6th Grade Math Unit and Lesson Plans, rev. 2019
DHH Lengel Middle School
Pottsville, PA

Block Length: 75 minutes
Blocks per cycle: 5
Length of Course: One Year
Developed by: Nathan Kraft, lead teacher

The Grade 6 curriculum is based on the newly adopted Pearson enVision 2.0 program. It begins with a review of arithmetic of decimals and fractions learned in 5th grade with a heavy emphasis on application. Students then explore the concepts of rational numbers, numeric and algebraic expressions, equations and inequalities, ratios and rates, percents, area, volume, and data analysis.

Resources: Pearson enVision 2.0,
Online Resources Include: Pearson Realize, Desmos, Khan Academy, Get More Math, Socrative

Marking Period	Units	Standards and Eligible Content	Assessments	Lessons	Objectives	Vocabulary
1	1 Use Positive Rational Numbers	CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers. CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions. M06.A-N.2.1.1 Solve problems involving operations (+, –, ×, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems. 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: 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?	Quizzes, Test, Open-Ended Questions, Khan Academy	1-1: Fluently Add, Subtract, and Multiply Decimals	Add and subtract decimals with precision. Multiply decimals. Add, subtract, and multiply decimals to solve real-world problems.	Product, Sum, Difference, Decimal, Estimate, Factor, Addends, Regroup, Whole Number
				1-2: Fluently Divide Whole Numbers and Decimals	Use place-value structure to divide whole numbers and decimals. Divide whole numbers and decimals to solve real-world problems.	Dividend, Divisor, Quotient
				1-3: Multiply Fractions	Use models to multiply fractions. Multiply the numerators and then the denominators to find the product of two fractions. Multiply mixed numbers.	
				1-4: Understand Division with Fractions	Use models to divide with fractions. Use equations to divide with fractions.	
				1-5: Divide Fractions by Fractions	Use models to divide fractions by fractions. Use an algorithm to divide fractions by fractions.	Reciprocal
				1-6: Divide Mixed Numbers	Divide with mixed numbers.	
				1-7: Solve Problems with Rational Numbers	Solve multistep problems with fractions and decimals.	

1	2 Integers and Rational Numbers	CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers. 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. 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.3.2.1 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.3.2.3 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.	Quizzes, Test, Open-Ended Questions, Khan Academy	2-1: Understand Integers	Identify opposites of integers. Compare and order integers. Use integers to represent real-world quantities and explain the meaning of 0 in each context.	Integers, Opposites
				2-2: Represent Rational Numbers on the Number Line	Plot rational numbers on a number line. Compare and order rational numbers. Use rational numbers to represent real-world quantities.	Rational Number
				2-3: Absolute Values of Rational Numbers	Use absolute value to represent a number's distance from 0. Interpret absolute value in real-world situations.	Absolute Value
				2-4: Represent Rational Numbers on the Coordinate Plane	Identify and graph points with rational coordinates on the coordinate plane.	Coordinate Plane, Ordered Pair, Origin, Quadrants, x- and y- axes
				2-5: Find Distances on the Coordinate Plane	Use absolute value to find the distance between two points that lie on the same horizontal or vertical line on a coordinate plane. Solve real-world and mathematical problems involving distances on the coordinate plane.	

1 & 2	3 Numeric and Algebraic Expressions	CC.2.2.6.B.1 Apply and extend previous understandings of arithmetic to algebraic expressions. 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.2.1.2 Write algebraic expressions to represent real-world or mathematical problems. M06.B-E.1.1.4 Evaluate expressions at specific values of their variables, including expressions that arise from formulas used 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 properties of operations to y + y + y to produce the equivalent expression 3y.	Quizzes, Test, Open-Ended Questions, Khan Academy	3-1: Understand and Represent Exponents	Write expressions using whole-number exponents to represent real-world and mathematical problems. Evaluate expressions with whole-number exponents.	Base, Evaluate, Exponent, Power
				3-2: Find Greatest Common Factor and Least Common Multiple	Find the prime factorization of a whole number. Find the greatest common factor and the least common multiple of two whole numbers. Use the GCF and the Distributive Property to add. Use the GCF and the LCM to solve problems.	Composite Number, Factor Tree, Greatest Common Factor (GCF), Least Common Multiple (LCM), Prime Factorization, Prime Number
				3-3: Write and Evaluate Numerical Expressions	Evaluate expressions using the order of operations.	Numerical Expression
				3-4: Write Algebraic Expressions	Write an algebraic expression to model a pattern. Write an algebraic expression from a word phrase. Use precise mathematical language when identifying parts of an expression.	Algebraic Expression, Coefficient, Term, Variable
				3-5: Evaluate Algebraic Expressions	Evaluate algebraic expressions, including those with whole numbers, decimals, and fractions.	Substitution
				3-6: Generate Equivalent Expressions	Write equivalent algebraic expressions. Identify equivalent algebraic expressions. Justify whether two expressions are equivalent.	Equivalent Expressions
				3-7: Simplify Algebraic Expressions	Use properties of operations to simplify algebraic expressions by combining like terms.	Like Terms, Simplify

2	4 Represent and Solve Equations and Inequalities	CC.2.2.6.B.2 Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. CC.2.2.6.B.3 Represent and analyze quantitative relationships between dependent and independent variables. M06.B-E.2.1.3 Solve real-world and mathematical 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.2.1.1 Use substitution to determine whether a given number in a specified set makes an equation or inequality true. 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. 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 between the dependent and independent variables using graphs and tables and/or relate these to an equation.	Quizzes, Test, Open-Ended Questions, Khan Academy	4-1: Understand Equations and Solutions	Identify equations and variables. Use substitution to find solutions to equations.	Equations, Solution of an Equation
				4-3: Write and Solve Addition and Subtraction Equations	Write one variable addition equations. Use inverse relationships to solve one-step addition equations.	Inverse Relationship
				4-4: Write and Solve Multiplication and Division Equations	Write one-variable mutliplication equations. Use inverse relationships to solve one-step multiplication equations.	
				4-5: Write and Solve Equations with Rational Numbers	Write and solve equations that involve fractions, decimals, and mixed numbers.	
				4-6: Understand and Write Inequalities	Understand the symbols required to write an inequality. Write inequalities to describe mathematical or real-world situations.	Inequality
				4-7: Solve Inequalities	Describe solutions to an inequality. Represent solutions to an inequality on a number line.	
				4-8: Understand Independent and Dependent Variables	Identify dependent and independent variables.	Dependent Variable, Independent Variable
				4-9: Use Patterns to Write and Solve Equations	Analyze the relationships between variables by using tables. Write equations to represent the relationships between variables.	
				4-10: Relate Tables, Graphs, and Equations	Analyze the relationship between dependent and independent variables using tables, graphs, and equations.	

2	5 Understand and Use Ratio and Rate	CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems. 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 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?	Quizzes, Test, Open-Ended Questions, Khan Academy	5-1: Understand Ratios	Use ratios to describe the relationship between two quantities. Use bar diagrams and double number line diagrams to model ratio relationships.	Ratio, Terms
				5-2: Generate Equivalent Ratios	Use multiplication and division to find equivalent ratios. Solve problems by finding equivalent ratios.	Equivalent Ratios
				5-3: Compare Ratios	Use ratio tables to compare ratios. Compare ratios to solve problems.	
				5-4: Represent and Graph Ratios	Represent equivalent ratios on graphs. Use ratio tables and graphs to solve problems.	
				5-5: Understand Rates and Unit Rates	Use rates to describe ratios in which the terms have different units. Use rates and unit rates to solve problems.	Rate, Unit Rate
				5-6: Compare Unit Rates	Use ratio reasoning to compare rates and solve problems.	Unit Price
				5-7: Solve Unit Rate Problems	Use unit rates to solve problems involving constant speed. Use unit rates to solve problems involving unit price. Solve unit rate problems using an equation.	Constant Speed

2 & 3	6 Understand and Use Percent	CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems. 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.	Quizzes, Test, Open-Ended Questions, Khan Academy	6-1: Understand Percent	Represent the percent of a whole. Find the percent of a whole.	Percent
				6-2: Relate Fractions, Decimals, and Percents	Write equivalent values as fractions, decimals, and percents. Write fractions as decimals and percents when the denominator of the fraction is not 100.	
				6-3: Represent Percents Greater Than 100 or Less Than 1	Write percents that are greater than 100. Write percents that are less than 1.	
				6-5: Find the Percent of a Number	Use the decimal form of a percent to find the percent of a number. Write an equation to solve a percent problem.	
				6-6: Find the Whole Given a Part and the Percent	Find the whole amount when given a part and the percent.	
3	7 Solve Area, Surface Area, and Volume Problems	CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume. 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.1.1.4 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. M06.C-G.1.1.3 Determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided.	Quizzes, Test, Open-Ended Questions, Khan Academy	7-1: Find Areas of Paralellograms and Rhombuses	Find the areas of paralellograms and rhombuses.	Area
				7-2: Solve Triangle Area Problems	Find the areas of triangles.	
				7-3: Find Areas of Trapezoids and Kites	Find the areas of trapezoids and kites.	Kite
				7-4: Find Areas of Polygons	Find the areas of polygons composed of triangles and special quadrilaterals.	
				7-5: Represent Solid Figures Using Nets	Identify polyhedron made up of triangles and rectangles. Represent solid figures using nets.	Base, Edge, Face, Net, Polyhedron, Vertex
				7-6: Find Surface Areas of Prisms	Find the surface area of triangular prisms and rectangular prisms. Find the surface area given the net of a polyhedron.	
				7-8: Find Volume with Fractional Edge Lengths	Find the volume of rectangular prisms with fractional edge lengths.	

3 & 4	8 Display, Describe, and Summarize Data	CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions. M06.D-S.1.1.1 Display numerical data in plots on a number line, including line plots, histograms, and 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.	Quizzes, Test, Open-Ended Questions, Khan Academy	8-1: Recognize Statistical Questions	Identify and write statistical questions.	Statistical Question
				8-2: Summarize Data Using Mean, Median, Mode, and Range	Identify the mean, median, mode and range of a dataset.	Mean, Median, Mode, Range
				8-3: Display Data in Box Plots	Make and interpret box plots.	Box Plot, Quartile
				8-4: Display Data in Frequency Tables and Histograms	Make and analyze frequency tables and histograms.	Frequency Table, Histogram
				8-5: Summarize Data Using Measures of Variability	Use measures of variability to describe a dataset.	Absolute Deviation, Interquartile Range, Mean Absolute Deviation
				8-6: Choose Appropriate Statistical Measures	Select and use appropriate statistical measures.	Outlier
				8-7: Summarize Data Distributions	Summarize numerical datasets.	Data distribution, Symmetric, Clustered, Peak, Skewed, Gaps

4	9 Seventh Grade Preparation	CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers. CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume. CC.2.4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models.	Quizzes, Test, Open-Ended Questions, Khan Academy	9-1: Adding and Subtracting Integers	Add and subtract integers and model solutions on the number line. Find missing values of equations.	
				9-2: Multiplying and Dividing Integers	Multiply and divide integers. Find missing values of equations.	
				9-3: Circles, Circumference and Area	Identify the radius and circumference of a circle. Find the radius, circumference, diameter, or area given one other value. (If given area, the radius should be a whole number.)	Circumference, Area, Diameter, Radius
				9-4: Probability	Find the probability of simple and compound events. Use simulations to find experimental probability.	Probability, Theoretical Probability, Experimental Probability, Compound Events