Moon Area School District Curriculum Map
Course: Algebra One
Grade Level: 9
Content Area: Mathematics
Frequency: Full-Year Course

Big Ideas

1. Solve linear equations.
2. Solve linear inequalities.
3. Write and interpret the equation of a line.
4. Learn methods of solving a linear system, including graphing, substitution, and elimination.
5. Learn the properties of exponents.
6. Categorize polynomials by their degree and number of terms and perform operations with polynomials.
7. Solve quadratic equations by factoring.
8. Interpret and analyze graphs.
9. Review Algebra One topics in preparation for the Algebra One Keystone Exam.

Essential Questions

10. What are real-life examples of adding and subtracting real numbers?
11. What is meant by equality when solving equations?
12. What does slope-intercept form of an equation tell us?
13. How do we use real-world data to write the equation of a line?
14. How do the words "and"/ "or" affect the outcome of an inequality?
15. How might one determine the most efficient method for solving a system of equations?
16. What can we do with a system of equations/inequalities that we cannot do with a single equation/inequality?
17. Why do we need to use exponential notation to model situations?
18. How can we identify the type of polynomial for it to be factored?
19. Why should we factor?
20. What factors should be considered when choosing a type of data display?

Primary Resource(s) & Technology:
Algebra 1 by McDougal Littel@2004, IXL online software,
Microsoft Teams, Promethean Boards, Student Laptops, Graphing Calculators

Pennsylvania and/or focus standards referenced at:
www.pdesas.org
www.education.pa.gov

Unit 1

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
3, 10	**A1.2.1.1.1** Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.	• Write and evaluate expressions using exponents and the order of operations • Check solutions to equations and inequalities • Use verbal and algebraic models to represent real life situations • Use tables and graphs to organize data and to represent functions • Translate and calculate expressions that model real life situations • Write equations for real life functions	August – September

Unit 2

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
10, 11	**A1.1.1.1.1** Compare and/or order any real numbers. **A1.2.1.1.2** Determine whether a relation is a function, given a set of points or a graph. **A1.2.1.1.3** Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table). **A1.2.3.3.1** Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.	• Addition, Subtraction, Multiplication, and Division of Real Numbers • Graphing and comparing real number using a number line • Finding the opposite and the absolute value of a real number • Solving absolute value equations • Use the distributive property to evaluate and simplify variable expressions • Organize data in a matrix • Add and subtract two matrices • Find the domain of a function • Introduction to probability concepts	September

Unit 3

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
1, 3, 11	**A1.1.2.1.2** Use and/or identify an algebraic property to justify any step in an equation-solving process.	• Solve linear equations in one variable. • Study formulas and learn to solve formulas from a specified variable. • Write equations in function form. • Use equations to model and solve real world problems.	September - October

Unit 4

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
3, 12, 13	**A1.1.1.4.1** Use estimation to solve problems. **A1.2.2.1.1** Identify, describe, and/or use constant rates of change. **A1.2.2.1.4** Determine the slope and/or y-intercept represented by a linear equation or graph. **A1.2.2.1.2** Apply the concept of linear rate of change (slope) to solve problems. **A1.2.1.2.1** Create, interpret, and/or use the equation, graph, or table of a linear function. **A1.2.2.2.1** Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot. **A1.2.1.2.2** Translate from one representation of a linear function to another (i.e., graph, table, and equation).	• Use linear equations and their graphs to model real life situations • Draw and make predictions using scatter plots • Graph linear equations by using tables, two points, point and slope of a line • Identify equations of vertical, horizontal, and parallel lines, and equations that direct variation • Identify and evaluate functions • Use graphs of linear functions to model and solve real life problems	October

Unit 5

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
3, 8, 12, 13, 20	**A1.1.2.1.1** Write, solve, and/or apply a linear equation (including problem situations). **A1.2.2.1.3** Write or identify a linear equation when given • the graph of the line, • two points on the line, or slope and one point **A1.2.3.2.3** Make predictions using the equations or graphs of best-fit lines of scatter plots.	• Write a linear equation of a line given a graph, the slope and one point, or two points on the line • Determine the difference between standard form, slope-intercept form, and point slope form • Develop and use linear models for real life situations • Find a linear equation that approximates a set of data points	November

Unit 6

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
2, 14	**A1.1.3.1.1** Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities). **A1.1.3.1.2** Identify or graph the solution set to a linear inequality on a number line. **A1.1.3.1.3** Interpret solutions to problems in the context of the problem situation. **A1.2.3.1.1** Calculate and/or interpret the range, quartiles, and interquartile range of data. **A1.2.3.2.1** Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations. **A1.2.3.2.2** Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).	• Write, solve, and graph linear inequalities in one variable including compound inequalities • Solve absolute value equations and inequalities • Graph linear inequalities in two variables • Organize data in stem and leaf and box and whisker plots and then interpret the graphs • Determine the mean, median, and mode of a data set	December

Unit 7

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
4, 15, 16	**A1.1.2.2.2** Interpret solutions to problems in the context of the problem situation. **A1.1.2.2.1** Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination. **A1.1.2.2.2** Interpret solutions to problems in the context of the problem situation. **A1.1.3.2.1** Write and/or solve a system of linear inequalities using graphing. **A1.1.3.2.2** Interpret solutions to problems in the context of the problem situation.	• Solve a system of two linear equations by graphing, substitution, and elimination • Appropriately choose a method of solving a system of equations • Determine and represent one solution, infinite solutions, and no solution for a system of equations • Solve a system of linear inequalities by graphing • Model real life problems using linear systems	January

Unit 8

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
5, 17	**A1.1.1.3.1** Simplify/evaluate expressions involving properties/laws of exponents, roots, and/ or absolute values to solve problems.	• Multiply and divide expressions with exponents, including zero and negative exponents • Use scientific notation to represent numbers and solve problems	February

Unit 9

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
5	**A1.1.1.1.2** Simplify square roots. **A1.1.1.5.3** Simplify/reduce a rational algebraic expression.	• Approximate and evaluate square roots • Simplify radicals	March

Unit 10

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
6, 7, 18, 19	**A1.1.1.2.1** Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials. **A1.1.1.5.1** Add, subtract, and/or multiply polynomial expressions (express answers in simplest form). **A1.1.1.5.2** Factor algebraic expressions, including difference of squares and trinomials. **A1.1.2.1.3** Interpret solutions to problems in the context of the problem situation.	• Add and subtract polynomials • Multiply polynomials and special product of polynomials. • Find the GCF of polynomials. • Factor polynomials (common monomials) where a=1	April - May

Unit 11

Big Ideas/ EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
9	Keystone Algebra One Eligible Content will vary depending on topics.	• Keystone Review is based on results from CDT data and varies each year according to the data.	May - June