

# Freetown Lakeville Public Schools

Grade 6 Unit Guide  
Mathematics

June 19, 2003

**Grade 6 Curriculum Guideline**

**Purpose of this Curriculum Guide:**

**Grade 6 Mathematics Mission:**

**Grade 6 Mathematics Philosophy:**

**This curriculum was written by:**

## Grade 6 Curriculum Guideline

### Unit: Data and Graphs

#### Topic:

#### Student Learning Outcomes

**30340** Describe and compare data sets using the concepts of median and mode.

**30343** Use appropriate ratios between 0 and 1 to represent the probability of the outcome and associate the probability with the likelihood of the event.

**30343** Predict the probability of outcomes of simple experiments (e.g., tossing a coin, rolling a die) and test the predictions.

#### Suggested Instructional Strategies

Reteaching Activity TP 44

#### Assessment

Quiz 1C 6-10; Test AB 5,6; E 8,9

#### Textbook References, Resources and Materials

Probability, Statistics and Graphing Grades 6-8 pgs. 15, 16  
Munchable Math pgs. 565-58  
Math the Right Way Grades 6-7 pgs 47, 51  
Probability, Statistics and Graphing, Intermediate pgs. 22, 23  
Incentive Publications pg. 68, 69  
Mastermind Riddle Math Series  
Math in Weather pgs. 69-70  
Math in Astronomy pg. 72

## Grade 6 Curriculum Guideline

### Unit: Decimals

#### Topic:

#### Student Learning Outcomes

- 30305** Convert between fractions, mixed numbers and decimals.
- 30312** Demonstrate an understanding of the inverse relationship of addition and subtraction, and use that understanding to simplify computation and solve decimal equations.
- 30313** Accurately and efficiently add and subtract positive decimals.
- 30316** Estimate results of computations with decimals.  
Describe reasonableness of estimates.

#### Textbook References, Resources and Materials

- 30305 - Math the Write Way gr. 4-5 pg. 46, gr. 6-7 p. 22  
Understanding Math Through Writing and Reading p. 10  
Mastermind Riddle Math p. 32  
Decimals, Percentages, Metric System and Consumer Math p. 41-43  
Math in Weather pgs. 58-60.  
Pizzazz C pgs. 71-76
- 30312 - PreAlgebra Gr. 5-6 pg. 22  
Pizzazz B
- 30313, 30316 - Pizzazz B pgs. 27-35

#### Suggested Instructional Strategies

**30305:** Challenge Activity TP 302  
**30312:** Reteaching Activity TP 171  
Explore TP 169  
Rewrite equations - true and untrue  
Enrichment worksheet 3-7  
**30316:** Explore TP 160

#### Assessment

**30305:** Quiz 5B 10, 11; Test A/B; 19-22; Test E 16, 17, 19  
**30312:** Quiz 3B 9-12; Test AB 22, 24; E 14  
**30313:** Quiz 3B 5-8 13, 14; Test A/B 14, 22; E 16, 17  
**30316:** Quiz 3B 1-4; Test A 6-8; B 11-13; E 16-19

## Grade 6 Curriculum Guideline

### Topic: Review

#### Student Learning Outcomes

- 30302** Demonstrate an understanding of place value to thousandths.
- 30307** Compare and order decimals to the thousandths.

#### Textbook References, Resources and Materials

Math the Write Way gr. 4-5 pg. 47, gr. 6-7 pg. 21  
Decimals, Percentages, Metric System and  
Consumer Math pgs. 2-11  
Middle School Math with Pizzazz! B-16 thru B-22  
Pizzazz B

#### Suggested Instructional Strategies

Explore TP 148  
Overhead tenths/hundredths grid transparency

#### Assessment

**30302:** Quiz 3A 7; Test A 9, 10; B 7, 8; E 9, 10, 11  
**30307:** Quiz 3A 1,2; Test AB 1; E 1, 2

## Grade 6 Curriculum Guideline

### Unit: Exponents

#### Topic:

#### Student Learning Outcomes

- 30301** Demonstrate an understanding of positive integer exponents, in particular, when used in powers of ten, e.g., 102, 105.
- 30303** Represent very large (billions) positive numbers in various forms such as expanded notation with and without exponents.

#### Textbook References, Resources and Materials

Middle School Math with Pizzazz B-75, A-49  
Mastermind Riddle Math Series (Incentive Publications) pg. 16  
Math the Write Way Gr. 6-7 pg. 9, Gr. 4-5 pg. 18  
Holt, Reinhart, Winston Grade 6 Math pg. 34  
Pre-Algebra gr. 5-6 pgs. 6-12

#### Suggested Instructional Strategies

Teaching Tool Transparency 23  
Challenge on TP 153  
Reteaching activity TP 81

#### Assessment

Quiz 3A 8, 9, 10; A 11, 12; B 9, 10; E 12, 13

## Grade 6 Curriculum Guideline

### Unit: Fractions

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- |              |   |                |
|--------------|---|----------------|
| <b>30304</b> | Demonstrate an understanding of fractions as a ratio of whole numbers, as parts of unit wholes, as parts of a collection, and as locations on the number line.  | Pizzazz Book C |
| <b>30305</b> | Identify and determine common equivalent fractions.<br>Convert between fractions, mixed numbers and decimals.   |                |
| <b>30307</b> | Compare and order positive fractions and mixed numbers.   |                |
| <b>30308</b> | Apply number theory concepts of divisibility rules for 2, 3, 4, 5, 6, 9,10 and 25 -to the solution of problems.<br>Apply number theory concepts - including multiples and least common multiple - to the solution of problems.  |                |
| <b>30312</b> | Demonstrate an understanding of the inverse relationship of addition and subtraction, and use that understanding to simplify computation and solve fractions.   |                |
| <b>30314</b> | Accurately and efficiently add and subtract positive fractions with unlike denominators. Simplify fractions.<br>Accurately and efficiently add and subtract positive fractions with like denominators. Simplify fractions.<br>Accurately and efficiently multiply positive fractions and mixed numbers. Simplify fractions.<br>Accurately and efficiently multiply positive fractions and mixed numbers by a whole number. Simplify fractions.<br>Accurately and efficiently divide positive fractions and mixed numbers. Simplify fractions. |                |
| <b>30316</b> | Estimate results of computations with addition and subtraction of positive fractions and mixed numbers.<br>Describe reasonableness of estimates.<br><br>Estimate results of computations with the multiplication and division of positive fractions and mixed numbers.<br>Describe reasonableness of estimates.   |                |

## Grade 6 Curriculum Guideline

### Suggested Instructional Strategies

Fraction bars/circles

**30305:** Teaching Tool transparency 5

Explore TP 298

Reateching Activity TP 300

Challenge Acitivity TP 302

Reteaching Activity TP 311

3 Ways to Compare Fractions: common denominators, cross multiplying, convert to decimals.

Supplemental material needs to be gathered to address integers and percents.

Brainstorming and editing rules of divisibility to create study sheet

3 Ways to find L.C. M. poster (trees, multiple-lists, factor lists)

**30312:** Reteaching Activity TP 171

Explore TP 169

Rewrite equations - true and untrue

Enrichment worksheet 3-7

**30314:** Explore Activity TP 326, 350 with fraction bars.

Lesson Enhancement Transparency 30, 31.

Reteaching Activity TP 344.

### Assessment

**30304:** Quiz 5B 1-5; Test A/B 8, 10, 14; Test E 10, 11

**30305:** Quiz 5B 4-7, 8,9, 12-13; Test A/B 15-1, 19-22, 27; Test E 9, 12, 13-15, 19

**30307:** Quiz 5A 1-4

**30308:** Quiz 5B 10, 11; Test A/B 19-22; Test E 16, 17, 19

**30312:** Quiz 3B 9-12; Test AB 22, 24; E 14

**30314:** Quiz 6B; Test A/B ; Test E

**30316:** Quiz 6B 1-4; Test A/B 17-20; Test E 21-24

Quiz 7A 3-5; Test A/B 4-7; Test E 1, 2

## Grade 6 Curriculum Guideline

### Unit: Geometry

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30324** Identify polygons based on their properties, including types of interior angles, perpendicular or parallel sides, and congruence of sides, e.g., quadrilaterals, pentagons, hexagons and octagons
- 30324** Identify triangles based on their congruence of sides, e.g., isosceles, equilateral, and right triangles.
- 30325** Identify three-dimensional shapes (e.g., cubes, prisms, spheres, cones, and pyramids) based on their properties, such as edges and faces.
- 30326** Identify relationships among points, lines, and planes, e.g., intersecting, parallel, perpendicular, skew lines.
- 30329** Predict, describe, and perform transformations on two-dimensional shapes, e.g., reflections.
- 30329** Predict, describe, and perform transformations on two-dimensional shapes, e.g., rotations and translations.
- 30329** Predict, describe, and perform transformations on two-dimensional shapes, e.g., reflections.
- 30330** Identify types of line symmetry.
- 30330** Identify types of rotational symmetry.
- 30331** Determine if two shapes are congruent by motions or series of motions, e.g., translations, rotations, and reflections.
- 30334** Identify, describe, classify, and construct acute, right, obtuse and straight angles, triangles, and quadrilaterals.
- 30334** Measure and construct acute, right, obtuse, and straight angles. Identify complementary and supplementary angles.
- 30334** Identify, measure, describe, classify, and construct triangles based on types of interior angles, e.g. acute, right and obtuse triangles.
- 30324** Identify quadrilaterals based on their properties, including types of interior angles, perpendicular or parallel sides, and congruence of sides, e.g., squares, rectangles, rhombuses, parallelograms and trapezoids.



## Grade 6 Curriculum Guideline

### Suggested Instructional Strategies

Level I

### Assessment

**30324:** Quiz 8B 9-11, 13; Test AB 7, 8; Test E 11, 12

Quiz 8B 6-8; Test A/B 6, 17; Test E 9, 10

**30325:** Quiz 8B 12; Test A/B 9; Test E 13, 14

**30326:** Quiz 8A 1-4; Test A/B 1; Test E 1

**30329:** Quiz 8A 8-10; Test A/B 4; Test E 4-6

**30330:** Quiz 8A 5-7; Test A/B 2, 3; Test E 2, 3; Quiz 8C 6, 7; Test A/B 13, 15; Test E 19, 20

**30331:** Quiz 8C 4, 5; Test A/B 12; Test E 17, 18

**30334:** Quiz 8C 1; Test AB 11; Test E 15, 21

**30324:** Quiz 8B 1-5; Test A/B 5, 16, 18; Test E 7,8

### Topic: Level I

#### Student Learning Outcomes

- 30338** Find surface areas of rectangular prisms, including using nets of the solid.
- 30338** Find surface areas of rectangular prisms.
- 30338** Identify and determine various views of a 3-dimensional figure.
- 30338** Find volumes of rectangular prisms.
- 30338** Find volumes of rectangular prisms using formulas.
- 30339** Find the sum of the interior angles in simple polygons (up to eight sides) with and without measuring the angles.

#### Textbook References, Resources and Materials

Drawing of box, fold and unfold  
Pizzazz D

## Grade 6 Curriculum Guideline

### Suggested Instructional Strategies

Need to find supplemental materials

### Assessment

## Grade 6 Curriculum Guideline

### Unit: Integers

#### Topic:

#### Student Learning Outcomes

- 30310** Use the number line to model integers.
- 30310** Use the number line to model addition of integers.
- 30310** Use the number line to model subtraction of integers.
- 30315** Add integers.
- 30315** Subtract integers.
- 30321** Solve linear equations using concrete models, tables, graphs, and paper-pencil methods.
- 30327** Graph points and identify coordinates of points on the Cartesian coordinate plane.
- 30329** Graph points and identify coordinates of points on the Cartesian coordinate plane.

#### Textbook References, Resources and Materials

Probability, Statistics and Graphing Gr. 6-8 pgs.  
30-34

#### Suggested Instructional Strategies

Level I

#### Assessment

- 30310:** Quiz 9A 1-3; Test A/B 1-3; Test E 1, 2
- 30315:** Quiz 9A 9, 14, 15; Test A/B 5, 13, 14; Test E 10-12; Quiz 9A 6, 7; Test A/B 4; Test E 5, 6
- 30321:** Quiz 9B 9; Test A/B 26; Test E 30
- 30327:** Quiz 9B 7, 8; Test A/B 24, 25; Test E 23-26
- 30329:** Quiz 9B 1, 2; Test A/B 18-20; Test E 19, 20

## Grade 6 Curriculum Guideline

### Topic: Level I

#### Student Learning Outcomes

- 30322** Produce and interpret graphs that represent the relationship between two variables in everyday situations.

#### Textbook References, Resources and Materials

Probability, Statistics and Graphing Gr. 6-8  
Exploring Statistics on the Elementary Grades (K-6)  
Everything You Need to Know About Math  
Homework pgs. 114-117  
Pizzazz E pgs. 4- 45  
USA Today (Current Topics)

#### Suggested Instructional Strategies

Need to find supplemental materials

#### Assessment

## Grade 6 Curriculum Guideline

### Unit: Introduction to Algebra

#### Topic:

#### Student Learning Outcomes

- 30312** Demonstrate an understanding of the inverse relationship of addition and subtraction, and multiplication and division and use that understanding to simplify computation and solve problems.
- 30318** Describe and compare equations and expressions.
- 30318** Replace variables with given values and evaluate/simplify, e.g.,  $2(m) + 3$  when  $m = 4$ .

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Variable Bingo  
Concentration Game

#### Assessment

**30312:** Quiz 2C 11-13; Test AB 29, 30; Test E 26, 27  
**30318:** Quiz 2C 1,2; Test AB 22, 22; Test E 18  
Quiz 2C 5,6,7; Test AB 25; Test E 21, 22

## Grade 6 Curriculum Guideline

### Unit: Measurements

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30333** Apply the concepts of perimeter and area to the solution of problems. Apply formulas where appropriate.
- 30333** Apply the concepts of area of squares and rectangles the solution of problems. Apply formulas where appropriate.
- 30335** Solve problems involving proportional relationships and units of measurement, e.g., same system unit conversions, converting in the metric system.
- 30335** Solve problems involving proportional relationships and units of measurement, using conversion factors, e.g., same system unit conversions, scale models, maps, and speed.
- 30336** Find areas of triangles and parallelograms. Recognize that shapes with the same number of sides but different appearances can have the same area. Develop strategies to find the area of more complex shapes.
- 30337** Use the concepts of radius, diameter, and circumference to find area of circles.
- 30333** Apply the concepts of perimeter to the solution of problems. Apply formulas where appropriate.

#### Suggested Instructional Strategies

Painter's tape kinesthetic TP 210  
Challenge Geoboards Activity  
Reteaching activity TP 213

#### Assessment

Quiz 4A 1-4; Test A 1, 4-6; Test B 4-6; E 1-3

## Grade 6 Curriculum Guideline

### Unit: Multiplication and Division

#### Topic:

#### Student Learning Outcomes

- 30312** Demonstrate an understanding of the inverse relationship of multiplication and division and use that understanding to simplify computation and solve decimal equations.
- 30313** Accurately and efficiently multiply, whole numbers times a decimal.
- 30313** Accurately and efficiently add, multiply a decimal times a decimal.
- 30313** Accurately and efficiently divide (with double-digit divisors) whole numbers and positive decimals by decimals.
- 30313** Accurately and efficiently divide (with double-digit divisors) whole numbers and positive decimals by whole numbers.

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Explore TP 195  
Lesson Enhancement transparency 10  
Alphabet multiplication  
Unit pricing activity/ Miles per gallon activity  
TP 190  
Enrichment 3-12  
TP 185 Kinesthetic play money activity

**30312:** Quiz 3C 9, 10, 14; A 23, 25; B 19, 20, 23; E 15

**30313:** Quiz 3C 1, 2; Test A 18; B 15; E 20; Quiz 3C 3, 4; A 15, 20

B 16, 21; E 19, 21, 24; Quiz 3C 7,8; A 16, 19, 25; B 17, 19, 20, 25; E 18, 23; Quiz 3C 5613; A 15, 20; B 16, 21; E 19, 21, 24

## Grade 6 Curriculum Guideline

### Unit: Number Theory

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30308** Apply number theory concepts-including prime and composite numbers and prime factorization to the solution of problems.

#### Suggested Instructional Strategies

Sieve of Eratosthenes  
Extend your thinking 5-2

#### Assessment

Quiz 5A 5, 6; Test AB 4, 5, 6; Test E 3, 4

## Grade 6 Curriculum Guideline

### Unit: Probability

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

**30342** Use tree diagrams and other models (e.g., lists and tables) to represent possible or actual outcomes of trials.

Analyze the outcomes.

**30342** Find the probability and analyze the outcomes of compound events.

#### Suggested Instructional Strategies

Level I

#### Assessment

## Grade 6 Curriculum Guideline

### Unit: Problem Solving

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

- 30309** Select and use appropriate operations to solve problems involving addition, subtraction, multiplication, division, and positive integer exponents with whole numbers, positive fractions, mixed numbers and decimals.  
Percents

#### Suggested Instructional Strategies

#### Assessment

## Grade 6 Curriculum Guideline

### Unit: Statistics

#### Topic:

#### Student Learning Outcomes

#### Textbook References, Resources and Materials

**30341** Interpret line plots, bar graphs, picto graphs, circle and line graphs, including misleading graphs.

Construct frequency charts, line plots, bar graphs, picto graphs and line graphs.

**30341** Construct and interpret bar graphs.

#### Suggested Instructional Strategies

Daily Transparency 1-1, 1-2, 1-4  
Problem of the Day  
Teaching tool transparency 22  
Linking cubes to create bar graphs  
Need to supplement for circle graphs

#### Assessment

**30341:** Quiz 1B 3,4; AB 11,12; E 6,7; Quiz 1B 1; AB 1A; E 11

## Grade 6 Curriculum Guideline

### Topic: Review

#### Student Learning Outcomes

- 30340** Describe and compare data sets using the concepts of mean.
- 30340** Describe and compare data sets using the concepts of median, mean, mode, maximum and minimum, range and outliers.
- 30341** Interpret stem-and-leaf plots.  
Construct stem-and-leaf plots.

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Explore TP 46  
Reteaching TP48 with linking cubes  
Bill Gates' son's allowance  
Kinesthetic activity TP 51  
Reteaching Activity TP 37

**30340:** Quiz 1C 1,2,4,5; Test AB 1B; E 10,: 14,15; Quiz 1C 3-9; Test AB 9, 10; E 14, 15  
**30341:** Quiz 1B 2; AB 5,6 E12

## Grade 6 Curriculum Guideline

### Unit: Whole Numbers

#### Topic:

#### Student Learning Outcomes

- 30311** Apply the Order of Operations for expressions involving addition, subtraction, multiplication, and division with grouping symbols (+, -, x, ÷) and exponents.
- 30317** Analyze and determine the rules for extending symbolic, arithmetic, and geometric patterns and progressions, e.g., ABBCCC; 1, 5, 9, 13 ...; 3, 9, 27, ....

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Invent own "Please Excuse My Dear Aunt Sally" poster  
Explore TP 98  
Reteaching Activity 100 TP  
Reteaching activity TP 105  
Poem: "Six Men of Indostan"  
  
(Need to supplement the geometric portion)

#### Assessment

**30311:** Quiz 2B 7-9; Test AB 17, 18; E 14  
**30317:** Quiz 2B 10-12; Test AB 19, 20; E 17

## Grade 6 Curriculum Guideline

### Topic: Review

#### Student Learning Outcomes

- 30302** Demonstrate an understanding of place value to billions and thousandths.
- 30303** Represent and compare very large (billions) and very small (thousandths) positive numbers in various forms such as expanded notation without exponents, e.g.,  $9724 = 9 \times 1000 + 7 \times 100 + 2 \times 10 + 4$ .
- 30307** Compare and order whole numbers.
- 30313** Accurately and efficiently add, subtract, multiply, and divide (with double-digit divisors) whole numbers using mental math.
- 30316** Estimate results of computations with sums and differences of whole numbers.  
Describe reasonableness of estimates.

#### Textbook References, Resources and Materials

#### Suggested Instructional Strategies

Dice Activity \_ \_ \_ , \_ \_ \_ , \_ \_ \_  
Construct large numbers  
Read, standard form  
Reteaching TP 96  
Homework middle column correct/odds  
War Card Game  
Jelly Bean Jar  
Reteaching Activity TP 92  
Explore TP 86  
Reteaching Activity TP 88

#### Assessment

**30302:** Quiz 2A 9; Test A/B 9; Form E 8  
**30303:** Quiz 2A 7,8; Test A/B 7,8; Form E 6,7  
**30307:** Quiz 2B 1,2; Test AB 11,12; E 10,11,28  
**30313:** Quiz 2B 3,4,13; Test AB 13, 14; E 12, 13  
**30316:** Quiz 2B 5, 6; Test AB 15, 16; E 14

## Grade 6 Curriculum Guideline

### Recommended Resources for Grade 6 Mathematics: