Gateway School District
Curriculum Map

Elementary Schools (K-4)

Cleveland Steward Elementary
5000 Gateway Campus Blvd.
Monroeville, PA 15146
412-373-5874

Ramsey Elementary
2200 Ramsey Road
Monroeville, PA 15146
412-373-5856

Evergreen Elementary
3831 Evergreen Drive
Monroeville, PA 15146
412-373-5842

University Park Elementary
320 Noel Drive
Monroeville, PA 15146
412-327-4113

Curriculum Map: Gr.-3 Mathematics

Course: Mathematics - Grade Three

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Unit 1: Multiplication and Division with Factors of 2, 3, 4, 5, and 10

Subject: Mathematics

Brief Summary of Unit
Students concentrate on the meaning of multiplication and division and begin developing fluency for learning products and representing and solving problems involving multiplication and division involving factors of 2, 3, 4, 5, and 10. The restricted set of facts keeps learning manageable, and also provides enough examples to do one- and two-step word problems and to start measurement problems involving weight, money, length, capacities, and time in the second module.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Interpret and/or describe products of whole numbers fluently within 100 (up to and including 10 X 10).
2. Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10).
3. Apply the commutative property of multiplication (not identification or definition of the property).
4. Apply the associative property of multiplication (not identification or definition of the property).
5. Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.
6. Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.
7. Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers.
8. Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols).
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain those using properties of operations.
10. Create or match a story to a given combination of symbols and numbers.

11. Identify the missing symbol that makes a number sentence true.
12. Use multiplication (up to and including 10 X 10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.
13. Determine the unknown whole number in a multiplication (up to and including 10 X 10) or division (limit dividends through 50), and limit divisors and quotients through 10) equation relating three whole numbers.
14. Interpret and/or model division as a multiplication equation with an unknown factor.
15. Demonstrate an understanding of the relationship between multiplication and division.
16. Demonstrate fluency.
17. Represent and solve problems.
18. Identify and explain patterns in arithmetic (including addition and subtraction).

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?
1. Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations. 2. Numerical quantities, calculations, 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 relation ships 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, com pared, 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.	1. How are relationships represented mathematically? 2. How can expressions, equations, and 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 is 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: Problem Solving with Mass, Time, Capacity, Length, and Money

Subject: Mathematics

Brief Summary of Unit
Students learn the 2, 3, 4, 5, and 10 facts as part of their fluency activities. They work with place value, comparison and rounding concepts. Students develop their number sense well enough that they can build proportional bar diagrams used in solving word problems in Grade 3 and beyond (e.g., "If this bar represents 62 kg, then a bar representing 35 kg needs to be slightly longer than half the 62 kg bar…"). Drawing the relative sizes of the lengths of two bars also prepares students to locate fractions on a number line in Module 5 (where they learn to locate the points 1/3 and 1/5 on the number line relative to each other and relative to the whole unit).

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Compare total values of combinations of coins (penny, nickel, dime, quarter) and/or dollar bills less than $5.00.
2. Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, and dollar).
3. Round amounts of money to the nearest dollar.
4. Tell, show and/or write time (analog) to the nearest minute.
5. Calculate elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).
6. Measure and estimate liquid volumes and masses of objects using standard units. (cups, pints, quarts, gallons, ounces, and pounds and metric units, grams, and kilograms.
7. Add, subtract, multiply, and divide to solve one-step word problems involving masses or liquid volumes that are given in the same units.
8. Use a ruler to measure lengths to the nearest quarter inch or centimeter.
9. Make estimations.
10. Distinguish between linear and area measurements.
11. Solve problems.
12. Tell and write time to nearest minute.
13. Calculate time intervals.
14. Make change using combination of coins and bills.

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: Multiplication and Division with Factors of 6, 7, 8, and 9

Subject: Mathematics

Brief Summary of Unit

Students learn the remaining multiplication and division facts in Module 3 as they continue to develop their understanding of multiplication and division strategies within 100 and use those strategies to solve two-step word problems. The "2, 3, 4, 5 and 10 facts" module (Module 1) and the "6, 7, 8 and 9 facts" module (Module 3) both provide important, sustained time for work in understanding the structure of rectangular arrays to prepare students for area in Module 4. This work is necessary because students initially find it difficult to distinguish the different squares in a rectangular array area model (the third array in the picture below), count them and recognize that the count is related to multiplication. Modules 1 and 3 slowly build up to a rectangular array area model using hands-on rectangular arrays (i.e., a Rekenrek) and/or pictures of rectangular arrays involving objects only (stars, disks, etc.)—all in the context of learning multiplication and division.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Interpret and/or describe products of whole numbers fluently within 100 (up to and including 10 X 10).
2. Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10).
3. Apply the commutative property of multiplication (not identification or definition of the property).
4. Apply the associative property of multiplication (not identification or definition of the property).
5. Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.
6. Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.
7. Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers.
8. Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols).
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations.
10. Create or match a story to a given combination of symbols and numbers.
11. Identify the missing symbol that makes a number sentence true.
12. Use multiplication (up to and including 10 X 10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.
13. Determine the unknown whole number in a multiplication (up to and including 10 X 10) or division (limit dividends through 50), and limit divisors and quotients through 10) equation relating three whole numbers.
14. Interpret and/or model division as a multiplication equation with an unknown factor.
15. Multiplication and Division.

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: Multiplication and Area

Subject: Mathematics

Brief Summary of Unit
Students are ready to investigate area and the formula for the area of a rectangle. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps. When that shape is a rectangle with whole number side lengths, it is easy to partition the rectangle into squares with equal areas (as in Module 3).

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Measure areas by counting unit squares (square centimeter, square meter, square inch, square foot, and non-standards units).
2. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
3. Demonstrate an understanding of properties of multiplication.
4. Represent and solve problems.
5. Identify and explain patterns in arithmetic (including addition and subtraction).
6. Determine the area of a rectangle as it relates to multiplication and addition.
7. Distinguish between linear and area measurements.

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: Fractions as Numbers on the Number Line

Subject: Mathematics

Brief Summary of Unit
Students transition from thinking of fractions as parts of a figure to points on a number line. To make that jump, students think of fractions as being constructed out of unit fractions: "1 fourth" is the length of a segment on the number line such that the length of four concatenated fourth segments on the line equals 1 (the whole). Once the unit "1 fourth" has been established, counting them is as easy as counting whole numbers: 1 fourth, 2 fourths, 3 fourths, 4 fourths, 5 fourths, etc. Students also compare fractions, find equivalent fractions in special cases, and solve problems that involve comparing fractions.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Demonstrate that when a whole or set is partitioned into y equal parts, the fraction 1/y represents 1 part of the whole and/or the fraction x/y represents x equal parts of the whole (limit the denominators to 2,3,4,6,and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).
2. Represent fractions on a number line (limit the denominators to 2,3,4,6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).
3. Recognize and generate simple equivalent fractions (limit the denominators to 1,2,3,4,6, and 8; limit numerators to whole numbers less than the denominator).
4. Express whole numbers as fractions, and/or generate fractions that are equivalent to whole numbers (limit the denominators to 1,2,3,4,6,and 8; limit numerators to whole numbers less than the denominator).
5. Compare two fractions with the same denominator (limit the denominators to 1,2,3,4,6,and 8), using the symbols >, =, or.
6. Round two- and three-digit whole numbers to the nearest ten or hundred, respectively.
7. Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and/or subtract two- and three-digit numbers from three-digit whole numbers.
8. Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).
9. Order a set of whole numbers from least to greatest or greatest to least (up through 9,999; limit sets to no more than four numbers).
10. Represent fractions on a number line.
11. Represent and generate equivalent fractions.
12. Compare fractions with the same numerator or same denominator.
13. Partition two-dimensional shapes into equal parts.
14. Express the area of a partition as a unit fraction of the whole.

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: Collecting and Displaying Data

Subject: Mathematics

Brief Summary of Unit
Students leave the world of exact measurements behind. By applying their knowledge of fractions from Module 5, they estimate lengths to the nearest halves and fourths of an inch and record that information in bar graphs and line plots. This module also prepares students for the multiplicative comparison problems of grade 4 by asking students "how many more" and "how many less" questions of scaled bar graphs.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1,2,5, and 10).
2. Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1,2, 5, and 10).
3. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units – whole numbers, halves, or quarters.
4. Translate information from one type of display to another. Limit to pictographs, tally charts, bar graphs, and tables.
5. Solve problems.
6. Make estimations.
7. Represent and interpret data using various displays.

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 7: Word Problems with Geometry and Measurement

Subject: Mathematics

Brief Summary of Unit
Students solve two-step word problems involving the four operations, and improve fluency for concepts and skills initiated earlier in the year. In Module 7, students also describe, analyze, and compare properties of two-dimensional shapes. By now, students have done enough work with both linear and area measurement models to study that there is no relationship in general between the perimeter and area of a figure, one of the concepts of the last module.

Stage One - Desired Results

Established Goals:(Standards of Learning, content standards)

1. Explain that shapes in different categories may share attributes, and that the shared attributes can define a larger category.
2. Recognize rhombi, rectangles, and squares as examples of quadrilaterals, and/or draw examples of quadrilaterals that do not belong to any of these subcategories
3. Partition shapes into parts with equal areas Express the area of each part as a unit fraction of the whole.
4. Solve two-step problems using the four operations (expressions are not explicitly states). Limit to problems with whole numbers and having whole-number answers.
5. Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols).
6. Use a ruler to measure lengths to the nearest quarter inch or centimeter.
7. Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.
8. Identify and classify shapes and their attributes.
9. Compare shapes.

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 3 - Standards for Mathematical Practice

Subject: Mathematics

Brief Summary of Unit

Standards for Mathematical Practice
[Mathematical Practices](#) resource page on SAS

Unit 1, Unit 3, Unit 4, Unit 5, Unit 6, Unit 7:
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

Unit 2:
MP# 1. Make sense of problems and persevere in solving them
MP# 2. Reason abstractly and quantitatively
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