

**Tunkhannock Area School District
Grade Six Mathematics
Curriculum Map 2014**

Quarter 1

Targeted Standard(s):

Domain

6.NS The Number System

PA Core Standards

CC.2.1.6.E.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.3 Develop and/or apply number theory concepts to find common factors and multiples.

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

PA Core Assessment Anchors

M06.A-N.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

M06.A-N.2 Compute with multi-digit numbers and find common factors and multiples.

M06.A-N.3 Apply and extend previous understandings of numbers to the system of rational numbers.

PA Core Assessment Anchor Descriptors

M06.A-N.1.1 Solve real-world and mathematical problems involving division of fractions.

M06.A-N.2.1 Compute with multi-digit numbers using the four arithmetic operations with or without a calculator.

M06.A-N.2.2 Apply number theory concepts (specifically, factors and multiples).

M06.A-N.3.1 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values and locations on the number line and coordinate plane.

M06.A-N.3.2 Understand ordering and absolute value of rational numbers.

PA Core Eligible Content

M06.A-N.2.1.1 Solve problems involving operations (+, −, ×, ÷) 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. *Example: Express $36 + 8$ as $4(9 + 2)$.*

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 $(2/3) \div (3/4)$, explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = (a/b) \times (d/c) = ad/bc$.)

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?

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., $-(-3) = 3$, and that 0

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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.3.2.3 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.

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

Example: Write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ 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.

Enduring Understandings:

- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Apply and extend previous understandings of numbers to the system of rational numbers.
- Understand ratio concepts and use ratio reasoning to solve problems.

Essential Questions:

1. How does the understanding of situations that require multiplying or dividing and an understanding of the inverse relationship between multiplication and division help us to solve problems involving fractions, decimals, integers/rational numbers in a real world context?

Core Content/Objectives		Instructional Actions	
Concepts What students will know	Competencies What students will be able to do	Activities:	Assessment How learning will be assessed
I. Whole Numbers and Decimals A. Computation of Whole Numbers (M06.A-N.2.1.1)	I. Whole Numbers and Decimals A. Fluently divide multi-digit numbers using standard algorithm	A. Fluency Activities <ul style="list-style-type: none"> • Math dash • Rocket Math • Math Minute B. http://insidemathematics.org/problems-of-the-	Formative assessment: <ul style="list-style-type: none"> • Vocabulary • daily homework • Peer-teaching • Problem Solving Activity Summative Assessments <ul style="list-style-type: none"> • Chapter Tests

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<p>B. Computation of Decimals (M06.A-N.2.1.1)</p>	<p>B. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>	<p>month/pom-rodtrains.pdf</p>	<ul style="list-style-type: none"> • Section Quizzes • Quarter Projects • Classroom Diagnostic Tool
<p>C. Greatest Common Factor and Least Common Multiple (M06.A-N.2.2.1) (M06.A-N.2.2.2)</p>	<p>C. 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 $4(9 + 2)$.</p>	<p>C. http://math.wiki.cvsd.k12.pa.us/file/view/Gr+6+Open+Ended+0809+-+Exponents%2C+Converting+Frac-Dec-%25.pdf</p> <p>http://insidemathematics.org/problems-of-the-month/pom-diggingdinosaurs.pdf</p> <p>http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Multiplying%20Decimals.pdf</p> <p>http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Adding+Subtracting%20Decimals.pdf</p>	
<p>D. Properties of Operations (M06.A-N.2.2.2)</p>	<p>D. Find the greatest common factor of two whole numbers less than or equal to 100 and</p>	<p>D. http://www.mathsisfun.com/greatest-common-factor.html</p>	

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<p>II. Fractions A. Computation (M06.A-N.1.1.1)</p>	<p>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 $4(9 + 2)$.</p> <p>II. Fractions</p> <p>A. 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 $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the</p> <p>B. Relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How</p>	<p>http://www.sheppardsoftware.com/mathgames/fractions/GreatestCommonFactor.htm</p> <p>http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Least%20Common%20Multiple.pdf</p> <p>https://mathseminar6.wikispaces.hcpss.org</p> <p>http://www.tacoma.k12.wa.us/academics/curriculum/math/Documents/HS%20Algebra%20I%20Unit%203/Lesson4Dist%20Prop%20with%20Algebra%20Tiles.pdf</p> <p>A. http://www.visualfractions.com/worksheets/compare/compareworksheets.pdf</p> <p>B. http://insidemathematics.org/common-core-math-tasks/6th-grade/6-2003%20Rabbit%20Costumes.pdf</p>	
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	value to find distances between points with the same first coordinate or the same second coordinate.		
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Materials/Resources/Technology

Quarter 2

Targeted Standard(s):

Domain

6.EE Expressions and Equations

6.RP Ratios and Proportional Relationships

PA Core Standards

CC.2.2.6.B.1 Apply and extend previous understandings of arithmetic to algebraic expressions.

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.

CC.2.2.6.B.3 Represent and analyze quantitative relationships between dependent and independent variables.

CC.2.1.6.D.1 Understand ratio concepts and use ratio reasoning to solve

PA Core Assessment Anchors

M06.B-E.1 Apply and extend previous understandings of arithmetic to numerical and algebraic expressions.

M06.B-E.2 Interpret and solve one-variable equations and inequalities.

M06.B-E.3 Represent and analyze quantitative relationships between dependent and independent variables.

M06.A-R.1 Understand ratio concepts and use ratio reasoning to solve problems.

PA Core Assessment Anchor Descriptors

M06.B-E.1.1 Identify, write, and evaluate numerical and algebraic expressions.

M06.B-E.2.1 Create, solve, and interpret one-variable equations or inequalities in real-world and mathematical problems.

M06.B-E.3.1 Use variables to represent two quantities in a real-world problem that change in relationship to one another.

M06.A-R.1.1 Represent and/or solve real-world and mathematical problems using rates, ratios, and/or percents.

PA Core Eligible Content:

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.2.1.2 Write algebraic expressions to represent real-world or mathematical problems.

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 used in real-world problems.

Example: Evaluate the expression $b^2 - 5$ 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 $6 + 3x$.

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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 $3y$.

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.2.1.3 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 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.

M06.A-R.1.1.1 Use ratio language and notation (such as 3 to 4, 3:4, $\frac{3}{4}$) 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 $b \neq 0$), 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 $\frac{3}{4}$ 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?

M06.A-R.1.1.5 Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.

Enduring Understandings:

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Understand ratio concepts and use ratio reasoning to solve problems.

Essential Questions:

1. How can we use mathematics to provide models that help us interpret data, make predictions, and better understand the world in which we live, and what are the limits of these models?
2. How do you translate given situations into math expressions and equations and formulas and use these to solve problems?
3. How are ratios related and used to represent real world situations including those dealing with unit rate, and percents?

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Core Content/Objectives		Instructional Actions	
Concepts What students will know	Competencies What students will be able to do	Activities:	Assessment How learning will be assessed
<p>I. Write and Evaluate Expressions</p> <p>Write and evaluate numerical expressions involving whole-number exponents. (M06.B-E.1.1.1)</p> <p>Write algebraic expressions from verbal descriptions. (M06.B-E.1.1.2)</p> <p>a. Parts of an Expression (M06.B-E.1.1.3)</p>	<p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p> <p>Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.</p> <p>a. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one 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</p>	<p>a. Fluency Activities</p> <ul style="list-style-type: none"> • Math dash • Rocket Math • Math Minute <p>a. http://www.onlinemathlearning.com/writing-expressions.html</p>	<p>Formative assessment:</p> <ul style="list-style-type: none"> • Vocabulary • daily homework • Peer-teaching • Problem Solving Activity <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Section Quizzes • Quarter Projects • Classroom Diagnostic Tool

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<p>b. Evaluating Expressions (M06.B-E.1.1.4)</p> <p>Write algebraic expressions</p>	<p>and a sum of two terms. Write, read, and evaluate expressions in which letters stand for numbers.</p> <p>b. 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 $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/$ Write, read, and evaluate expressions in which letters stand for numbers.</p>	<p>b. http://betterlesson.com/document/55780/numerical-and-algebraic-expressions-2-1</p> <p>http://www.ezscool.com/Grade6/Math/Algebra/ws1.html</p>	
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<p>to represent real-world or mathematical problems. M06.B-E.2.1.2</p> <p>A. Properties of Operations (M06.B-E.1.1.5)</p> <p>B. Equivalent Expressions (M06.B-E.2.1.1)</p>	<p>A. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ 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 $3y$.</p> <p>B. 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.</p>	<p>A. http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Order%20of%20Operations.pdf</p> <p>http://www.gobookee.org/get_book.php?u=aHR0cDovL3d3dy50YWNvbWEuazEyLndhLnVzL2FjYWRIbWljcy9jdXJyaWN1bHVtL21hdGgvRG9jdW1lbnRzL0hJTlIwQWxnZWJyYSUyMEkIMjB3aXRoJTlIwQWxnZWJyYSUyMFRpbGVzLnMFBYb3AlMjB3aXRoJTlIwQWxnZWJyYSUyMFRpbGVzLnBkZgpBY3Rpdml0eSAzOiBUaGUgRGZdHJpYnV0aXZlIFByb3BlcnR5IC0gVGZjY21hIFNjaG9vbHM=</p> <p>B. http://www.mathworksheetsland.com/6/25opsequal/ip.pdf</p>	
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<p>II. Equations A. Solving Equations (M06.B-E.2.1.3)</p> <p>B. Using Variables (M06.B-E.3.1.1) (M06.B-E.2.1.3)</p>	<p>I. Equations</p> <p>A. 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.</p> <p>B. 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.</p> <p>C. 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</p>	<p>A. http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Evaluating%20Variable%20Expressions.pdf</p> <p>B. http://www.mathgoodies.com/lessons/vol7/expressions.html</p> <p>http://www.teach-nology.com/worksheets/math/Grade6/exp19.html</p>	
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<p>C. Solving Real World Problems (M06.B-E.2.1.3)</p> <p>D. Inequalities (M06.B-E.2.1.4)</p> <p>E. Quantitative Relationships (M06.B-E.3.1.1) (M06.B-E.3.1.2)</p>	<p>are all nonnegative rational numbers.</p> <p>D. 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.</p> <p>E. 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</p>	<p>http://www.superteacherworksheets.com/algebra/basic-algebra4.pdf</p>	
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<p>I. Ratio Concepts A. Describing Ratio Relationships (M06.A-R.1.1.1)</p> <p>B. Unit Rate and Ratios (M06.A-R.1.1.2)</p>	<p>relationship between distance and time.</p> <p>I. Ratio Concepts A. 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.” B. 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 $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.” C. Use ratio and rate reasoning to solve real-world and</p>	<p>A. http://math.serpmedia.org/dragonfly/dragonfly.pdf</p> <p>B. http://www.rtmsd.org/Page/12515 http://www.math-aids.com/Ratios/</p> <p>C. http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Proportions.pdf</p>	
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<p>C. Solving Real World Problems</p> <p>a. Making and Comparing Tables (M06.A-R.1.1.3)</p>	<p>mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</p> <p>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. 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.</p> <p>b. Solve unit rate problems including those involving unit</p>	<p>http://www.kutasoftware.com/FreeWorksheets/PreAlgWorksheets/Proportions.pdf</p> <p>b. http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/elementarymathemati</p>	
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<p>b. Unit Rate Problems (M06.A-R.1.1.4)</p>	<p>pricing and constant speed. For 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? 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.</p>	<p>cs/K6%20Support%20Documents/6th%20Grade%20Support/Examples%20of%20Problems%20for%20Solving%20Unit%20Rates.pdf</p>	
<p>c. Percent of a Quantity (M06.A-R.1.1.5)</p>	<p>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. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by</p>	<p>c.http://www.virtualnerd.com/common-core/grade-6/6_RP-ratios-proportional-relationships/A/3/3c http://www.mathplayground.com/balloon_invaders_percent.html</p>	

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<p>d. Ratio Reasoning (M06.A- R.1.1.3)</p>	<p>reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</p> <p>d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. 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.</p>	<p>d.http://map.mathshell.org/materials/lessons.php?taskid=210</p> <p>http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/elementarymathematics/K6%20Support%20Documents/6th%20Grade%20Support/Identifying%20Ratios%20Worksheet.pdf</p>	
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Quarter 3

Targeted Standard(s):

Domain

6.SP Statistics and Probability

6.G Geometry

PA Core Standards

CC.2.4.6.B.1 Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

PA Core Assessment Anchors

M06.C-G.1 Solve real-world and mathematical problems involving area, surface area, and volume.

M06.D-S.1 Demonstrate understanding of statistical variability by summarizing and describing distributions.

PA Core Assessment Anchor Descriptors

M06.C-G.1.1 Find area, surface area, and volume by applying formulas and using various strategies.

M06.D-S.1.1 Display, analyze, and summarize numerical data sets in relation to their context.

PA Core Eligible Content:

M06.D-S.1.1.1 Display numerical data in plots on a number line, including dot plots, histograms, and box-and whisker plots.

M06.D-S.1.1.2 Determine quantitative measures of center (e.g., median, mean, and/or mode) and variability (e.g., range, interquartile range, and/or mean absolute deviation).

M06.D-S.1.1.1 Display numerical data in plots on a number line, including dot plots, histograms, and box-and whisker plots.

M06.D-S.1.1.2 Determine quantitative measures of center (e.g., median, mean, and/or mode) and variability (e.g., range, interquartile range, and/or 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.

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 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 up 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.**

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<p>Enduring Understandings:</p> <ul style="list-style-type: none"> • Develop understanding of statistical variability. • Summarize and describe distributions. • Solve real-world and mathematical problems involving area, surface area, and volume.
<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. How can probability and proportional reasoning be used to make reasonable predictions? How can we use the relationship between area, surface area, and volume to help us draw, construct, model, and represent real situations and/or solve problems of area, surface area and volume?

Core Content/Objectives		Instructional Actions	
Concepts What students will know	Skills What students will be able to do	Activities:	Assessment How learning will be assessed
<p>I. Statistics and Probability A. Statistical Questions (M06.D-S.1.1.1)</p>	<p>I. Statistics and Probability A. 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.</p>	<p>A. Fluency Activities</p> <ul style="list-style-type: none"> • Math dash • Rocket Math • Math Minute 	<p>Formative assessment:</p> <ul style="list-style-type: none"> • Vocabulary • daily homework • Peer-teaching • Problem Solving Activity <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Section Quizzes • Quarter

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<p>B. Distribution of Data (M06.D-S.1.1.2)</p> <p>C. Measures of Center (M06.D-S.1.1.2)</p> <p>D. Displaying Data (M06.D-S.1.1.1)</p>	<p>B. 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.</p> <p>C. 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.</p> <p>D. Display numerical data in plots on a number line, including dot plots,</p>	<p>B. http://www.mathworksheetsland.com/6/43data.html http://www.mathworksheetsland.com/6/43datadis/lesson.pdf http://www.mathsisfun.com/data/index.html</p> <p>C. http://www.mathworksheetsland.com/7/30measures/ip.pdf http://www.education.com/study-help/article/measures-central-tendency-numerical-data_answer/</p> <p>D. http://learnzillion.com/lessonsets/384-display-data-in-a-line-plot-with-fractions-of-a-unit-and-use-line-plots-to-solve-</p>	<p>Projects</p> <ul style="list-style-type: none">• Classroom Diagnostic Tool
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<p>b. Describing Attributes (M06.D-S.1.1.3)</p> <p>c. Measures of Center and Patterns (M06.D-S.1.1.3)</p>	<p>b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 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.</p> <p>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</p>	<p>b. http://www.opusmath.com/common-core-standards/6.sp.5b-describing-the-nature-of-the-attribute-under-investigation-including-how</p> <p>c. http://www.opusmath.com/common-core-standards/6.sp.5c-giving-quantitative-measures-of-center-median-and-or-mean-and</p> <p>http://learnzillion.com/lessonsets/213-summarize-numerical-data-sets-in-relation-to-their-context</p>	
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<p>d. Relating to Data Distribution (M06.D-S.1.1.4)</p>	<p>context in which the data were gathered. 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.</p> <p>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. 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.</p>	<p>d. http://www.opusmath.com/common-core-standards/6.sp.5d-relating-the-choice-of-measures-of-center-and-variability-to-the-shape-of</p> <p>http://www.projectlearning.org/commoncore/scopesequence/sp.html</p>	
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<p>II. Geometry A. Area (M06.C-G.1.1.1) (M06.C-G.1.1.2)</p> <p>B. Volume (M06.C-G.1.1.3)</p>	<p>II. Geometry A. 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.</p> <p>B. 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 $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with</p>	<p>A. http://tulyn.com/6th-grade-math/area</p> <p>http://www.math-play.com/6th-grade-math-games.html</p> <p>http://www.ehow.com/how_8341479_6th-grade-math-area.html</p> <p>http://www.math-aids.com/Geometry/Perimeter/</p> <p>B. http://www.ixl.com/math/grade-6/volume-of-cubes-and-rectangular-prisms</p> <p>http://www.internet4classrooms.com/grade_level_help/surface_area_volume_math_sixth_6th_grade.htm</p> <p>http://www.k12mathworksheets.com/worksheet/volume-of-rectangular-prisms/</p>	
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<p>C. Coordinate Plane (M06.C-G.1.1.4)</p> <p>D. 3-D Figures (M06.C-G.1.1.5) (M06.C-G.1.1.6)</p>	<p>fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p>C. 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 of the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p> <p>D. Represent three-dimensional figures using nets made up of rectangles and triangles,</p>	<p>C. http://alex.state.al.us/lesson_view.php?id=9850</p> <p>http://www.onlinemathlearning.com/polygon-coordinate-plane-6g3.html</p> <p>http://maccss.ncdpi.wikispaces.net/file/view/Middle+School+Template.pdf</p> <p>D. http://www.onlinemathlearning.com/3d-shapes-nets.html</p> <p>http://alex.state.al.us/lesson_view.php?&print=friendly&id=26301</p>	
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<p>a. Interpreting Inequalities (M06.A-N.3.2.1)</p>	<p>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.</p> <p>a. 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.</p>	<p>http://www.brighthubeducation.com/middle-school-math-lessons/128427-finding-the-surface-area-of-3-dimensional-figures-using-nets/</p> <p>a. http://learnzillion.com/lessonsets/230</p> <p>http://www.virtualnerd.com/common-core/grade-6/6_NS-number-system/C/6/6b</p> <p>http://www.onlinemathlearning.com/ordered-pair-coordinate-plane-6ns6b.html</p>	
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Materials/Resources/Technology

Quarter 4
<p>Targeted Standard(s): Operations of Rational Numbers Order of Operations Unit Rates & Scale Factors</p>
<p><u>Domain</u></p>
<p><u>PA Core Standards</u> CC227B1 AND CC226B2 CC216E4 CC217D1 AND CC216E1 CC217D1 AND CC216D1 CC227B3 AND CC226B3</p>
<p><u>PA Core Assessment Anchors</u></p>
<p><u>PA Core Assessment Anchor Descriptors</u></p>
<p><u>PA Core Eligible Content:</u></p>
<p>Enduring Understandings:</p>

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- Develop understanding of properties to add , subtract multiply and divide rational numbers
- Summarize and describe order of operations
- Solve real-world and mathematical problems involving exponents, fractions whole numbers rate and ratios

Essential Questions:

- How can the four operations be used to solve real world situations?

Core Content/Objectives		Instructional Actions	
Concepts What students will know	Skills What students will be able to do	Activities:	Assessment How learning will be assessed

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<p>I. Operations of Rational Numbers</p> <p>A. Apply properties to add, subtract, multiply, and divide rational numbers.</p> <p>B. Apply the Four Operations to Real-World Situations</p>	<p>A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</p>	<p>Fluency Activities</p> <ul style="list-style-type: none"> • Math dash • Rocket Math • Math Minute <p>A. Adding and Subtracting on a Number Line</p> <p>A. Interactive Number Line</p> <p>A. Rational Numbers, Lesson and Practice Problems</p> <p>A. Video Explaining Opposite Quantities</p> <p>A. Homework Video Tutor, Identifying Properties of Real Numbers</p> <p>A. Interactive Quiz on Identifying Properties</p> <p>A. Convert between fractions, decimals, and whole numbers</p> <p>B. Examples of Multiplication and Division in Real World Contexts</p>	<p>Formative assessment:</p> <ul style="list-style-type: none"> • Vocabulary • daily homework • Peer-teaching • Problem Solving Activity <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Section Quizzes • Quarter Projects • Classroom Diagnostic Tool
<p>II. Order of Operations</p> <p>A. Add, Subtract, Multiply, and Divide Signed Rational Numbers.</p> <p>B. Calculate Numeric Expressions with Exponents</p> <p>C. Evaluating Expressions Involving Fractions, Decimals, and Whole Numbers.</p>	<p>A. Compute fluently and solve problems using positive and negative rational numbers (including integers).</p> <p>B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</p> <p>C. Use properties of operations to generate equivalent expressions.</p>	<p>A. Order of Operations Rap Video</p> <p>A. Simplify numeric expressions involving exponents</p> <p>A. Order of Operations Game</p> <p>A. Evaluating Expressions, Interactive Study Guide</p> <p>A. Order of Operations - PEMDAS</p>	

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<p>III. Unit Rates & Scale Factors</p> <p>A. Identify & Calculate Unit Rate</p> <p>B. Determine Equivalency Between Ratios</p> <p>C. Write & Solve Proportional Relationships</p> <p>D. Proportional Relationships on Graphs</p>	<p>A. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</p> <p>C. Recognize and represent proportional relationships between quantities: Decide whether two quantities are in a proportional relationship.</p> <p>D. Recognize and represent proportional relationships between quantities:</p> <p>a. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>b. Represent proportional relationships by equations.</p> <p>c. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.</p>	<p>A. Writing Ratios</p> <p>A. Writing Unit Ratios from Word Problems</p> <p>A. Interactive Activity for Calculating Rate</p> <p>A. How to Video/Examples for Unit Rate</p> <p>A. Identify and write ratios</p> <p>A. Calculate unit rate</p> <p>A. Determine equivalency between ratios</p> <p>C. Complete the Proportions</p> <p>C. Teacher Resource, Teaching Word Problems Using Proportions</p> <p>D. Identify and/or create a scale</p>	
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