



Gateway School District Curriculum Map

Middle Schools (5-8)

Moss Side Middle School (5-6)
9000 Gateway Campus Blvd.
Monroeville, PA 15146
412-373-5830

Gateway Middle School
4450 Old William Penn Highway
Monroeville, PA 15146
412-373-5780

Curriculum Map: GMS - 7 Mathematics

Course: Mathematics: 7

Unit 1: Ratios and Proportional Relationships

Subject: Mathematics

Brief Summary of Unit

Students build on their Grade 6 experiences with ratios, unit rates, and fraction division to analyze proportional relationships. They decide whether two quantities are in a proportional relationship, identify constants of proportionality, and represent the relationship by equations. These skills are then applied to real-world problems. (A-R.1.1) (B-E.2.2) (C-G.1.1)

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.
2. Determine whether two quantities are proportionally related.
3. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
4. Represent proportional relationships by equations.
5. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$, where r is the unit rate.
6. Use proportional relationships to solve multi-step ratio and percent problems.
7. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers.
8. Solve problems involving scale drawings of geometric figures, including finding length and area.
9. Compute unit rates associated with ratios of fractions.
10. Recognize and represent proportional relationships between quantities.
11. Use proportional relationships to solve multi-step ratio and percent problems.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

1. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations.
2. Numerical quantities, calculations, and

Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

1. How are relationships represented mathematically?
2. How can expressions, equations, and

measurements can be estimated or analyzed by using appropriate strategies and tools.

3. Data can be modeled and used to make inferences.
4. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.
5. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.
6. Mathematical relationships among numbers can be represented, compared, and communicated.
7. Measurement attributes can be quantified and estimated using customary and non-customary units of measure.
8. Patterns exhibit relationships that can be extended, described, and generalized.

inequalities be used to quantify, solve, model and/or analyze mathematical situations?

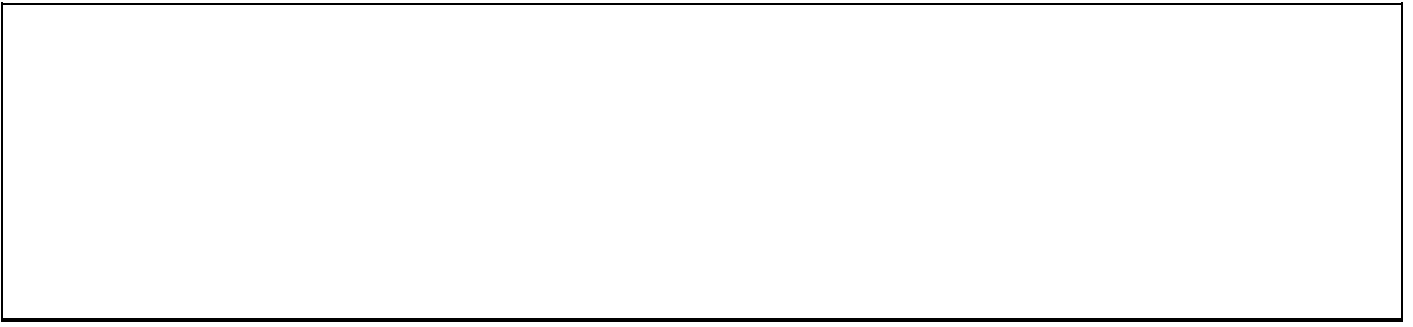
3. What does it mean to estimate or analyze numerical quantities?
4. When is it appropriate to estimate versus calculate?
5. What makes a tool and/or strategy appropriate for a given task?
6. How does the type of data influence the choice of display?
7. How can probability and data analysis be used to make predictions?
8. How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?
9. How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?
10. How can geometric properties and theorems be used to describe, model, and analyze situations?
11. How can data be organized and represented to provide insight into the relationship between quantities?
12. How is mathematics used to quantify, compare, represent, and model numbers?
13. How can mathematics support effective communication?
14. Why does "what" we measure influence "how" we measure?
15. In what ways are the mathematical attributes of objects or processes measured, calculated, and/or interpreted?
16. How precise do measurements and calculations need to be?
17. How can patterns be used to describe relationships in mathematical situations?
18. How can recognizing repetition or regularity assist in solving problems more efficiently?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan



Unit 2: Rational Numbers

Subject: Mathematics

Brief Summary of Unit

Students continue to build an understanding of the number line. They learn to add, subtract, multiply, and divide rational numbers. This includes rational numbers as they appear in expressions and equations. (A-N.1.1) (B-E.2.2)

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Apply properties of operations to add and subtract rational numbers, including real-world contexts.
2. Represent addition and subtraction on a horizontal or vertical number line.
3. Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.
4. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers.
5. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers, and graph the solution set of the inequality.
6. Compute unit rates associated with ratios of fractions.
7. Recognize and represent proportional relationships between quantities.
8. Use proportional relationships to solve multi-step ratio and percent problems.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan

Unit 3: Expressions and Equations

Subject: Mathematics

Brief Summary of Unit

Students' previous work with generating equivalent expressions and solving equations is expanded. They solve real-life and mathematical problems using numerical and algebraic expressions and equations. Students' work with expressions and equations is applied to finding unknown angles and problems involving area, volume, and surface area.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.
2. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.
3. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers.
4. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers, and graph the solution set of the inequality.
5. Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.
6. Model and solve real world and mathematical problems using multiple representations such as algebraic, graphical and using tables.
7. Solve multi-step equations or inequalities with one variable.
8. Solve and interpret multi-step real life and mathematical problems posed with positive and negative rational numbers.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan

Unit 4: Percent and Proportional Relationships

Subject: Mathematics

Brief Summary of Unit

Students focus on ratio and proportion, with a concentration on percent. Students work on problems that include simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error, as well as percent problems about populations, which prepare students for probability models about populations.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Use proportional relationships to solve multi-step ratio and percent problems.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan

Unit 5: Statistics and Probability

Subject: Mathematics

Brief Summary of Unit

Students learn to draw inferences about populations based on random samples. Through the study of chance processes, students learn to develop, use and evaluate probability models.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Determine whether a sample is a random sample given a real-world situation.
2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.
3. Compare two numerical data distributions using measures of center and variability.
4. Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible.
5. Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.
6. Find the probability of a simple event, including the probability of a simple event not occurring.
7. Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.
8. Draw inferences about two populations based on random sampling concepts.
9. Determine and approximate relative frequencies and probabilities of events.
10. Draw informal comparative inferences about two populations using measures of center and measures of variability.
11. Find probabilities of independent compound events.
12. Predict the approximate relative frequency given the probability.
13. Find the probability of a simple event, including the probability of a simple event not occurring.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

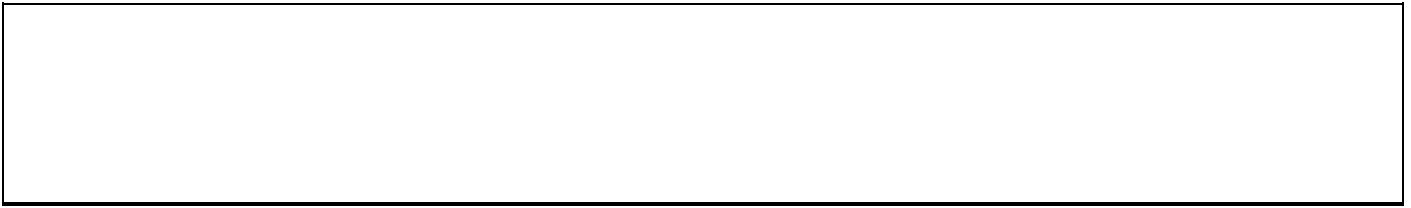
Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan



Unit 6: Geometry

Subject: Mathematics

Brief Summary of Unit

Students end the year by drawing and constructing informal geometrical figures. They will also revisit unknown angle, area, volume, and surface area problems, which now include problems involving percentages of areas or volumes.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Identify or describe the properties of all types of triangles based on angle and side measure.
2. Use and apply the triangle inequality theorem.
3. Describe the two-dimensional figures that result from slicing three-dimensional figures.
4. Identify and use properties of supplementary, complementary and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure.
5. Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).
6. Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s).
7. Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.
8. Use properties of angle types and properties of angles formed when two parallel lines are cut by a transversal line to solve problems.
9. Solve problems involving area and circumference of a circle(s).
10. Solve mathematical problems involving area, volume and surface area of two- and three-dimensional objects.
11. Solve problems involving scale drawings of geometric figures.
12. Apply the properties of all types of triangles based on angle and side measure including the triangle inequality theorem.
13. Describe the two-dimensional figures that result from slicing three-dimensional figures.

Understandings: What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

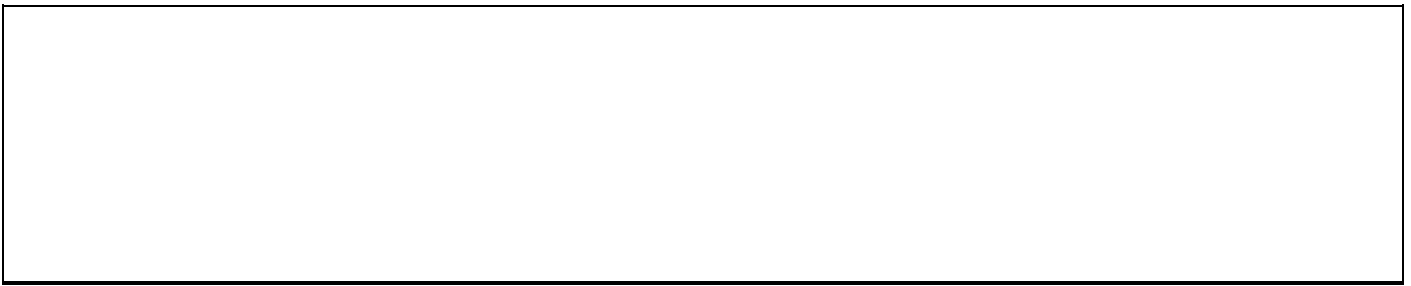
Essential Questions: What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks: What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan



Unit: Summary Gr 7 - Standards for Mathematical Practice

Subject: Mathematics

Brief Summary of Unit

Standards for Mathematical Practice

[Mathematical Practices](#) resource page on SAS

Unit 1, 2, 3, 4, 5, 6:

MP# 1. Make sense of problems and persevere in solving them

MP# 2. Reason abstractly and quantitatively

MP# 3. Construct viable arguments and critique the reasoning of others

MP# 4. Model with mathematics

MP# 5. Use appropriate tools strategically

MP# 6. Attend to precision

MP# 7. Look for and make use of structure

MP# 8. Look for and express regularity in repeated reasoning

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

Understandings:What will students understand (about what big ideas) as a result of the unit? "Students will understand that..."

Essential Questions:What arguable, recurring, and thought-provoking questions will guide inquiry and point toward the big ideas of the unit?

Stage Two - Assessment Evidence

Performance Tasks:What evidence will be collected to determine whether or not the understandings have been developed, the knowledge and skill attained, and the state standards met?

Other Evidence:(quizzes, tests and so on)

Stage Three - Learning Plan

Learning Experiences
What sequence of learning activities and teaching will help students to engage with, develop, and demonstrate the desired understandings
List the key teaching and learning activities in sequence. Code each activity with the appropriate initials of the WHERETO elements. The WHERETO elements are
bWb - Where are we going Why
What is expected bHb - How will we hook and hold student interest bEb - How will we equip students for expected performances bRb - How will we help students rethink and revise bE2b - How will students self-evaluate and reflect on their learning bTb - How will we tailor learning to varied needs, interests, learning styles bOb - How will we organize and sequence the learning
Include at least one strategy included in the Marzano, Pickering, and Pollock (2001) text.