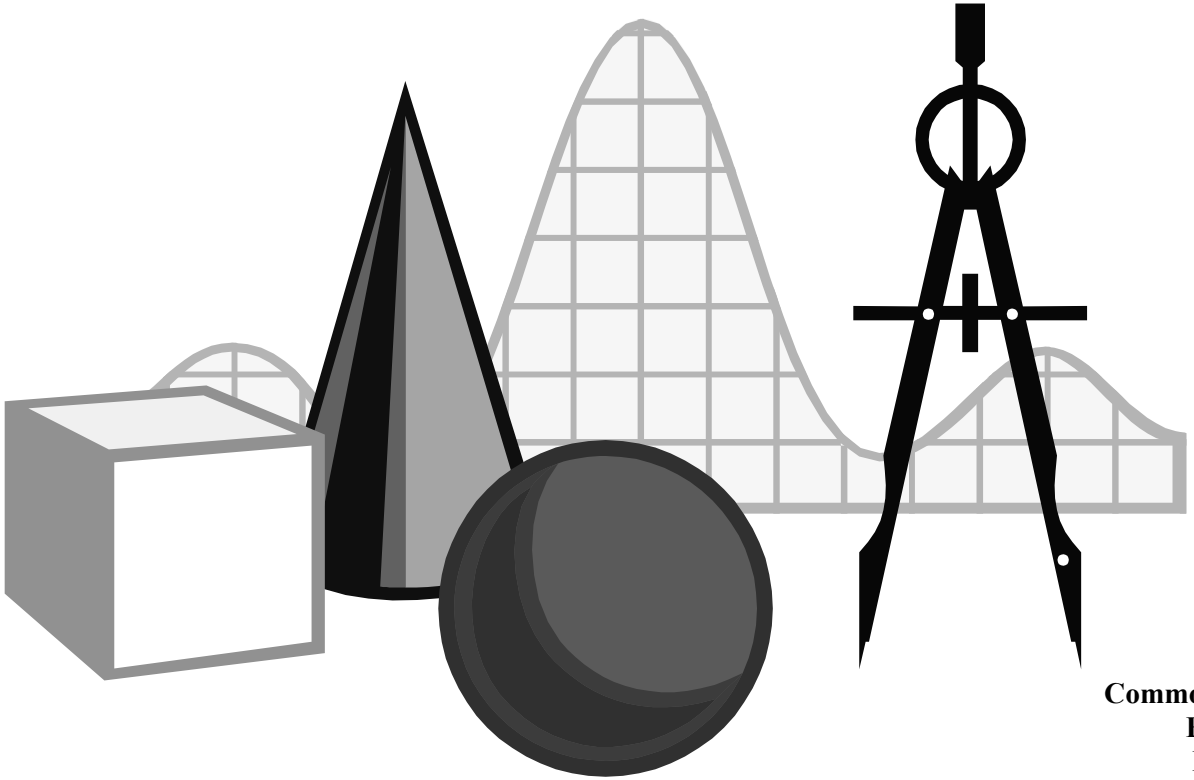
MATHEMATICS STANDARDS OF LEARNING SAMPLE SCOPE AND SEQUENCE

Grade 8



Commonwealth of Virginia
Board of Education
Richmond, Virginia
2002

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Copyright © 2002

by the

Virginia Department of Education
P.O. Box 2120
Richmond, Virginia 23218-2120
www.pen.k12.va.us

All rights reserved. Reproduction of materials
contained herein for instructional purposes in
Virginia classrooms is permitted.

Superintendent of Public Instruction
Jo Lynne DeMary

Deputy Superintendent
M. Kenneth Magill

Assistant Superintendent for Instruction
Patricia I. Wright

Office of Middle Instructional Services
Maureen B. Hijar, Director
Wendy M. Geiger, Mathematics Specialist

NOTICE TO THE READER

The Virginia Department of Education does not unlawfully discriminate on the basis of sex, race, color, religion, handicapping conditions, or national origin in employment or in its educational programs and activities.
The *Mathematics Standards of Learning Sample Scope and Sequence* and the *Mathematics Standards of Learning Curriculum Framework* can be found in a PDF and Word file format on the Virginia Department of Education's Web site at http://www.pen.k12.va.us.

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Preface

As an additional resource to help school divisions develop curricula aligned to the 2001 Mathematics Standards of Learning, the Virginia Department of Education has developed sample scope and sequence documents in kindergarten through grade eight and in core high school courses. These sample documents provide guidance on how the essential knowledge and skills that are identified in the Standards of Learning and the Standards of Learning Curriculum Framework may be introduced to students in a logical, sequential, and meaningful manner.

These sample scope and sequence documents are intended to serve as general guides to help teachers and curriculum developers align their curricula and instruction to support the Standards of Learning. Each sample document is organized around specific topics to help teachers present information in an organized, articulated manner. Also included are correlations to the Standards of Learning for that curricular area for a particular grade level or course, as well as ideas for classroom assessments and teaching resources.

The sample scope and sequence documents are not intended to prescribe how curriculum should be developed or how instruction should be delivered. Instead, they provide examples showing how teachers and school divisions might present to students in a logical and effective manner information that has been aligned with the Standards of Learning. School divisions that need assistance in developing curricula aligned with the Standards of Learning are encouraged to consider the sample scope and sequence guides. Teachers who use the documents should correlate the content identified in the guides with available instructional resources and develop lesson plans to support instruction.

Copies of the sample scope and sequence guides are available at http://www.pen.k12.va.us in both PDF and Microsoft Word formats. These materials are copyrighted, and all rights are reserved. Reproduction of these materials for instructional purposes in Virginia classrooms is permitted.

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Introduction

This middle school sample scope and sequence is based on the essential knowledge and skills listed under each Mathematics Standard of Learning in the Curriculum Framework. It is not intended to be a complete list of all the lessons that need to be taught and mastered during the middle school years, but instead organizes the key skills and processes around organizational topics reflective of the focus of the Standards of Learning. An important aspect of these organizational topics is the use of representations and relationships. Students can develop and deepen their understanding of mathematical concepts and relationships as they create, compare, and use various representations to organize and record their thinking about mathematical ideas.

Students in the middle grades use problem solving, mathematical communication, mathematical reasoning, connections, and representations to integrate understanding across the content in the Mathematics Standards of Learning. In the middle grades students build on the concrete reasoning experiences developed in elementary school while developing the deeper mathematical understandings required for success in abstract learning experiences. Students who have successfully completed the middle grades mathematics program should be prepared for high school mathematics course work.

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	SOL Grade 6	SOL Grade 7	SOL Grade 8
Rational Numbers: Representations & Relationships	6.1 6.2 6.4 6.5	7.1 7.14	8.5
Rational Numbers: Operations/Estimation	6.6 6.7 6.8	7.2 7.4 7.5 7.6	8.1 8.3 8.7 8.10
Rational Numbers: Order of Operations		7.2	8.1 8.4
Number Sense/ Number Theory	6.3 6.22	7.1 7.2 7.3 7.5	8.1 8.2 8.5
Proportional Reasoning	6.2	7.6 7.11	8.3 8.17
Measurement: Actual/Estimate	6.9 6.10 6.11 6.12 6.13 6.14	7.7 7.8	8.6 8.7 8.10
Geometry: Basic Ideas	6.11 6.13 6.14 6.15 6.16	7.9 7.10	8.6 8.10

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	SOL Grade 6	SOL Grade 7	SOL Grade 8
Geometry: Plane	6.14 6.15	7.7 7.9 7.10	8.8 8.10
Geometry: Solid	6.17	7.8	8.7 8.9
Geometry: Spatial Relationships	6.17	7.10 7.12 7.13	8.8 8.9 8.16
Data Analysis: Representations & Relationships	6.2 6.8 6.18 6.19	7.16 7.17 7.18	8.12 8.13
Probability	6.2 6.20	7.14 7.15 7.18	8.11
Patterns and Functions: Representations & Relationships	6.21 6.22	7.18 7.19	8.14 8.16 8.17
Algebra: Representations & Relationships	6.23	7.2 7.3 7.20 7.21 7.22	8.4 8.14 8.15 8.16 8.17 8.18

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers Representation & Relationships	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: base ten blocks, number lines, Algeblocks, squares, cubes ▪ Graph paper ▪ Calculators ▪ Scientific Calculators ▪ Computer software ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Teacher Staff Development Guide
	▪ Identify the perfect squares from 0 to 100. ▪ Identify the two consecutive whole numbers between which the square root of a given whole number from 0 to 100 lies (e.g., $\sqrt{57}$ lies between 7 and 8 since $7^2 = 49$ and $8^2 = 64$).	8.5		
Rational Numbers Order of Operations *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Simplify numerical expressions containing exponents where the base is a rational number and the exponent is a positive whole number, using the order of operations and properties of operations with real numbers.	8.1		
	▪ Substitute numbers for variables in an algebraic expression and simplify the expression by using the order of operations. Exponents used are whole numbers less than 4. ▪ Apply the order of operations to evaluate formulas.	8.4		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Measurement Actual/Estimate	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, right triangles, base ten blocks ▪ Graph paper ▪ Calculators ▪ Computer Software ▪ *Mathematics Curriculum Framework*
	▪ Identify the parts of a right triangle (the hypotenuse and the legs). ▪ Verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement. ▪ Find the measure of a side of a right triangle, given the measures of the other two sides. The measures of the sides of the triangle may be whole numbers no larger than 15 or decimals in tenths. ▪ Solve real-life problems involving right triangles by using the Pythagorean Theorem.	8.10		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Proportional Reasoning	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: geoboards, similar shapes, Algeblocks, squares, cubes ▪ Calculators ▪ Scientific Calculators ▪ Spreadsheets ▪ Computer Software ▪ *Mathematics Curriculum Framework*
	▪ Write problems that require establishing a relationship between ratios. ▪ Solve problems by using proportions.	8.17		
	▪ Solve practical problems by using computation procedures for whole numbers, integers, rational numbers, percents, ratios, and proportions.	8.3		
Algebra Representations & Relationships	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Create problems that require the use of a formula. ▪ Substitute known values for variables in a formula. ▪ Solve a formula by using algebraic procedures. ▪ Create problems that involve a functional relationship. ▪ Solve problems that involve functions.	8.17		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Algebra Representations & Relationships (cont'd.)	▪ Apply the following algebraic terms appropriately: *domain, range, independent variable*, and *dependent variable*. ▪ Identify examples of domain, range, independent variable, and dependent variable. ▪ Determine the domain of a function. ▪ Determine the range of a function. ▪ Determine the independent variable of a relationship. ▪ Determine the dependent variable of a relationship.	8.18	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: geoboards, similar shapes, Algeblocks, squares, cubes ▪ Calculators ▪ Scientific Calculators ▪ Spreadsheets ▪ Computer Software ▪ *Mathematics Curriculum Framework*

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Patterns and Functions Relationships & Representations	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards ▪ Graph paper ▪ Calculators ▪ Graphing calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Graph in a coordinate plane ordered pairs that represent a relation. ▪ Write a rule that represents a relation from a table of values. ▪ Write a table of values from the rule that represents a relation. ▪ Write a table of values from the graph of ordered pairs of a relation. ▪ Describe and represent relations and functions, using tables, graphs, and rules. ▪ Relate and compare different representations of the same relation.	8.14		
	▪ Construct a table of ordered pairs by substituting values for x in a linear equation to find values for y. ▪ Plot in the coordinate plane ordered pairs (x, y) from a table. ▪ Connect the ordered pairs to form a straight line.	8.16		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Measurement Actual/Estimate	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, angle rulers, protractors, right triangles, triangles ▪ Graph paper ▪ Calculators ▪ Graphing Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle Grades Teachers* Staff Development Guide
	▪ Measure angles of less than 360° to the nearest degree, using appropriate tools.	8.6		
Geometry Basic Ideas	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Identify and describe the relationships among the angles formed by two intersecting lines. ▪ Identify and describe pairs of angles that are vertical. ▪ Identify and describe pairs of angles that are supplementary. ▪ Identify and describe pairs of angles that are complementary.	8.6		
	▪ Identify the parts of a right triangle (the hypotenuse and the legs). ▪ Verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement.	8.10		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Plane	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, Fraction Islands ▪ Graph paper ▪ Dot paper ▪ Mathematics Curriculum Framework ▪ DOE *Geometry for Middle Grades Teachers* Staff Development Guide
	▪ Identify the geometric transformations (rotation, reflection, translation, and dilation) by using a variety of real-life examples ▪ Demonstrate the reflection of a figure over a vertical or horizontal line on a coordinate grid. ▪ Demonstrate 90°, 180°, 270°, and 360° rotations of a figure on a coordinate grid. ▪ Demonstrate the translation of a figure on a coordinate grid. ▪ Demonstrate the dilation of a figure from a fixed point on a coordinate grid.	8.8		
	▪ Verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement	8.10		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Solid	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Solids, Cubes ▪ Graph paper ▪ Dot paper ▪ Mathematics Curriculum Framework ▪ DOE *Geometry for Middle Grades Teachers* Staff Development Guide
	▪ Compute the surface area of a pyramid by finding the sum of the areas of the triangular faces and the base. ▪ Compute the surface area of a cone by calculating the sum of the areas of the side and the base, using formulas. ▪ Compute the volume and surface area of rectangular solids (prisms), cylinders, cones, and square pyramids, using formulas.	8.7		
	▪ Construct three-dimensional models, given top, side, and bottom views.	8.9		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Data Analysis: Representation & Relationship *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: multicolored counters, geoboards ▪ Graph paper ▪ Calculators ▪ Graphing Calculators ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide
	▪ Make comparisons, predictions, and inferences, given data sets of no more than 20 items that are displayed in frequency distributions; box-and-whisker plots; scattergrams; line, bar, circle, and picture graphs; and histograms.	8.12		
	▪ Describe the characteristics of a matrix, including designating labels for rows and columns. ▪ Use a matrix of no more than twelve entries to organize and describe a data set. ▪ Identify the position of an element by row and column. ▪ Transfer data from a chart to a matrix.	8.13		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers: Operations/ Estimation	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Checks, Check Registers ▪ Calculators ▪ Spreadsheets ▪ *Mathematics Curriculum Framework*
	▪ Recognize, represent, compare, and order rational numbers expressed in scientific notation, using both positive and negative exponents. ▪ Compare and order fractions, decimals, percents, and numbers written in scientific notation.	8.1		
	▪ Solve practical problems by using computation procedures for whole numbers, integers, rational numbers, percents, ratios, and proportions. ▪ Maintain a checkbook and check registry for five or fewer transactions. ▪ Compute a discount and the resulting (sale) price for one discount.	8.3		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Probability	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: multicolored counters, various dice, random number generators, games, Geoboards ▪ Calculators ▪ Graphing Calculators ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide
	▪ Analyze a problem situation, and determine the likelihood of an event occurring, using knowledge of probability. ▪ Predict the outcome of an event by analyzing its probability. ▪ Explain the consequences of making different choices, using knowledge of probability. ▪ Make predictions about the outcomes of games of chance, board games, and grading scales by using knowledge of probability.	8.11		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Number Sense/Number Theory	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, line graphs, Fraction strips, fraction circles & fraction circle rings, Fraction Islands, base ten blocks ▪ Graph paper ▪ Calculators ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Identify the two consecutive whole numbers between which the square root of a given whole number from 0 to 100 lies (e.g., $\sqrt{57}$ lies between 7 and 8 since $7^2 = 49$ and $8^2 = 64$).	8.5		
	▪ Describe orally and in writing the relationships among the sets of natural or counting numbers, whole numbers, integers, rational numbers, irrational numbers, and real numbers. ▪ Illustrate the relationships among the subsets of the real number system by using graphic organizers such as Venn diagrams. Subsets include real numbers, rational numbers, irrational numbers, integers, whole numbers, and natural numbers. ▪ Identify the subsets of the real number system to which a given number belongs. ▪ Determine whether a given number is a member of a particular subset of the real number system, and explain why. ▪ Describe each subset of the set of real numbers.	8.2		
	▪ Recognize, represent, compare, and order rational numbers expressed in scientific notation, using both positive and negative exponents. ▪ Compare and order fractions, decimals, percents, and numbers written in scientific notation.	8.1		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Algebra: Representations & Relationships *Include Whole Numbers, Fractions, and Decimals*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Algeblocks ▪ Calculators ▪ Graphing calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Substitute numbers for variables in an algebraic expression and simplify the expression by using the order of operations. Exponents used are whole numbers less than 4. ▪ Apply the order of operations to evaluate formulas.	8.4		
	▪ Solve two-step linear equations by showing the steps and using algebraic sentences. ▪ Solve two-step inequalities by showing the steps and using algebraic sentences.	8.15		
	▪ Substitute known values for variables in a formula. ▪ Solve a formula by using algebraic procedures.	8.17		
	▪ Construct a table of ordered pairs by substituting values for x in a linear equation to find values for y. ▪ Plot in the coordinate plane ordered pairs (x, y) from a table. ▪ Connect the ordered pairs to form a straight line.	8.16		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Algebra: Representations & Relationships (cont'd.)	▪ Graph in a coordinate plane ordered pairs that represent a relation. ▪ Write a rule that represents a relation from a table of values. ▪ Write a table of values from the rule that represents a relation. ▪ Write a table of values from the graph of ordered pairs of a relation. ▪ Describe and represent relations and functions, using tables, graphs, and rules. ▪ Relate and compare different representations of the same relation	8.14	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Algeblocks ▪ Calculators ▪ Graphing calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Apply the following algebraic terms appropriately: domain, range, independent variable, and dependent variable. ▪ Identify examples of domain, range, independent variable, and dependent variable. ▪ Determine the domain of a function. ▪ Determine the range of a function. ▪ Determine the independent variable of a relationship. ▪ Determine the dependent variable of a relationship.	8.18		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Spatial Relationships	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, Fraction Islands, Algeblocks, Cubes ▪ Graph paper ▪ Dot paper ▪ Calculators ▪ Computer Software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Plot in the coordinate plane ordered pairs (x, y) from a table.	8.16		
	▪ Identify the geometric transformations (rotation, reflection, translation, and dilation) by using a variety of real-life examples	8.8		
	▪ Construct three-dimensional models, given top, side, and bottom views.	8.9		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers: Operations/ Estimation *Include Whole Numbers, Fractions, and Decimals.* *Use Variables in formulas.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, solids, right triangles, triangles, rectangles ▪ Graph paper ▪ Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Compute the surface area of a pyramid by finding the sum of the areas of the triangular faces and the base. ▪ Compute the surface area of a cone by calculating the sum of the areas of the side and the base, using formulas. ▪ Compute the volume and surface area of rectangular solids (prisms), cylinders, cones, and square pyramids, using formulas.	8.7		
	▪ Find the measure of a side of a right triangle, given the measures of the other two sides. The measures of the sides of the triangle may be whole numbers no larger than 15 or decimals in tenths	8.10		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Measurement Actual/Estimate *Include Whole Numbers, Fractions, and Decimals.* *Use variables in formulas.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Geoboards, solids, right triangles, triangles, rectangles ▪ Graph paper ▪ Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Compute the surface area of a pyramid by finding the sum of the areas of the triangular faces and the base. ▪ Compute the surface area of a cone by calculating the sum of the areas of the side and the base, using formulas. ▪ Compute the volume and surface area of rectangular solids (prisms), cylinders, cones, and square pyramids, using formulas. ▪ Investigate and solve problems involving volume and surface area of rectangular solids (prisms), cylinders, cones and pyramids	8.7		

Grade 8 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Patterns and Functions: Relationships *Include Whole Numbers, Fractions, and Decimals.* *Use variables in formulas.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Portfolios ▪ Manipulatives: Geoboards, Algeblocks ▪ Calculators ▪ Graphing calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Create problems that require the use of a formula. ▪ Substitute known values for variables in a formula. ▪ Solve a formula by using algebraic procedures. ▪ Create problems that involve a functional relationship. ▪ Solve problems that involve functions	8.17		