

Brick Township Public Schools MATHEMATICS CURRICULUM

Sixth Grade

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

**BRICK TOWNSHIP PUBLIC SCHOOLS
SIXTH GRADE MATH CURRICULUM**

Content Area: Mathematics

Course Title: Sixth Grade Math

Grade Level: 6

Ratios & Proportional Relationships

8 weeks

Number Sense

6 weeks

Expressions and Equations

6 weeks

Geometry

7 weeks

Statistics and Probability

6 weeks

Created on: June 2015 - Revised on: June 2017 - Board Approved on: September 14, 2017

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The following Standards for Mathematical Practice will be covered throughout each unit of the curriculum.

MP.1	Make sense of problems and persevere in solving them.	<ul style="list-style-type: none">● Find meaning in problems● Look for entry points● Analyze, conjecture and plan solution pathways● Monitor and adjust● Verify answers● Ask themselves the question: “Does this make sense?”
MP.2	Reason abstractly and quantitatively.	<ul style="list-style-type: none">● Make sense of quantities and their relationships in problems● Learn to contextualize and decontextualize● Create coherent representations of problems
MP.3	Construct viable arguments and critique the reasoning of others.	<ul style="list-style-type: none">● Understand and use information to construct arguments● Make and explore the truth of conjectures● Recognize and use counterexamples● Justify conclusions and respond to arguments of others
MP.4	Model with Mathematics.	<ul style="list-style-type: none">● Apply mathematics to problems in everyday life● Make assumptions and approximations● Identify quantities in a practical situation● Interpret results in the context of the situation and reflect on whether the results make sense
MP.5	Use appropriate tools strategically.	<ul style="list-style-type: none">● Consider the available tools when solving problems● Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website, and other technological tools)● Make sound decisions of which of these tools might be helpful
MP.6	Attend to precision.	<ul style="list-style-type: none">● Communicate precisely to others● Use clear definitions, state the meaning of symbols and are careful about specifying units of measure and labeling axes● Calculate accurately and efficiently
MP.7	Look for and make use of structure.	<ul style="list-style-type: none">● Discern patterns and structures● Can step back for an overview and shift perspective● See complicated things as single objects or as being composed of several objects
MP.8	Look for and express regularity in repeated reasoning.	<ul style="list-style-type: none">● Notice if calculations are repeated and look both for general methods and shortcuts● In solving problems, maintain oversight of the process while attending to detail● Evaluate the reasonableness of their immediate results

BRICK TOWNSHIP PUBLIC SCHOOLS

Sixth Grade Math: Ratios and Proportional Relationships

Content Area: Mathematics

Unit Title: Ratios & Proportional Relationships

Target Course/Grade Level: 6

Unit Summary

Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus, students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSLS for Mathematics, Language Arts Literacy, Science and Technology. <http://www.state.nj.us/education/cccs/>

21st Century Themes:

The unit will integrate the 21st Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11. Use technology to enhance productivity.

Technology connections:

Infused within the unit are connections to the NJSLS Educational Technology standard 8.1.

<http://www.nj.gov/education/cccs/2014/tech/>

8.1 Educational Technology

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

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Learning Targets	
Content Standards	
CONTENT STANDARDS LINK: http://www.state.nj.us/education/cccs/2016/math/	
Number	New Jersey Student Learning Standard
MA.6.6.RP.A.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.”
MA.6.6.RP.A.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 $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.
MA.6.6.RP.A.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.
MA.6.6.RP.A.3 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
MA.6.6.RP.A.3 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 mowed in 35 hours? At what rate were lawns being mowed?
MA.6.6.RP.A.3 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.
MA.6.6.RP.A.3 d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

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<p>Unit Essential Questions</p> <ul style="list-style-type: none">● Use ratio language to describe a relationship between two quantities● Express ratios in three ways (a/b a to b and $a:b$) when $b \neq 0$● Find the unit rate● Make tables and graphs to represent equivalent ratios● Solve unit rate problems including pricing and constant speed● Find the percent of a quantity as a rate per 100● Determine what percent one number is to another● Use ratio reasoning to convert measurement units	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none">● A ratio is a special relationship between two quantities where for every x units of one quantity there are y units of another quantity● The quantities being compared in a ratio are called terms.● In a proportional relationship there are an infinite number of ratios equal to the lowest terms or constant ratio. Equal ratios can be found by multiplying both terms by the same non-zero number.● A unit rate is a rate that compares a quantity to one unit of another quantity.● A formula is a common relationship between quantities expressed as an equation.● A special proportional relationship involves distance (d), rate (r), and time (t). The formula showing this relationship is $d = r \times t$.● Rates are easily compared when each is expressed as a unit rate.
<p>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none">● Understand the concept of a ratio● Understand the concept of a unit rate● Use ratios and rates to solve real world problems	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none">● Use ratio language to describe a relationship between two quantities● Express ratios in three ways (a/b a to b and $a:b$) when $b \neq 0$● Find the unit rate● Make tables and graphs to represent equivalent ratios● Solve unit rate problems including pricing and constant speed● Find the percent of a quantity as a rate per 100● Determine what percent one number is to another● Use ratio reasoning to convert measurement units

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

- Direct Observations
- DO-NOW
- Class participation
- Exit tickets
- Guided practice
- Independent practice
- Open-Ended Questions
- Whole class and small group discussion
- Writing Prompts
- Journals
- Homework
- Worksheets
- Quizzes
- Self-Assessment
- Online Assignments

Summative Assessments

- Chapter/Unit Tests
- Teacher Designed Tests
- Mid/ End Chapter Quizzes
- Unit Projects
- Performance Task
- Post Test
- Final Exam
- Presentations
- Online Assessments
- PARCC (subject) test

Modifications (Special Education, ELLs, Gifted and Talented)

Special Education:

Follow all IEP modifications and accommodations/504 plans which may include the following:

- Extra help opportunities provided
- Allow use of a calculator, when appropriate
- Modified length and time frame of assignments
- Alternate assessments with extended time
- Provide guided notes and study guides as needed
- Preferential Seating
- Extra Practice
- Directions repeated, clarified, and reworded
- Breakdown task into manageable units
- Differentiated instruction
- Use of manipulatives
- Math tool paper available

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- Cooperative learning groups
- Supplemental books
- Repeat, reword or clarify directions
- Small group instruction as needed
- Instructional technology as needed/required

English Language Learners:

- Native language text (if available)
- Native language to English dictionaries (if available)
- Use visual aids to assist understanding
- Vocabulary Practice
- Assign a stronger student as a “buddy”
- Modeling
- Small group instruction as needed
- More/less time as appropriate
- Instructional technology as needed/required
- Preferential Seating

Gifted and Talented/Honors:

- Enrichment/Extension Activities
- Opportunities to provide Peer Tutoring
- Real world application
- Rigorous tasks
- Interest based extension activities
- Differentiated instruction
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use centers, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities
- Small group instruction as needed
- Movement from teacher-directed learning to student-directed learning

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Big Ideas Math Green Textbook
- Big Ideas Math Resources by Chapter
- Big Ideas Math Record and Practice Journal
- Access to [Big Ideas Math](#) for teachers and students
- Classroom projector
- Supplemental online resources ([Khan Academy](#), [cool math](#), [Moby Max](#), [Ten Marks](#))

Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS

Sixth Grade Math: Number Sense

Content Area: Mathematics**Unit Title:** Number Sense**Target Course/Grade Level:** 6**Unit Summary**

Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSLs for Mathematics, Language Arts Literacy, Science and Technology. <http://www.state.nj.us/education/cccs/>

21st Century Themes:

The unit will integrate the 21st Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11. Use technology to enhance productivity.

Technology connections:

Infused within the unit are connections to the NJSLs Educational Technology standard 8.1.

<http://www.nj.gov/education/cccs/2014/tech/>

8.1 Educational Technology

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Learning Targets	
Content Standards	
CONTENT STANDARDS LINK: http://www.state.nj.us/education/cccs/2016/math/	
Number	New Jersey Student Learning Standard
MA.6.6.NS.A.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 $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the 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 many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?
MA.6.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.6.NS.B.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 $4(9 + 2)$.
MA.6.6.NS.C.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.
MA.6.6.NS.C.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.
MA.6.6.NS.C.6.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.
MA.6.6.NS.C.6.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
MA.6.6.NS.C.6.c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

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MA.6.6.NS.C.7	Understand ordering and absolute value of rational numbers.
MA.6.6.NS.C.7.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.
MA.6.6.NS.7.b	Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C .
MA.6.6.NS.7.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 situation. For example “an account balance of -30 dollars, write $ -30 = 30$ to describe the size of the debt in dollars.
MA.6.6.NS.7.d	Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.
MA.6.6.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.
<p>Unit Essential Questions</p> <ul style="list-style-type: none"> ● How do operations affect whole numbers? ● What makes a computational strategy both effective and efficient? ● How is fraction division similar to and different from whole number division? ● How are decimal operations similar to and different from whole number operations? ● What is the difference between factors and multiples? ● When do we use least common multiple (LCM) and greatest common factor (GCF)? ● How can we apply and extend our understanding of the number line to include negative and opposite numbers? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● The magnitude of numbers affects the outcome of operations on them. ● Computational fluency includes understanding the meaning and the appropriate use of numerical operations. ● Operations apply to all types of numbers. ● Connections exist between pre-fraction skills (GCF, LCM) and fraction operations, enabling fluent & efficient computation. ● All numbers have an exact position on the number line. ● All numbers have relationships with other numbers and with zero on the number line.

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Unit Objectives

Students will know...

- Procedures for dividing fractions.
- Procedures for computing fluently with multi-digit numbers.
- Procedures for finding common factors and multiples.
- When to use LCM & GCF.
- The relationships between numbers on the number line.

Unit Objectives

Students will be able to...

- Divide fractions using a standard algorithm and using models.
- Divide multi-digit numbers.
- Solve real world decimal problems using standard algorithms.
- Find the least common multiple (LCM) and greatest common factor (GCF) of a set of numbers.
- Use positive and negative numbers and zero to represent real world quantities.
- Identify opposite numbers as having opposite signs and being on opposite sides of zero.
- Identify, graph, order, and compare integers.
- Order rational numbers.
- Identify absolute value of numbers as its distance from zero and as a magnitude for a positive or negative number in a real world context.

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Modifications (ELLs, Special Education, Gifted and Talented)

Special Education :

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- Directions repeated, clarified, and reworded
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Gifted and Talented/Honors :

- Enrichment/Extension Activities
- Opportunities to provide Peer Tutoring
- Real world application
- Rigorous tasks
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- Differentiated instruction
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- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use centers, stations, or contracts
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Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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- Big Ideas Math Resources by Chapter
- Big Ideas Math Record and Practice Journal
- Access to [Big Ideas Math](#) for teachers and students
- Classroom projector
- Supplemental online resources ([Khan Academy](#), [cool math](#), [Moby Max](#), [Ten Marks](#))

Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS
Sixth Grade Math: Expressions and Equations**Content Area:** Mathematics**Unit Title:** Expressions and Equations**Target Course/Grade Level:** 6**Unit Summary**

Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSLs for Mathematics, Language Arts Literacy, Science and Technology. <http://www.state.nj.us/education/cccs/>

21st Century Themes:

The unit will integrate the 21st Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

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Learning Targets	
Content Standards	
CONTENT STANDARDS LINK: http://www.state.nj.us/education/cccs/2016/math/	
Number	New Jersey Student Learning Standard
MA.6.6.EE.A	Apply and extend previous understandings of arithmetic to algebraic exponents.
MA.6.6.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.
MA.6.6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
MA.6.6.EE.A.2.a	Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.
MA.6.6.EE.A.2.b	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 and a sum of two terms.
MA.6.6.EE.A.2.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 $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.
MA.6.6.EE.A.3	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 $3y$.
MA.6.6.EE.A.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.
MA.6.6.EE.B	Reason about and solve one-variable equations and inequalities.
MA.6.6.EE.B.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.
MA.6.6.EE.B.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.
MA.6.6.EE.B.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.
MA.6.6.EE.B.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

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	on number line diagrams.
MA.6.6.EE.C	Represent and analyze quantitative relationships between dependent and independent variables.
MA.6.6.EE.C.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.
Unit Essential Questions <ul style="list-style-type: none">• How can mathematical situations be translated and represented abstractly using variables, expressions, and equations?• How can patterns be used to identify a relationship between two quantities?• What are algebraic expressions and how can they be written and evaluated?• How can equations be graphed?• How can we use rules of arithmetic, algebra, and equivalence to transform equations into equations that can be solved?	Unit Enduring Understandings <i>Students will understand that...</i> <ul style="list-style-type: none">• Some mathematical situations can be translated and represented using a variable in an algebraic expression.• The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculation that results.• There is an agreed upon order in which operations are carried out in a numerical expressions.• The Distributive Property of Multiplication over Addition lets you multiply a sum by multiplying each addend separately and then finding the sum of the products.• Some quantities have a mathematical relationship; the value of one quantity can be found if you know the value of the other quantity. Patterns can sometimes be used to identify a relationship between two quantities.• Some problems can be solved by recording and organizing data in a table and by finding and using numerical patterns in the table.• Equations can be transformed into equivalent equations and solved using properties of equality and inverse operations. A solution to an inequality is a value that makes the inequality true.

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Unit Objectives

Students will know...

- Write and evaluate algebraic expressions
- Write and evaluate one-variable equations and inequalities
- Represent and analyze quantitative relationships between dependent and independent variables

Unit Objectives

Students will be able to...

- Write and evaluate numerical expressions involving whole number exponents
- Write expressions using numbers and variables
- Identify parts of an expression
- Evaluate expressions given specific values for variables
- Solve simple equations using order of operations
- Apply the distributive property to generate equivalent expressions
- Identify when two expressions are equivalent
- Solve an equation or inequality by finding all the values that make it true
- Use variables to represent unknown numbers when solving real-world mathematical problems
- Solve real-world problems by writing and solving equations
- Write, solve, and graph inequalities in real world and mathematical problems
- Use graphs, tables, and equations to identify the relationships between dependent and independent variables

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

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- DO-NOW
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- Independent practice
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- Writing Prompts
- Journals
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- Self-Assessment
- Online Assignments

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- Teacher Designed Tests
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- Post Test
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- Presentations
- Online Assessments
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- Extra Practice
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- Breakdown task into manageable units
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Brick Township Public Schools MATHEMATICS CURRICULUM

Sixth Grade

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- Use of manipulatives
- Math tool paper available
- Cooperative learning groups
- Supplemental books
- Repeat, reword or clarify directions
- Small group instruction as needed
- Instructional technology as needed/required

English Language Learners :

- Native language text (if available)
- Native language to English dictionaries (if available)
- Use visual aids to assist understanding
- Vocabulary Practice
- Assign a stronger student as a “buddy”
- Modeling
- Small group instruction as needed
- More/less time as appropriate
- Instructional technology as needed/required
- Preferential Seating

Gifted and Talented/Honors :

- Enrichment/Extension Activities
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- Rigorous tasks
- Interest based extension activities
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Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS

Sixth Grade Math: Geometry

Content Area: Mathematics**Unit Title:** Geometry**Target Course/Grade Level:** 6**Unit Summary**

Students build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. Try to find the areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangle and parallelograms. Students find the areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSLs for Mathematics, Language Arts Literacy, Science and Technology. <http://www.state.nj.us/education/cccs/>

21st Century Themes:

The unit will integrate the 21st Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11. Use technology to enhance productivity.

Technology connections:

Infused within the unit are connections to the NJSLs Educational Technology standard 8.1.

<http://www.nj.gov/education/cccs/2014/tech/>

8.1 Educational Technology

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

Brick Township Public Schools MATHEMATICS CURRICULUM

Sixth Grade

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ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Learning Targets	
Content Standards	
CONTENT STANDARDS LINK: http://www.state.nj.us/education/cccs/2016/math/	
Number	New Jersey Student Learning Standard
MA.6.6.G.A.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.
MA.6.6.G.A.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 $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
MA.6.6.G.A.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.
MA.6.6.G.A.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.
Unit Essential Questions <ul style="list-style-type: none"> • How can measurements and geometric relationships be used to solve problems? • How does coordinate geometry illustrate a connection between geometry and algebra? 	Unit Enduring Understandings <i>Students will understand that...</i> <ul style="list-style-type: none"> • Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. • Geometric properties can be used to construct geometric figures. • Coordinate geometry facilitates the visualization of algebraic relationships.
Unit Objectives <i>Students will know...</i> <ul style="list-style-type: none"> • How to find the area of polygons. • How to find the volume of rectangular prisms. • How to draw polygons on a coordinate plane. • How to use nets to determine surface area. 	Unit Objectives <i>Students will be able to...</i> <ul style="list-style-type: none"> • Find the area of triangles. • Find the area of quadrilaterals. • Find the area of composite figures. • Solve real-world problems using area. • Find the volume of rectangular prisms. • Show volume is $V=Bh$ and $V=lwh$. • Solve real world problems using volume. • Draw polygons on a coordinate plane given coordinate vertices. • Solve real world problems using coordinate geometry.

Brick Township Public Schools MATHEMATICS CURRICULUM

Sixth Grade

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- Make a net of a 3-D figure.
- Identify a 3-D figure from a net.
- Use nets to find surface area.
- Solve real-world problems using nets.

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

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- Enrichment/Extension Activities
- Opportunities to provide Peer Tutoring
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- Teach cognitive and methodological skills
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- Organize integrated problem-solving simulations
- Propose interest-based extension activities

Brick Township Public Schools MATHEMATICS CURRICULUM

Sixth Grade

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ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

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- Movement from teacher-directed learning to student-directed learning

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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- Big Ideas Math Record and Practice Journal
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Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS

Sixth Grade Math: Statistics and Probability

Content Area: Mathematics

Unit Title: Statistics and Probability

Target Course/Grade Level: 6

Unit Summary

Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSLs for Mathematics, Language Arts Literacy, Science and Technology. <http://www.state.nj.us/education/cccs/>

21st Century Themes:

The unit will integrate the 21st Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

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CRP11. Use technology to enhance productivity.

Technology connections:

Infused within the unit are connections to the NJSLs Educational Technology standard 8.1.

<http://www.nj.gov/education/cccs/2014/tech/>

8.1 Educational Technology

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

Brick Township Public Schools MATHEMATICS CURRICULUM**Sixth Grade**

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Learning Targets	
Content Standards	
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Number	New Jersey Student Learning Standard
MA.6.6.SP.A.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.
MA.6.6.SP.A.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.
MA.6.6.SP.A.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.
MA.6.6.SP.B.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
MA.6.6.SP.B.5a	Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations.
MA.6.6.SP.B.5b	Summarize numerical data sets in relation to their context, such as by: b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
MA.6.6.SP.B.5c	Summarize numerical data sets in relation to their context, such as by: 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.
MA.6.6.SP.B.5d	Summarize numerical data sets in relation to their context, such as by: 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.

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<p>Unit Essential Questions</p> <ul style="list-style-type: none">• What are the different ways that data can be represented?• What are the different numerical measures that describe data sets?• How do you determine which numerical measure is the most appropriate to use to analyze a given data set?	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Statistical questions anticipate variability in the data. These questions can be answered by collecting and analyzing data. The question to be answered determines the data that needs to be collected.• Each type of graph is most appropriate for certain kinds of data. A histogram uses bars to compare continuous numerical data grouped into intervals.• Box plots are useful for plotting data above a number line. Box plots show the spread for each quarter of the data.• 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>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none">• The concept of statistical variability• How to find measures of central tendencies• How to summarize and describe data distributions through graphing	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Determine whether a question is a statistical question or not.• Describe data sets by looking at their center, spread, and overall shape.• Find the mean of a data set.• Find the median, mode, and range of data sets.• Make and use histograms, dot plots, and box plots.• Summarize numerical data sets by identifying sample size, possible bias, and units of measurement.• Use mean absolute deviation and interquartile range to measure variability in a set of data.• Decide which measure of central tendency most accurately describes a given set of data.• Recognize an appropriate statistical measures.

BRICK TOWNSHIP PUBLIC SCHOOLS

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