Course Title: Mathematics	**Length of Course:** 30 Cycles
Grade Level(s): 5	**Periods Per Cycle:** 6
Units of Credit: N/A	**Length of Period:** 80 Minutes
Classification: Required	**Total Instructional Time:** 240 Hours

Course Description

This course is designed to review and refine the basic mathematical and computational skills as they apply to whole numbers, decimals, and fractions. It covers a variety of fundamental mathematical skills that include: Numbers and Operations, Algebraic Concepts, Geometry, Measurement, Data and Probability.

Instructional Strategies, Learning Practices, Activities, and Experiences

Anchor Charts	Guided Practice	PSSA Preparation
Anticipatory Sets	Higher-Level Questioning	Small Group Interventions
Assessments (Chapter, Unit, Teacher-Created)	Homework	Study Island
Bell Ringers	Interaction Sequence	Teacher Demonstrations
Calculators	Journals	Teacher Observations
Class Discussions	Manipulatives	Technology Integration
Closure	Posted Objectives	Videos/DVDs
Critical Thinking	Practice Exercises	Vocabulary (Cards, Strategies, and Lists)
Fact Fluency	Presentations	Wait Time
Flexible Groups	Projects	Wait Time Extended
Graphic Organizers		

Assessments

Assessments (Chapter, Unit, Teacher-Created)	Higher-Level Questioning	Study Island
Closure	Presentations	Teacher Observations
Fact Fluency	Projects	

Materials/Resources

Anchor Charts	Internet Resources	Study Island
Calculators	Journals	Trade Books, Picture Books, Big Books
Graphic Organizers	Manipulatives	Videos/DVDs
Houghton Mifflin 2007	Resource Books (Math in Practice)	Vocabulary (Cards, Strategies, and Lists)

Adopted: 1/27/88
Revised: 9/3/91; 9/16/98; 9/17/03; 8/17/09; 5/20/13**;** 5/20/2019

Unit 1: Numbers and Operations: Base Ten – Place Value Concepts
The Standards of Mathematical Practices

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.
Construct viable arguments and critique the reasoning of others.	Model with mathematics.
Use appropriate tools strategically.	Attend to precision.
Look for and make use of structure.	Look for and express regularity in repeated reasoning.

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<u>2.1 Numbers and Operations - Base Ten</u> • Understand the relationship between the value of digits in different places in a multi-digit number	**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.
• Read and write decimals to the thousandths place in word form, base-ten form, and expanded form	**M05.A-T.1.1.3** - Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. **Example:** $347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (0.1) + 9 \times (0.01) + 2 \times (0.001)$
• Understand powers of ten	**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:** $4 \times 10^2 = 400$ **Example 2:** $0.05 \div 10^3 = 0.00005$
• Compare two decimals to the thousandths	**M05.A-T.1.1.4** - Compare two decimals to thousandths based on meanings of the digits in each place using >, =, and < symbols.
• Round decimals to any place	**M05.A-T.1.1.5** - Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

Unit 2: Numbers and Operations: Fractions

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
2.1 Numbers and Operations – Fractions • Generate common denominators and use them to find equivalent fractions • Use strategies, including common denominators as shown by visual models, to add and subtract fractions, including mixed numbers • Understand that fractions represent division • Multiply a fraction, including mixed numbers, by a whole number or a fraction • Make sense of the product when multiplying fractions • Understand what happens when a unit fraction is divided by a whole number • Understanding what happens when a whole number is divided by a whole number • Model and solve problems involving division with fractions • Problem solve with fractions	**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:** 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. **M05.A-F.2.1.4** - Divide unit fractions by whole numbers and whole numbers by unit fractions.

Unit 3: Numbers and Operations: Base Ten – Multi-Digit Computation	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
2.1 Numbers and Operations – Base Ten • Understand and fluently use a standard algorithm for multiplying multi-digit whole numbers • Explore whole number division with up to 4-digit dividends and 2-digit divisors using place value strategies and an understanding of inverse operations • Use place value understanding to add decimals to hundredths • Use place value understanding to subtract decimals to hundredths • Make connections between the procedures for whole number computations and decimal computations • Use decimal understanding to estimate sums and differences and determine the reasonableness of an answer • Multiply a decimal by a whole number and by a decimal • Divide whole numbers by decimals, decimals by whole numbers, and decimals by decimals • Understand the placement of the decimal point when multiplying and dividing decimals	**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.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-T.1.1.5** - Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

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Unit 4: Measurement and Data

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<u>2.4 Measurement and Data, and Probability</u> • Convert between different units within the same measurement system	**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.
• Use conversions to solve multistep word problems	
• Make line plots with units in halves, fourths, and eighths	**M05.D-M.2.1.2** - Display and interpret data shown in tallies, tables, charts, pictographs, bar graphs, line graphs, and use a title, appropriate scale, and labels. A grid, will be provided to display data on bar graphs or line graphs.
• Solve multistep problems about the data shown on the line plots	**M05.D-M.2.1.1** - Solve problems involving computation of fractions by using information presented in line plots.
• Understand the concept of volume, and measure volume by counting the number of cubes it takes to fill a figure	**M05.D-M.3.1** - Use, describe, and develop procedures to solve problems involving volume.
• Understand that volume is measured in cubic units	
• Explore the volume of rectangular prisms and make connections between volume and area	**M05.D-M.3.1.1** - Apply the formulas V = l × w × h and V = B × 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.**
• Discover the formula for determining the volume of a rectangular prism	
• Solve problems about volume	

Unit 4: Measurement and Data - continued	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
2.4 Measurement and Data, and Probability –continued • Recognize volume as additive and find the volumes of complex figures • Locate and graph points in the first quadrant of the coordinate plane • Solve problems by graphing points • Form ordered pairs, graph them, and identify relationships between them	**M05.D-M.3.1.2** - Find volumes of solid figures composed of two non-overlapping right rectangular prisms. **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.

Unit 5: Operations and Algebraic Thinking

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
2.2 Algebraic Concepts – Operations and Algebraic Thinking • Interpret math expressions and write expressions for mathematical situations	**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.
• Simplify expressions using order of operations	**M05.B-O.1.1.1** - Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions and evaluate expressions containing these symbols.
• Compare two expressions without evaluating them	**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.
• Generate numerical patterns using two given rules	
• Identify apparent relationships between corresponding terms of two patterns with the same starting numbers that follow different rules	**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.
• Locate and graph points in the first quadrant of the coordinate plane and form ordered pairs, graph them, and identify relationships between them	**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.

Unit 6: Geometry	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
2.3 Geometry • Understand that all attributes that belong to a category of two-dimensional shapes also belong to all subcategories of that category • Classify two-dimensional figures in a hierarchy based on the properties of the shapes • Represent real-world and mathematical problems by plotting points in quadrant 1 of the coordinate place 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. **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.