

# Freetown Lakeville Public Schools

Grade 7 Unit Guide  
Mathematics

June 19, 2003

## Grade 7 Curriculum Guideline

**Purpose of this Curriculum Guide:**

**Grade 7 Mathematics Mission:**

**Grade 7 Mathematics Philosophy:**

**This curriculum was written by:**

## Grade 7 Curriculum Guideline

### Unit: Algebra

#### Topic:

#### Student Learning Outcomes

- 30407** Apply the rules of powers and roots to the solution of problems. Extend the Order of Operations to include positive integer exponents.
- 30408** Demonstrate an understanding of the properties of arithmetic operations on rational numbers.  
Use the associative, commutative, and distributive properties.
- 30409** Translate words and phrases into algebraic expressions and vice versa.
- 30409** Use the inverse relationships of addition and subtraction, multiplication and division to simplify computations and solve problems.
- 30409** Use the inverse relationships of squaring and finding square roots to simplify computations and solve problems.
- 30411** Determine when an estimate rather than an exact answer is appropriate and apply in problem situations.
- 30413** Extend, represent, analyze, and generalize a variety of patterns with tables, words, and, when possible, symbolic expressions.  
(include geometric progressions)
- 30414** Evaluate simple algebraic expressions for given variable values, e.g.,  $3a^2 - b$  for  $a = 3$  and  $b = 7$ .
- 30416** Create and use symbolic expressions and relate them to verbal, tabular, and graphical representations.  
(Supplementary materials needed)
- 30419** Set up and solve linear equations and inequalities with one or two variables, using algebraic methods, models, and/or graphs.

#### Textbook References, Resources and Materials

Chapter 2 all  
Punchline Problem Solving pp. 92-95  
Punchline - Bridge to Algebra  
Pre A with Pizzazz Section DD



## Grade 7 Curriculum Guideline

### Suggested Instructional Strategies

Hands-on Equations  
Play Guess My Role

### Assessment

**30409:** Quiz 2B p. 58 and/or teacher made quiz (2-4 to 2-8) Assessment Source Book

**30411:** Chapter 2 Tests; A-E pp. 59-74 or teacher made test

**30414:** Quiz 2A p. 57 and/or teacher made quiz for 2-1 to 2-3

Hands on Equation Quiz

## Grade 7 Curriculum Guideline

### Unit: Data and Graphs

#### Topic:

#### Student Learning Outcomes

**30439** Use tree diagrams, tables, organized lists, basic combinatorics ("fundamental counting principle"), and area models to compute odds for simple compound events (e.g., multiple coin tosses or rolls of dice), number of possible outcomes for simple compound events, permutations, and combinations.

#### Textbook References, Resources and Materials

Use Order from Connections Book Chapter 12-1, 12-2, 12-3, 12-4, 12-7  
Punchline Problem Solving pp. 121-125  
Punchline - Bridge to Algebra pp. 108-112  
PreA with Pizzazz - BB55-BB63

#### Suggested Instructional Strategies

Use dice, spinners, fair and unfair games, cards

#### Assessment

**30439:** Chapter 12 Test pp. 269-282 A-E; Quiz 12A p. 267 (for 12-1 to 12-3) and/or teacher made quiz

## Grade 7 Curriculum Guideline

### Unit: Decimal Concepts: Estimating and Solving Equations

#### Topic:

#### Student Learning Outcomes

- 30410** Estimate and compute with decimals.
- 30404** Represent numbers in decimal and scientific notation.

#### Textbook References, Resources and Materials

Chapter 3 Sections 1&2, 5  
See Science teacher  
Supplementary materials needed  
MS math with Pizzazz (see Ed)  
Mathimagination - Book E  
Punchline Problem Solving pp. 21-39  
Basic Essentials of Math Book I

#### Suggested Instructional Strategies

Use menus to order; use catalogs

Teacher-made post test

Make a Fair/Unfair Game

## Grade 7 Curriculum Guideline

### Unit: Fractions

#### Topic:

#### Student Learning Outcomes

- 30401** Compare and order fractions (rational numbers).
- 30401** Translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.
- 30401** Compare and order mixed numbers.
- 30401** Estimate fractions and mixed numbers (i.e., rational numbers).
- 30405** Apply number theory concepts, including prime factorization, to the solution of problems.
- 30410** Compute with fractions and mixed numbers, including simplification of fractions.

#### Textbook References, Resources and Materials

Supplementary materials needed  
See FC Science  
Fraction 24 cards  
Chapter 3 Sections 6-10  
Punchline Problem Solving pp. 53-71  
Mathimagination - book D  
MS Math With Pizzazz - book C  
Punchline Bridge to Algebra pp. 70-83

#### Suggested Instructional Strategies

Use recipes  
Fraction Bars  
Fraction Kit

#### Assessment

**30401:** Teacher made quiz on 3-8 to 3-10; Teacher made test  
**30405:** Teacher made quiz on 3-6 and 3-7  
**30410:** Quiz 4B p. 100 and/or teacher made quiz; Quiz 4A p. 99 (for 4-1 to 4-3) and/or teacher made quiz  
CMP - Fraction Acre Project

## Grade 7 Curriculum Guideline

### Unit: Geometry

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30423** Analyze, apply, and explain the relationship between the number of sides and the sums of the interior and exterior angle measures of polygons.
- 30402** Define, compare, order, and apply frequently used irrational numbers, such as  $\pi$  in relationship to area of a circle.
- 30409** Use the inverse relationships of squaring and finding square roots to simplify computations and solve problems.
- 30420** Explain and analyze-both quantitatively and qualitatively, using pictures, graphs, charts, or equations-how a change in one variable results in a change in another variable in functional relationships, e.g.,  $C = (\pi)d$ ,  $A = (\pi)r^2$  ( $A$  as a function of  $r$ ),  $A_{\text{rectangle}} = 1w$  ( $A$  rectangle as a function of 1 and  $w$ ).
- 30423** Analyze, apply, and explain the relationship between the number of sides and the sums of the interior and exterior angle measures of polygons.
- 30425** Demonstrate an understanding of the relationships of angles formed by intersecting lines, including parallel lines cut by a transversal.
- 30426** Demonstrate an understanding of the Pythagorean Theorem. Apply the theorem to the solution of problems.
- 30428** Predict the results of transformations on unmarked or coordinate planes and draw the transformed figure, e.g., predict how tessellations transform under translations, reflections, line symmetry, and rotations.
- 30429** Identify three-dimensional figures (e.g., prisms, pyramids) by their physical appearance, distinguishing attributes, and spatial relationships such as parallel faces.
- 30430** Recognize and draw two-dimensional representations of three-dimensional objects, e.g., nets, projections, and perspective (Isometric and Orthographic) drawings.

Chapters 4 & 11 all  
Ed's booklets  
Geoboards, blocks - 3D shapes, 2D representations (nets), computer, tangrams  
See Art Teacher  
Punchline Problem Solving pp. 47-51; 72-91; 117-120  
Mathimagination - Book F  
Punchline Bridge to Algebra pp. 113-121; 136-146; 152-165  
PreA with Pizzazz pp. 8-22;47-55



## Grade 7 Curriculum Guideline

**30433** Demonstrate an understanding of the concepts and apply formulas and procedures for determining measures, including those of area and perimeter/circumference of parallelograms, trapezoids, circles, rectangles, triangles, and squares.

Given the formulas, determine the surface area and volume of cylinders and rectangular prisms. Use technology as appropriate.

### **Suggested Instructional Strategies**

Supplementary materials needed

### **Assessment**

**30409:** Quiz 2B p. 58 and/or teacher made quiz (2-4 to 2-8)  
**30411:** Chapter 2 Tests; A-E pp. 59-74 or teacher made test  
**30414:** Quiz 2A p. 57 and/or teacher made quiz for 2-1 to 2-3

Powerpoint presentation  
Brochure  
Design a Container for a new drink

## Grade 7 Curriculum Guideline

### Unit: Graphing

#### Topic:

#### Student Learning Outcomes

**30437** Select, create, interpret, and utilize various tabular and graphical representations of data (e.g., circle graphs, bar graphs, stem-and-leaf plots, tables, line plots, charts, line graphs, and scatterplots).

Differentiate between continuous and discrete data and ways to represent it.

**30438** Find, describe, and interpret appropriate measures of central tendency (mean, median, and mode) and spread (range) that represent a set of data. Use these notions to compare different sets of data.

#### Textbook References, Resources and Materials

chapter 1 all  
See Science teacher and social studies teacher

#### Suggested Instructional Strategies

Interpret graphs from newspapers, etc.  
Follow stocks from newspaper  
MCAS question #30 Statistics '98  
Use student surveys to construct graphs (favorite colors, birthdays, pets, etc.)  
Use student quiz grades for stem and leaf, line plots. Graph Study Time vs. Test Score.  
Use data from sports cards.  
Use Math/Science Connection Worksheet T1, T2 from Interdisciplinary book  
MCAS Sample Question #51

#### Assessment

**30437:** Quiz 1A p. 35 (for 1-1 to 1-4 ) and/or teacher made quiz; Quiz 1-B p. 36 and/or teacher made quiz (for 1-5 to 1-7)  
Survey Project, Stock Project

## Grade 7 Curriculum Guideline

### Unit: Measurement

#### Topic:

#### Student Learning Outcomes

- 30403** Converting measurements between units, e.g., days to hours.
- 30403** Solving problems involving conversion of rates, e.g., miles per hour to feet per hour.
- 30431** Select, convert (within the same system of measurement), and use appropriate units of measurement or scale.

#### Textbook References, Resources and Materials

See Ms. Cole  
Metric and Measurement  
PreA with Pizzazz CC23-CC26  
See Science teachers

#### Suggested Instructional Strategies

Measure to 1/8 of an inch.  
Measure to nearest cm.  
Convert within customary units (mass, liquid, linear)  
Convert within metric system (see p. 76)

#### Assessment

**30403:** Pre-test Quiz 7B p. 154 (for 7-5 to 7-7)

## Grade 7 Curriculum Guideline

### Unit: Probability

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30436** Describe the characteristics and limitations of a data sample. Identify different ways of selecting a sample, e.g., convenience sampling, responses to a survey, random sampling.

#### Suggested Instructional Strategies

Supplementary materials needed

#### Assessment

- 30409:** Quiz 2B p. 58 and/or teacher made quiz (2-4 to 2-8)  
**30411:** Chapter 2 Tests; A-E pp. 59-74 or teacher made test  
**30414:** Quiz 2A p. 57 and/or teacher made quiz for 2-1 to 2-3

Powerpoint presentation  
Brochure  
Design a Container for a new drink

## Grade 7 Curriculum Guideline

### Recommended Resources for Grade 7 Mathematics: