

# MATH

LENGTH OF TIME: one year

GRADE LEVEL: 6

## COURSE STANDARDS:

Students will:

1. Use symbols to represent patterns and create equivalent patterns and make generalizations from them to find a rule. (PA Std. 2.1.8d, 2.3.8a, 2.4.8a, 2.8.8b)
2. Know and use benchmark fractions. (PA Std. 2.2.8b)
3. Understand and perform addition, subtraction, and multiplication operations with fractions and decimals. (PA Std. 2.1.8a, 2.2.8b, 2.4.8d)
4. Investigate relationship among fractions, decimals, and percents, and ratios. (PA Std. 2.1.8a, 2.1.8g, 2.2.8a)
5. Use, classify, measure, and construct angles, triangles, and polygons. (PA Std. 2.3.8a, 2.3.8c, 2.3.8d, 2.3.8e, 2.3.8f)
6. Develop strategies for estimating and calculating percents. (PA Std. 2.1.8a, 2.5.8a, 2.2.8e, 2.2.8f)
7. Measure regular and irregular areas. (PA Std. 2.3.8a, 2.3.8d)
8. Discover links between area and perimeter. (PA Std. 2.3.8e, 2.2.8f)
9. Use customary and metric units. (PA Std. 2.5.8b)
10. Interpret a variety of open-ended tasks with the ability to understand how to solve a problem. (PA Std. 2.5.8a, 2.5.8b, 2.5.8c, 2.5.8d)
11. Computes chance in situations with few outcomes. (PA Std. 2.7.8a)
12. Use repeated trails to estimate chances. (PA Std. 2.6.8d, 2.7.8d)
13. Use tree diagrams to represent two- or three-event situations. (PA Std. 2.7.8b)
14. Know how to determine factors and multiples, understand prime and composite numbers, and greatest common factor and least common multiple. (PA Std. 2.1.8a)
15. Acquire a competence in using calculators (scientific and graphing). (PA Std. 2.6.8f, 2.8.8i)

## RELATED PA ACADEMIC STANDARDS FOR MATHEMATICS

- 2.1 Numbers, Number Systems and Number Relationships
- 2.2 Computation and Estimation
- 2.3 Measurement and Estimation
- 2.4 Mathematical Reasoning and Connections
- 2.5 Mathematical Problem Solving and Communication
- 2.6 Statistics and Data Analysis
- 2.7 Probability and Predictions
- 2.8 Algebra and Functions

## PERFORMANCE ASSESSMENTS:

Students will demonstrate achievement of the standards by:

1. Demonstrating through drawings, manipulative, and other concrete methods addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals. (Course Standard 3,4,5)
2. Using calculators to estimate and/or compute with all number sets and problem solving situations. (Course Standard 4,8)
3. Demonstrating ability to identify a position on a map and to give direction to a given location. (Course Standard 6, 7)
4. Communicating orally/written regarding real world situations that involve the basic operations of whole numbers, fractions, and decimals. (Course Standard 4)
5. Explaining/demonstrating the relationships between ratios, proportions, and percents. (Course Standard 5)
6. Applying estimation strategies to real world situations to verify reasonable/ correctness of answer. (Course Standard 8)
7. Explaining/demonstrating various problem solving strategies that can be used with routine and non-routine real world problems. (Course Standard 1-15)
8. Demonstrating ability to convert between visual and symbolic representations in problem solving. (Course Standard 1, 2)
9. Explaining the difference between experimental and theoretical probability (Course Standard 15)
10. Creating and using models to demonstrate an understanding of geometry as it relates to the physical world. (Course Standard 6, 7)

## DESCRIPTION OF COURSE:

This course will transfer computational skill (paper, pencil, calculator, computer generated) to real world situations. Students will be able to analyze, formulate, and solve problems using various problem solving strategies. It will also allow the students to display their understanding of real world mathematical situations by thinking, communicating, and making connections with prior skills/knowledge.

## TITLES OF UNITS:

- |                             |         |
|-----------------------------|---------|
| 1. Prime Time               | 22 days |
| 2. Data About Us            | 16 days |
| 3. Shapes and Designs       | 19 days |
| 4. Bits and Pieces          | 24 days |
| 5. Covering and Surrounding | 24 days |
| 6. How Likely Is It?        | 17 days |
| 7. Bits and Pieces II       | 30 days |
| 8. Ruins of Montarek        | 24 days |

## SAMPLE INSTRUCTIONAL STRATEGIES:

1. Open-ended extended tasks
2. Calculators
3. Projects
4. Cooperative learning

5. Group presentations - CPS strategy

**MATERIALS:**

1. Textbook: Connected Mathematics, Prentice-Hall, 2002
2. Manipulatives - fraction, decimal, metric, geometric
3. Calculators
4. Mathematical Olympiad
5. Geo-boards
6. "24" Game

**METHODS OF ASSISTANCE AND ENRICHMENT:**

1. Teacher tutoring
2. Peer tutoring - study groups
3. Worksheets for review/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 manipulatives
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 (whole numbers, fractions, decimals)
  - to problem solve using the various strategies
  - to use the calculator (procedures)
  - to use calculator at appropriate times
  - to use computers for instruction/remediation
2. Communication
  - listen and understand
  - respond orally and in writing
  - exchange information orally
  - read and use a variety of methods to understand texts/other written material
  - interpret information
  - produce, perform, or exhibit work

3. Thinking/Problem Solving
  - compute, measure, estimate
  - construct (geometry)
  - to interpret answers in correct context
  - recognize patterns
  - to apply the various problem solving strategies to different situations
  - make predictions (proportion probability)
  
4. Application of Knowledge
  - demonstrate connections, relationships to real world situations
  - evaluate work using various criteria
  
5. Interpersonal Skills
  - team work
  - demonstrate skills
  - work cooperatively
  - communicate effectively