JUNIOR HIGH SCHOOL
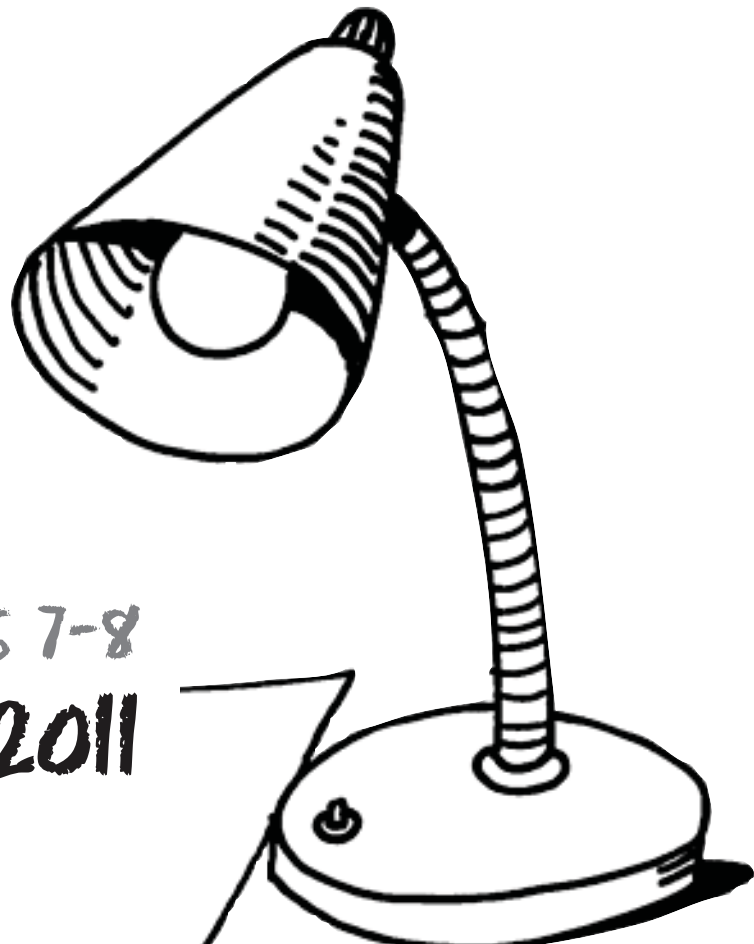# DISTRICT SYLLABI /
COURSE HANDBOOK

Van Wyck Junior High School
Wappingers Junior High School

GRADES 7-8
2010 - 2011

HICKS

MATH 7
Code M141 Full Year

Prerequisite: None

Areas of Study Include:
- **Algebraic Reasoning**
  - Exponents
  - Metric Measurements
  - Applying Exponents
  - Order of Operations
  - Properties
  - Variables and Algebraic Expressions
  - Solving Equations
- **Integers and Rational Numbers**
  - Integers
  - Solving Equations containing Integers
  - Factors and Multiples
  - Rational Numbers
- **Applying Rational Numbers**
  - Estimation and Place Value
- **Patterns and Functions**
  - Coordinate Plane
- **Proportional Relationships**
  - Rates, Ratios, Proportions
  - Customary Measurements
- **Collecting, Displaying, and Analyzing Data**
  - Organizing and Displaying Data
  - Representing and Analyzing Data
- **Geometric Figures**
  - Classifying Polygons, Triangles and Quadrilateral
  - Missing Angles of Quadrilaterals and Triangles
- **Measurement: Two Dimensional Figures**
  - Perimeter, Circumference, Area
  - Using Squares and Square Roots
- **Measurement: Three Dimensional Figures**
  - Volume
  - Surface Area
- **Probability**
  - Introduction to Probability
- **Multi- Step Equations and Inequalities**
  - Two Step Equations
  - Solving One Step Inequalities
- **Polynomials**
  - Identifying Polynomials
  - Add and Subtract Monomials
- **Functions Tables**
  - Tables and Graphs
  - Graphing Linear Functions
- **Scale Drawings and Scale Models**
- **Converting Money into Different Currencies**
- **Pythagorean Theorem**
- **Multi- Step Equations**
  - Solving Multi- Step Equations
  - Solving Equations with Variables on both sides

Assessment: Math 7 students will take a district-wide exam at the end of the 2nd quarter, the NYS Math Assessment in May, and a district-wide final exam in June. The NYS Math Assessment (extended response questions only) will count as 25% of the final exam grade. The district-wide final exam counts as 20% of the final course average.

For the complete NYS Core Curriculum for Math 7, see page 69 of: http://www.emsc.nysed.gov/3-8/MathCore.pdf

MATH 7H
Code M161 Full Year

Prerequisite: Placement in the Honors program is by application. The selection process takes place at the end of the first semester of grade 6. Mathematics and Science are blocked for teaming purposes. In order to qualify for Honors Mathematics, students must meet the criteria and be accepted for both the Mathematics Honors and Science Honors programs.

Note: The junior high school Honors program is rigorous and demanding. Students are expected to meet and maintain high standards of performance in Honors courses. The program is comprehensive in scope and sequence and accelerated in pace of instruction.

Mathematics Honors is an accelerated study of mathematics. Seventh grade Honors combines two years of mathematics (Math 7 and Math 8) into one year of Math 7H.

Math 7 Honors is for students who have excelled and demonstrated a firm grasp of concepts and skills in sixth grade mathematics and science, have at least a 93 average in each course, have the teachers' recommendation, earned a score of 4 on the NYS Grade 4 Science Assessment, and earned a score of 4 on the NYS Grade 5 Math Assessment. The students must display a high degree of interest in math and science, be motivated and self-directed, easily understand new concepts and principles, and display a high level of problem-solving skills.

Students who are not meeting the criteria at any time during the school year will be reviewed for possible removal from the Honors program.

Areas of Study Include:
- **Algebraic Expressions and Integers**
  - Variables and Expressions
  - Order of Operations
  - Evaluating Expressions
  - Integers
  - The Coordinate Plane
- **Solving One-Step Equations**
  - Properties of Numbers
  - Simplifying Variable Expressions
  - Variables and Equations
  - One-Step Equations
  - Inequalities and their Graphs
  - Solving One-Step Inequalities
- **Decimals and Equations**
  - Statistics
  - Using Formulas
  - One-Step Equations with Decimals
  - Metric System
- **Factors, Fractions, and Exponents**
  - Divisibility and Factors
  - Exponents
  - Prime Factorization
  - GCF
  - LCM
  - Venn Diagrams
  - Rational Numbers
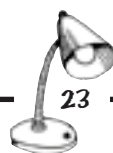
- Exponents and Multiplication
- Exponents and Division
- Scientific Notation
- Customary Units of Measure
- Relative Error
- Powers of Products and Quotients
• **Ratios, Proportions, and Percents**
  - Proportions
  - Unit Rates and Currency
  - Similar Figures, Scale Drawings, and Problem Solving Using Maps
  - Basic Probability
  - Percents (including applications)
• **Solving Equations and Inequalities**
  - Solving Two-Step Equations
  - Solving Multi-Step Equations
  - Solving Multi-Step Inequalities
  - Transforming Formulas
• **Geometry**
  - Introduction to Geometry: Points, Lines, and Planes
  - Angle Relationships and Parallel Lines
  - Classifying Polygons
  - Circles and Circumference
  - Area of Quadrilaterals, Triangles, and Circles
  - Surface Area
  - Volume
• **Data Analysis and Probability**
  - Frequency Tables
  - Graphs: Double Line, Bar, and Circle
  - Using Graphs to Persuade
  - Counting Outcomes
  - Theoretical Probability
  - Independent and Dependent Events
  - Permutations and Combinations
  - Experimental Probability
  - Random Samples and Surveys
• **Right Triangles**
  - Square Roots and Irrational Numbers
  - Pythagorean Theorem
• **Spatial Thinking**
  - Constructions
  - Translations
  - Symmetry
  - Reflections
  - Rotations
  - Dilations
• **Linear Functions and Graphing**
  - Relations and Functions
  - Slope and y-intercept
  - Rules for Linear Functions
  - Graphing Lines
  - Solving Systems of Linear Equations
  - Graphing Linear Inequalities
• **Nonlinear Functions and Polynomials**
  - Polynomials
  - Adding and Subtracting Polynomials
  - Multiplying a Polynomial by a Monomial
  - Multiplying Binomials
  - Factoring Trinomials
  - Quadratics
  - Linear and Non-Linear Equations

Assessment: Math 7H students will take a district-wide exam at the end of the 2nd quarter, the NYS Math Assessment in May, and a district-wide final exam in June. The NYS Math Assessment (extended response questions only) will count as 25% of the final exam grade. The district-wide final exam counts as 20% of the final course average.

For the complete NYS Core Curriculum for Math 7 Honors (7th & 8th grade math), see page 69 and page 79 of: http://www.emsc.nysed.gov/3-8/MathCore.pdf

MATH 8
Code M241 Full Year

Prerequisite: Successful completion of Math 7

Areas of Study Include:
• **Principles of Algebra**
  - Algebraic Expressions
  - Algebraic Inequalities
  - Solving Two-Step Equations
• **Graphs, Functions, and Sequences**
  - Ordered Pairs
  - Graphing on a Coordinate Plane
  - Interpreting Graphs and Tables
  - Equations, Tables and Graphs
• **Exponents and Roots**
  - Look for a Pattern in Integer Exponents
  - Properties of Exponents
  - Scientific Notation
  - Squares and Roots
  - Estimating Square Roots
  - The Pythagorean Theorem
• **Ratios, Proportions and Similarity**
  - Ratios, Rates and Unit Rates
  - Equivalent Measures
  - Solving Proportions
  - Dilations
• **Percents**
  - Relating Decimals, Fractions and Percents
  - Estimate with Percents
  - Finding Percents
  - Finding a Number when the Percent is Known
  - Applications of Percents
• **Foundations of Geometry**
  - Points, Lines, Planes and Angles
  - Parallel and Perpendicular Lines
  - Angles: Vertical, Supplementary, Complementary, Angles formed by Parallel Lines cut by a Transversal
  - Angles in Triangles
  - Classifying Polygons
• **Transformations**
  - Symmetry
  - Rotations, Reflections, Translations, Dilations
  - Properties Preserved and Not Preserved
• **Multi-Step Equations and Inequalities**
  - Simplifying Algebraic Expressions
  - Solving Multi-Step Equations
  - Solving Equations with Variables on both sides
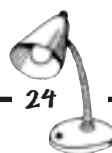
- **Polynomials**
  - Model Polynomials
  - Simplifying Polynomials
  - Adding Polynomials
  - Subtracting Polynomials
  - Multiplying Polynomials by Monomials
  - Multiplying Binomials
  - Dividing Polynomials by Monomials
- **Factoring Polynomials**
  - GCF
  - Trinomials
- **Solving Inequalities**
  - Solving Inequalities and Graphing the Solution
  - Solving Linear Inequalities
- **Graphing Lines**
  - Graphing Using a Table of Values
  - Slope of a Line
  - Graphing Using Slope-Intercept Form
  - Solving Systems
- **Functions**
  - Linear Functions
  - Interpret Data Using Multiple Representations
  - Linear vs. Non-Liners Equations
  - Quadratic Functions
- **Constructions**
  - Congruent Segments
  - Congruent Angles
  - Perpendicular Bisector
  - Angle Bisector

Assessment: Math 8 students will take a district-wide exam at the end of the 2nd quarter, the NYS Math Assessment in May, and a district-wide final exam in June. The NYS Math Assessment (extended response questions only) will count as 25% of the final exam grade. The district-wide final exam counts as 20% of the final course average.

For the complete NYS Core Curriculum for Math 8, see page 79 of:
http://www.emsc.nysed.gov/3-8/MathCore.pdf

ALGEBRA HONORS
Code M371 Full Year (1 high school credit)

Prerequisite: Completion of Math 7 Honors at the mastery level

Note: Algebra students will take the NYS Algebra Regents Examination in June. This regents exam will be the final examination for the course.

The junior high school Honors program is rigorous and demanding. Students are expected to meet and maintain high standards of performance in Honors courses. The program is comprehensive in scope and sequence and accelerated in pace of instruction.

Mathematics Honors is an <u>accelerated</u> study of mathematics. Students apply for entrance and are accepted to the program prior to entering 7th grade. At that time they must meet the entrance criteria for both mathematics honors and science honors. However, these programs are not linked at the 8th grade level and thus students may be enrolled in either one or both programs.

In the eight grade mathematics honors course, students study ninth grade mathematics topics at an advanced level in

preparation for the NYS Algebra Regents Examination. Successful completion of this course earns students one high school credit.

Students who are not meeting the criteria at any time during the school year will be reviewed for possible removal from the Honors program.

Entry to the Mathematics Honors program in grades other that 7th grade is under special circumstances only and may require summer study. Parents should contact the District Coordinator for Mathematics and Business Education for further information.

Areas of Study Include:
- **Pre-Algebra**
  - Absolute Value
  - Operations with Signed Numbers
  - Properties of Real Numbers, Closure
  - Evaluating Algebraic Expressions using Signed Numbers
  - Order of Operations
- **Algebraic Expressions, Geometric Formulas, and Open Sentences**
  - Translating Verbal Phrases
  - Letters to Represent Variables
  - Writing Algebraic Equations
  - Perimeter and Area of Polygons
  - Reasoning with Area and Perimeter
  - Shaded Area
  - Volume of Rectangular Solid and Cylinder
  - Surface Area of a Rectangular Solid and Cylinder
- **Operations with Algebraic Expressions**
  - Adding Algebraic Expressions
  - Subtracting Monomials
  - Subtracting Polynomials
  - Multiplying Powers with the Same Base
  - Multiplying Monomials
  - Multiplying a Monomial by a Polynomial
  - Multiplying Binomials
  - Dividing Powers with the Same Base
  - Zero and Negative Exponents
  - Scientific Notation
  - Dividing a Monomial by a Monomial
  - Dividing a Polynomial by a Monomial
- **Solving Linear Equations and Inequalities**
  - Preparing to Solve an Equation
  - Solving One Step Equations
  - Solving Equations in One Variable
  - Solving Literal Equations
  - Solving Verbal Problems
  - Solving Linear Inequalities
  - Solving Verbal Inequality Problems
- **Measurement, Proportions, and Percents**
  - Converting Fractions, Percents, and Decimals
  - Calculating Rate using Appropriate Units
  - Solving Problems Involving Conversions within Measurement Systems
  - Proportion
  - Percent and Percentage Problems
  - Percent of Increase and Decrease
  - Relative Error in Measuring Square and Cubic Units
  - Direct Variation
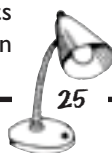
- **Coordinate Geometry**
  - Solutions of Open Sentences in Two Variables
  - Graphing Linear Functions Using Their Solutions
  - Graphing a Line Parallel to an Axis
  - The Slope of a Line
  - Parallel and Perpendicular Lines
  - The Slope-Intercept Form of an Equation
  - Graphing Linear Functions Using Their Slopes
  - Writing an Equation of a Line
  - Graphing First Degree Inequalities in Two Variables
- **Systems of Linear Open Sentences in Two Variables**
  - Using a Graph, Addition, and Substitution Methods to Solve a System of Linear Equations
  - Using Systems of Equations to Solve Verbal Problems
  - Graphing the Solution Set of a System of Inequalities
- **Special Products and Factors**
  - Factors and Factoring
  - Common Monomial Factors
  - The Square of a Monomial and Multiplying the Sum and the Difference of Two Terms
  - Factoring the Difference of Two Squares
  - Multiplying Binomials and Factoring Trinomials
  - Factoring a Polynomial Completely
- **Algebraic Fractions, and Equations and Inequalities Involving Fractions**
  - The Meaning of an Algebraic Fraction and Reducing
  - Fractions to Lowest Terms
  - Multiplying Fractions
  - Dividing Fractions
  - Adding and Subtracting Fractions
  - Solving Equations with Fractional Coefficients
  - Solving Fractional Equations
- **Operations with Radicals**
  - Radicals and Rational & Irrational Numbers
  - Finding the Principle Square Root of a Monomial
  - Simplifying a Square-Root Radical
  - Addition and Subtraction of Radicals
  - Multiplication of Square-Root Radicals
  - Division of Square-Root Radicals
- **Quadratic Equations**
  - The Standard Form of a Quadratic Equation
  - Solving a Quadratic Equation by Factoring
  - Solving Incomplete Quadratic Equations
  - Quadratic Proportions
  - Using Quadratic Equations to Solve Problems
  - The Graph of a Quadratic Function
  - Graphic Solution of Quadratic-Linear Systems
  - Algebraic Solutions
  - Exponential Growth and Decay
  - Graphing Exponential Functions
  - Graphing Absolute Value
- **Right Triangle Trigonometry**
  - Pythagorean Theorem
  - Direct and Indirect Measurements
  - Sine, Cosine, Tangent, and Applications
  - Trigonometric Ratios
  - Using the Trigonometric Ratios to Solve Problems

- **Probability**
  - Empirical and Theoretical Probability
  - Simple Probability Rules
  - And, Or, Not
  - Counting Principle
  - Two or More Events
  - Factorials
  - Permutations
- **Statistics**
  - Collecting Data/Organizing Data
  - Classify as Univariate, Bi-variate, Quantitative, Qualitative
  - Stem and Leaf Plot
  - Sampling Bias
  - Histograms
  - Mean, Median, Mode, Range
  - Measures of Central Tendency
  - Quartiles, Percentiles, Cumulative Frequency, and Cumulative Frequency Histogram
  - Box & Whisker
  - Scatter Plot
  - Types of Relationships
  - Line of Best Fit
  - Writing an Equation
  - Interpolate/Extrapolate
  - Difference Between Correlation and Causation
  - Linear Transformation of Univariate
  - Data Affecting Range, Mean, Median and Mode

Assessment: Students will take a district-wide exam at the end of the 2nd quarter and the NYS Algebra Regents Examination in June. This Regents exam will be the final examination for the course and will count as 20% of the final course average.

Textbook: *Algebra 1*, published by McDougal Littell/Houghton Mifflin, ©2008

For the complete NYS Core Curriculum for Algebra, see page 87 of: http://www.emsc.nysed.gov/3-8/MathCore.pdf

MATH ACADEMIC INTERVENTION SERVICES (AIS)

The Board of Regents adopted revisions to the Commissioner of Education's regulation requiring school districts to provide academic intervention services to students who score below New York State's designated performance level on state assessments and/or who are at risk of not achieving the state learning standards. Students who meet the eligibility requirements for AIS are mandated to attend.