

# **DARIEN PUBLIC SCHOOLS**

---

## **CURRICULUM GUIDE**

### **Math 6**

**Approved by the Board of Education  
March 12, 2008**

# **DARIEN PUBLIC SCHOOLS**

---

## **BOARD OF EDUCATION**

---

---

Mr. John V. Boulton  
Mrs. Kimberly P. Westcott  
Mrs. Clara C. Sartori  
Mrs. Elizabeth A Hagerty-Ross  
Mrs. Susan T. Perticone  
Mr. James M. Plutte  
Mr. George A. Reilly  
Mrs. Heather L. Shea  
Mr. Morgan B Whittier

## **CURRICULUM GUIDE AUTHORS**

---

---

Russ Caruso  
Steve Dunn  
Dan Kensek  
George Taylor  
Michelle Wetter

## **DATES**

---

---

DRAFT Completion Date: February 14, 2008

Board of Education Approval: March 12, 2008

## TABLE OF CONTENTS

### SECTION I – Course Information

Statement of Philosophy.....	4
Overview.....	6
Essential Questions.....	7
Process Skills.....	8
Student Performance Summary.....	8
Grading Guidelines.....	9

### SECTION II – Units of Study

Summary of Units.....	10
Unit 1 Number Sense and Algebraic Thinking.....	11
Unit 2 Measurement and Statistics.....	13
Unit 3 Decimal Addition and Subtraction.....	15
Unit 4 Decimal Multiplication and Division.....	17
Unit 5 Number Patterns and Fractions.....	19
Unit 6 Addition and Subtraction of Fractions.....	21
Unit 7 Multiplication and Division of Fractions.....	23
Unit 8 Ratio, Proportion, and Percent.....	25
Unit 9 Geometric Figures.....	27
Unit 10 Geometry and Measurement.....	29
Unit 11 Integers.....	31
Unit 12 Equations and Functions.....	33
Unit 13 Probability and Statistics.....	35

### SECTION III - Related Goals and Standards

The Connecticut Framework: K-12 Curricular Goals and Standards.....	37
National Standards.....	38

### SECTION IV – Learning Resources

Primary Resources.....	40
Technology Resources.....	40

# **SECTION I - Course Information**

---

---

## **STATEMENT OF PHILOSOPHY**

---

---

### **MMS MATHEMATICS DEPARTMENT PHILOSOPHY**

Middlesex Middle School believes that all students can be successful in mathematics. We believe in providing an environment where mathematics can be learned and appreciated by all students. The mathematics curriculum serves to accommodate developmental differences among students. The learning environment will provide a bridge from simple to more complex math concepts in such a way that is accessible to all students. The curriculum aims to provide stimulating new material while embedding review throughout the program. All courses provide real-world applications, which seek to prepare students for all of their future endeavors.

### **DISTRICT MATHEMATICS PHILOSOPHY**

Mathematics is a vigorous and growing discipline – a universal language useful for communication and research in other disciplines. We want our students to reason and communicate mathematically, to be mathematical problem-solvers, to value mathematics and to feel confident in their ability to use mathematics. Creating such a foundation necessitates a well-articulated and developmentally appropriate mathematics program for all, developing the mathematical power of each.

Mathematics is more than a collection of concepts and skills to be mastered. It is the exploration of ideas and concepts, the understanding of relationships, the ability to make predictions, to analyze data, to estimate results, to communicate ideas and to solve problems in this ever-changing world. It is no longer limited to the study of complex calculations and formulas. We are moving from a curriculum often dominated by memorization of isolated facts and procedures to one that emphasizes conceptual understandings, multiple representations, deliberate connections and mathematical problem solving. Rather than being a transmitter of knowledge, the teacher becomes a facilitator of learning, guiding, questioning, listening, clarifying and creating an environment in which the student is an active participant in learning.

The needs of today's society demand that all students become mathematically literate to function effectively. It will be necessary for our students to be able to use mathematics in their personal lives, further studies and future workplaces. As educators, we must recognize that students have differing abilities, performance levels, needs and interests and provide them with the best mathematics education possible so that they may achieve their personal ambitions and career goals.

Too often, students have learned to compute without understanding why the computation procedures make sense or how they apply to their lives. Instruction must focus on the behaviors that contribute to the development of mathematical thinking and number sense – explaining procedures used, justifying reasoning, judging the reasonableness of solutions and reflecting on the application of concepts.

When students gain knowledge from meaningful experiences, they are much more likely to retain and use what they have learned. Sound practice in the teaching of mathematics means that students are guided to use concrete materials and explore ideas with classmates. In this way, knowledge evolves from personal experience.

The fundamental objective of education has always been to prepare students to be contributing members of the society in which they live. The objectives of this mathematics curriculum support and affirm this tradition.

## **OVERVIEW**

---

The mathematics program in the sixth grade follows up and builds upon concepts and skills learned in previous grades. Emphasis is placed on operations with whole numbers, decimals and fractions. Applications are applied through statistics, percent and measurement. Elements of plane and solid geometry are also explored. Mental math and estimation are simultaneously taught in order to teach students how to recognize the reasonableness of math. In accordance with the standards of the National Council of Teachers of Mathematics, there is significant work with manipulatives, activity based learning, data analysis and problem solving.

## **ESSENTIAL QUESTIONS**

---

### **For Course:**

- How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?
- How are the base ten number system and fractions, decimals, percents and ratios related?
- How do geometric relationships and measurements help us to solve problems and make sense of our world?
- How can collecting, organizing and displaying data help us analyze information and make reasonable predictions and informed decisions?

### **K-12 Math Curriculum Essential Questions**

- How does math help us to make sense of our world?
- How does math help us to understand real-world phenomena, engage in higher level thinking, make decisions, and meet challenges?
- What are the natural and cultural patterns around us?
- How does math, as a universal language, empower us and help us to communicate?

#### Central Ideas:

Understand patterns in the world around us  
Be able to function successfully in society  
Engage in deductive and inductive reasoning  
Participate in intelligent citizenship  
Utilize problem-solving skills  
Use abstract and concrete thinking  
Open the mind to possibilities  
Promote effective communication  
Conduct mental mathematics  
Understanding practical uses of math  
Integrate technology and math

## **PROCESS SKILLS**

---

---

- Reading (Comprehending)
- Reading (Analyzing)
- Reading (Appreciating)
- Writing mathematical equations
- Speaking the language of algebra
- Listening
- Viewing
- Using graphs and tables
- Studying
- Reasoning and Reflecting
- Using Learning Resources and Technology
- Working Independently and Collaboratively
- Performing
- Quantifying
- Understanding Number Operations
- Using and Creating Formulas
- Problem Solving
- Using Technology

## **STUDENT PERFORMANCE SUMMARY**

---

---

- Demonstration
- Model with Written Explanation and/or Visuals
- Cooperative Learning
- Computer based lab work
- Tests and quizzes
- Preparation for standardized tests

- Homework and class participation
- Practical and theoretical applications

## **GRADING GUIDELINES**

---

	<b><u>Expectations of Students</u></b>	<b><u>% of Report Card Grade</u></b>
Homework	100% of all assignments	0 – 15%
Notebook	All notes maintained	0 – 10%
Tests	All tests taken/made up	45 – 60%
Quizzes	All quizzes taken/made up	30 – 40%
Projects		0 – 20%
Class Participation		0 – 5%

## **SECTION II – Units of Study**

---

### **SUMMARY OF UNITS**

---

<b><u>Unit Title</u></b>	<b><u>Duration (Weeks)</u></b>
Unit 1 Number Sense and Algebraic Thinking	2 weeks
Unit 2 Measurement and Statistics	3 weeks
Unit 3 Decimal Addition and Subtraction	2 weeks
Unit 4 Decimal Multiplication and Division	3 weeks
Unit 5 Number Patterns and Fractions	3 weeks
Unit 6 Addition and Subtraction of Fractions	2 weeks
Unit 7 Multiplication and Division of Fractions	2 weeks
Unit 8 Ratio, Proportion, and Percent	3 weeks
Unit 9 Geometric Figures	3 weeks
Unit 10 Geometry and Measurement	3 weeks
Unit 11 Integers	2 weeks
Unit 12 Equations and Functions	2 weeks
Unit 13 Probability and Statistics	2 weeks

## **UNIT 1 Number Sense and Algebraic Thinking**

---

### **ESSENTIAL QUESTIONS**

1. Can students identify real-life situations in which place value and mathematical operations are used?
  2. Can students use the order of operations to evaluate expressions?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Problem Solving**

- Understand how operations are related
- Understand meanings of operations
- Understand relationships among numbers
- Make reasonable estimates

#### **Algebra**

- Understand patterns
- Analyze situations using algebraic symbols
- Represent situations using algebraic symbols

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Whole number operations
2. Estimation
3. Powers and exponents
4. Order of operations
5. Variables and expressions
6. Equations and mental math
7. Drawing a diagram

#### **Skills**

1. Find sum, difference, product and/or quotient
2. Estimate by rounding
3. Find values of powers
4. Evaluate expressions using order of operations
5. Evaluate expressions with variables by substitution
6. Solve equations using mental math

## **VOCABULARY**

---

Factor, power, base, exponent, numerical expression, evaluate, order of operations, variable, variable expression, equation, solution, solve

## **ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessment

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **UNIT 2 Measurement and Statistics**

---

### **ESSENTIAL QUESTIONS**

1. Can students communicate the results of a survey using a variety of graphing techniques?
  2. How can students use problem solving skills to analyze data?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Algebra**

- Use models to understand relationships
- Represent situations using algebraic symbols

#### **Geometry**

- Specify locations using coordinate geometry

#### **Measurement**

- Understand the units of measurement
- Understand the processes of measurement
- Understand measureable attributes of objects
- Apply proper tools to find measures
- Apply proper formulas to find measures

#### **Data Analysis and Probability**

- Collect, organize, and display data
- Develop inferences that are based on data

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Measurement using customary and metric units
2. Find perimeter and area of figures
3. Scale drawings
4. Frequency tables
5. Line plots
6. Bar graphs
7. Coordinate plane
8. Circle graphs

9. Mean, median, mode

### **Skills**

1. Measure objects using customary and metric units
2. Convert units within the same system
3. Use scale drawings to find actual lengths
4. Create and interpret frequency tables, line plots and bar graphs
5. Plot and read ordered pairs on the coordinate plane
6. Use the coordinate plane to display data
7. Use circle graphs to interpret data and make predictions
8. Use the mean, median and mode as ways to describe data

---

---

### **VOCABULARY**

---

---

Inch, foot, yard, mile, millimeter, centimeter, meter, kilometer, perimeter, area, scale drawing, scale, data, frequency table, line plot, bar graph, ordered pair, coordinates, line graph, circle graph, mean, median, mode, range

---

---

### **PERFORMANCE ASSESSMENT**

---

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects

---

---

### **CORE TEXT FOR STUDENTS**

---

---

Course 1 Math, McDougal Littell

---

---

### **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

---

See Section IV, Learning Resources

---

---

### **MATERIALS AND SUPPLIES**

---

---

See Section IV, Learning Resources

## **UNIT 3 Decimal Addition and Subtraction**

---

### **ESSENTIAL QUESTIONS**

1. Can students apply basic operation knowledge using decimals?
  2. Are students able to measure real-life objects using the metric system?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand ways of representing numbers
- Understand numbers
- Understand relationships among numbers
- Make reasonable estimates

#### **Measurement**

- Understand the units of measurement
- Understand the processes of measurement
- Apply proper tools to find measures

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Decimals and place value
2. Comparing and ordering decimals
3. The Metric System
4. Rounding decimals
5. Decimal estimation
6. Adding and subtracting decimals

#### **Skills**

1. Write decimals in expanded notation
2. Order decimals
3. Measure lengths in the metric system
4. Change units of length in the metric system
5. Round decimals
6. Add and subtract decimals

## **VOCABULARY**

---

Decimal, number line, front-end estimation, commutative property of addition, associative property of addition

## **PERFORMANCE ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **UNIT 4 Decimal Multiplication and Division**

---

### **ESSENTIAL QUESTIONS**

1. Can students apply basic operation knowledge using decimals, with a focus on multiplication and division?

---

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Problem Solving**

- Make reasonable estimates
- Understand meanings of operations
- Compute fluently
- Understand how operations are related

#### **Algebra**

- Understand patterns
- Represent situations using algebraic symbols

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Decimal multiplication
2. Distributive property
3. Decimal division
4. Multiplying and dividing by powers of 10
5. Changing metric units

#### **Skills**

1. Multiply decimals and whole numbers
2. Use the distributive property to evaluate expressions
3. Multiply decimals by decimals
4. Divide a decimal by a whole number
5. Divide a number by a decimal
6. Multiply and divide a decimal by a power of ten
7. Convert one metric unit of measure to another

### **VOCABULARY**

---

Commutative property and associative property of multiplication, distributive property, mass, gram, milligram, kilogram, capacity, liter, milliliter, kiloliter

## **ASSESSMENT**

---

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessment

## **CORE TEXT FOR STUDENTS**

---

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

---

See Section IV, Learning Resources

## **UNIT 5 Number Patterns and Fractions**

---

### **ESSENTIAL QUESTIONS**

1. Can students relate prime factorization to the greatest common factor and to the least common multiple of pairs of numbers?

---

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand numbers
- Understand relationships among numbers
- Understand ways to represent numbers
- Compute fluently

#### **Algebra**

- Understand patterns
- Use models to understand relationships

#### **Measurement**

- Understand the units of measurement
- Apply proper techniques to find measures

---

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Prime factorization
2. Greatest common factor
3. Equivalent fractions
4. Least common multiple
5. Ordering fractions
6. Mixed numbers and improper fractions
7. Changing fractions to decimals

#### **Skills**

1. Write whole numbers as the product of prime factors
2. Find the greatest common factor of 2 or more numbers
3. Write equivalent fractions
4. Find least common multiples of 2 or more numbers
5. Compare and order fractions
6. Rewrite mixed numbers and improper fractions
7. Write decimals as fractions and vice versa

## **VOCABULARY**

---

---

Divisible, prime number, composite number, prime factorization, common factor, greatest common factor, fraction, equivalent fractions, simplest form, multiple, common multiple, least common multiple, least common denominator, mixed numbers, improper fraction, proper fraction

## **ASSESSMENT**

---

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessment

## **CORE TEXT FOR STUDENTS**

---

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

---

See Section IV, Learning Resources

## **UNIT 6 Addition and Subtraction of Fractions**

---

### **ESSENTIAL QUESTIONS**

1. Can students use models to construct algorithms for adding and subtracting fractions and mixed numbers and apply these skills to real-life problems?
  2. Can students see the relationship among equivalent fractions, mixed numbers and improper fractions?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Numbers and Operations**

- Understand numbers
- Understand meanings of operations
- Compute fluently
- Understand how operations are related

#### **Measurement**

- Understand the units of measurement
- Apply proper techniques to find measures

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Fraction estimation
2. Adding and subtracting fractions with same denominators
3. Adding and subtracting fractions with different denominators
4. Adding and subtracting mixed numbers
5. Subtracting and regrouping

#### **Skills**

1. Round fractions
2. Find the least common denominator of two fractions
3. Add and subtract fractions with common and different denominators
4. Add mixed numbers
5. Subtract mixed numbers with and without regrouping

## **VOCABULARY**

---

Fraction, simplest form, least common denominator, mixed number, improper fraction

## **ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessment

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **UNIT 7 Multiplication and Division of Fractions**

---

### **ESSENTIAL QUESTIONS**

1. Can students use models to help them understand the meaning of fraction multiplication and division?
  2. Can students form algorithms for multiplying and dividing fractions and apply these skills to solving real-life problems?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Numbers and Operations**

- Understand numbers
- Understand meanings of operations
- Compute fluently
- Understand how operations are related
- Make reasonable estimates

#### **Algebra**

- Represent situations using algebraic symbols

#### **Measurement**

- Understand measurable attributes of objects
- Understand units of measurement
- Understand the systems of measurement

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Multiplying fractions and whole numbers
2. Multiplying fractions
3. Multiplying mixed numbers
4. Dividing fractions
5. Dividing mixed numbers
6. Customary measurements

#### **Skills**

1. Multiply a fraction and a whole number
2. Multiply fractions
3. Multiply mixed numbers
4. Divide fractions by using a reciprocal
5. Divide mixed numbers
6. Change customary units of measure

## **VOCABULARY**

---

Factor, common factor, simplest form, mixed number, improper fraction, whole number, reciprocal, ounce, pound, ton, cup, pint, quart, gallon

## **PERFORMANCE ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

---

## **UNIT 8 Ratio, Proportion, and Percent**

---

### **ESSENTIAL QUESTIONS**

1. Can students apply their knowledge of ratios in order to solve proportions in real life situations?
  2. Can students make connections between decimals, percents and fractions?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand numbers
- Understand ways of representing numbers
- Understand relationships among numbers
- Understand how operations are related

#### **Algebra**

- Understand relations
- Represent situations using algebraic symbols

#### **Measurement**

- Understand the units of measurement
- Apply proper techniques to find measures

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Ratios
2. Rates
3. Proportions
4. Scale drawings
5. Understanding percents
6. Percents, decimals, and fractions
7. Finding percent of a number

#### **Skills**

1. Use a ratio to compare two values
2. Write rates, equivalent rates, and unit rates
3. Write and solve a proportion
4. Use proportions to find measures of objects
5. Write percents as decimals and fractions
6. Write fractions as decimals and percents
7. Multiply to find percent of a number
8. Find simple interest

## **VOCABULARY**

---

Scale drawing, scale, ratio, equivalent ratio, rate, unit rate, proportion, cross products, percent, interest, principal, annual interest rate, simple interest

## **ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special Assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessments

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

---

## **UNIT 9 Geometric Figures**

---

### **ESSENTIAL QUESTIONS**

1. Can students integrate algebraic concepts, problem-solving and reasoning skills to solve problems related to geometric measurement?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand numbers
- Understand ways of representing numbers
- Understand relationships among numbers
- Understand how operations are related

#### **Algebra**

- Represent situations using algebraic symbols

#### **Geometry**

- Analyze properties of two dimensional shapes
- Use spatial reasoning to solve problems
- Use symmetry to analyze math situations

#### **Measurement**

- Understand the units of measurement
- Apply proper techniques to find measures

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Introduction to geometry
2. Angles and their measures
3. Classifying angles
4. Classifying triangles
5. Classifying quadrilaterals
6. Polygons
7. Congruent and similar figures
8. Line symmetry

## **Skills**

1. Describe geometric figures and identify polygons
2. Name points, segments, rays and lines
3. Identify angles as acute, right, or obtuse
4. Use a protractor to measure angles
5. Learn how to draw angles
6. Identify triangles as equilateral, isosceles or scalene
7. Identify triangles as acute, right or obtuse
8. Find the sum of the measures of a triangle's angles
9. Identify parallel, intersecting and perpendicular lines
10. Identify quadrilaterals as a parallelogram, rectangle, rhombus and/or square
11. Identify congruent and similar shapes and polygons
12. Identify line symmetry in a figure

## **VOCABULARY**

---

Point, line, ray, endpoint, segment, plane, intersecting lines, parallel lines, angle, vertex, degrees, acute angle, obtuse angle, right angle, straight angle, acute triangle, right triangle, obtuse triangle, vertical angles, complementary angles, supplementary angles, scalene triangle, isosceles triangle, equilateral triangle, quadrilateral, parallelogram, rectangle, rhombus, square, pentagon, hexagon, octagon, regular polygon, diagonal, congruent, similar, corresponding parts, line symmetry

## **ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessment

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **UNIT 10 Geometry and Measurement**

---

### **ESSENTIAL QUESTIONS**

1. Can students apply geometric concepts, problem solving and reasoning skills to solve problems related to geometric measurement?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Algebra**

- Represent situations using algebraic symbols
- Analyze situations using algebraic symbols

#### **Geometry**

- Understand properties of two dimensional shapes
- Analyze properties of three dimensional shapes

#### **Measurement**

- Understand the units of measurement
- Apply proper techniques to find measures
- Understand measurable attributes of objects
- Understand the systems of measurement

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Area of parallelograms
2. Area of a triangle
3. Circumference of a circle
4. Area of a circle
5. Identifying solid figures
6. Surface Area of a prism
7. Volume of a prism

#### **Skills**

1. Identify parallelograms, rectangles and squares
2. Use properties of parallelograms
3. Find the area of a parallelogram
4. Find the area of a triangle
5. Find the circumference of a circle
6. Find the area of a circle
7. Find the area of a shaded region

8. Find the surface area of a prism
9. Find the volume of a prism

## **VOCABULARY**

---

---

Area, base and height of a triangle and parallelogram, circle, center, radius, diameter, circumference, pi, perpendicular, solid, prism, cylinder, pyramid, cone, sphere, face, edge, vertex, surface area, volume

## **ASSESSMENT**

---

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessments

## **CORE TEXT FOR STUDENTS**

---

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

---

See Section IV, Learning Resources

## **UNIT 11 Integers**

---

### **ESSENTIAL QUESTIONS**

1. Can students plot integers on a number line?
  2. Can students add, subtract, multiply, and divide negative integers?
  3. Can students apply their knowledge of negative integers to solve real-life problems?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand numbers
- Understand number systems
- Understand meanings of operations
- Understand how operations are related

#### **Algebra**

- Understand patterns

#### **Geometry**

- Specify locations using coordinate geometry
- Apply transformations to math situations
- Use symmetry to analyze math situations

#### **Data Analysis and Probability**

- Use proper statistical methods to analyze data

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Comparing integers
2. Adding integers
3. Subtracting integers
4. Multiplying integers
5. Dividing integers
6. Transformations in a coordinate plane

#### **Skills**

1. Understanding negative numbers on a number line
2. Add, subtract, multiply, and divide integers

- 3.
4. Plot points of a coordinate plane
5. Slide, rotate, and flip geometric figures in a coordinate plane

## **VOCABULARY**

---

---

Integers, absolute value, negative integers, negative sign, opposite, positive integers, quadrant, translation, transformation, reflection, coordinate plane

## **ASSESSMENT**

---

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessments

## **CORE TEXT FOR STUDENTS**

---

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

---

See Section IV, Learning Resources

## **UNIT 12 Equations and Functions**

---

### **ESSENTIAL QUESTIONS**

1. Can students use variable equations to generate and organize data to discover patterns and write functions?
  2. Can students see the connections between the concept of a function, input – output tables, and graphs?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Number and Operations**

- Understand meanings of operations
- Understand numbers
- Understand ways of representing numbers
- Understand relationships among numbers
- Understand how operations are related

#### **Algebra**

- Understand patterns
- Understand functions
- Use models to understand relationships
- Represent situations using algebraic symbols
- Analyze situations using algebraic symbols

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Writing expressions and equations
2. Solving addition equations
3. Solving subtraction equations
4. Solving multiplication and division equations
5. Exploring functions
6. Graphing functions

#### **Skills**

1. Solve addition equations
2. Solve subtraction equations
3. Solve multiplication and division equations

4. Evaluate a function using tables and graphs

**VOCABULARY**

---

Function, input, output, linear function

**ASSESSMENT**

---

Tests

Quizzes

Homework

Special assignments

Class participation

Oral presentations

Group projects

Performance assessments

**CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

**ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

**MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **UNIT 13 Probability and Statistics**

---

### **ESSENTIAL QUESTIONS**

1. Can students use variable equations to generate and organize data to discover patterns and write functions?
  2. Can students use counting techniques to find the number of ways an event can occur?
- 

### **RELATED DARIEN AND CT CONTENT STANDARDS**

#### **Data Analysis and Probability**

- Understand basic concepts of probability
- Apply basic concepts of probability
- Collect, organize, and display data
- Develop inferences that are based on data

### **CONTENT KNOWLEDGE OBJECTIVES**

---

#### **Content**

1. Introduction to probability
2. Finding outcomes
3. Counting techniques
4. Probability of multiple independent events
5. Stem and leaf plots

#### **Skills**

1. Find probability of an event
2. Use diagrams, tables and lists to find outcomes
3. Find the probability of two or more independent events
4. Organize and read data using stem and leaf plots

### **VOCABULARY**

---

Outcome, event, probability, tree diagram, combination, permutation, independent events, stem and leaf plot

---

## **ASSESSMENT**

---

Tests  
Quizzes  
Homework  
Special assignments  
Class participation  
Oral presentations  
Group projects  
Performance assessments

## **CORE TEXT FOR STUDENTS**

---

Course 1 Math, McDougal Littell

## **ADDITIONAL TEXTS/ RESOURCES FOR USE BY STUDENTS**

---

See Section IV, Learning Resources

## **MATERIALS AND SUPPLIES**

---

See Section IV, Learning Resources

## **SECTION III - Goals and Standards**

---

### **Connecticut Content Standards**

#### **Algebraic Reasoning: Patterns and Functions**

- Relationships that are expressed in words may be translated into algebraic expressions, equations or inequalities.
- Mathematical relationships may be represented and analyzed with the help of tables, graphs, equations and inequalities.
- Simple one-step equations can be solved using informal methods.
- When there is a relationship between two variables, the rate of change may be constant or varying.

#### **Numerical and Proportional Reasoning**

- Whole numbers, fractions, decimals and integers can be modeled on number lines, scales, and the coordinate plane and used to solve problems.
- Appropriate computational strategies facilitate problem solving.
- Place value patterns may be expressed using exponents to write powers of ten.
- The division interpretation of fractions may be used to write equivalent decimal forms.
- With fractions and decimals, products or quotients may be larger or smaller than either factor.
- Percent is an expression of frequency in terms of parts per hundred.
- Ratios and rates may be used to compare quantities.

#### **Geometry and Measurement**

- The metric system of measurement is based on powers of ten and ratios where multiples of ten underlie unit conversions.
- Triangles and some combinations of polygons are more stable than other polygons under stress.
- Angle measurement is based on rotation.
- The formulas for the area of triangles, parallelograms, trapezoids, and circles are based on the rectangle.
- Problems involving measurement can be solved through the use of appropriate tools, techniques and strategies.

## **Working with Data: Probability and Statistics**

- Set of data can be displayed and compared using various systematic or graphical representations.
- Measures of spread and measures of central tendency can be used to describe the shape of data sets.
- Probabilities are useful for predicting what will happen in a large number of trials, but will not determine, for certain, the outcome of a single trial.
- Probability can be expressed in various forms.

## **NCTM Standards**

### **Numbers and Operations**

- Work flexibly with fractions, decimals, and percents to solve problems
- Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line
- Develop meaning for percents greater than 100 and less than 1
- Understand and use ratios and proportions to represent quantitative relationships
- Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation
- Use factors, multiples, prime factorization, and relatively prime numbers to solve problems
- Develop meaning for integers and represent and compare quantities with them

### **Algebra**

- Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules
- Relate and compare different forms of representation for a relationship
- Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations

### **Geometry**

- Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties
- Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects
- Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship

### **Measurement**

- Understand both metric and customary systems of measurement

- Understand relationships among units and convert from one unit to another within the same system
- Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume

### **Data Analysis and Probability**

- Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population
- Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatter plots

### **Problem Solving**

- Build new mathematical knowledge through problem solving
- Solve problems that arise in mathematics and in other contexts
- Apply and adapt a variety of appropriate strategies to solve problems
- Monitor and reflect on the process of mathematical problem solving

### **Reasoning and Proof**

- Recognize reasoning and proof as fundamental aspects of mathematics
- Make and investigate mathematical conjectures
- Develop and evaluate mathematical arguments and proofs
- Select and use various types of reasoning and methods of proof

### **Communication**

- Organize and consolidate their mathematical thinking through communication
- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
- Analyze and evaluate the mathematical thinking and strategies of others
- Use the language of mathematics to express mathematical ideas precisely

### **Connections**

- Recognize and use connections among mathematical ideas
- Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
- Recognize and apply mathematics in contexts outside of mathematics

### **Representation**

- Create and use representations to organize, record, and communicate mathematical ideas
- Select, apply, and translate among mathematical representations to solve problems
- Use representations to model and interpret physical, social, and mathematical phenomena

## **SECTION IV – Learning Resources**

---

### **PRIMARY RESOURCES**

---

#### **Textbook**

- Passport to Mathematics Book 1, McDougal Littell

### **TECHNOLOGY RESOURCES**

---

#### **Websites**

- [www.algebra.com](http://www.algebra.com)
- [www.aplusmath.com](http://www.aplusmath.com)
- [www.funbrain.com](http://www.funbrain.com)
- [www.math.com](http://www.math.com)
- [www.mathforum.org](http://www.mathforum.org)
- [www.nctm.org](http://www.nctm.org)
- [www.state.ct.us/sde](http://www.state.ct.us/sde)

#### **Other Resources**

- Computer lab
- Access
- Microsoft Excel
- Mobile lab top lab
- TI-83 graphing calculator