

East Penn School District
Elementary Curriculum

A Planned Course Statement
for

3rd Grade Mathematics

Length of Period (mins.) 60

Periods per Cycle: 5

Length of Course (yrs.) 1.0

Adopted: June 28, 2010

Revised: April, 2013

Developed by:

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Description of Course

Course Title: K-5 Mathematics

Description:

The East Penn School District Mathematics curriculum will balance the learning of both content and process. The content consists of topics in numbers and operations, measurement, geometry, statistics and probability, and algebra. The processes will focus on problem solving, communication, representation, reasoning and proof, and connections. This curriculum will reflect 21st century skills such as collaboration, critical thinking, and the effective use of technology to prepare students to become lifelong learners and contributors to a global society.

Goals:

1. To use technology as a tool to enrich learning and to enhance achievement.
2. To utilize a differentiated project-based approach grounded through student achievement data that reflects the needs of all learners.
3. To provide career exploration opportunities throughout the mathematics curriculum scope and sequence.
4. To provide a rigorous and relevant learning experience that enables students to meet or exceed state standards and to develop 21st century skills.
5. To encourage and foster collaborative home and school relationships that support students' achievement in mathematics.

Requirements:

None

Key to Levels of Achievement (Listed with each learning objective)

Awareness (A):	Students are introduced to concepts, forms, and patterns.
Learning (L):	Students are involved in a sequence of steps and practice activities which involved further development and allow evaluation of process.
Understanding (U):	Students demonstrate ability to apply acquired concepts and skills to individual assignments and projects on an independent level.
Reinforcement (R):	Students maintain and broaden understanding of concepts and skills to accomplish tasks at a greater level of sophistication

Pennsylvania Standards For Mathematical Practice

- Make sense of and persevere in solving complex and novel mathematical problems.
- Use effective mathematical reasoning to construct viable arguments and critique the reasoning of others.
- Communicate precisely when making mathematical statements and express answers with a degree of precision appropriate for the context of the problem/situation.
- Apply mathematical knowledge to analyze and model situations/relationships using multiple representations and appropriate tools in order to make decisions, solve problems, and draw conclusions.
- Make use of structure and repeated reasoning to gain a mathematical perspective and formulate generalized problem solving strategies.

Big Ideas		Essential Questions				
<ul style="list-style-type: none"> • Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations. • Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools. • Mathematical relationships among numbers can be represented, compared, and communicated. 		<ul style="list-style-type: none"> • How are relationships represented mathematically? • How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations. • What does it mean to estimate numerical quantities? • When is it appropriate to estimate versus calculate? • How is mathematics used to quantify, compare, represent, and model numbers? 				
M03.A-T Number and Operations in Base Ten		Use place value understanding and properties of operations to perform multi-digit arithmetic.	L/U U/R L U/R	M03.A-T.1.1 Apply place value strategies to solve problems <ul style="list-style-type: none"> • 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; limit sets to no more than four numbers) 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	M03.A-T.1.1.1 M03.A-T.1.1.2 M03.A-T.1.1.3 M03.A-T.1.1.4 CC.2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

<p>M03.A-F Number and Operations – Fractions</p>		<p>Develop understanding of fractions as numbers.</p>	<p>L/U</p> <p>L/U</p> <p>L</p> <p>L</p>	<p>M03.A-F.1.1 Develop and apply number theory concepts to compare quantities and magnitudes of fractions and whole numbers.</p> <ul style="list-style-type: none"> • 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 the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary). • Represent fractions on a number line (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary). • Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator). <i>Example 1: $1/2 = 2/4$</i> <i>Example 2: $4/6 = 2/3$</i> • Express whole numbers as fractions, and/or generate fractions that are equivalent to whole numbers (limit the denominators to 1, 2, 3, 4, 6, and 8). <i>Example 1: Express 3 in the form $3 = 3/1$.</i> <i>Example 2: Recognize that $6/1 = 6$</i> 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	<p>M03.A-F.1.1.1 M03.A-F.1.1.2 M03.A-F.1.1.3 M03.A-F.1.1.4 M03.A-F.1.1.5</p> <p>CC.2.1.3.C.1 Explore and develop an understanding of fractions as numbers.</p>
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			L/U	<ul style="list-style-type: none"> Compare two fractions with the same denominator (limit the denominators to 1, 2, 3, 4, 6, and 8), using the symbols $>$, $=$, or $<$, and/or justify the conclusions. 		
Big Ideas:		Essential Questions:			•	
<ul style="list-style-type: none"> Mathematical relationships can be represented as expressions, equations, and inequalities in mathematical situations. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools. Mathematical relationships among numbers can be represented, compared, and communicated Patterns exhibit relationships that can be extended, described, and generalized. 		<ul style="list-style-type: none"> How are relationships represented mathematically? How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations. What makes a tool and/or strategy appropriate for a given task? How is mathematics used to quantify, compare, represent, and model numbers? How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? 			•	
M03.B-O Operations and Algebraic Thinking		Represent and solve problems involving multiplication and division		M03.B-O.1.1 Understand various meanings of multiplication and division	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment 	M03.B-0.1.1.1 M03.B-0.1.1.2 CC.2.2.3.A.1 Represent and solve problems involving multiplication and division.

			L	<ul style="list-style-type: none"> Interpret and/or describe products of whole numbers up to and including 10×10. <i>Example 1: Interpret 35 as the total number of objects in 5 groups, each containing 7 objects.</i> <i>Example 2: Describe a context in which a total number of objects can be expressed as 5×7.</i> 	<ul style="list-style-type: none"> Alternative Assessment 	
			L	<ul style="list-style-type: none"> Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10). <i>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.</i> <i>Example 2: Describe a context in which a number of shares or a number of groups can be expressed as $48 \div 8$.</i> 		
M03.B-O Operations and Algebraic Thinking		Represent and solve problems involving multiplication and division	L	<p>M03.B-O.1.2 Solve mathematical and real world problems using multiplication and division, including determining the missing number in a multiplication and/or division equation.</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.B-0.1.2.1 M03.B-0.1.2.2</p> <p>CC.2.2.3.A.1 Represent and solve problems involving multiplication and division</p>

			L	<ul style="list-style-type: none"> 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. <i>Example: Determine the unknown number that makes an equation true.</i> 		
M03.B-O Operations and Algebraic Thinking		Understand properties of multiplication and the relationship between multiplication and division.	L L	<p>M03.B-O.2.1 Use properties to simplify and solve multiplication problems</p> <ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.B-O.2.1.1 M03.B-O.2.1.2</p> <p>CC.2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division</p>
M03.B-O Operations and Algebraic Thinking		Understand properties of multiplication and the relationship between multiplication and division.	L	<p>M03.B-O.2.2 Relate division to a missing number multiplication equation.</p> <ul style="list-style-type: none"> Interpret and/or model division as a multiplication equation with an unknown factor. <i>Example: Find $32 \div 8$ by s solving $8 \times ? = 32$</i> 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.B-O.2.2.1</p> <p>CC.2.2.3.A.3 Understand properties of multiplication and the relationship between multiplication and division</p>

<p>M03.B-O Operations and Algebraic Thinking</p>		<p>Solve problems involving the four operations and identify and explain patterns in arithmetic</p>	<p>L/U U L L L L</p>	<p>M03.B-O.3.1 Use operations, patterns, and estimation strategies to solve problems (may include word problems).</p> <ul style="list-style-type: none"> 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. <i>Example 1: Observe that 4 times a number is always even.</i> <i>Example 2: Explain why 6 times a number can be decomposed into three equal addends.</i> Create or match a story to a given combination of symbols (+, -, ×, ÷, <, >, =) and numbers. Identify the missing symbol (+, -, ×, ÷, <, >, =) that makes a number sentence true. 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.B-O.3.1.1 M03.B-O.3.1.2 M03.B-O.3.1.3 M03.B-O.3.1.4 M03.B-O.3.1.5 M03.B-O.3.1.6 M03.B-O.3.1.7</p> <p>CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.</p>
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Big Ideas:		Essential Questions:				
<ul style="list-style-type: none"> Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization 		<ul style="list-style-type: none"> How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems? How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving? How can geometric properties and theorems be used to describe, model, and analyze situations? 				
MO3.C-G Geometry		Reason with shapes and their attributes	L L L	M03.C-G.1.1 <ul style="list-style-type: none"> Analyze characteristics of polygons. Explain that shapes in different categories may share attributes, and that the shared attributes can define a larger category. <i>Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides.</i> <i>Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.</i> 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. <i>Example 1: Partition a shape into 4 parts with equal areas.</i> 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	M03.C-G.1.1.1 M03.C-G.1.1.2 M03.C-G.1.1.3 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

				<i>Example 2: Describe the area of each of 8 equal parts as 1/8 of the area of the shape.</i>		
Big Ideas:		Essential Questions:				
<ul style="list-style-type: none"> • Data can be modeled and used to make inferences. • Measurement attributes can be quantified and estimated using customary and non-customary units of measure. 		<ul style="list-style-type: none"> • How does the type of data influence the choice of display? • How can probability and data analysis be used to make predictions? • Why does “what” we measure influence “how” we measure? • In what ways are mathematical attributes of objects or processes measured, calculated, and/or interpreted? • How precise do measurements and calculations need to be? 				
M03.D-M Measurement and Data		Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses and lengths of objects	L/U L/U	M03.D-M.1.1 <ul style="list-style-type: none"> • Determine and calculate time and elapsed time. 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). 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	M03.D-M.1.1.1 M03.D-M.1.1.2 CC.2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.
M03.D-M Measurement and Data		Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses and lengths of objects	L	M03.D-M.1.2 <ul style="list-style-type: none"> • Use the attributes of liquid volume, mass, and length of objects. 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]). 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	M03.D-M.1.2.1 M03.D-M.1.2.2 M03.D-M.1.2.3 CC.2.4.3.A.1 Solve problems involving measurement and estimation of temperature, liquid volume, mass, or length.

			L L	<ul style="list-style-type: none"> 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. 		
M03.D-M Measurement and Data		Solve problems involving measurement and estimation of intervals of time, money, liquid volumes, masses and lengths of objects	U U U	<p>M03.D-M.1.3 Count, compare, and make change using a collection of coins and one-dollar bills</p> <ul style="list-style-type: none"> Compare total values of combinations of coins (penny, nickel, dime, 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. 	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.D-M.1.3.1 M03.D-M.1.3.2 M03.D-M.1.3.3</p> <p>CC.2.4.3.A.3 Solve problems involving money using a combination of coins and bills.</p>
M03.D-M Measurement and Data		Represent and interpret data	U U	<p>M03.D-M.2.1 Organize, display, and answer questions based on data</p> <ul style="list-style-type: none"> 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). <p><i>Example 1: (One-step)</i> “Which category is the largest?”</p> <p><i>Example 2: (Two-step)</i> “How many more are in category A than in category B?”</p>	<ul style="list-style-type: none"> Teacher Observations Quizzes Tests Assignments Problem Solving DOL Problem of the Day Computer Assessment Alternative Assessment 	<p>M03.D-M.2.1.1 M03.D-M.2.1.2 M03.D-M.2.1.3 M03.D-M.2.1.4</p> <p>CC.2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.</p>

			U	<ul style="list-style-type: none"> • 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. <i>Example: Convert a tally chart to a bar graph.</i> 		
M03.D-M Measurement and Data		Geometric measurement: understand concepts of area and relate area to multiplication and to addition	L L	M03.D-M.3.1 Find the areas of plane figures <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	M03.D-M.3.1.1 M03.D-M.3.1.2 CC.2.4.3.A.5 Determine the area of a rectangle and apply the concept to multiplication and addition.
M03.D-M Measurement and Data		Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures	L/U	M03.D-M.4.1 <ul style="list-style-type: none"> • Find and use the perimeters of plane figures. 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. 	<ul style="list-style-type: none"> • Teacher Observations • Quizzes • Tests • Assignments • Problem Solving • DOL • Problem of the Day • Computer Assessment • Alternative Assessment 	M03.D-M.4.1.1 CC.2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

