Scope and Sequence Grade 6

I. Whole Number Concepts and Operations
   A. Numeration
      1. Reading and writing numbers (RA)
      2. Place value (RA)
      3. Comparing and ordering (RA)
      4. Rounding (RA)
      5. Powers and exponents (TA)
      6. Square numbers and square roots (TA)
      7. Scientific Notation (TA)
   B. Number Theory
      1. Prime and composite numbers (TA)
      2. Prime Factorization (TA)
      3. Divisibility (TA)
      4. Factors and greatest common factors (RA)
      5. Multiples and least common multiples (RA)
   C. Addition
      1. Adding with 4 or more digits (RA)
      2. Addition expressions/ sentences/ equations (TA)
      3. Estimation and mental math (RA)
      4. Problem solving (RA)
   D. Subtraction
      1. Subtracting with 4 or more digits (RA)
      2. Subtraction expressions/sentence/equations (TA)
      3. Estimation and mental math (RA)
      4. Problem solving (RA)
   E. Multiplication
      1. By a multi-digit number (RA)
      2. Multiplication expressions/sentences/equations (TA)
      3. Estimation and mental math (TA)
      4. Problem solving (TA)
   F. Division
      1. By a 1-digit divisor (RA)
      2. By multiples of 10 and 100 (RA)
      3. By a multi-digit divisor (TA)
      4. Division expression/sentences/equations (TA)
      5. Estimation and mental math (TA)
      6. Problem solving (TA)
II. Fraction Concepts and Operations

A. Concepts
   1. Part of a whole/part of a set (RA)
   2. Mixed numbers, fractions greater than 1 (RA)
   3. Equivalent fractions (RA)
   4. Lowest terms/simplest form (RA)
   5. Comparing and ordering (TA)
   6. Common denominators (TA)
   7. Rounding/estimating (TA)
   8. Reciprocals (TA)
   9. Related to decimals (TA)
   10. Related to percents (TA)

B. Operations
   1. Addition/subtraction, like denominators (RA)
   2. Addition/subtraction, unlike denominators (TA)
   3. Addition/subtraction, mixed numbers (TA)
   4. Multiplication/division, by a whole number (RA)
   5. Multiplication/division, fractions (TA)
   6. Multiplication/division, mixed numbers (TA)
   7. Estimation and mental math (TA)
   8. Problem solving (TA)
   9. Expressions/sentences/equations (TA)

III. Decimal Concepts and Operations

C. Concepts
   1. Meaning of decimals (RA)
   2. Related to fractions (RA)
   3. Place value (RA)
   4. On a number line (RA)
   5. Comparing and ordering (TA)
   6. Rounding (TA)
   7. Terminating and repeating (TA)
   8. Nonrepeating/irrational numbers (TA)
   9. Related to percent (TA)
   10. Scientific notation (TA)

D. Operations
   1. Addition (RA)
   2. Subtraction (RA)
   3. Multiplication, by a whole number (RA)
   4. Multiplication, by a power of ten (TA)

5. Multiplication, by a decimal (TA)
6. Division, by a whole number (TA)
7. Division, by a power of ten (RA)
8. Division by a decimal (TA)
9. Estimation and mental math (TA)
10. Problem solving (TA)
11. Expressions/sentences/equations (TA)

IV. Number Sense, Estimation, and Mental Math

A. Number Sense

1. Meaning of whole numbers (RA)
2. Fractions (RA)
3. Decimals (RA)
4. Percent and ratios (TA)
5. Integers (TA)
6. Number patterns (RA)
7. Number relationships (TA)
8. Relative magnitude of numbers (RA)

B. Estimation Strategies

1. Deciding when to estimate (RA)
2. Underestimates and overestimates (RA)
3. Adjusting an estimate (RA)
4. Using front-end digits (RA)
5. Rounding whole numbers/decimals (RA)
6. Rounding fractions/mixed numbers (RA)
7. Substituting compatible numbers (RA)
8. Using a range (TA)
9. Using a reference point or benchmark (TA)
10. Clustering (TA)

C. Mental Math Strategies

1. Mental-computation strategies
    a. Multiply/divide by 10,100, 1,000 (RA)
    b. Use properties and patterns (RA)
    c. Break apart numbers (RA)
    d. Compatible numbers (RA)
    e. Compensation (TA)
    f. With fractions (TA)
    g. With percents (TA)

V. Mathematical Processes

Scope and Sequence Grade 6

A. Problem Solving

1. Analyze Word Problems
    a. Choose an operation (RA)
    b. Too much or too little information (RA)
    c. Multiple-step problems (RA)
    d. Choose an exact answer or an estimate (RA)
    e. Estimating (RA)
2. Analyze Strategies
    a. Draw or use a picture/diagram (RA)
    b. Guess and check (RA)
    c. Look for a pattern (RA)
    d. Make an organized list (RA)
    e. Make a table (RA)
    f. Use logical reasoning (RA)
    g. Solve a simpler problem (RA)
    h. Work backward (RA)
    i. Choose/compare strategies (RA)
3. Decision Making
    a. Plan an event, make a choice, etc. (RA)
4. Problem Solving Guide/Checklist
    a. Understand
        1.) Determine what you know (RA)
        2.) Use data from pictures, graphs (RA)
        3.) Tell what you need to find out (RA)
    b. Plan
        1.) Choose an operation/strategy (RA)
        2.) Choose a computation method (RA)
        3.) Estimate the answer (RA)
    c. Solve
        1.) Carry out the plan (RA)
        2.) Try another strategy if needed (RA)
        3.) Give the answer (RA)
    d. Look back
        1.) Check your answer (RA)
        2.) Check reasonableness of your answer (RA)
        3.) Be sure the question is answered (TA)

B. Reasoning.

1. Critical Thinking, Logical Reasoning

a. Classifying/sorting (RA)
b. Comparing/contrasting (RA)
c. Finding/extending/using patterns (RA)
d. Making generalizations (RA)
e. Drawing conclusions (RA)
f. Making/testing conjectures (RA)
g. Explaining/justifying answers (RA)

2. Visual and Creative Thinking
   a. Visual patterns (RA)
   b. Spatial reasoning (RA)
   c. Solve nonroutine problems (RA)
   d. Generate problems (RA)
   e. Develop alternative ways to solve problems (RA)

C. Connections
1. Curriculum Connections
   a. Social studies/history/geography (RA)
   b. Health/physical education (RA)
   c. Science (RA)
   d. Music (RA)
   e. Reading/language/literature (RA)
   f. Art (RA)
2. Math Strand Connections
   a. Patterns (RA)
   b. Estimation and mental math (RA)
   c. Algebra readiness (TA)
   d. Geometry (TA)
   e. Using/collecting data (TA)
3. Real World Connections
   a. Students' daily life (RA)
   b. Consumer (RA)
   c. Career (RA)
   d. Multicultural connections (RA)

D. Communication
1. Write about it/journal (RA)
2. Talk about it/share (RA)
3. Working in groups (RA)

VI. Geometry
A. Plane and Solid Shapes

1. Identify plane figures (RA)
2. Identify solid figures (RA)
3. Relate plane figures to solid figures (RA)
4. Sides and corners/vertices (RA)
5. Symmetry (RA)
6. Lines, line segments, rays, planes, angles (RA)
7. Circles and parts of circles (RA)
8. Tessellations (TA)
9. Draw/construct/build (TA)
10. Visual thinking (TA)

B. Classification

1. Similar figures (TA)
2. Congruent figures (TA)
3. Transformations (slides, flips, turns) (TA)
4. Pairs of lines/line segments (RA)
5. Angles (RA)
6. Polygons (RA)
7. Triangles (RA)
8. Quadrilaterals (RA)
9. Polyhedrons/solid shapes (RA)

C. Formulas

1. Perimeter and circumference (TA)
2. Area (TA)
3. Surface area (TA)
4. Volume (TA)

VII. Patterns, Relationships, and Algebraic Thinking

A. Patterns

1. With objects/geometric figures (RA)
2. With numbers (TA)
3. In tables, charts, and graphs (RA)
4. Used to make predictions (RA)
5. Logical reasoning (TA)

B. Relationships

1. Function tables (RA)
2. Ordered pairs (RA)
3. Linear (TA)
4. Graphing equations (TA)
5. Venn diagrams (TA)

6. Commutative and associative properties (TA)
7. Distributive property (TA)
8. Zero and identity properties (TA)

C. Algebraic Thinking

1. Expressions, Equations, Inequalities
   a. Variables (TA)
   b. Writing/evaluating expressions (TA)
   c. Order of operations (TA)
   d. Solving/writing for addition/subtraction (TA)
   e. Solving/writing for multiplication/division (TA)
   f. Graphing equations (TA)
   g. Related to formulas (TA)
2. Integers
   a. Writing and reading (TA)
   b. On a number line (TA)
   c. Comparing and ordering (TA)
   d. Adding and subtracting (TA)
   e. Multiplying and dividing (TA)
   f. Graphing in four quadrants (TA)
3. Rational and Real Numbers
   a. Repeating and nonrepeating numbers (TA)
   b. Exponents and powers (TA)
   c. Squares and square roots (TA)
   d. Irrational and real numbers

VIII. Measurement, Time, and Money

A. Measurement

1. Length, choosing appropriate units (RA)
2. Length, converting units (RA)
3. Capacity, choosing appropriate units (RA)
4. Capacity, converting units (RA)
5. Weight/mass, choosing appropriate units (RA)
6. Weight/mass, converting units (RA)
7. Angles (TA)

B. Perimeter, Area, Volume

1. Estimating (TA)
2. Perimeter and circumference (TA)
3. Area (TA)
4. Surface area (TA)

5. Volume (TA)
6. Perimeter/area/volume relationships (TA)
7. Irregular figures (TA)

C. Time

1. Elapsed time (RA)

IX. Data, Statistics and Probability

A. Graphing

1. Reading pictographs (RA)
2. Making pictographs (RA)
3. Reading bar graphs (TA)
4. Making bar graphs (TA)
5. Reading line graphs (TA)
6. Making line graphs (TA)
7. Reading line plots (TA)
8. Making line plots (TA)
9. Reading stem-and-leaf diagrams (TA)
10. Making stem-and-leaf diagrams (TA)
11. Reading box-and-whisker plots (TA)
12. Making box-and-whisker plots (TA)
13. Reading scatter plots (TA)
14. Making scatter plots (TA)
15. Reading circle graphs (TA)
16. Graphing ordered pairs (TA)
17. Graphing equations (TA)
18. Making predictions (TA)

B. Data and statistics

1. Collecting and organizing data (TA)
2. Reading/making charts and tables (RA)
3. Tally charts (RA)
4. Frequency and distribution (TA)
5. Range, mode, median, mean (RA)
6. Sampling (TA)
7. Correlation/dispersed points (TA)
8. Using data in problem solving (TA)
9. Interpreting data (TA)
10. Making predictions (TA)
11. Misleading statistics (TA)

C. Probability

1. Outcomes (RA)
2. Tree diagrams (TA)
3. Writing probabilities (RA)
4. Certain/possible/impossible events (TA)
5. Experimental/theatrical probability (TA)
6. Simulation (TA)
7. Fair and unfair games (TA)
8. Making predictions (TA)

X. Ration, Proportion, and Percent

A. Ratio and Proportion

1. Read and write ratios (TA)
2. Equal (equivalent) ratios (TA)
3. Solve proportions (TA)
4. Rate and unit price (TA)
5. Related to maps and scale drawings (TA)
6. Related to similar figures (TA)

B. Percent

1. Related to ratios (TA)
2. Related to fractions/decimals (TA)
3. Finding a percent of a number (TA)
4. Related to circle graphs (TA)
5. Estimation/mental math strategies (TA)

XI. Technology

A. Calculators

1. In problem solving (RA)
2. As a tool for computing (RA)
3. Scientific calculators (TA)
4. Fraction calculators (TA)

B. Computers

1. Spreadsheet tool (TA)
2. Graphing tool (TA)
3. Geometry tool (TA)
4. Internet access (TA)