

MATH

LENGTH OF TIME: 1 year

GRADE LEVEL: 5

COURSE STANDARDS:

Students will:

1. Use numbers, number systems, and equivalent forms (including numbers, words, objects, and graphics) to represent theoretical and practical situations. (PA Academic Std 2.1.5)
2. Compute, measure, and estimate to solve theoretical and practical problems using appropriate tools which include modern technology such as calculators and computer software. (PA Academic Std 2.2.5, 2.3.5)
3. Apply the concepts of patterns, functions, and relations to solve theoretical and practical problems. (PA Academic Std 2.8.5, 2.11.5)
4. Formulate and solve problems while being able to communicate the mathematical processes used and the reasons for using them. (PA Academic Std 2.4.5, 2.5.5)
5. Understand, apply and use mathematical vocabulary to describe the basic concepts of algebra, geometry, probability, and statistics to solve theoretical and practical problems. (PA Academic Std 2.6.5, 2.7.5, 2.9.5, 2.10.5)
6. Evaluate and draw references from charts, tables, and graphs showing the relationships between data and real-world situations. (PA Academic Std 2.6.5)
7. Make decisions based upon the collection, organization, analysis, and interpretation of statistical data and predictions of outcomes based upon the application of probability. (PA Academic Std 2.7.3)
8. Conducts one large scale mathematical investigation and communicates the mathematical processes used, the reasoning, and the results found. (PA Academic Std 2.2.5, 2.4.5, 2.5.5, 2.6.5)

RELATED PA ACADEMIC STANDARDS FOR MATHEMATICS

- 2.1.5 Numbers, Number Systems and Number Relationships
- 2.2.5 Computation and Estimation
- 2.3.5 Measurement and Estimation
- 2.4.5 Mathematical Reasoning and Connections
- 2.5.5 Mathematical Problem Solving and Communication
- 2.6.5 Statistics and Data Analysis
- 2.7.5 Probability and Predictions
- 2.8.5 Algebra and Functions
- 2.9.5 Geometry
- 2.10.5 Trigonometry
- 2.11.5 Concepts of Calculus

PERFORMANCE ASSESSMENTS:

Students will demonstrate achievement of the standards by:

1. Completing unit tests using pencil, paper, and calculator activities with/without rubrics. (Course Standards 1-7)
2. Demonstration of the problem solving process with routine and non-routine problems. (Course Standards 1-7)
3. Oral questioning and interviewing. (Course Standards 1-7)
4. Self and peer assessment provided by Everyday Math. (Course Standards 1-7)
5. Teacher observation at completion of task or activity. (Course Standards 1-7)
6. Student portfolio to maintain student work. (Course Standards 1-7)
7. Math journal, math messages. (Course Standards 1-7)
8. Oral or written presentation to demonstrate a solution, concept, project, survey, etc. with/without rubrics. (Course Standards 1-7)
9. Group and individual mathematical investigations. (Course Standards 8)
10. Free response questions with/without rubrics. (Course Standards 1-7)
11. Class and homework assignments. (Course Standards 1-7)

DESCRIPTION OF COURSE:

This course stresses the fundamentals, application, and appreciation of mathematics. Students will solve problems using skills commensurate to those standards indicated above and communicate effectively using mathematical language. Students will demonstrate number sense, problem solving skills, reasoning abilities, and technological skills throughout the course.

Instruction will include, but not be limited to: numeration through the trillions and thousandths, solve addition and subtraction problems with multi-digit whole numbers and decimals; solves extended multiplication and division facts; multiplies multi-digit numbers, renames fractions, decimals and percents, convert between fractions and mixed numbers, measures using US customary and metric units; adding and subtracting fractions and decimals; identify prime and composite numbers; calculate area and perimeter; collect, interpret, and analyze data; predict test and summarize experiments; effectively use a calculator, protractor, compass, reflective mirror and computer; with problem solving skills, estimation abilities, and use of technology integrated throughout the course.

TITLES OF UNITS:

Spiral program – on-going

1. Number and Numeration
2. Operations and Computation
3. Data and Chance
4. Measurement
5. Geometry
6. Patterns, Functions and Algebra

Unit Pacing Completion

Unit 1 – Number Theory – mid September

Unit 2 – Estimation and Computation – mid October

Unit 3 – Geometry Explorations – mid November

Unit 4 – Division – mid December

Unit 5 – Fractions, Decimals and Percents – mid January

Unit 6 – Using Data, Addition and Subtraction of Fractions – mid February

Unit 7 – Exponents and Negative Numbers – end of February

Unit 8 – Fractions and Ratios – mid/end March

Unit 9 – Coordinates, Area, Volume and Capacity – beginning of April

Unit 10 – Using Data, Algebra Concepts and Skills – end of April

Unit 11 – Volume – mid/end May

Unit 12 – Probability and Rate - June

SAMPLE INSTRUCTIONAL STRATEGIES:

1. Teacher/student made activities
2. Teacher/student led discussions and activities
3. Problem solving strategies
4. Calculators and computer software
5. Individual and group explorations and investigations
6. Games and manipulatives
7. Written explanations
8. Teacher/peer modeling
9. Math Word Wall

MATERIALS:

1. Everyday Mathematics: The University of Chicago School Mathematics Project, Everyday Learning Corporation, 2007, Chicago, Illinois.
2. Calculators, TI-15
3. Computers
4. Materials suggested by Everyday Math
5. Computer software, Everyday Math games
6. Standard related games and manipulatives
7. Base 10 blocks
8. Number lines and number grids
9. Reflective mirrors
10. Everyday Math templates
11. Student reference books

METHODS OF ASSISTANCE AND ENRICHMENT:

- A. Assistance
1. IST
 2. Cooperative groups
 3. Peer helpers
 4. Volunteer tutors

5. Flexible/modified grouping
6. Re-teaching with alternative strategies
7. Extended instructional time
8. Differentiated grouping – use of Everyday Math Differentiation Handbook
9. Modified testing
10. Teacher assessment CD – Everyday Math

B. Enrichment

1. Enhanced curriculum
2. Peer tutoring
3. Modified testing
4. Math journal and/or projects
5. Individual mathematical investigations
6. IST
7. PAL
8. Differentiated grouping – provided by Everyday Math Differentiation Handbook
9. Teacher assessment CD – Everyday Math

PORTFOLIO DEVELOPMENT:

1. Teacher/student assessments
2. Math journals
3. Individual/group investigations, projects, and/or activities
4. Written explanation of problem solving strategies
5. Student reflections
6. Pre/post grade level district assessment

METHODS OF EVALUATION:

1. Recognizing student achievement checklists
2. Self assessments – Everyday Math
3. Investigations, projects, and/or journals (on-going assessments)
4. Problem solving activities
5. Written and oral presentations
6. Pre and Post grade level district assessments
7. Written Unit assessments – Everyday Math

INTEGRATED ACTIVITIES:

1. Concepts
 - demonstrate knowledge of the basic concepts and principles for the above mentioned standards
2. Communication
 - compose and make oral presentations using appropriate mathematical language
 - written entries in math journal using appropriate mathematical terms and vocabulary
 - explains solutions and strategies clearly and logically with supporting evidence

- listen to, and understand, oral math presentations
3. Thinking/Problem Solving
 - apply the concepts of the above mentioned standards to formulate and solve problems
 - make critical judgments using the learned skills
 - draw conclusions and show relationships in mathematical settings
 - make decisions and predictions based upon the application of learned skills
 4. Application of Knowledge
 - use learned skills to solve authentic problems
 - exhibit skills with calculators and computer software and application programs
 - examine, evaluate, and solve routine and non-routine problems
 5. Interpersonal Skills
 - work cooperatively with others on projects and investigations
 - work effectively with others on projects and investigations
 - communicate effectively using appropriate mathematical language