POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

MATH: GRADE 6	STATE STANDARD AREA/UNIT:	Algebraic Concepts: Expressions and Equations	TIME FRAME:	Ongoing

NATIONAL COMMON CORE STANDARDS:

Apply and extend previous understandings of algebraic expressions.

- **6.EE.1** Write and evaluate numerical expressions involving whole-number exponents.
- **6.EE.2** Write, read, and evaluate expressions in which letters stand for numbers.
  - ***a.*** Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*
  - ***b.*** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view on or more parts of an expression as a single entity. *For example, describe the expression 2(8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*
  - ***c.*** *Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations) For example, use the formulas $V = s^3$ and $A = 6\ s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.*
- **6.EE.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expressions 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*
- **6.EE.4** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*

Reason about and solve one-variable equations and inequalities

- **6.EE.5** Understand solving an equation or inequality as a process of answering a question; which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
- **6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- **6.EE.7** 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 nonnegative rational numbers.
- **6.EE.8** Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Represent and analyze quantitative relationships between dependent and independent variables

- **6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*

MATHEMATICAL PRACTICES:

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

POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

ESSENTIAL QUESTIONS	VOCABULARY	ASSESSMENT	

• **How do you apply and extend previous understandings of arithmetic to algebraic expressions?**
• **How do you reason about and solve one-variable equations and inequalities in real world and mathematical problems?**
• **How do you represent and analyze quantitative relationships between dependent and independent variables?**
	Algebraic Expression
	Equation
	Variable
	Term
	Exponent
	Sum
	Product
	Difference
	Quotient
	Factor
	Coefficient
	Formula
	Parentheses
	Order of operations
	Distributive property
	Inequality
	Substitution
	Equivalent expressions
	Like terms
	Number line diagram
	Constraint
	Dependent/independent variable
		Formative:
		• Journals/logs
		• KWL chart
		• At the bell activities
		• Question and answer
		• Thumbs up/thumbs down
		• Individual white boards
		• Homework
		• Quizzes
		• Constructed response/open-ended problem solving
		• Performance tasks
		• Exit slips
			Summative:
			• Benchmark assessments
			• Performance based assessments
			  o Quizzes
			  o Tests
			  o Constructed response/open-ended problem solving
			  o Performance tasks
			  o Projects
			• Spiral Review Checkpoints
			• StudyIsland Practice

UNIT OF INSTRUCTION: EXPRESSIONS AND EQUATIONS	PA CORE ASSESSMENT ANCHORS	PA ELIGIBLE CONTENT STANDARDS/ESSENTIAL CONTENT LEARNING ACTIVITIES
	CC.2.1.6.B.1 Apply and extend previous understanding of arithmetic to algebraic expressions. **Essential Skills and Understandings** • Ability to develop understanding of a whole-number exponent as shorthand for repeated multiplication of a number times itself. • Ability to write and evaluate numerical expressions involving whole-number exponents. • Ability to extend understanding of order of operations to include exponents. • Ability to write algebraic expressions from verbal descriptions. • Ability to identify parts of an expressions using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity) • Ability to define a variable. • Knowledge that there are multiple ways to read the same expression. • Ability to read expressions aloud to explore the concept. • Ability to evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems. • Ability to use properties of operations to simplify expressions, therefore, producing equivalent expressions. **CC.2.1.6.B.2** Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems. **Essential Skills and Understandings** • Ability to use substitution to determine whether a given number in a specified set makes an equation or inequality true. • Ability to write algebraic expressions to represent real-world or mathematical problems. • Ability to reinforce that solving equations is finding values of the variable that make the equation true. • Ability to develop conceptual understanding of inverse operations. • Ability to develop an understanding of how to apply properties of equality. • Knowledge of preserving equivalence as you solve equations. • Ability to 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.1: Apply and extend previous understandings of arithmetic to numerical and 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 **M06.B-E.1.1.3** • Identify parts of an expressions using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity) **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 **M06.B-E.1.1.5** • Apply the properties of operations to generate equivalent expressions **M06.B-E.2: Interpret and solve one-variable equations and inequalities.** **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 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 in equalities on number line **M06.B-E.3: Represent and analyze quantitative relationships between dependent and independent variables.**

	• Ability to develop conceptual understanding of representing solutions to inequalities on a number line diagram. • Knowledge of ≤ and ≥. • Knowledge of symbolic components of the graph of an inequality; specifically, open circle vs. closed circle, direction of shading. • Knowledge that an open circle represents a value that is NOT actually part of the solution set. • Knowledge that solutions to x>c or x<c are not just integers but also fractions and decimals. • Ability to 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 in equalities on number line. **CC.2.1.6.B.3** Represents and analyze quantitative relationships between dependent and independent variables. **Essential Skills and Understandings** • Ability to differentiate between independent and dependent variables. • Knowledge of the relationships between the two variables. • Ability to write an equation to express the relationship between the dependent and independent variables • Knowledge of terminology associated with graphing ordered pairs. • Ability to write an equation based on a graph or a table. • Ability to analyze the relationship between the dependent and independent variables using graphs and tables and or relate these to an equation.	**M06.B-E.3.1.1** • Write an equation to express the relationship between the dependent and independent variables **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.

DIFFERENTIATION ACTIVITIES:
Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

ENRICHMENT:

- Pearson SuccessNet On-Line Teacher's Edition
- Grade 7 Unit: Algebraic Concepts: Expressions and Equations, based on student need
- First In Math
- StudyIsland
- MATHCOUNTS
- Web-based Math Resources/tutorials
- Small group instruction
- Connected Math Workshops
- Math Centers
- Teacher generated/differentiated instruction enrichment and activities
- Supporting the range of learners as per teacher manual
- Encourage and support learners in explaining how they applied their skills during mathematical tasks
- Enrichment based on student GIEP or need of student
- Hands-On Equations
- Groundworks
- Math Art Projects and Activities
- Challenge Math (Grades 4-5-6)
- Problem Solving Genius (Zaccaro) 5-6th grade
- Cranium Crackers logic and math 5-6

REMEDIATION:

- Pearson Successnet On-Line Teacher's Edition
- Investigations Workshops
- Web-based Math Resources/tutorials
- First In Math
- Math Centers
- Supporting the range of learners as per teacher manual
- Teacher generated/differentiated instruction activities
- Math connections/activities with English Language Arts books, writing, activities
- Small group instruction
- Adapted assignments
- Additional time
- Alternative Assessments
- Chunking of content, assignment and/or assessments
- One-on-one re-teaching
- Volunteer/peer tutoring
- Accommodations based on IEP and/or need
- ELL student(or based on student need) additional support
    - Provide specific examples
    - Use of Manipulatives
    - Simplified language in word problems
    - Visuals
    - Flashcards
    - Multiple-meaning words
    - Bilingual dictionary/picture dictionary
- Math Support, Learning Support, or ELL Teachers as appropriate and based on need

RESOURCES:

- EnVISION Math, Grade 6 (Topics 1, 2, 4,13, 15)
- Scott Foresman-Addison Wesley (SFAW)
- PDE SAS portal: http://www.pdesas.org
- Thinking Maps
- KWL Charts
- Versatiles
- Partner Games
- Calculators
- Exit Tickets
- Adaptions checklist
- ELL Instructional Strategies for Math
    - ESL Handbook
    - Click on "Academic Resources" from PMSD website
    - Click on "ESL" on left side of tool bar.
    - Click on the link to the PMSD ESEL Handbook
        - Scroll through to page 44 in the appendices.
- Teacher generated/differentiated instruction resources and activities
- Promethean Flipcharts/ActiveVotes
- Student math handbook flipchart
- Math Internet Resources from PMSD Resource Page
- BrainPOP
- First In Math
- StudyIsland
- http://www.khanacademy.org/
- Thinkfinity website: http://www.thinkfinity.org/home
- IXL Website: http://www.IXL.com/math/
- United Streaming: http://streaming.discoveryeducation.com/index.cfm
- www.sumdog.com
- http://edhelper.com/place_value.html
- http://illuminations.nctm.org
- http://insidemathematics.org
- www.teachingchannel.org
- http://illustrativemathematics.org/standards/k8
- http://wiki.warren.kyschools.us/groups/wcpscommoncorestandards/
- www.teachingchannel.org
- http://www.learnzillion.com
- http://www.commoncoresheets.com
- http://www.kidsknowit.com
- http://www.teacherspayteachers.com
- flexmath.ck12.org/

POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

MATH: GRADE 6	STATE STANDARD AREA/UNIT:	Geometry: Geometry	TIME FRAME:	Ongoing

NATIONAL COMMON CORE STANDARDS:

Solve real-world and mathematical problems involving area, surface area, and volume

- **6.G.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- **6.G.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
- **6.G.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- **6.G.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real world and mathematical problems

MATHEMATICAL PRACTICES:

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ESSENTIAL QUESTIONS	VOCABULARY	ASSESSMENT	
		Formative:	**Summative:**

• **How do you find the volumes of right rectangular prisms with fractional edge lengths?**
• **How do you use nets to find surface area of 3-dimensional figures?**
• **How do you determine the area of triangles, quadrilaterals, irregular polygons and compound polygons?**
• **How do you calculate the area of a polygon on a plane given the coordinates of the vertices?**
• **How do you solve real-world and mathematical problems involving area, surface area, and volume?**
	Area
	Surface area
	Volume
	Quadrilateral – trapezoid, rhombus, parallelogram, square, rectangle
	Polygon – irregular, compound
	Composing
	Decomposing
	Rectangular prism/triangular prisms
	Edge – Fractional edge length
	Vertices
	3 -dimensional figures
	Nets
		• Journals/logs
		• KWL chart
		• At the bell activities
		• Question and answer
		• Thumbs up/thumbs down
		• Individual white boards
		• Homework
		• Quizzes
		• Constructed response/open-ended problem solving
		• Performance tasks
		• Exit slips
			• Benchmark assessments
			• Performance based assessments
			  o Quizzes
			  o Tests
			  o Constructed response/open-ended problem solving
			  o Performance tasks
			  o Projects
			• Spiral Review Checkpoints
			• StudyIsland Practice

UNIT OF INSTRUCTION: GEOMETRY	PA CORE ASSESSMENT ANCHORS	PA ELIGIBLE CONTENT STANDARDS/ESSENTIAL CONTENT LEARNING ACTIVITIES
	CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume. **Essential Skills and Understandings** • Ability to determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided. • Ability to combine triangles to create rectangles. • Ability to partition quadrilaterals and polygons into all triangles or a combination of triangles and rectangles/squares. • Ability to determine the area of irregular or compound polygons. • Knowledge of the base and height of a right triangle are the length and width of a rectangle to discover the formula A = $\frac{bh}{2}$. • Ability to determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided. • Ability to use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals) given coordinates for the vertices of a polygon in the plane. Formulas will be provided. • Ability to represent three-dimensional figures using nets made of rectangles and triangles. • Ability to determine the surface area of triangular and rectangular prisms (including cubes). Formulas will be provided.	**M06.C-G.1: 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). **M06.C-G.1.1.2** • Determine the area of irregular or compound polygons. **M06.C-G.1.1.3** • Determine the volume of right rectangular prisms with fractional edge lengths. **M06C-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). **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).

DIFFERENTIATION ACTIVITIES:
Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

ENRICHMENT:

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- ELL student(or based on student need) additional support
    - Provide specific examples
    - Use of Manipulatives
    - Simplified language in word problems
    - Visuals
    - Flashcards
    - Multiple-meaning words
    - Bilingual dictionary/picture dictionary
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- First In Math
- StudyIsland
- http://www.khanacademy.org/
- Thinkfinity website: http://www.thinkfinity.org/home
- IXL Website: http://www.IXL.com/math/
- United Streaming: http://streaming.discoveryeducation.com/index.cfm
- www.sumdog.com
- http://edhelper.com/place_value.html
- http://illuminations.nctm.org
- http://insidemathematics.org
- www.teachingchannel.org
- http://illustrativemathematics.org/standards/k8
- http://wiki.warren.kyschools.us/groups/wcpscommoncorestandards/
- www.teachingchannel.org
- http://www.learnzillion.com
- http://www.commoncoresheets.com
- http://www.kidsknowit.com
- http://www.teacherspayteachers.com
- flexmath.ck12.org/

POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

MATH: GRADE 6	STATE STANDARD AREA/UNIT:	Numbers and Operations: The Number System	TIME FRAME:	Ongoing

NATIONAL COMMON CORE STANDARDS:

Apply and extend previous understandings of multiplication and division to divide fractions by fractions

- **6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain the (2/3)÷ (3/4) = 8/9 because ¾ of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1.2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length ¾ mi and area ½ square mi?*

Compute fluently with multi-digit numbers using the standard algorithm

- **6.NS.2** Fluently divide multi-digit numbers using the standard algorithm.
- **6.NS.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- **6.NS.4** 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. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4(9 + 2).*

Apply and extend previous understanding of numbers to the system of ration numbers

- **6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge): use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- **6.NS.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
  - **a.** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3)=3, and that 0 is its own opposite.
  - **b.** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
  - **c.** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find the position pairs of integers and other rational numbers on a coordinate plane.
- **6.NS.7** Understand ordering and absolute value of rational numbers.
  - **a.** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3>-7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*
  - **b.** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3ºC>-7ºC to express the fact that -3ºC is warmer than -7ºC.*
  - **c.** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world

MATHEMATICAL PRACTICES:

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situation. *For example, for an account balance of -30 dollars, write* $|-30| = 30$ *to describe the size of the debt in dollars.*

d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represent a debt greater than 30 dollars.*

- **6.NS.8** Solve real-world and mathematical problems by graphing 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.

ESSENTIAL QUESTIONS	VOCABULARY	ASSESSMENT	

• **How do you apply and extend previous understandings of multiplication and division to divide fractions by fractions?**
• **How do you fluently compute with multi-digit numbers and find common factors and multiples?**
• **How do you apply and extend previous understandings of numbers to the system of rational numbers?**
• **How do you solve real-world and mathematical problems involving division of fractions?**
• **How do you represent and/or solve real-world and mathematical problems using rates, ratios, and/or percents?**
	Visual fraction model
	Quotient
	Common factor
	Greatest common factor
	Common multiple
	Least Common Multiple
	Distributive property
	Compute
	Reciprocal
	Multiplicative inverse
	Rational number
	Quadrants
	Ordered pair
	Coordinate plane
	Absolute value
	Reflection
	Multi-digit
	Horizontal/vertical
	Inequality
	Negative/positive
	Integers
	Plot
	Magnitude
		Formative:
		• Journals/logs
		• KWL chart
		• At the bell activities
		• Question and answer
		• Thumbs up/thumbs down
		• Individual white boards
		• Homework
		• Quizzes
		• Constructed response/open-ended problem solving
		• Performance tasks
		• Exit slips
			Summative:
			• Benchmark assessments
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			  o Quizzes
			  o Tests
			  o Constructed response/open-ended problem solving
			  o Performance tasks
			  o Projects
			• Spiral Review Checkpoints
			• StudyIsland Practice

UNIT OF INSTRUCTION: THE NUMBER SYSTEM	PA CORE ASSESSMENT ANCHORS	PA ELIGIBLE CONTENT STANDARDS/ESSENTIAL CONTENT LEARNING ACTIVITIES
	CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions. **Essential Skills and Understandings** • Ability to explore the concept that division breaks quantities into groups. • Ability to emphasize that when dividing by a value that is less than one, the quotient is greater than the dividend. • Ability to explore both the measurement concept and the partition concept of division of fractions. • Ability to introduce the fact that the measurement concept uses repeated subtraction or equal groups. • Ability to explore the common denominator algorithm as a method of repeated subtraction. • Knowledge of partition concept focuses on "How much is one?" • Knowledge of algorithm $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ab}{bc}$ (invert and multiply) is an extension of the partition concept. • Ability to interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions. **CC.2.1.6.E.2** Identify and choose appropriate processes to compute fluently with multi-digit numbers. **Essential Skills and Understandings** • Ability to solve problems involving operations (+, −, ×, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems. **CC.2.1.6.E.3** Develop and/or apply number theory concepts to find common factors and multiples. **Essential Skills and Understandings** • Ability to build on student knowledge of and differentiate between factors and multiples. • Ability to build on student knowledge of factor pairs of whole numbers. • Ability to identify and differentiate between common factors and common multiples of 2 whole numbers. • Ability to find the greatest common factor of two whole numbers less than or equal to 100 and the least common	**M06.A-N.1: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.** **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. **M06.A-N.2: Compute with multi-digit numbers and find common factors and multiples.** **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.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. **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. **M06.A-N.3: Apply and extend previous understandings of numbers to the system of rational numbers.** **M06.A-N.3.1.3** • 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

multiple of two whole numbers less than or equal to 12.
- Ability to 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.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

Essential Skills and Understandings
- Ability to introduce and define coordinate plane terminology, including coordinate plane and quadrants I, II, III, and IV.
- Ability to 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.
- Ability to 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.
- Ability to write, interpret, and explain statements of order for rational numbers in real-world contexts.
- Ability to 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.
- Ability to include positive and negative fractions and decimals on a number line.
- Ability to develop conceptual understanding to go beyond "absolute value always is positive."
- Ability to 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.
- Ability to 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.

integers and other rational numbers on a coordinate plane.

M06.A-N.3.2.1
- Write, interpret, and explain statements of order for rational numbers in real-world contexts.

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.

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.

DIFFERENTIATION ACTIVITIES:
Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

ENRICHMENT:

- Pearson SuccessNet On-Line Teacher's Edition
- Grade 7 Unit: Numbers and Operations: The Number System, based on student need
- First In Math
- StudyIsland
- MATHCOUNTS
- Web-based Math Resources/tutorials
- Small group instruction
- Connected Math Workshops
- Math Centers
- Teacher generated/differentiated instruction enrichment and activities
- Supporting the range of learners as per teacher manual
- Encourage and support learners in explaining how they applied their skills during mathematical tasks
- Enrichment based on student GIEP or need of student
- Hands-On Equations
- Groundworks
- Math Art Projects and Activities
- Challenge Math (Grades 4-5-6)
- Problem Solving Genius (Zaccaro) 5-6th grade
- Cranium Crackers logic and math 5-6

REMEDIATION:

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- Investigations Workshops
- Web-based Math Resources/tutorials
- First In Math
- Math Centers
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- Math connections/activities with English Language Arts books, writing, activities
- Small group instruction
- Adapted assignments
- Additional time
- Alternative Assessments
- Chunking of content, assignment and/or assessments
- One-on-one re-teaching
- Volunteer/peer tutoring
- Accommodations based on IEP and/or need
- ELL student(or based on student need) additional support
    - Provide specific examples
    - Use of Manipulatives
    - Simplified language in word problems
    - Visuals
    - Flashcards
    - Multiple-meaning words
    - Bilingual dictionary/picture dictionary
- Math Support, Learning Support, or ELL Teachers as appropriate and based on need

RESOURCES:

- EnVISION Math, Grade 6 (Topics 2, 3, 8, 10)
- Scott Foresman-Addison Wesley (SFAW)
- PDE SAS portal: http://www.pdesas.org
- Thinking Maps
- KWL Charts
- Versatiles
- Partner Games
- Calculators
- Exit Tickets
- Adaptions checklist
- ELL Instructional Strategies for Math
    - ESL Handbook
    - Click on "Academic Resources" from PMSD website
    - Click on "ESL" on left side of tool bar.
    - Click on the link to the PMSD ESEL Handbook
        - Scroll through to page 44 in the appendices.
- Teacher generated/differentiated instruction resources and activities
- Promethean Flipcharts/ActiveVotes
- Student math handbook flipchart
- Math Internet Resources from PMSD Resource Page
- BrainPOP
- First In Math
- StudyIsland
- http://www.khanacademy.org/
- Thinkfinity website: http://www.thinkfinity.org/home
- IXL Website: http://www.IXL.com/math/
- United Streaming: http://streaming.discoveryeducation.com/index.cfm
- www.sumdog.com
- http://edhelper.com/place_value.html
- http://illuminations.nctm.org
- http://insidemathematics.org
- www.teachingchannel.org
- http://illustrativemathematics.org/standards/k8
- http://wiki.warren.kyschools.us/groups/wcpscommoncorestandards/
- www.teachingchannel.org
- http://www.learnzillion.com
- http://www.commoncoresheets.com
- http://www.kidsknowit.com
- http://www.teacherspayteachers.com
- flexmath.ck12.org/

POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

MATH: GRADE 6	STATE STANDARD AREA/UNIT:	Numbers and Operations: Ratios and Proportional Relationships	TIME FRAME:	Ongoing

NATIONAL COMMON CORE STANDARDS:

Understand ratio concepts and use ratio reasoning to solve problems.

- **6.RP.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*
- **6.RP.2** Understand the concept of a unit rate *a/b* associated with a ratio *a:b* with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.*
- **6.PR.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
  - **a.** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
  - **b.** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be moved in 35 hours? At what rate were lawns being mowed?*
  - **c.** 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 percent.
  - **d.** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

MATHEMATICAL PRACTICES:

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

ESSENTIAL QUESTIONS	VOCABULARY	ASSESSMENT	
		Formative:	**Summative:**

• **How do you represent ratio relationships in various forms?**
• **Can you determine unit rates in context?**
• **How do you convert measurement units using equivalent ratios?**
• **How do you use the understanding of ratio concepts and use reasoning to solve problems?**
	Ratio
	Proportion
	Unit rate
	Equivalent ratios
	Percent
	Equation
	Line diagram
		• Journals/logs
		• KWL chart
		• At the bell activities
		• Question and answer
		• Thumbs up/thumbs down
		• Individual white boards
		• Homework
		• Quizzes
		• Constructed response/open-ended problem solving
		• Performance tasks
		• Exit slips
			• Benchmark assessments
			• Performance based assessments
			  ○ Quizzes
			  ○ Tests
			  ○ Constructed response/open-ended problem solving
			  ○ Performance tasks
			  ○ Projects
			• Spiral Review Checkpoints
			• StudyIsland Practice

UNIT OF INSTRUCTION: Ratios and Proportional Relationships	PA CORE ASSESSMENT ANCHORS	PA ELIGIBLE CONTENT STANDARDS/ESSENTIAL CONTENT LEARNING ACTIVITIES
	CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve problems. **Essentials Skills and Understandings** • Knowledge of ratio language and notation to describe a ratio relationship as a comparison between two quantities. • Knowledge that a ratio is not always a comparison of part-to-whole; can be part-to-part or whole-to-whole. • Knowledge that a unit rate emphasizes finding an equivalent ratio with a denominator of 1. • Ability to 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. • Ability to use multiplicative relationships to extend an initial ratio to equivalent ratios; when working backward, use the inverse operation (division). • Ability to expand ratio reasoning to units of measurement. • Ability to use division to determine unit rate. • Ability to recognize a linear relationship appears when the pairs are plotted on the coordinate plane. • Ability to 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. • Ability to introduce percent as a special rate where a part is compared to a whole and the whole always has value of 100. • Ability to solve problems using equivalent ratios. (NOTE: proportions are not introduced until Grade7.) This is developing proportional reasoning without formal proportions. • 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.	**M06.A0R.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, ¾) to describe a ratio relationship between two quantities. **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. **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. **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.

DIFFERENTIATION ACTIVITIES:
Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

ENRICHMENT:	• Pearson SuccessNet On-Line Teacher's Edition
	• Grade 7 Unit: Numbers and Operations: Ratios and Proportional Relationships, based on student need
	• First In Math
	• StudyIsland
	• MATHCOUNTS
	• Web-based Math Resources/tutorials
	• Small group instruction
	• Connected Math Workshops
	• Math Centers
	• Teacher generated/differentiated instruction enrichment and activities
	• Supporting the range of learners as per teacher manual
	• Encourage and support learners in explaining how they applied their skills during mathematical tasks
	• Enrichment based on student GIEP or need of student
	• Hands-On Equations
	• Groundworks
	• Math Art Projects and Activities
	• Challenge Math (Grades 4-5-6)
	• Problem Solving Genius (Zaccaro) 5-6th grade
	• Cranium Crackers logic and math 5-6
		REMEDIATION:	• Pearson Successnet On-Line Teacher's Edition
			• Investigations Workshops
			• Web-based Math Resources/tutorials
			• First In Math
			• Math Centers
			• Supporting the range of learners as per teacher manual
			• Teacher generated/differentiated instruction activities
			• Math connections/activities with English Language Arts books, writing, activities
			• Small group instruction
			• Adapted assignments
			• Additional time
			• Alternative Assessments
			• Chunking of content, assignment and/or assessments
			• One-on-one re-teaching
			• Volunteer/peer tutoring
			• Accommodations based on IEP and/or need
			• ELL student(or based on student need) additional support
			  o Provide specific examples
			  o Use of Manipulatives
			  o Simplified language in word problems
			  o Visuals
			  o Flashcards
			  o Multiple-meaning words
			  o Bilingual dictionary/picture dictionary
			• Math Support, Learning Support, or ELL Teachers as appropriate and based on need

RESOURCES:

- EnVISION Math, Grade 6 (Topic 12)
- Scott Foresman-Addison Wesley (SFAW)
- PDE SAS portal: http://www.pdesas.org
- Thinking Maps
- KWL Charts
- Versatiles
- Partner Games
- Calculators
- Exit Tickets
- Adaptions checklist
- ELL Instructional Strategies for Math
    - ESL Handbook
    - Click on "Academic Resources" from PMSD website
    - Click on "ESL" on left side of tool bar.
    - Click on the link to the PMSD ESEL Handbook
        - Scroll through to page 44 in the appendices.
- Teacher generated/differentiated instruction resources and activities
- Promethean Flipcharts/ActiveVotes
- Student math handbook flipchart
- Math Internet Resources from PMSD Resource Page
- BrainPOP
- First In Math
- StudyIsland
- http://www.khanacademy.org/
- Thinkfinity website: http://www.thinkfinity.org/home
- IXL Website: http://www.IXL.com/math/
- United Streaming: http://streaming.discoveryeducation.com/index.cfm
- www.sumdog.com
- http://edhelper.com/place_value.html
- http://illuminations.nctm.org
- http://insidemathematics.org
- www.teachingchannel.org
- http://illustrativemathematics.org/standards/k8
- http://wiki.warren.kyschools.us/groups/wcpscommoncorestandards/
- www.teachingchannel.org
- http://www.learnzillion.com
- http://www.commoncoresheets.com
- http://www.kidsknowit.com
- http://www.teacherspayteachers.com
- flexmath.ck12.org/

POCONO MOUNTAIN SCHOOL DISTRICT CURRICULUM

MATH: GRADE 6	STATE STANDARD AREA/UNIT:	Measurement, Data and Probability: Statistics and Probability	TIME FRAME:	Ongoing

NATIONAL COMMON CORE STANDARDS:

Develop understanding of statistical variability

- **6.SP.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*
- **6.SP.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- **6.SP.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Summarize and describe distributions

- **6.SP.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- **6.SP.5** Summarize numerical data sets in relation to their context, such as by:
  - **a.** Reporting the number of observations.
  - **b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
  - **c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as, describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
  - **d.** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

MATHEMATICAL PRACTICES:

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

ESSENTIAL QUESTIONS	VOCABULARY		ASSESSMENT	

• **How do you develop understanding of statistical variability?**
• **How do you summarize and describe distributions?**
	Variability
	Probability
	Dot Plots
	Distribution
	Histogram
	Box & Whisker Plots
	Statistical question
	Frequency table
	Cluster
	Interquartile range
	Mean Absolute Deviation
		Symmetrical
		Skew
		Outlier
		Median
		Mean
		Measure of center
		Range
		Mode
		Spread
		Statistics
			Formative:
			• Journals/logs
			• KWL chart
			• At the bell activities
			• Question and answer
			• Thumbs up/thumbs down
			• Individual white boards
			• Homework
			• Quizzes
			• Constructed response/open-ended problem solving
			• Performance tasks
			• Exit slips
				Summative:
				• Benchmark assessments
				• Performance based assessments
				  o Quizzes
				  o Tests
				  o Constructed response/open-ended problem solving
				  o Performance tasks
				  o Projects
				• Spiral Review Checkpoints
				• StudyIsland Practice

UNIT OF INSTRUCTION: STATISTICS AND PROBABILITY	PA CORE ASSESSMENT ANCHORS	PA ELIGIBLE CONTENT STANDARDS/ESSENTIAL CONTENT LEARNING ACTIVITIES
	CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions. **Essential Skills and Understandings** • Knowledge of median and mean as measures of center. • Ability to look at a set of data and estimate the measures of center. • Ability to recognize that a dot plot is a line plot. • Ability to recognize that a box plot is a box-and-whisker plot. • Ability to display numerical data in plots on a number line, including line plots, histograms, and box-and whisker plots • Knowledge of conceptual understanding of statistical interpretation, focusing on the context of data sets. • Ability to determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation). • Ability to describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered. • Ability to identify data that are outliers and understand how they affect the measures of central tendency. • Ability to 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.	**M06.D-S.1: Demonstrate understanding of statistical variability by summarizing and describing 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.

DIFFERENTIATION ACTIVITIES:
Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

ENRICHMENT:	• Pearson SuccessNet On-Line Teacher's Edition
	• Grade 7 Unit: Measurement, Data and Probability: Statistics and Probability, based on student need
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	• StudyIsland
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	• Small group instruction
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	• Math Centers
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			• One-on-one re-teaching
			• Volunteer/peer tutoring
			• Accommodations based on IEP and/or need
			• ELL student(or based on student need) additional support
			  o Provide specific examples
			  o Use of Manipulatives
			  o Simplified language in word problems
			  o Visuals
			  o Flashcards
			  o Multiple-meaning words
			  o Bilingual dictionary/picture dictionary
			• Math Support, Learning Support, or ELL Teachers as appropriate and based on need

RESOURCES:

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- http://www.khanacademy.org/
- Thinkfinity website: http://www.thinkfinity.org/home
- IXL Website: http://www.IXL.com/math/
- United Streaming: http://streaming.discoveryeducation.com/index.cfm
- www.sumdog.com
- http://edhelper.com/place_value.html
- http://illuminations.nctm.org
- http://insidemathematics.org
- www.teachingchannel.org
- http://illustrativemathematics.org/standards/k8
- http://wiki.warren.kyschools.us/groups/wcpscommoncorestandards/
- www.teachingchannel.org
- http://www.learnzillion.com
- http://www.commoncoresheets.com
- http://www.kidsknowit.com
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- flexmath.ck12.org/