East Penn School District
Secondary Curriculum

A Planned Course Statement
for
Mathematics

Course #	Grades	Department
6300	6th	Mathematics

Length of Period (mins): 43

Total Clock Hours: 129

Periods per Cycle: 6

Length of Course (years): 1.0

Type of Offering: **X** Required ___ Elective

Credit: 1.0

Adopted: 6/28/2010
Revised: 6/ 2014

Developed by:
Heather Bealer
Ellen Nixon
Sarah Pomerhn
Gregg Scholl
Cindy Snow
Lisa Walker

Description of Course: Mathematics

Course Title: 6th Grade Mathematics- #6300

Description: This course is designed to focus on manipulating whole numbers, decimals, and fractions, using probability, percent, measurement, geometry, problem solving, and understanding patterns and number theory. Opportunities to integrate computers and technology will also be provided.

The course material will provide the foundation needed for the future study of mathematics and will prepare and wi prepare students for taking Pre-Algebra in 7th grade.

Goals: Students will be able to independently use their learning to:

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

Requirements: None

Text:
(If Applicable) Holt McDougal Mathematics (Course 1)

2.1 Numbers and Operations

Big Ideas	Standard	Concepts What students should know (key knowledge) Essential Questions	Competencies What students should be able to do (key skills) Students will:	Assessment	Learning Activities	Duration
Ratios and Proportional Relationships Ratios, Proportions, and Percent	CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How can mathematics support effective communication? ● 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 can patterns be used to describe relationships in mathematical situations?	● **M06.A-R.1.1.1** use ratio language and notation (such as 3 to 4, 3:4, 3/4) to describe a ratio relationship between two quantities. Example 1: "The ratio of girls to boys in a math class is 2:3 because for every 2 girls there are 3 boys." Example 2: "For every five votes candidate A received, candidate B received four votes." ● **M06.A-R.1.1.2** find the unit rate a/b associated with a ratio a:b (with b ≠ 0) and use rate language in the context of a ratio relationship. Example 1: "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." Example 2: "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." ● **M06.A-R.1.1.3** construct tables of equivalent ratios relating quantities	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 7-1 Ratios and Rates ● 7-2 Using Tables to Explore Equivalent Ratios and Rates ● chapter 7 extension - Graphing Equivalent Ratios and Ratios ● 7-4 Proportions ● 7-5 Percents ● 7-6 Percent, Decimals, and Fractions ● 7-7 Percent of a Number ● 7-8 Solving Percent Problems	

			with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios. ● **M06.A-R.1.1.4** solve unit rate problems including those involving unit pricing and constant speed. Example: If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? ● **M06.A-R.1.1.5** find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percentage.			
The Number System Ratios, Proportions, and Percent	CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How can mathematics support effective communication? ● How are relationships represented mathematically? ● How can expressions,	● **M06.A-N.1.1.1** interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions. Example 1: Given a story context for (2/3) ÷ (3/4), explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = (a/b) × (d/c) = ad/bc.) Example 2:	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 5-6 Dividing Fractions and Mixed Numbers ● 5-7 Solving Fraction Equations: Multiplication and Division	

		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 can patterns be used to describe relationships in mathematical situations?	How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? Example 3: How many 2 1/4-foot pieces can be cut from a 15 1/2-foot board?			
The Number System Number Theory Concepts and Operations	CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How can mathematics support effective communication? ● What makes a tool and/or strategy appropriate for a given task? ● What does it mean to estimate or analyze numerical quantities?	● **M06.A-N.2.1.1** solve problems involving operations (+, –, ×, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 1-2 Divide Multi-Digit Whole Numbers ● 3-3 Adding and Subtracting Decimals ● 3-4 Multiplying Decimals ● 3-5 Dividing Decimals by Whole Numbers ● 3-6 Dividing by Decimals ● 3-7 Interpreting the Quotient	
The Number System Number Theory Concepts and Operations	CC.2.1.6.E.3 Develop and/or apply number theory concepts to find common factors and multiples.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How can mathematics support effective communication? ● What makes a tool and/or strategy	● **M06.A-N.2.2.1** find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration	● 1-5 Properties and Mental Math ● 4-2 Greatest Common Factor ● 5-1 Least Common Multiple	

		appropriate for a given task? ● What does it mean to estimate or analyze numerical quantities?	● **M06.A-N.2.2.2** apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. Example: Express 36 + 8 as 4(9 + 2).	● Resources found on Moodle Math Sharing		
The Number System Integers and Other Rational Numbers	CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How can mathematics support effective communication? ● 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?	● **M06.A-N.3.1.1** represent quantities in real-world contexts using positive and negative numbers, explaining the meaning of 0 in each situation (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge). ● **M06.A-N.3.1.2** determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself (e.g., –(–3) = 3; 0 is its own opposite). ● **M06.A-N.3.1.3** locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane.	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 7-3 Ordered Pairs ● 9-1 Integers and Absolute Value ● 9-2 Comparing and Ordering Integers ● chapter 9 extension - Negative Rational Numbers ● 9-3 - The Coordinate Plane ● 9-4 Polygons in the Coordinate Plane ● 9-5 Transformations in the Coordinate Plane	

			• **M06.A-N.3.2.1** write, interpret, and explain statements of order for rational numbers in real-world contexts. Example: Write –3°C > –7°C to express the fact that –3°C is warmer than –7°C. • **M06.A-N.3.2.2** interpret the absolute value of a rational number as its distance from 0 on the number line and as a magnitude for a positive or negative quantity in a real-world situation. Example: For an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars, and recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars. • **M06.A-N.3.2.3** solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.			

2.2 Algebraic Concepts

Big Ideas	Standard	**Concepts** What students should know (key knowledge) Essential Questions	**Competencies** What students should be able to do (key skills) Students will:	Assessment	Learning Activities	Duration
Expressions and Equations Algebraic Expressions	CC.2.2.6.B.1 Apply and extend previous understandings of arithmetic to algebraic expressions.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How are relationships represented mathematically? ● How can mathematics support effective communication? ● How can recognizing repetition or regularity assist in solving problems more efficiently?	● **M06.B-E.1.1.1** write and evaluate numerical expressions involving whole-number exponents. ● **M06.B-E.1.1.2** write algebraic expressions from verbal descriptions. Example: Express the description “five less than twice a number” as 2y-5. ● **M06.B-E.1.1.3** identify parts of an expression using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity). Example: Describe the expression 2(8+7) as a product of two factors. ● **M06.B-E.1.1.4** evaluate expressions at specific values of their variables, including expressions that arise from formulas	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 1-3 Exponents ● 1-4 Order of Operations ● 1-5 Properties and Mental Math ● 2-1 Variables and Expressions ● 2-2 Translating Between Words and Math ● 2-3 Translating Between Tables and Expressions ● 4-3 Equivalent Expressions	

			in real-world problems. Example: Evaluate the expression b2 - 5 when b = 4. ● **M06.B-E.1.1.5** apply the properties of operations to generate equivalent expressions. Example 1: Apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x. Example 2: Apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y). Example 3: Apply the properties of operations to y + y + y to produce the equivalent expression 3y.			
Expressions and Equations Algebraic Equations	CC.2.2.6.B.2 Understand the process of solving a one-variable equation or inequality and apply it to real-world and mathematical problems.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How are relationships represented mathematically? ● How can mathematics support effective communication? ● How can recognizing repetition or	● **M06.B-E.2.1.1** use substitution to determine whether a given number in a specified set makes an equation or inequality true. ● **M06.B-E.2.1.2** write algebraic expressions to represent real-world or mathematical problems. ● **M06.B-E.2.1.3** solve real-world and mathematical	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 2-4 Equations and Their Solutions ● 2-5 Addition Equations ● 2-6 Subtraction Equations ● 2-7 Multiplication Equations ● 2-8 Division Equations ● 3-3 Adding and Subtracting Decimals ● 3-4 Multiplying Decimals ● 3-5 Dividing Decimals by Whole Numbers	

		regularity assist in solving problems more efficiently? ● How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? ● How can data be organized and represented to provide insight into the relationship between quantities?	problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q, and x are all non-negative rational numbers. ● **M06.B-E.2.1.4** write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines.		● 3-6 Dividing by Decimals ● 3-7 Interpreting the Quotient ● 3-8 Solving Decimal Equations ● 5-4 Solving Fraction Equations: Addition and Subtraction ● 5-7 Solving Fraction Equations: Multiplication and Division	
Expressions and Equations Algebraic Equations	CC.2.2.6.B.3 Represent and analyze quantitative relationships between dependent and independent variables.	● How is mathematics used to quantify, compare, represent, and model numbers? ● How are relationships represented mathematically? ● How can mathematics support effective communication? ● How can recognizing repetition or regularity assist in solving problems more efficiently? ● How can expressions, equations, and inequalities be	● **M06.B-E.3.1.1** write an equation to express the relationship between the dependent and independent variables. Example: In a problem involving motion at a constant speed of 65 units, write the equation d = 65t to represent the relationship between distance and time. ● **M06.B-E.3.1.2** analyze the relationship	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 9-2 Comparing and Ordering Integers ● 10-1 Tables and Functions ● 10-2 Graphing Functions ● Chapter 10 Extension ● 10-4 Inequalities	

		used to quantify, solve, model, and/or analyze mathematical situations? ● How can data be organized and represented to provide insight into the relationship between quantities?	between the dependent and independent variables using graphs and tables and/or relate these to an equation.			

2.3 Geometry

Big Ideas	Standard	Concepts What students should know (key knowledge) Essential Questions	Competencies What students should be able to do (key skills) Students will:	Assessment	Learning Activities	Duration
Geometry Area, Surface Area, and Volume	CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.	● How can recognizing repetition or regularity assist in solving problems more efficiently? ● 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?	● **M06.C-G.1.1.1** determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided. ● **M06.C-G.1.1.2** determine the area of irregular or compound polygons. Example: Find the area of a room in the shape of an irregular polygon by composing and/or decomposing. ● **M06.C-G.1.1.3** determine the volume of right	● Teacher Observation ● Projects ● Summative assessments ● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 8-3 Area of Rectangles and Parallelograms ● 8-4 Area of Triangles and Trapezoids ● 8-5 Area of Composite figures ● 8-6 Volume of Prisms ● 8-7 Surface Area	

		● How can geometric properties and theorems be used to describe, model, and analyze situations?	rectangular prisms with fractional edge lengths. Formulas will be provided. ● **M06.C-G.1.1.4** given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals). Formulas will be provided. ● **M06.C-G.1.1.5** represent three-dimensional figures using nets made of rectangles and triangles. ● **M06.C-G.1.1.6** determine the surface area of triangular and rectangular prisms (including cubes). Formulas will be provided.			

2.4 Measurement, Data, and Probability

Big Ideas	Standard	Concepts What students should know (key knowledge) Essential Questions	Competencies What students should be able to do (key skills) Students will:	Assessment	Learning Activities	Duration
Statistics and Probability Data and Distributions	CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and	● What does it mean to estimate or analyze numerical quantities? ● What makes a tool and/or strategy	● **M06.D-S.1.1.1** display numerical data in plots on a number line, including line plots, histograms, and	● Teacher Observation ● Projects ● Summative assessments	● 6-1 Mean, Median, Mode, and Range ● 6-2 Additional Data and Outliers	

	summarizing distributions.	appropriate for a given task? ● How can data be organized and represented to provide insight into the relationship between quantities? ● How does the type of data influence the choice of display? ● How can probability and data analysis be used to make predictions?	box-and-whisker plots. ● **M06.D-S.1.1.2** determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation). ● **M06.D-S.1.1.3** describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered. ● **M06.D-S.1.1.4** relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	● Entrance/Exit Slips ● Questioning ● Collaboration ● Resources found on Moodle Math Sharing	● 6-3 Measures of Variation ● 6-4 Line Plots, Frequency Tables, and Histograms ● 6-5 Describing Distributions	