

MATH

LENGTH OF TIME: one year

GRADE LEVEL: 7

COURSE STANDARDS:

Students will:

1. Create and interpret scatter plots, box plots, stem-and-leaf diagrams, histograms, and number line plots. (PA Std 2.6.8 c, e)
2. Describe data in tabular and graphical forms. (PA Std 2.8.8 g)
3. Use measures of central tendency (mean, median, mode, range and quartiles). (PA Std 2.6.8a)
4. Multiply, divide, add and subtract positive and negative integers. (PA Std 2.2.8 b)
5. Plot ordered pairs in all four quadrants of the coordinate plane. (PA Std 2.8.8 g)
6. Connect fractions, decimals, and percentages and relate to ratio. (PA 2.1.8 a)
7. Explore percentages as operators. (PA Std 2.2.8 b, d)
8. Understand the notions of rate, scale factor and ratio as linear function. (PA Std 2.3.8 b, f)
9. Recognize geometric shapes in real objects and representations. (PA Std 2.9.8 c)
10. Investigate properties of regular and semi-regular polyhedral. (PA Std 2.9.8 d)
11. Relate tables to algebraic descriptions and formulas (PA Std 2.8.8 b)
12. Relate expressions in equivalent forms. (PA Std 2.8.8 c)
13. Use squares and square roots to solve area problems. (PA Std 2.1.8 a)
14. Explore the interrelationships of the sides and angles of triangles as well as the properties of parallel lines and quadrilaterals. (PA Std 2.9.8 a, e)
15. Construct triangles and use transformations to become familiar with the concepts and congruence and similarity. (PA Std 2.9.8 f, h)
16. Use the properties of number operations and the characteristics of numbers to simplify calculations. (PA Std 2.1.8 b)

RELATED PA ACADEMIC STANDARDS FOR MATHEMATICS

- 2.1 Numbers, Number Systems and Number Relationships
- 2.2 Computation and Estimation
- 2.3 Measurement and Estimation
- 2.6 Statistics and Data Analysis
- 2.8 Algebra and Functions
- 2.9 Geometry

PERFORMANCE ASSESSMENTS:

Students will demonstrate achievement of the standards by:

1. Collecting and analyzing data to answer a question and presenting the results in poster form using appropriate graphs.(Course Standards 1-3)
2. Using calculators to estimate and/or compute with all number sets and problem solving situations. (Course Standard 1-8)

3. Manipulate four 4's using adding, subtracting, multiplying, dividing, and grouping to equal the amounts 1 through 10 as a demonstration of order of operations. (Course Standard 4, 12)
4. Showing connections between scale measure and proportion by drawing room floor plans or enlarging a picture. (Course Standards 6, 8)
5. Using equations to solve routine and non-routine problems. (Course Standards 4, 11, 12)
6. Applying formulas to find area, perimeter, volume, interest, discount, commission, and taxes. (Course Standards 4, 6, 7, 11, 13)
7. Creating projects such as math games, crossword/crossnumber puzzles, posters, and collages to make mathematics relevant. (Course Standard 1,2,3,6,7)

DESCRIPTION OF COURSE:

Students will be encouraged to make relationships between their classroom learning and real life experiences. This course stresses improvement of the basic math skills. Students will be encouraged to use calculators and computers to enhance their problem solving.

TITLES OF UNITS:

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|-----------------------------|---------|
| 1. Variables and Patterns | 22 days |
| 2. Stretching and Shrinking | 19 days |
| 3. Comparing and Scaling | 24 days |
| 4. Accentuate the Negative | 25 days |
| 5. Moving Straight Ahead | 28 days |
| 6. Filling and Wrapping | 24 days |
| 7. What Do You Expect? | 21 days |
| 8. Data Around Us. | 22 days |

SAMPLE INSTRUCTIONAL STRATEGIES:

1. Journal/notebook writing
2. Cooperative learning
3. Calculators
4. Projects
5. Extra credit reports
6. Manipulative-based activities

MATERIALS:

1. Textbook – Connected Mathematics, Prentice Hall, 2002
2. Manipulatives - fraction, decimal, metric, geometric
3. Integer counters (counters)
4. Algebra tiles
5. Probability manipulatives
6. Challenge games

METHODS OF ASSISTANCE AND ENRICHMENT:

1. Tutoring by teacher
2. Peer tutoring - study group
3. Worksheets for review and enrichment

4. Projects and reports

PORTFOLIO DEVELOPMENT:

1. Solution to open-ended problem done as homework
2. Students' corrections of errors or misconceptions
3. Sketch made of students' work with manipulative
4. Drawings done by students
5. Draft, revised, or final revisions of student work including writing and diagrams
6. Description of a student activity showing the understanding of a math concept

METHODS OF EVALUATION:

1. Projects - rubrics set by criteria
2. Homework - completeness
3. Tests and quizzes
4. Interdisciplinary units
5. Open-ended extended task assessments

INTEGRATED ACTIVITIES:

1. Concepts
 - to be efficient in four math operations (fractions, decimals, integers)
 - to use variables in place of numbers with four operations
 - to solve equations using rational numbers
 - to problem solve using equations
 - to use the calculators
 - to use the computer programs for instruction/remediation
2. Communication
 - listen and understand
 - respond orally and in writing
 - exchange information orally
 - read and use a variety of methods to solve problems
 - interpret information
 - produce, perform or exhibit work
3. Thinking/Problem Solving
 - analyze (order of operations)
 - evaluation (variables)
 - compute, measure, estimate
 - apply the concepts
 - problem solve using the operations
 - show relationships
 - make predictions (proportions, probability)
 - construct (geometry)
 - translate
 - recognize patterns

4. Application of Knowledge
 - use (formulas)
 - evaluate (variables)
 - relate (area, scale drawings, measure, probability)
 - exhibit skills
 - examine and evaluate problems
 - demonstrate connections, relationships

5. Interpersonal Skills
 - demonstrate skills
 - work cooperatively
 - communicate effectively
 - work effectively with others