average rate of change of a function over a specified interval and interpret the meaning.
- Alg1.DS.A.1: Analyze and interpret graphical displays of data.
- Alg1.CED.A.4 Solve literal equations and formulas for a specified variable that highlights a quantity of interest.
- ISTE-KNOWLEDGE COLLECTOR.3.D - build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

<b>Unwrapped Concepts (Students need to know)</b>	<b>Unwrapped Skills (Students need to be able to do)</b>	<b>Bloom's Taxonomy Levels</b>	<b>Webb's DOK</b>
the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.	Interpret	Understand	2
linear, quadratic and exponential equations in two variables.	Create	Create	3
linear, quadratic and exponential equations in two variables.	Graph	Apply	2
linear, quadratic and exponential equations given graphs, verbal descriptions or tables.	Construct	Create	3
functions expressed symbolically and	Graph	Apply	2
key features of the graph.	Identify	Remember	1
key features of the graph.	Interpret	Understand	2
the slope (rate of change) and the y-intercept (constant term) of a linear model in the context of the data.	Interpret	Understand	3
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
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.	Explain	Understand	2
a system of linear equations algebraically and/or graphically.	Solve	Analyze	3
that a function from one set (domain) to another set (range) assigns to each element of the domain exactly one element of the range.	Understand	Understand	2

tables, graphs and verbal descriptions	Use	Analyze	2
key characteristics of a function that models the relationship between two quantities.	Interpret	Understand	3
equations and inequalities in one variable	Create	Create	3
Equations and inequalities to model and/or solve problems.	Use	Analyze	4

### **Essential Questions:**

1. How do you evaluate algebraic expressions?
2. How do you solve linear equations with variables on both sides?
3. How do you determine the slope of a line?
4. How do you graph a linear equation?
5. How do you write a linear equation given two points?

### **Enduring Understanding/Big Ideas:**

1. Substitute a value into the expression and follow order of operations.
2. Get the variables together on one side; isolate the variable by using inverse operations.
3. By counting the rise over run or using the slope formula
4. By creating a table, determining the x and y intercept, or determining the slope and y intercept
5. Find the slope, then write equation in slope intercept form

### **Unit Vocabulary:**

<b>Academic Cross-Curricular Words</b>	<b>Content/Domain Specific</b>
Ratios Rate of change Solve Variable Independent variable Dependent variable Constant	Algebraic expression Equation Linear Domain Range Function Proportions Evaluate Simplify Parallel Solution Slope Y-intercept Rational Number Irrational Number

	Real Number System Whole Number Integer Percentages Absolute Value Distribute Like terms Coefficient Square root Perfect square Identity System of equation
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**Resources for Vocabulary Development:** textbook

## Topic 1: Number Sense and Operations

### **Engaging Experience 1**

**Title:** Student White Board Work with Distributive Property and Combining Like Terms

**Suggested Length of Time:** 20 minutes per day/every other day over a period of 1-2 weeks

**Standards Addressed**

*Priority:*

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

**Detailed Description/Instructions:** Teacher will provide problems. Students will solve those on individual white boards so teacher can check for understanding. Beginning with basic examples of the distributive property then moving on to basic example of combining like terms. Finally, combine distributing and combining like terms together in multi-step expressions.

**Bloom's Levels:** Understand

**Webb's DOK:** 2

### **Engaging Experience 2**

**Title:** Bowling with Order of Operations

**Suggested Length of Time:** 20 minutes

**Standards Addressed**

*Priority:*

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

*Supporting:*

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.

**Detailed Description/Instructions:** Teacher will provide dice to groups of students (or can roll dice on SMART Notebook document - see Schoology lesson for Order of Operations). Groups will roll 3 dice and then use operations to try and create numbers #0-7 using the order of operations concept.

**Bloom's Levels:** Understand

**Webb's DOK:** 2

## Topic 2: Solving Equations

### **Engaging Experience 1**

**Title:** Around the Room Rotation Stations

**Suggested Length of Time:** 45 minutes after lesson on multi-step equations with variable on one side of equal sign and 45 minutes after lesson on multi-step equations with variables on both sides of the equation

### **Standards Addressed**

*Priority:*

- Alg1.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.

**Detailed Description/Instructions:** Students will walk around the classroom/hallway solving equations. Once they find their solution they will need to search around the room/hallway to find their next equation

**Bloom's Levels:** Create

**Webb's DOK:** 3

## Topic 3: Graphing Equations

### **Engaging Experience 1**

**Title:** Find your Partner

**Suggested Length of Time:** 20 minutes/day as warm-up throughout the 5-day lessons

#### **Standards Addressed**

*Priority:*

- Alg1.CED.A.2: Create and graph linear equations in two variables.
- Alg1.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.

*Supporting:*

- Alg1.CED.A.4 Solve literal equations and formulas for a specified variable that highlights a quantity of interest.

**Detailed Description/Instructions:** Pass out a half-sheet of paper with an equation or graph on it to every student. Have students identify important information from the equation or graph they were given. Then allow students time to wander around the room and find their “partner” with the equivalent equation or graph.

**Bloom’s Levels:** Create, Understand

**Webb’s DOK:** 3



## Topic 4: Writing Equations

### **Engaging Experience 1**

**Title:** Foldable

**Suggested Length of Time:** 15-20 minutes developing the foldable over 2 days

#### **Standards Addressed**

*Priority:*

- Alg1.LQE.A.3: Construct linear equations given graphs, verbal descriptions or tables.
- Alg1.IF.B.1: Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities.
- Alg1.CED.A.1: Create equations and inequalities in one variable and use them to model and/or solve problems.

*Supporting:*

- Alg1.NQ.B.1: Use units of measure as a way to understand and solve problems involving quantities.
  - d. Choose and interpret the scale and the origin in graphs and data displays.

**Detailed Description/Instructions:** The class will create a foldable together. It will be divided into three sections: tables, equations and graphs. In each section they will see the same data displayed as each type.

**Bloom's Levels:** Create

**Webb's DOK:** 3

**Rubric:** N/A Teacher example is provided in Schoology.

## Topic 5: Systems

### **Engaging Experience 1**

**Title:** Lotus Chart - Systems of Equations

**Suggested Length of Time:** 30 minutes per day during Systems topic focusing on one method per day

### **Standards Addressed**

*Priority:*

- Alg1.REI.B.1: Solve a system of linear equations algebraically and/or graphically.
- Alg1.REI.C.1: Explain that the graph of an equation in two variables is the set of all its solutions plotted in the Cartesian coordinate plane.
- Alg1.IF.C.1: Graph functions expressed symbolically and identify and interpret key features of the graph.

*Supporting:*

- Alg1.DS.A.1: Analyze and interpret graphical displays of data.

**Detailed Description/Instructions:** Students will be given a Lotus chart that the teacher created with various systems around the outside boxes. On day 1, students will receive a Lotus chart and solve the systems graphically. On day 2, students will receive a new Lotus chart and solve the systems with the substitution method. On day 3, students will receive a new Lotus chart and solve the systems with the elimination method. All systems will equal the same coordinate located at the middle of each Lotus chart.

**Bloom's Levels:** Analyze

**Webb's DOK:** 3

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.) Based on the Algebra I EOC Performance Event, students will be given various cell phone plans and various individuals who are purchasing a new plan. Students must match each individual with each plan. Students must explain their reasoning for the match and display each plan as an equation, table, and graph.

Students will be given a crime scene scenario where they have to create a portfolio of evidence proving that they have arrested the right person and will demonstrate their understanding of their mathematical content present in the problem.

\*Can be found on SCHOOLGY\*

### **Rubric for Engaging Scenario:**

## Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Number Sense and Operations	Student White Board Work with Distributive Property and Combining Like Terms	Teacher will provide problems. Students will solve those on individual white boards so teacher can check for understanding. Beginning with basic examples of the distributive property then moving on to basic example of combining like terms. Finally, combine distributing and combining like terms together in multi-step expressions.	20 minutes per day/every other day over a period of 1-2 weeks
Number Sense and Operations	Bowling with Order of Operations	Teacher will provide dice to groups of students (or can roll dice on SMART Notebook document - see Schoology lesson for Order of Operations). Groups will roll 3 dice and then use operations to try and create numbers #0-7 using the order of operations concept.	20 minutes
Solving Equations	Around the Room Rotation Stations	Students will walk around the classroom/hallway solving equations. Once they find their solution they will need to search around the room/hallway to find their next equation.	45 minutes after lesson on multi-step equations with variable on one side of equal sign and 45 minutes after lesson on multi-step equations with variables on both sides of the equation

Graphing Equations	Find your Partner	Pass out a half-sheet of paper with an equation or graph on it to every student. Have students identify important information from the equation or graph they were given. Then allow students time to wander around the room and find their “partner” with the equivalent equation or graph.	20 minutes/day as warm-up throughout the 5-day lessons
Writing Equations	Foldable	The class will create a foldable together. It will be divided into three sections: tables, equations and graphs. In each section they will see the same data displayed as each type.	15-20 minutes developing the foldable over 2 days
Systems	Lotus Chart - Systems of Equations	Students will be given a Lotus chart that the teacher created with various systems around the outside boxes. On day 1, students will receive a Lotus chart and solve the systems graphically. On day 2, students will receive a new Lotus chart and solve the systems with the substitution method. On day 3, students will receive a new Lotus chart and solve the systems with the elimination method. All systems will equal the same coordinate located at the middle of each Lotus chart.	30 minutes per day during Systems topic focusing on one method per day

## Unit 2: Inequalities

**Subject:** Pre-Algebra

**Grade:** 9, 10

**Name of Unit:** Inequalities

**Length of Unit:** 1-2 weeks

**Overview of Unit:** Students will solve and graph inequalities. Students will solve word problems with one variable.

**Priority Standards for unit:**

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- Alg1.CED.A.1: Create equations and inequalities in one variable and use them to model and/or solve problems.
- Alg1.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.

**Supporting Standards for unit:**

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- Alg1.NQ.B.1: 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.
- ISTE-GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

<b>Unwrapped Concepts (Students need to know)</b>	<b>Unwrapped Skills (Students need to be able to do)</b>	<b>Bloom's Taxonomy Levels</b>	<b>Webb's DOK</b>
the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.	Interpret	Understand	2
equation and inequalities in one variable and use them to model and/solve problems.	Create	Create	3
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.	Explain	Understand	2

**Essential Questions:**

1. How do you solve a multi-step linear inequality?
2. How do you graph an inequality on a number line?

**Enduring Understanding/Big Ideas:**

3. Isolate the variable by using inverse operations
4. Determine whether an open dot or closed dot is used and draw an arrow representing the numbers that make the inequality true

**Unit Vocabulary:**

<b>Academic Cross-Curricular Words</b>	<b>Content/Domain Specific</b>
	Inequality Less than Greater than Less than or equal to Greater than or equal to

**Resources for Vocabulary Development:** textbook

## Topic 1: Solving Multi-Step Inequalities/Graph on Number Line

### **Engaging Experience 1**

**Title:** Rows and Columns Game

**Suggested Length of Time:** 20 minutes after covering 1-2 step inequalities and 20 minutes after covering multi-step inequalities.

### **Standards Addressed**

*Priority:*

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- Alg1.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.

*Supporting:*

- ISTE-GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

**Detailed Description/Instructions:** Every student gets a sheet of paper with two columns of inequality problems. They fold the paper in half and then work the problems out in their column (the right side of the paper) while their partner sitting in the row next to them, works out the problems on the other half of the paper (the left side of the paper). Each side-by-side problem will have the same answer. After both partners solve the inequalities, they check their answers before moving on to the next problem.

**Bloom's Levels:** Understand

**Webb's DOK:** 2



## Topic 2: Word Problem with One-Variable

### **Engaging Experience 1**

**Title:** Card Sort Match. LESS METHOD

**Suggested Length of Time:** 30 minutes

**Standards Addressed**

*Priority:*

- Alg1.CED.A.1: Create equations and inequalities in one variable and use them to model and/or solve problems.

**Detailed Description/Instructions:** LESS method is using a **L**abel, **E**quation, showing your work by **S**olving for a solution and a **S**entence to correctly answer different word problems. Students will be given cards with examples of word problems then they will need to identify the correct label solving and sentence that goes with the equation. Each group will have to sort them and match them accordingly.

**Bloom's Levels:** Create

**Webb's DOK:** 3

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)  
“You’re the Teacher”

You are the math teacher of a 9th grade Pre-Algebra class. Your students just took a test on solving and graphing inequalities and you are beginning to grade them... A fictional student assessment will be graded by the “teacher” and they will include feedback on each question that is missed. At the end of grading, the “teacher” must create 3 additional questions that will help the student practice what he or she missed.

## Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Solving Multi-Step Inequalities/Graph on Number Line	Rows and Columns Game	Every student gets a sheet of paper with two columns of inequality problems. They fold the paper in half and then work the problems out in their column (the right side of the paper) while their partner sitting in the row next to them, works out the problems on the other half of the paper (the left side of the paper). Each side-by-side problem will have the same answer. After both partners solve the inequalities, they check their answers before moving on to the next problem.	20 minutes after covering 1-2 step inequalities and 20 minutes after covering multi-step inequalities
Word Problem with One-Variable	Card Sort Match. LESS METHOD	LESS method is using a Label, Equation, showing your work by Solving for a solution and a Sentence to correctly answer different word problems. Students will be given cards with examples of word problems then they will need to identify the correct label solving and sentence that goes with the equation. Each group will have to sort them and match them accordingly.	30 minutes

## Unit 3: Exponentials

**Subject:** Pre-Algebra

**Grade:** 9, 10

**Name of Unit:** Exponentials

**Length of Unit:** 2 weeks

**Overview of Unit:** Students will simplify radical and exponential expressions. Student will use radicals to solve equations.

**Priority Standards for unit:**

- Alg1.NQ.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents. Limit to rational exponents with a numerator of 1.

**Supporting Standards for unit:**

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- ISTE-EMPOWERED LEARNER 1.C - use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- ISTE-KNOWLEDGE COLLECTOR.3.C - curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- ISTE-CREATIVE COMMUNICATOR.6.B - create original works or responsibly repurpose or remix digital resources into new creations.

<b>Unwrapped Concepts (Students need to know)</b>	<b>Unwrapped Skills (Students need to be able to do)</b>	<b>Bloom's Taxonomy Levels</b>	<b>Webb's DOK</b>
expressions involving radicals and rational exponents using the properties of exponents. Limit to rational exponents with a numerator of 1	Rewrite	Remember	1

**Essential Questions:**

1. How do you apply properties of exponents to simplify expressions?
2. How are exponents and scientific notation related?
3. How do you simplify a radical expression?

**Enduring Understanding/Big Ideas:**

1. Use the properties of exponents to decide whether to add, subtract, multiply.
2. Scientific notation uses powers of 10 to write very large or very small numbers.
3. By finding a perfect square factor.

**Unit Vocabulary:**

Academic Cross-Curricular Words	Content/Domain Specific
	Exponent Base Scientific notation Radical Square root Perfect square number Factor

**Resources for Vocabulary Development:** textbook

## Topic 1: Radicals and Exponents

### **Engaging Experience 1**

**Title:** Exponents Tarsia Puzzle

**Suggested Length of Time:** 15-20 minutes after each new exponent property is covered

#### **Standards Addressed**

*Priority:*

- Alg1.NQ.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents. Limit to rational exponents with a numerator of 1.

**Detailed Description/Instructions:** Students will cut out the puzzle pieces and then work to put the puzzle pieces together - matching question and answer together. A Tarsia puzzle example is located on Schoology.

**Bloom's Levels:** Remember

**Webb's DOK:** 1

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

Students will create a prezi or powerpoint explaining the key concepts of the chapter per section (properties, steps to simplify, etc.). They will need to include examples of their own work (i.e., notes, homework) as a part of their presentation.

## Summary of Engaging Learning Experiences for Topics

<b>Topic</b>	<b>Engaging Experience Title</b>	<b>Description</b>	<b>Suggested Length of Time</b>
Radicals and Exponents	Exponents Tarsia Puzzle	Students will cut out the puzzle pieces and then work to put the puzzle pieces together - matching question and answer together. A Tarsia puzzle example is located on Schoology.	15-20 minutes after each new exponent property is covered



## Unit 4: Polynomials

**Subject:** Pre-Algebra

**Grade:** 9, 10

**Name of Unit:** Polynomials

**Length of Unit:** 1-2 weeks

**Overview of Unit:** Students will identify and name polynomials Students will then add, subtract or multiply/factor basic polynomials.

### Priority Standards for unit:

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- Alg1.SSE.A.2: Analyze the structure of polynomials to create equivalent expressions or equations.
- Alg1.SSE.A.3: Choose and produce equivalent forms of a quadratic expression or equations to reveal and explain properties.
- Alg1.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.

### Supporting Standards for unit:

- Alg1.NQ.B.2: Define and use appropriate quantities for representing a given context or problem.
- Alg1.NQ.B.1: 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.
- ISTE-GLOBAL COLLABORATOR.7.A - use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- ISTE-GLOBAL COLLABORATOR.7.B - use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.	Interpret	Understand	2

the structure of polynomials	Analyze	Analyze	2
equivalent expressions or equations	Create	Create	2
equivalent forms of a quadratic expression or equations to reveal and explain properties.	Choose	Remember	1
equivalent forms of a quadratic expression or equations to reveal and explain properties.	Produce	Create	2
polynomials	Add, subtract and multiply	Apply	2
that polynomials follow the same general rules of arithmetic and are closed under these operations.	Understand	Understand	3

**Essential Questions:**

1. How do you classify polynomials?
2. How do you simplify polynomial expressions?
3. How do you factor binomials?
4. How do you factor trinomials with a leading coefficient of 1?

**Enduring Understanding/Big Ideas:**

1. Number of terms (monomial, binomial, trinomial) and degree (linear, quadratic, cubic)
2. Add, subtract, multiply
3. GCF
4. Factor trinomial by short-cut method (answer of 2 binomials)

**Unit Vocabulary:**

Academic Cross-Curricular Words	Content/Domain Specific
	Polynomial Monomial Binomial Trinomial Linear Quadratic Cubic Degree Like terms Leading coefficient Factor Terms Greatest common factor

**Resources for Vocabulary Development:** textbook

## Topic 1: Polynomials

### **Engaging Experience 1**

**Title:** Polynomial Dice Activity

**Suggested Length of Time:** 20-30 minutes over a weeklong period focusing on one method per day then a mixed review at the end.

#### **Standards Addressed**

*Priority:*

- Alg1.SSE.A.1: Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.
- Alg1.SSE.A.2: Analyze the structure of polynomials to create equivalent expressions or equations.
- Alg1.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.

**Detailed Description/Instructions:** Students will roll two dice. Use those two monomials/polynomials for the problem. Each time they will name/identify the polynomial. Then students will be told whether they are adding, subtracting, or multiplying.

**Bloom's Levels:** Apply, Understand

**Webb's DOK:** 2, 3

### **Engaging Experience 2**

**Title:** Kahoot Factoring Practice

**Suggested Length of Time:** 20-25 minutes

#### **Standards Address:**

*Priority:*

- Alg1.SSE.A.3: Choose and produce equivalent forms of a quadratic expression or equations to reveal and explain properties.
- ISTE-EMPOWERED LEARNER1.C - use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- ISTE-GLOBAL COLLABORATOR.7.A - use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- ISTE-GLOBAL COLLABORATOR.7.B - use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

**Detailed Description/Instructions:** Teacher creates or searches for a Kahoot game with factoring binomials and basic trinomials (leading coefficient of one). Students participate in the kahoot activity with their phone or laptop. After each question is answered, students explain their process for factoring to their partner before moving on to the next question.

**Bloom's Levels:** Remember

**Webb's DOK:** 1

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.) Students complete the polynomial problems (adding, subtracting, multiplying, factoring) on a worksheet and find the answer from the two choices. The answer designates which “item” they draw on the attached face. The result is a picture of a face created and colored.

## Summary of Engaging Learning Experiences for Topics

Topic	Engaging Experience Title	Description	Suggested Length of Time
Polynomials	Polynomial Dice Activity	Students will roll two dice. Use those two monomials/polynomials for the problem. Each time they will name/identify the polynomial. Then students will be told whether they are adding, subtracting, or multiplying.	20-30 minutes over a weeklong period focusing on one method per day then a mixed review at the end
Polynomials	Kahoot Factoring Practice	Teacher creates or searches for a Kahoot game with factoring binomials and basic trinomials (leading coefficient of one). Students participate in the Kahoot activity with their phone or laptop. After each question is answered, students explain their process for factoring to their partner before moving on to the next question.	20-25 minutes

## Unit 5: Data and Statistics

**Subject:** Pre-Algebra

**Grade:** 9, 10

**Name of Unit:** Data and Statistics

**Length of Unit:** 1 week

**Overview of Unit:** Students will solve for measures of central tendency. Student will identify relationships between different forms of data.

**Priority Standards for unit:**

- Alg1.DS.A.8: Distinguish between correlation and causation.

**Supporting Standards for unit:**

- Alg1.DS.A.3: Interpret differences in shape, center and spreads in the context of the data sets, accounting for possible effects of outliers.
- ISTE-EMPOWERED LEARNER 1A - articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- ISTE-DIGITAL CITIZEN.2.D - manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.
- ISTE-COMPUTATIONAL THINKER.5.A - formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- ISTE-COMPUTATIONAL THINKER.5.B - collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

<b>Unwrapped Concepts (Students need to know)</b>	<b>Unwrapped Skills (Students need to be able to do)</b>	<b>Bloom's Taxonomy Levels</b>	<b>Webb's DOK</b>
between correlation and causation	Distinguish	Analyze	2

**Essential Questions:**

1. How do you represent a given set of data?
2. How do you find mean, median, mode and range?

**Enduring Understanding/Big Ideas:**

1. Stem and leaf, box and whisker, scatter plot, histogram, frequency tables.
2. Use appropriate formulas

**Unit Vocabulary:**

Academic Cross-Curricular Words	Content/Domain Specific
Average Data	Box and whisker Stem and leaf Scatter plot Histogram Mean Median Mode Range Outliers Interquartile range Sample Frequency table

**Resources for Vocabulary Development:** textbook



## Topic 1: Measures of Central Tendency and Displays

### **Engaging Experience 1**

**Title:** Around the Room Rotation Stations

**Suggested Length of Time:** 45 minutes

#### **Standards Addressed**

*Priority:*

- Alg1.DS.A.8: Distinguish between correlation and causation.

*Supporting:*

- Alg1.DS.A.3: Interpret differences in shape, center and spreads in the context of the data sets, accounting for possible effects of outliers.

**Detailed Description/Instructions:** Students will walk around the classroom/hallway solving measures of central tendency or finding the graph to match that measure. Once they find their solution they will need to search around the room/hallway to find their next equation

**Bloom's Levels:** Analyze

**Webb's DOK:** 2

**Rubric:** Answer Key for questions with matching graph will need to teacher made.

## Engaging Scenario

**Engaging Scenario** (An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)  
M&M activity: Students will get a mini bag of M&M's (or skittles) They will use the contents of those bags and find the measures of central tendency.  
Students will use classroom and individual data based on continuous improvement data tracking to analyze correlations and reflect on progress in the course.

## Summary of Engaging Learning Experiences for Topics

<b>Topic</b>	<b>Engaging Experience Title</b>	<b>Description</b>	<b>Suggested Length of Time</b>
Measures of Central Tendency and Displays	Around the Room Rotation Stations	Students will walk around the classroom/hallway solving measures of central tendency or finding the graph to match that measure. Once they find their solution they will need to search around the room/hallway to find their next equation	45 minutes

# 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.