MATH

LENGTH OF TIME: 1 year

GRADE LEVEL: 3

COURSE STANDARDS:
Students will:
CC.2.1.3.B.1: Apply place value understanding and properties of operations to perform multi-digit arithmetic.
CC.2.1.3.C.1: Explore and develop an understanding of fractions as numbers.
CC.2.2.3.A.1: Represent and solve problems involving multiplication and division.
CC.2.2.3.A.2: Understand properties of multiplication and the relationship between multiplication and division.
CC.2.2.3.A.3: Demonstrate multiplication and division fluency.
CC.2.2.3.A.4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.
CC.2.3.3.A.1: Identify, compare, and classify shapes and their attributes.
CC.2.3.3.A.2: Use the understanding of fractions to partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole.
CC.2.4.3.A.2: Tell and write time to the nearest minute and solve problems by calculating time intervals.
CC.2.4.3.A.3: Solve problems and make change involving money using a combination of coins and bills.
CC.2.4.3.A.4: Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.
CC.2.4.3.A.5: Determine the area of a rectangle and apply the concept to multiplication and to addition.
CC.2.4.3.A.6: Solve problems involving perimeters of polygons and distinguish between linear and area measures.

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, and Probability

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. (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. (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. Free response questions with/without rubrics. (Course Standards 1-7)
10. Class and homework assignments. (Course Standards 1-7)

DESCRIPTION OF COURSE:
This course stresses the fundamentals, application, and appreciation of mathematics. The course focuses on the Pennsylvania Common Core Standards suggested for third grade to include problem solving, communication with the use of math language, reasoning, estimation, number sense and numeration, whole number concepts and computation, geometry, measurement, fractions, patterns, statistics, and probability. Technology will be integrated throughout the course.

Instruction will include, but not be limited to:
- Round two- and three-digit whole numbers to the nearest ten or hundred, respectively.
- Add two- and three-digit whole numbers (limit sums from 100 through 1,000) and/or subtract two- and three-digit numbers from three-digit whole numbers.
- Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).
- Order a set of whole numbers from least to greatest or greatest to least (up through 9,999, and limit sets to no more than four numbers).
- Demonstrate that when a whole or set is partitioned into y equal parts, the fraction 1/y represents 1 part of the whole and/or the fraction x/y represents x equal parts of the whole (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary).
- Represent fractions on a number line (limit denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; and no simplification necessary).
- Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8 and limit numerators to whole numbers less than the denominator). Example 1: 1/2 = 2/4 Example 2: 4/6 = 2/3
- Express whole numbers as fractions, and/or generate fractions that are equivalent to whole numbers (limit denominators to 1, 2, 3, 4, 6, and 8). Example 1: Express 3 in the form 3 = 3/1. Example 2: Recognize that 6/1 = 6.
- Compare two fractions with the same denominator (limit denominators to 1, 2, 3, 4, 6, and 8), using the symbols >, =, or <, and/or justify the conclusions.

- Interpret and/or describe products of whole numbers (up to and including 10×10). Example 1: Interpret 35 as the total number of objects in 5 groups, each containing 7 objects. Example 2: Describe a context in which a total number of objects can be expressed as 5×7.
- Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50 and limit divisors and quotients through 10). Example 1: Interpret $48 \div 8$ as the number of objects in each share when 48 objects are partitioned equally into 8 shares, or as a number of shares when 48 objects are partitioned into equal shares of 8 objects each. Example 2: Describe a context in which a number of shares or a number of groups can be expressed as $48 \div 8$.
- Use multiplication (up to and including 10×10) and/or division (limit dividends through 50 and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.
- Determine the unknown whole number in a multiplication (up to and including 10×10) or division (limit dividends through 50 and limit divisors and quotients through 10) equation relating three whole numbers. Example: Determine the unknown number that makes an equation true.
- Apply the commutative property of multiplication (not identification or definition of the property).
- Apply the associative property of multiplication (not identification or definition of the property).
- Interpret and/or model division as a multiplication equation with an unknown factor. Example: Find $32 \div 8$ by solving $8 \times ? = 32$.
- Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.
- Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.
- Assess the reasonableness of answers. Limit problems posed with whole numbers and having whole-number answers.
- Solve two-step equations using order of operations (equation is explicitly stated with no grouping symbols).
- Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.
- Create or match a story to a given combination of symbols $(+, -, \times, \div, <, >,$ and $=)$ and numbers.
- Identify the missing symbol $(+, -, \times, \div, <, >,$ and $=)$ that makes a number sentence true.
- Explain that shapes in different categories may share attributes and that the shared attributes can define a larger category. Example 1: A rhombus and a rectangle are

both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.

- Recognize rhombi, rectangles, and squares as examples of quadrilaterals and/or draw examples of quadrilaterals that do not belong to any of these subcategories.
- Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. Example 1: Partition a shape into 4 parts with equal areas. Example 2: Describe the area of each of 8 equal parts as 1/8 of the area of the shape.
- Explain that shapes in different categories may share attributes and that the shared attributes can define a larger category. Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.
- Tell, show, and/or write time (analog) to the nearest minute.
- Calculate elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).
- Measure and estimate liquid volumes and masses of objects using standard units (cups [c], pints [pt], quarts [qt], gallons [gal], ounces [oz.], and pounds [lb]) and metric units (liters [l], grams [g], and kilograms [kg]).
- Add, subtract, multiply, and divide to solve one-step word problems involving masses or liquid volumes that are given in the same units.
- Use a ruler to measure lengths to the nearest quarter inch or centimeter
- Compare total values of combinations of coins (penny, nickel, dime, and quarter) and/or dollar bills less than $5.00.
- Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, and dollar).
- Round amounts of money to the nearest dollar
- Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).
- Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more are in category A than in category B?"
- Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.
- Translate information from one type of display to another. Limit to pictographs, tally charts, bar graphs, and tables. Example: Convert a tally chart to a bar graph.
- Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units).
- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

- Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

TITLES OF UNITS:
1. Routines, review and assessment
2. Adding and subtracting whole numbers
3. Linear measures and area
4. Multiplication and division
5. Place value in whole numbers and decimals
6. Geometry
7. Fractions
8. Measurement and data
9. Probability

Unit Pacing Completion
Unit 1 – Routines, Review and Assessment – end of September
Unit 2 – Adding and Subtracting Whole Numbers – 3rd week of October
Unit 3 – Linear Measures and Area – mid November
Unit 4 – Multiplication & Division – mid December
Unit 5 – Place Value in Whole Numbers and Decimals – mid January
Unit 6 – Geometry – mid February
Unit 7 – Multiplication & Division – end of February
Unit 8 – Fractions - 3rd week in March
Unit 9 – Multiplication & Division – mid April
Unit 10 - Measurement and Data – mid May
Unit 11 - Probability – 1st week of June

SAMPLE INSTRUCTIONAL STRATEGIES:
1. Teacher/student made activities
2. Teacher/student led discussions and activities
3. Problem solving strategies
4. Calculators and computers
5. Individual and group explorations and investigations
6. Games and manipulatives
7. Written explanations and journal activities
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

3. Computers
4. Enrichment materials
5. Standard related games and manipulatives
6. Base 10 blocks
7. Pattern blocks and templates
8. EDM reference books
9. Judy clocks
10. Measurement tools
11. Plastic coins

METHODS OF ASSISTANCE AND ENRICHMENT:
A.   Assistance
   1. IST
   2. Cooperative groups
   3. Peer helpers
   4. Volunteers/tutors
   5. Flexible/modified grouping
   6. Re-teaching with alternative strategies
   7. Extended instructional time

B.   Enrichment
   1. Modified curriculum
   2. Peer tutoring
   3. Modified testing
   4. Math journal and/or projects
   5. Individual mathematical investigations
   6. IST
   7. PAL

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. Post grade level assessment

METHODS OF EVALUATION:
1. Teacher/student checklists
2. Individual/group tests
3. Investigations, projects, and/or journals
4. Problem solving activities
5. Written and oral presentations
6. Pre and Post grade level assessment

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 computers
        -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