

Brick Township Public Schools MATHEMATICS CURRICULUM

Eighth Grade

Aligned to the New Jersey Student Learning Standards for Mathematics

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

**BRICK TOWNSHIP PUBLIC SCHOOLS
MATHEMATICS CURRICULUM**

Content Area: Mathematics

Course Title: Eighth Grade Math

Grade Level: 8

The Number System

4 weeks

Expressions and Equations

12 weeks

Functions

8 weeks

Geometry

8 weeks

Statistics

4 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

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The Number System: Unit 1

Content Area: Mathematics

Unit Title: The Number System

Target Course/Grade Level: Grade 8 Math

Unit Summary

Students develop an understanding of rational and irrational numbers. They express fractions as terminating or repeating decimals and express terminating and repeating decimals as fractions. Students use rational approximations of irrational numbers to compare and order numbers. Students understand that it is often useful to convert numbers to other representations in order to solve problems.

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.nj.gov/education/cccs/2016/math/g08.pdf>

Number	New Jersey Student Learning Standards for Mathematics
8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).
Unit Essential Questions <ul style="list-style-type: none">• How are decimals, fractions, and percents related?• How do you compare and order rational and irrational numbers?	Unit Enduring Understandings <p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Every number belongs to a set(s) and how the number compares to other numbers.• There are differences between each set of real numbers, particularly between rational and irrational.
Unit Objectives <p><i>Students will know...</i></p> <ul style="list-style-type: none">• That every rational number is either a terminating or a repeating decimal.• The real number system and how the subsets relate to one another.• The difference between rational and irrational numbers.	Unit Objectives <p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Convert terminating and repeating decimals into reduced fractions.• Read, write, classify, and compare rational numbers.• Compare real numbers and order them on a number line.• Use rational approximations or irrational numbers to compare numbers.

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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
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- 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
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- Allow use of a calculator, when appropriate
- Modified length and time frame of assignments
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- Preferential Seating

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- Extra Practice
- Directions repeated, clarified, and reworded
- Breakdown task into manageable units
- Differentiated instruction
- 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
- Effective teacher questioning; ranging from fact recall to higher order critical thinking questions

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

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- Big Ideas Math textbook and resources
- Scientific calculators
- Supplemental online resources:
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 - <https://www.khanacademy.org/>
 - <http://www.coolmath.com/>
 - <http://www.mobymax.com/>
 - <https://www.tenmarks.com/>
 - <https://www.ixl.com/math/>

Teacher Notes:

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BRICK TOWNSHIP PUBLIC SCHOOLS

Expressions and Equations : Unit 2

Content Area: Mathematics

Unit Title: Expressions and Equations

Target Course/Grade Level: Grade 8 Math

Unit Summary

Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students will solve systems of linear equations in two variables by inspection, algebraically, and/or graphically to demonstrate solutions correspond to points of intersection of their graphs.

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:

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CRP6. Demonstrate creativity and innovation.

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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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ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILL**Learning Targets****Content Standards****CONTENT STANDARDS LINK:** <http://www.nj.gov/education/cccs/2016/math/g08.pdf>

Number	New Jersey Student Learning Standards for Mathematics
8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3^{-5} = 3^{-3} = 1/33 = 1/27$.
8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
8.EE.A.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.
8.EE.A.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .
8.EE.C.7	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). New Jersey Student Learning Standards for Mathematics 57 b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.EE.C.8	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection

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	<p>satisfy both equations simultaneously.</p> <p>b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.</p> <p>c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.</p>
<p>Unit Essential Questions</p> <ul style="list-style-type: none"> ● How do you add, subtract, multiply, and divide very large and small numbers? ● How can linear equations be used to represent real-life situations? ● What are the connections between proportional relationships, lines, and linear equations? ● What is equivalence? ● How can you communicate mathematical ideas effectively? ● Why are equations helpful? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Equation solving is working backwards and undoing operations. ● An ordered pair is a solution to a linear equation, so it must be on the graph of the line. ● A solution to an equation (or a system of equations) is the value of the variable that makes the equation (or both equations) true. ● Like terms must be combined. ● The distributive property can be used to simplify expressions and solve equations.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> ● Expressions are simplified by various means. ● Equations can be solved using the properties of equality. ● Slope is a constant rate of change. ● The slope represents the unit rate in a proportional relationship. ● The solution of a one variable equation can be represented on a number line. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Simplify real number expressions by multiplying and dividing monomials. ● Use the law of exponents to find powers of monomials. ● Write and evaluate expressions using negative exponents. ● Use scientific notation to write small and large numbers. ● Compute with numbers written in scientific notation. ● Find square roots and cube roots and use square root and cube root symbols to represent solutions to equations.. ● Identify proportional and nonproportional linear relationships by finding a constant rate of change. ● Find rate of change.

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- Find slope of a line.
- Compare and contrast proportional and nonproportional linear relationships.
- Use direct variation to solve problems.
- Graph linear equations using the slope and y- intercept.
- Graph a function using x-and y-intercepts.
- Use technology to investigate situations to determine if they display linear behavior.
- Find one solution for a set of two equations.
- Solve systems of equations by graphing.
- Solve systems of equations by substitution.
- Solve systems of equations by elimination.
- Graph and analyze slope triangles.
- Solve multi-step equations using inverse operations.
- Solve equations with variables on both sides.

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Evidence of Learning

Formative Assessments

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- Independent practice
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Summative Assessments

- Chapter/Unit Tests
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- Unit Projects
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Modifications (Special Education, ELLs, Gifted and Talented)

Special Education :

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

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- Partial credit for late work
- Allow use of a calculator, when appropriate
- Modified length and time frame of assignments
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- Preferential Seating
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- Directions repeated, clarified, and reworded
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- 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
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 - <https://www.khanacademy.org/>
 - <http://www.coolmath.com/>
 - <http://www.mobymax.com/>
 - <https://www.tenmarks.com/>
 - <https://www.ixl.com/math/>

Teacher Notes:

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Functions : Unit 3

Content Area: Mathematics

Unit Title: Functions

Target Course/Grade Level: Grade 8 Math

Unit Summary

Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.

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:

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Learning Targets

Content Standards

CONTENT STANDARDS LINK: <http://www.nj.gov/education/cccs/2016/math/g08.pdf>

Number	New Jersey Student Learning Standards for Mathematics
8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.A.2	Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
8.F.A.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
8.F.B.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
Unit Essential Questions <ul style="list-style-type: none">• Which representation of a pattern more clearly shows whether or not the pattern is linear: a table of values or a graph of the pattern?• Are all functions linear? Are all lines functions?• What do you expect to see in this graph given its equations?	Unit Enduring Understandings <p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Real-life data can be modeled and interpreted through equations and graphs.• There is a relationship between graphs and their corresponding tables.• Predictions about graphs can be made based on the equations that correspond to them.

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Unit Objectives

Students will know...

- Whether relations are functions.
- The rules of functions.
- The difference between linear and nonlinear functions.
- The difference between proportional and nonproportional linear relationships.
- The slope of a line is the constant rate of change.
- The slope-intercept form and its components.

Unit Objectives

Students will be able to...

- Determine whether a relation is a function.
- Complete function tables.
- Analyze the change in x-value and how it changes the y-value.
- Compare functions in their different forms (tables, graphs, and equations).
- Translate verbal expressions to create function equations.
- Construct a function to model the linear relationship between two variables.
- Graph equations in two variables by making a table of values and plotting points.
- Graph linear equations using slope and y-intercept.
- Interpret $y = mx + b$ as a linear function.
- Write an equation from the given graph using the slope and y- intercept.
- Sketch a graph of a function from a qualitative description and give a qualitative description of a graph of a function.

BRICK TOWNSHIP PUBLIC SCHOOLS

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Teacher Notes:

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Geometry : Unit 4

Content Area: Mathematics

Unit Title: Geometry

Target Course/Grade Level: Grade 8 Math

Unit Summary

Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students understand the Pythagorean Theorem and apply it to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

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

Eighth Grade

Aligned to the New Jersey Student Learning Standards for Mathematics

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

Learning Targets

Content Standards

CONTENT STANDARDS LINK: <http://www.nj.gov/education/cccs/2016/math/g08.pdf>

Number	New Jersey Student Learning Standards for Mathematics
8.G.A.1	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are transformed to lines, and line segments to line segments of the same length. b. Angles are transformed to angles of the same measure. c. Parallel lines are transformed to parallel lines
8.G.A.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.A.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
8.G.A.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
8.G.B.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in realworld and mathematical problems in two and three dimensions.
8.G.B.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
8.G.C.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

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<p>Unit Essential Questions</p> <ul style="list-style-type: none">• Will a transversal always create a pair of congruent obtuse angles and a pair of congruent acute angles?• Why must you find the area of a figure base and multiply that by its height in order to find its volume?• How do you know if two shapes are similar? What's the difference between similar shapes and congruent shapes?• When is the Pythagorean Theorem applicable?	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none">• Students will be able to find the missing angles in shapes and sets of lines using their vocabulary knowledge.• Students will be able to explain how to obtain an image from its pre-image and vice versa.• Students will be able to solve real world problems using the Pythagorean Theorem• Students will understand that in order to determine a shape's volume, they must multiply the area of the shape's base by the height of the shape.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none">• The relationships of angles formed by two parallel lines cut by a transversal.• The relationship among the angles of triangles.• The Pythagorean Theorem.• The formulas for finding the volume of cylinders, cones and spheres.• The effects of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none">• Identify types of angles.• Find missing angles in shapes and sets of lines.• Understand and apply a rotation about the origin.• Understand and apply a reflection about the x-axis or y-axis.• Understand and apply translations.• Understand and apply dilations.• Determine that the image and pre-image are congruent figures or similar figures by applying an effective sequence of transformations.• Identify parallel and perpendicular lines.• Identify angles formed by a transversal.• Use scale factors to create scale drawings.• Set up and solve proportions to find missing sides of similar shapes.• Determine if a triangle is a right triangle using the Pythagorean Theorem.• Apply the Pythagorean Theorem to determine unknown side lengths.• Apply the Pythagorean Theorem to solve real world problems.• Determine the volume of cylinders, cones and spheres.

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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
- Partial credit for late work
- 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

Brick Township Public Schools MATHEMATICS CURRICULUM

Eighth Grade

Aligned to the New Jersey Student Learning Standards for Mathematics

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

- Extra Practice
- Directions repeated, clarified, and reworded
- Breakdown task into manageable units
- Differentiated instruction
- 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
- Effective teacher questioning; ranging from fact recall to higher order critical thinking questions

English Language Learners :

- Native language text (if available)
- Native language to English dictionaries (if available)
- Use visual aids to assist understanding
- Vocabulary Practice
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Gifted and Talented/Honors :

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

- Big Ideas Math textbook and resources
- Scientific calculators
- Supplemental online resources:
 - <https://www.illustrativemathematics.org/>
 - <https://www.khanacademy.org/>
 - <http://www.coolmath.com/>
 - <http://www.mobymax.com/>
 - <https://www.tenmarks.com/>
 - <https://www.ixl.com/math/>

Teacher Notes:

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BRICK TOWNSHIP PUBLIC SCHOOLS

Statistics : Unit 5

Content Area: Mathematics

Unit Title: Statistics

Target Course/Grade Level: Grade 8 Math

Unit Summary

Students use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship in terms of the situation.

Primary interdisciplinary connections:

Infused within the unit are connections to the 2016 NJSL 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:

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Learning Targets

Content Standards

CONTENT STANDARDS LINK: <http://www.nj.gov/education/cccs/2016/math/g08.pdf>

Number	New Jersey Student Learning Standards for Mathematics
8.SP.A.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.A.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.
8.SP.A.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
8.SP.A.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.
Unit Essential Questions <ul style="list-style-type: none">• What do you expect to see in the scatter plot based on the predicted correlation from the data?• Using the best-fit-line equation, find the x-value(s) for the given y-value and vice versa.• Is the y-intercept of the best-fit-line equation reasonable for the given situation?• Why do you think the data does/doesn't have a linear trend?• How can you read and create a two-way table?	Unit Enduring Understandings <p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Scatter plots can be created by both hand and with technology.• Scatter plots can be used to analyze real-world data to make predictions about future data.• Two-way tables can be used to analyze the relationships between data in the table.

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Unit Objectives

Students will know...

- How to identify the relationship between two sets of data displayed on a scatterplot.
- How to make conjectures about scatter plots.
- Lines of best fit can be used to make predictions about data.

Unit Objectives

Students will be able to...

- Create and interpret scatter plots.
- Make predictions of correlations based on the data topics.
- Identify correlations of scatter plots.
- Determine the best-fit lines for the data.
- Find the equation of the best-fit lines.
- Use the best-fit line to predict values of data.
- Solve problems in the context of bivariate measurement data interpreting the slope and intercept.
- Create and analyze a two-way table.
- Use scatter plots and two-way tables to interpret real data.

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

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- Exit tickets
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- Independent practice
- Open-Ended Questions
- Whole class and small group discussion
- Writing Prompts
- Journals
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- 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:

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 - <http://www.coolmath.com/>
 - <http://www.mobymax.com/>
 - <https://www.tenmarks.com/>
 - <https://www.ixl.com/math/>

Teacher Notes: