Math 8 Curriculum Outline – 2009/10

Textbook: "Middle Grades Math: Tools for Success, Course 3"; Prentice Hall; 2001	
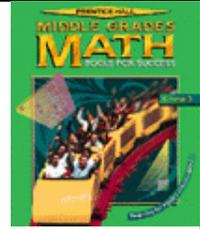
The eighth grade math curriculum is divided into the eleven concept units listed below. The material in Units 1 through 9 will be taught prior to the May 2010 NYS Math Assessment Test, however the order in which the material is presented is subject to change.

Unit 1: Review of 7th grade Curriculum

Students will be assessed based on their understanding of: drawing the graphic representation of a pattern from an equation or from a table of data; writing an equation to represent a function from a table of values; solving proportions relating to unit price, using a map scale and converting money between different currencies; identifying and labeling parts of a right triangle; using the Pythagorean Theorem to determine the unknown length of a side of a right triangle and proving whether a triangle is a right triangle; determining the sum of the interior angles of polygons; identifying and classifying polynomials; adding and subtracting monomials; and, solving multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation.

Unit 2: Number Sense and Algebraic Expressions
(Approximately 6 - 8 days)

Students will understand meanings of operations and procedures, and how they relate to one another.

- Translate verbal sentences into algebraic inequalities and expressions.

- Write verbal expressions that match given mathematical expressions

- Develop and apply the laws of exponents for multiplication and division.

- Evaluate expressions with integral exponents.

- Solve equations/proportions to convert equivalent measurements within metric and customary systems (include Fahrenheit/Celsius conversions).

Unit 3: Percent /Estimation
(Approximately 15-19 days)

- Read/write/identify percents less than 1% and greater than 100%.

- Apply percents to tax, percent increase/decrease, simple interest, sale price, commission, interest rates, and gratuities.

Students will compute accurately and make reasonable estimates.

- Estimate a percent of a quantity given an application.

- Justify the reasonableness of answers using estimation.

Unit 4: Polynomials

(Approximately 15-19 days)

Students will perform algebraic procedures accurately.
- Use physical models to perform operations with polynomials.

- Multiply and divide monomials

- Add/subtract polynomials (integer coefficients)

- Multiply a binomial by a monomial and a binomial by a binomial, "FOIL", (integer coefficients).

- Divide a polynomial by a monomial (integer coefficients).

- Factor algebraic expressions using GCF.

- Factor a trinomial (a=1; c has no more than 3 sets of factors)

Unit 5: Geometric Relationships
(Approximately 13-17 days)

Students will identify and justify geometric relationships, formally and informally.
- Identify pairs of vertical angles as congruent.

- Identify pairs of supplementary and complementary angles.

- Calculate the missing angle in a supplementary/complementary pair.

- Determine angle pair relationship when given two parallel lines cut by a transversal.

- Calculate the missing angle measurements when given two parallel lines cut by a transversal.

- Calculate the missing angle measurements when given two intersecting lines and an angle.

- Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines.

Unit 6: Graphing Applications (Algebra Standard)
(Approximately 13-17 days)

Students will recognize, use, and represent algebraically patterns, and relations.
- Describe a situation involving relationships that match a given graph.

- Create a graph given a description or an expression for a situation involving a linear or non-linear relationship.

- Understand that numerical information can be represented in multiple ways: arithmetically, algebraically and graphically.

- Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line..

Unit 7: Transformational Geometry
(Approximately 10-14 days)
Students will apply transformations and symmetry to analyze problem solving situations.
- Describe and identify transformations in the plane using proper function notation (reflections, rotations, dilations, translations).

- Students will learn how to draw the image of a figure:
    - rotated 90/180 degrees.
    - reflected over a given line.
    - under a translation and a dilation.
- Students will gain an understanding of which properties are preserved and which are not preserved under all transformations (orientation/size).

Unit 8: Algebraic Inequalities
(Approximately 7-10 days)

Students will perform algebraic procedures accurately.
- Solve multi-step inequalities and graph the solution set on a number line.

- Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number).

Unit 9: Coordinate Geometry
(Approximately 12-14 days)

Students will apply coordinate geometry to analyze problem solving situations.
- Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change.

- Determine the y-intercept of a line and understand its definition.

- Graph a line using a table of values

- Determine the equation of a line given the slope and the y-intercept

- Graph a line from an equation in slope-intercept form ($y = mx + b$)

- Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines).

- Distinguish between linear and nonlinear equations ax^2 + bx + c; a=1 (only graphically).

- Recognize the characteristics of quadratics in tables, graphs, equations, and situations

*********** NYS 8th Grade Assessment May 2009 *********

Unit 10: Functions

(Approximately 7-10 days)

Students will recognize, use, and represent algebraically patterns, relations, and functions.
- Define and use correct terminology when referring to function (domain and range)

- Determine if a relation is a function.

- Interpret multiple representations using equation, table of values, and graph.

Unit 11: Geometry Constructions
(Approximately 5-8 days)
Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.
- Construct congruent segments, congruent angles, perpendicular bisector, and angle bisector.