



# Gateway School District

## Curriculum Map

### High School (9-12)

Gateway High School  
3000 Gateway Campus Blvd.  
Monroeville, PA 15146  
412-373-5744

## Curriculum Map: Mathematics

**Course:** Standards and Anchors Review

**Grade(s):** 10 – 11

### Unit 1: Operations with Real Numbers and Expressions 1

#### Brief Summary of Unit

This unit is the first part of the discussion of operations with real numbers and expressions. A wide variety of topics are covered including comparing and ordering numbers, simplifying square roots and expressions, and finding GCF and LCM.

#### Stage One—Desired Results

**Established Goals:** (Standards of Learning, Content Standards)

Students will be able to:

1. Compare and Order Numbers
2. Simplify Square Roots
3. Simplify and Evaluate Expressions
4. Find Greatest Common Factor and Least Common Multiple of Monomials

#### Understandings:

1. Square roots can be simplified using factor trees and perfect squares.
2. Writing numbers in the same form can make comparing and ordering much easier.
3. Evaluating and simplifying expressions requires the use of the order of operations.

#### Essential Questions:

1. How does the order of operations help to simplify and evaluate expressions?
2. What is the difference between GCF and LCM?
3. How do I know what numbers to keep inside square roots and which ones to take outside square roots when simplifying square roots?

#### Stage Two—Assessment Evidence

**Performance Tasks:**

**Other Evidence:** :(quizzes, tests and so on)

### Stage Three—Learning Plan

## Unit 2: Operations with Real Numbers and Expressions 2

### Brief Summary of Unit

This unit is the second half of the discussion of operations with real numbers and expressions. Different methods of factoring are used to simplify expressions. Simplifying polynomials and using estimation to solve problems are also included.

### Stage One—Desired Results

**Established Goals:** (Standards of Learning, Content Standards)

Students will be able to:

1. Use Estimation to solve problems
2. Simplify Polynomial Expressions
3. Factor Algebraic Expressions
4. Simplify Rational Algebraic Expressions

#### Understandings:

1. Factoring polynomials reverses the multiplication process.
2. Different methods of factoring can be used to simplify expressions.
3. Using estimation can allow a person to use mental math to solve problems.
4. Like terms are needed to add and subtract polynomials.

#### Essential Questions:

1. What are the advantages of solving a problem using estimation?
2. Are “like terms” needed to add, subtract, multiply, and/or divide polynomials?

### Stage Two—Assessment Evidence

#### Performance Tasks:

**Other Evidence:** (quizzes, tests and so on)

### Stage Three—Learning Plan

## Unit 3: Linear Equations and Inequalities

### Brief Summary of Unit

The material in this unit is centered on linear equations and inequalities. The unit starts out by dealing with one equation or inequality, then continues by exploring systems of equations or inequalities.

### Stage One—Desired Results

**Established Goals:** (Standards of Learning, Content Standards)

Students will be able to:

1. Write, solve, and/or apply a linear equation.
2. Interpret solutions to problems in the context of the problem situation.
3. Use and/or identify an algebraic property to justify any step in an equation solving process.
4. Write or solve compound inequalities and/or graph their solution sets on a number line.

5. Identify or graph the solution set to a linear inequality on a number line.
6. Interpret solutions to problems in the context of the problem situation.
7. Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.
8. Write and solve a system of linear equations by graphing.
9. Interpret solutions to problems in the context of the problem situation.

**Understandings:**

1. Graphs can be used to visually represent the relationship between two variable quantities as they change.
2. The solution of a system of linear equations can be found algebraically or graphically and is the point where the linear equations intersect.
3. The solutions of a system of linear inequalities can be represented by the overlapping part of the shaded regions on a graph.
4. Systems of linear equations/inequalities can model real world situations and solve complex problems.
5. One form for writing the equation of a line is the slope-intercept form.
6. One form for writing the equation of a line is the point-slope form.
7. A linear inequality in two variables has an infinite number of solutions.
8. An inequality is a mathematical sentence that uses an inequality symbol to compare the values of two expressions.
9. The solution of an inequality can be represented on a number line.

**Essential Questions:**

1. How does representing functions graphically help you solve a system of equations?
2. How do you know which linear equation form to use when writing an equation?

**Stage Two—Assessment Evidence**

**Performance Tasks:**

**Other Evidence:** :(quizzes, tests and so on)

**Stage Three—Learning Plan**

**Unit 4: Functions**

**Brief Summary of Unit**

This unit focuses on topics related to relations and functions such as domain, range, and characteristics of a function. Identifying and representing patterns is also discussed.

**Stage One—Desired Results**

**Established Goals:** (Standards of Learning, Content Standards)

Students will be able to:

1. Identify the domain and range of a relation.
2. Translate from one representation of a linear function to another (i.e. graph, table, equation).
3. Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
4. Determine whether a relation is a function, given a set of points or a line.

<p><b>Understandings:</b></p> <ol style="list-style-type: none"> <li>1. Functions are a special type of relation where each value in the domain is paired with exactly one value in the range.</li> <li>2. Some sequences have function rules that can be used to find any term of the sequence.</li> <li>3. A vertical line test shows whether a relation is a function.</li> </ol>	<p><b>Essential Questions:</b></p> <ol style="list-style-type: none"> <li>1. When is a relation a function?</li> <li>2. What are some techniques that can be used to write algebraic expressions for patterns?</li> </ol>
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**Stage Two—Assessment Evidence**

**Performance Tasks:**

**Other Evidence:** :(quizzes, tests and so on)

**Stage Three—Learning Plan**

**Unit 5: Coordinate Geometry and Data Analysis**

**Brief Summary of Unit**

This unit focuses on data and how it can be used to represent different situations. The connection between data, equations, and making predictions is also discussed.

**Stage One—Desired Results**

**Established Goals:** (Standards of Learning, Content Standards)

Students will be able to:

1. Identify, describe, and/or use constant rates of change.
2. Apply the concept of linear rate of change (slope) to solve problems.
3. Write or identify a linear equation when given: the graph of the line, two points on the line, or the slope and a point on the line.
4. Determine the slope and/or  $y$ -intercept represented by a linear equation or graph.
5. Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
6. Make predictions using the equations or graphs of best-fit lines of scatter plots.
7. Use Measures of Central Tendency and Dispersion to Summarize Data.
8. 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).
9. Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.
10. Find probabilities for compound events.

<p><b>Understandings:</b></p>	<p><b>Essential Questions:</b></p>
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1. Graphs can be used to visually represent the relationship between two variable quantities as they change.
2. Predictions can be made about real world situations using linear relationships.
3. Finding probabilities can explain and solve complex problems.
4. Data depicted graphically can be easier to understand than information written.
5. Measures of central tendency indicate how a set of data “tends” to act.
6. Analyzing data is used in almost every profession.

1. How can slope, equations, and best fit lines be used to make predictions?
2. What is used to best summarize data?

**Stage Two—Assessment Evidence**

**Performance Tasks:**

**Other Evidence:** :(quizzes, tests and so on)

**Stage Three—Learning Plan**