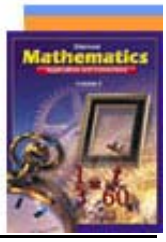
Math 7 Curriculum Outline – 2009/10

Textbook: "Mathematics: Applications and Connections, Course 2"; Glencoe; 2001



The seventh grade math curriculum is divided into the sixteen concept units listed below. Although the material in Units 1 through 14 will be taught prior to the May 2009 NYS Math Assessment Test, the order in which the material is presented is subject to change.

Unit 1: Review of 6th grade Curriculum

Students will be assessed based on their understanding of: evaluating 2 variable expressions; translating and solving two-step verbal problems; solving simple proportions; identifying and plotting points on a coordinate plane; recording data on a frequency table; constructing Venn Diagrams; determining the most appropriate graph to display data; listing possible outcomes for compound events; and determining probability of dependent events.

Unit 2: Measurement 1

- Convert capacities and volumes within a given system
- Identify customary and metric units of mass
- Convert mass within a given system
- Determine the tool and technique to measure with an appropriate level of precision: mass
- Justify the reasonableness of the mass of an object
- Determine personal references for customary /metric units of mass.
- Identify the relationships between relative error and magnitude when dealing with large numbers (e.g., money, population).

Unit 3: Number Sense and Systems

- Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers)
- Recognize the difference between rational and irrational numbers (e.g., explore different approximations of π)
- Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers
- Classify irrational numbers as non-repeating/non-terminating decimals
- Recognize and state the value of the square root of a perfect square (up to 225)
- Determine the square root of non-perfect squares using a calculator
- Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line)
- Justify the reasonableness of answers using estimation.

Unit 4: Exponents

- Develop the laws of exponents for multiplication and division
- Write numbers in scientific notation
- Translate numbers from scientific notation into standard form
- Compare numbers written in scientific notation
- Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (e.g., 10^{-2} = .01 = 1/100)

Unit 5: Number Theory

- Determine the prime factorization of a given number and write in exponential form
- Find the common factors and greatest common factor of two or more numbers
- Determine multiples and least common multiple of two or more numbers

Unit 6: Integers

- Add, subtract, multiply, and divide integers
- Add and subtract two integers (with and without the use of a number line)

Unit 7: Evaluating Expressions and Formulas

- Simplify expressions using order of operations. *Note: Expressions may include absolute value and/or integral exponents greater than 0.*
- Evaluate formulas for given input values (surface area, rate, and density problems).

Unit 8: Equation Solving

- Translate two-step verbal expressions into algebraic expressions
- Solve one-step inequalities (positive coefficients only)
- Graph the solution set of an inequality (positive coefficients only) on a number line.
- Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation

Unit 9: Polynomials

- Add and subtract monomials with exponents of one.
- Identify a polynomial as an algebraic expression containing one or more terms

Unit 10: Geometry 1

- Calculate the radius or diameter, given the circumference or area of a circle
- Identify the right angle, hypotenuse, and legs of a right triangle
- Explore the relationship between the lengths of the three sides of a right triangle to develop the Pythagorean Theorem
- Find a missing angle when given angles of a quadrilateral
- Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle
- Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator.

Unit 11: Volume/Surface Area

- Calculate the volume of prisms and cylinders, using a given formula and a calculator
- Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)
- Determine the surface area of prisms and cylinders, using a calculator and a variety of methods
- Estimate surface area

Unit 12: Statistics and Probability

- Draw central angles in a given circle using a protractor (circle graphs)
- Identify and collect data using a variety of methods
- Display data in a circle graph
- Convert raw data into double bar graphs and double line graphs
- Calculate the range for a given set of data
- Select the appropriate measure of central tendency
- Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph)Identify and explain misleading statistics and graphs
- Interpret data to provide the basis for predictions and to establish experimental probabilities
- Determine the validity of sampling methods to predict outcomes
- Predict the outcome of an experiment
- Design and conduct an experiment to test predictions
- Compare actual results to predicted results

Unit 13: Patterns, Relations, Functions: Graphing

- Draw the graphic representation of a pattern from an equation or from a table of data.
- Create algebraic patterns using charts/tables, graphs, equations, and expressions.

Unit 14: Problem Solving

Students will explore the different methods and strategies for solving problems including: working backwards, trial and error, drawing diagrams or making a chart, and solving simpler problems.

********** NYS 7th Grade Assessment May 2010 **********

Unit 15: Patterns, Relations and Functions

- Write an equation to represent a function from a table of values.
- Build a pattern to develop a rule for determining the sum of the interior angles of polygons.

Unit 16: Measurement II

- Calculate distance using a map scale
- Calculate unit price using proportions
- Compare unit prices
- Convert money between different currencies with the use of an exchange rate table and a calculator