MATH

LENGTH OF TIME: 1 year

GRADE LEVEL: 5

COURSE STANDARDS:
Students will:

1. Apply place value to show an understanding of operations and rounding as they pertain to whole numbers and decimals. (Standard - CC.2.1.5.B.1)

2. Extend an understanding of operations with whole numbers to perform operations including decimals. (Standard - CC.2.1.5.B.2)

3. Use the understanding of equivalency to add and subtract fractions. (Standard - CC.2.1.5.C.1)

4. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Standard - CC.2.1.5.C.2)

5. Interpret and evaluate numerical expressions using order of operations. (Standard - CC.2.2.5.A.1)

6. Analyze patterns and relationships using two rules. (Standard - CC.2.2.5.A.4)

7. Graph points in the first quadrant on the coordinate plane and interpret these points when solving real world and mathematical problems. (Standard - CC.2.3.5.A.1)

8. Classify two-dimensional figures into categories based on an understanding of their properties. (Standard - CC.2.3.5.A.2)

9. Solve problems using conversions within a given measurement system. (Standard - CC.2.4.5.A.1)

10. Represent and interpret data using appropriate scale. (Standard - CC.2.4.5.A.2)

11. Solve problems involving computation of fractions using information provided in a line plot. (Standard - CC.2.4.5.A.4)

12. Apply concepts of volume to solve problems and relate volume to multiplication and to addition. (Standard - CC.2.4.5.A.5)

RELATED PA ACADEMIC STANDARDS FOR MATHEMATICS

CC.2.1: Numbers and Operations
CC.2.2: Algebraic Concepts
CC.2.3: Geometry
CC.2.4: Measurement, Data, & Probability

PERFORMANCE ASSESSMENTS

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

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:

CC.2.1: Numbers and Operations

M05.A-T.1.1.1: Demonstrate an understanding that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left. Example: Recognize that in the number 770, the 7 in the tens place is 1/10 the 7 in the hundreds place.
M05.A-T.1.1.2: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. Example 1: $4 \times 102 = 400$ Example 2: $0.05 \div 103 = 0.00005$

M05.A-T.1.1.3: Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. Example: 347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (0.1) + 9 × (0.01) + 2 × (0.001)

M05.A-T.1.1.4: Compare two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols.

M05.A-T.1.1.5: Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-T.2.1.1: Multiply multi-digit whole numbers (not to exceed three-digit by three-digit).

M05.A-T.2.1.2: Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.

M05.A-T.2.1.3: Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1: Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12

M05.A-F.2.1.1: Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers).

M05.A-F.2.1.2: Multiply a fraction (including mixed numbers) by a fraction.

M05.A-F.2.1.3: Demonstrate an understanding of multiplication as scaling (resizing). Example 1: Comparing the size of a product to the size of one factor on the basis of the size of the other factor without performing the indicated multiplication. Example 2: Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.

M05.A-F.2.1.4: Divide unit fractions by whole numbers and whole numbers by unit fractions.

CC.2.2: Algebraic Concepts

M05.B-O.1.1.1: Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions and evaluate expressions containing these symbols.

M05.B-O.1.1.2: Write simple expressions that model calculations with numbers and interpret numerical expressions without evaluating them. Example 1: Express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921 without having to calculate the indicated sum or product.

M05.B-O.2.1.1: Generate two numerical patterns using two given rules. Example: Given the rule “add 3” and the starting number 0 and given the rule “add 6” and the starting number 0, generate terms in the resulting sequences.

M05.B-O.2.1.2: Identify apparent relationships between corresponding terms of two patterns with the same starting numbers that follow different rules. Example: Given two patterns in which the first pattern follows the rule “add 8” and the second pattern follows the rule “add 2,” observe that the terms in the first pattern are 4 times the size of the terms in the second pattern.

CC.2.3: Geometry

M05.C-G.1.1.1: Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I.

M05.C-G.1.1.2: Represent real-world and mathematical problems by plotting points in quadrant I of the coordinate plane and interpret coordinate values of points in the context of the situation.

M05.C-G.2.1.1: Classify two-dimensional figures in a hierarchy based on properties. Example 1: All polygons have at least three sides, and pentagons are polygons, so all pentagons have at least three sides. Example 2: A rectangle is a parallelogram, which is a quadrilateral, which is a polygon; so, a rectangle can be classified as a parallelogram, as a quadrilateral, and as a polygon.

CC.2.4: Measurement, Data, & Probability

M05.D-M.1.1.1: Convert between different-sized measurement units within a given measurement system. A table of equivalencies will be provided. Example: Convert 5 cm to meters.

M05.D-M.2.1.1: Solve problems involving computation of fractions by using information presented in line plots.
M05.D-M.2.1.2: Display and interpret data shown in tallies, tables, charts, pictographs, bar graphs, and line graphs, and use a title, appropriate scale, and labels. A grid will be provided to display data on bar graphs or line graphs.

M05.D-M.2.1.1: Solve problems involving computation of fractions by using information presented in line plots.

M05.D-M.2.1.2: Display and interpret data shown in tallies, tables, charts, pictographs, bar graphs, and line graphs, and use a title, appropriate scale, and labels. A grid will be provided to display data on bar graphs or line graphs.

M05.D-M.3.1.1: Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems. Formulas will be provided.

M05.D-M.3.1.2: Find volumes of solid figures composed of two non-overlapping right rectangular prisms.

UNIT TITLES OF UNITS & PACING

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. Common Core State Standards Everyday Mathematics: The University of Chicago School Mathematics Project, Everyday Learning Corporation, 2012, 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