

Marsh Valley School District Quick Reference Curriculum Guide--4th Grade Math June 2004

Skills are identified with Introduced (I), Practiced (P), Mastered (M), and Reinforced (R)

Mathematical Reasoning and Problem Solving

Problem Solving

- Solve grade level appropriate problems throughout all strands (M) 298.01
- Experiment with manipulatives and real world experiences to identify and solve problems (P) 298.03b
- Apply the four step problem solving process: explore, plan, solve, examine (P) 298.02a
- Apply a variety of strategies to solve problems: Choose an Operation, Act It Out, Use a Pattern, Make a Model or Drawing, Guess and Check, Make a Table or Systematic List, use Logical Reasoning, Work Backwards (P) 298.04a
- Appropriately use a 4-function calculator to solve complex grade-level problems (P) 298.03a

Story Problems

- Model and solve real world and story problems using number sentences to describe the situation (P)
- Estimate and solve multi-step story problems related to addition and subtraction (M)
- Estimate and solve story problems related to multiplication, including two-step problems (I-P)
- Solve simple story problems related to division and interpret the remainders (I)

Reasoning

- Use estimation to predict computation results and to evaluate the reasonableness of an answer (P) 297.03b
- Decide when to use paper/pencil, mental math, or calculators to solve computations problems (P) 297.02f
- Identify extra or missing information that is necessary to solve problems (P) 298.01a

Mathematics Processes

Communication

- Use appropriate grade level vocabulary within all strands (I-P) 298.04b

- Organize and consolidate mathematical thinking to communicate with others (P) 298.04c
- Express mathematical ideas using words, number, symbols, tables, charts, graphs, diagrams, and models (P) 298.04a
- Extend mathematical knowledge by considering the thinking strategies of others (P)

Number Sense

Whole Numbers

- Explain how numbers are used in real world contexts (P)
- Identify and use periods in whole numbers to name numbers through the millions period (I-P) 297.01b
- Round to the hundreds, thousands, and ten thousands in numbers up to 5 digits (I-P)

Place Value

- Identify place value to the ten thousands place (M) 297.01a
- Identify place value to the millions place (I-P)
- Apply understanding of place value to write numbers in standard and expanded form through the thousands place (M) 297.01f

Comparing/Ordering

- Compare and order whole numbers using mathematical symbols (<, >, =) and vocabulary (M) 297.01a

Number Theory

- Explore and apply number theory concepts: odd/even (M) 297.02a
- Explore and apply number theory concepts: multiple, factor (I-P) 297.02g

Money

- Determine the value of a collection of bills and coins up to \$100.00 (M) 297.01c
- Make change from \$20.00 (P) 297.02d
- Solve story problems related to money including two-step problems (P) 297.02d

Decimals

- Explore/apply the concept of decimals using a variety of manipulatives, models, and real life applications (I-P) 297.02d

- Read and write decimals in numbers and words through hundredths (I-P) 297.01e
- Identify place value in decimal numbers through hundredths (I-P)
- Compare and order decimals through hundredths (I-P) 297.01e

Fractions

- Explore and apply the concept of common fractions using models and real life applications (P) 297.02c
- Recognize and represent common fractions using numbers, words, and pictures (M) 297.02c

Concepts and Language of Algebra, Functions, and Mathematical Models

- Explore and apply the following properties: commutative, associative, distributive, identity, and zero (P) 297.02a
- Represent vertical notation in horizontal form and vice versa (M) 297.01a
- Write number sentences using symbols (boxes or letters) to represent an unknown number (M) 297.03a
- Solve an equation with an operation on both sides of the equal sign (P) 297.01c
- Solve simple missing addend problems using reversal of operations (P-M) 297.03a
- Solve missing factor problems using reversal of operations (I) 297.02a
- Reproduce, create, describe, and extend geometric and numeric patterns (P) 301.01a
- Construct a function table (T-chart) to store data from a simple numeric pattern (I-P) 303.01b
- Determine a rule from a simple pattern to solve a problem or to make a prediction (I) 303.01b

Estimation and Accurate Computation

Addition and Subtraction

- Estimate and subtract whole numbers with renaming (M) 297.02a
- Solve simple missing addend problems using reversal of operations (P-M) 300.03a
- Add and subtract money (M) 297.02a

Multiplication 297.02b, e

- ❑ Explore and apply the concept of multiplication using manipulatives, a variety of models (i.e. repeated addition, arrays, skip counting), and real life applications (M)
- ❑ Demonstrate an understanding of the relationship between multiplication and division as inverse operations (I-P)
- ❑ Solve missing factor problems using reversal of operations (I)
- ❑ Memorize multiplication facts to 10 x 10 (M)
- ❑ Solve multiplication problems involving a single digit factor and multiples of 10, 100, or 1,000 (I-P)
- ❑ Estimate and multiply a one-digit factor by a one-to four-digit factor, with and without regrouping (I-P)
- ❑ Use mental math to multiply multiples of 10 by multiples of 10, 100, and 1,000 (I-P)
- ❑ Estimate and multiply a two to three-digit number by a two-digit number (I-P)
- ❑ Estimate and multiply a given money amount by a whole number (I-P)

Division 297.02b

- ❑ Explore/apply the concept of division as the sharing and grouping of objects using a variety of models and real-life applications (I-P)
- ❑ Estimate and solve division problems with one-digit divisors and one-digit quotients, with and without remainders (I-P)
- ❑ Estimate and solve division problems with one-digit divisors and two-digit quotients (I-P)
- ❑ Solve simple story problems related to division and interpret the remainders (I)

Concepts and Principles of Measurement

- ❑ Sequence events relative to time (P) 299.01f
- ❑ Solve story problems involving time and calendars (P) 299.01f
- ❑ Determine time to the nearest minute using both digital and analog clocks (M) 299.01e
- ❑ Memorize relationships between seconds, minutes, hours, days and year (M) 299.01e
- ❑ Determine elapsed time in calendar time and analog time (P) 299.01f

- ❑ Explore concepts of length, temperature, weight, and capacity using standard/nonstandard units and tools (P) 299.01a
- ❑ Estimate to predict reasonable measurements (P) 299.01b
- ❑ Identify best unit of measure in customary and metric system (P) 299.01 c-d
- ❑ Recognize and order inch, foot, yard, and mile (M) 299.01c
- ❑ Use a ruler to measure to the nearest half-inch (M) 299.01b
- ❑ Use a ruler to measure to the nearest quarter-inch (I) 299.01b
- ❑ Use a ruler to measure to the nearest centimeter (M) 299.01b
- ❑ Recognize and order cup, pint, quart, and gallon (M) 299.01c
- ❑ Recognize and order milliliter and liter (P) 299.01d
- ❑ Recognize and order ounces and pounds (P) 299.01c
- ❑ Identify equivalent measures of length and capacity within the customary system (I-P) 299.01c
- ❑ Perform simple conversion within the customary system (I) 299.01c
- ❑ Determine appropriate tools to measure length, mass, capacity, weight, and temperature (P) 299.01a
- ❑ Use a thermometer to determine temperature in Fahrenheit and Celsius (P) 299.01 c-d
- ❑ Use a scale to measure weight/mass in ounces/pounds or grams/kilograms (P) 299.01 a- b
- ❑ Use appropriate tools to measure capacity cup, pint, quart, gallon, milliliter, liter (I) 299.01 a- b
- ❑ Add subtract units of length, weight and capacity (I-P)
- ❑ Determine the perimeter or polygons 299.01 c-d
- ❑ Determine the area of area of a rectangle (I-P) 301.01c

Concepts and Principles of Geometry

- ❑ Classify quadrilateral according to properties and attributes (I) 301.01b
- ❑ Analyze, identify, name and compare regular and irregular polygons (P) 301.01a
- ❑ Predict/describe the results of slides, flips and turns of plane figures (P) 301.01e
- ❑ Identify congruent and similar figures and shapes (I) 301.01
- ❑ Identify multiple lines of symmetry (P) 301.01b
- ❑ Name common geometric solids (I-P)
- ❑ Identify and name attributes of geometric solids: edge, vertices, face (P) 301.01e
- ❑ Identify, name, and draw intersecting, parallel, and perpendicular lines (I) 301.01e
- ❑ Identify right angles (I-P) 301.01e

Data Analysis, Probability, and Statistics

- ❑ Use vocabulary such as more and less, likely/unlikely, possible/impossible (I) 302.01c
- ❑ Explore probability through experimentation and events (I) 302.04a
- ❑ Record results of experiments and events using tables and graphs (I) 302.04a
- ❑ Make predictions, summarize outcomes, and draw conclusions from experiments and events (I) 302.04a
- ❑ Express simple probability as a fraction (I) 302.04a
- ❑ Analyze, predict, summarize, and draw conclusions from data in charts, data files, tables, schedules, and story problems. (P) 302.01b
- ❑ Interpret simple line graphs (P) 302.02a
- ❑ Interpret simple circle graphs (I-P) 302.02a
- ❑ Collect and record data in a variety of graphic forms (P) 302.02a
- ❑ Construct a line, bar, pictograph and table to record data (P) 302.02a
- ❑ Represent data from story problems in graphs, charts and diagrams (P) 302.02a
- ❑ Determine the mean of a simple set of real world data (I-P) 302.03a

