

# Brick Township Public Schools MATHEMATICS CURRICULUM

## Seventh Grade

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS

### BRICK TOWNSHIP PUBLIC SCHOOLS MATHEMATICS CURRICULUM

**Content Area:** Mathematics

**Course Title:** Seventh Grade Math

**Grade Level:** 7

The Number System

8 weeks

Expressions and Equations

6-7 weeks

Ratios and Proportions

5-6 weeks

Geometry

8 weeks

Statistics and Probability

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

BRICK TOWNSHIP PUBLIC SCHOOLS

Seventh Grade Math: UNIT 1

**Content Area: Mathematics**

**Unit Title:** The Number System

**Target Course/Grade Level: 7**

**Unit Summary**

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

**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/>

**21<sup>st</sup> Century Themes:**

The unit will integrate the 21<sup>st</sup> 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 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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<b>Learning Targets</b>	
<b>Content Standards</b>	
<b>CONTENT STANDARDS LINK:</b> <a href="http://www.nj.gov/education/cccs/2016/math/">http://www.nj.gov/education/cccs/2016/math/</a>	
<b>Number</b>	<b>New Jersey Student Learning Standard</b>
MA.7.7.NS.A.1	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
MA.7.7.NS.A.1a	Describe situations in which opposite quantities combine to make 0. <i>For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?</i>
MA.7.7.NS.A.1b	Understand $p + q$ as the number located a distance $ q $ from $p$ , in the positive or negative direction depending on whether $q$ is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
MA.7.7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
MA.7.7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
MA.7.7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
MA.7.7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
MA.7.7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If $p$ and $q$ are integers, then $-(p/q) = (-p)/q = p/(-q)$ . Interpret quotients of rational numbers by describing real world contexts.
MA.7.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.7.7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
MA.7.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

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<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"><li>• What are rational numbers?</li><li>• How are fractions and decimals related?</li><li>• How can the additive inverse be applied to solve problems involving rational numbers?</li><li>• How can numbers be used to describe concepts such as sea level, losing yardage in a football game, or temperatures that drop below 0?</li><li>• How can you determine if the sums, differences, products, and quotients of rational numbers are either positive or negative?</li><li>• How can properties of rational numbers be applied to perform operations?</li></ul>	<p><b>Unit Enduring Understandings</b></p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"><li>• Apply mathematical operations with rational numbers to real-world contexts.</li><li>• Explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers.</li></ul>
<p><b>Unit Objectives</b></p> <p><i>Students will know how to...</i></p> <ul style="list-style-type: none"><li>• How to apply operations with rational numbers.</li><li>• How to compare and order rational numbers.</li><li>• The concept of absolute value and its application to integers.</li><li>• How to use and justify the rules for adding, subtracting, multiplying, and dividing integers.</li></ul>	<p><b>Unit Objectives</b></p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"><li>• Graph rational numbers by using a horizontal or vertical number line diagram.</li><li>• Use a horizontal or vertical number line diagram to represent addition and subtraction.</li><li>• Write fractions as terminating or repeating decimals.</li><li>• Write decimals as fractions.</li><li>• Compare and order rational numbers.</li><li>• Add and subtract fractions with like and unlike denominators.</li><li>• Add and subtract mixed numbers.</li><li>• Multiply and divide fractions and mixed numbers.</li><li>• Read and write integers, and find the absolute value of an integer.</li><li>• Add and subtract integers.</li><li>• Use commutative, associative, identity, and distributive properties to solve problems.</li></ul>

**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
- Online Assignments
- Self-Assessment

**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 (ELLs, Special Education, 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

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

### English Language Learners :

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

### Gifted and Talented/Honors :

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

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

[7.NS.A.1 Comparing Freezing Points](#)

[7.NS.A.1b-c Differences of Integers](#)

[7.NS.A.2 Why is a Negative Times a Negative Always Positive](#)

[7.NS.A.2d Equivalent fractions approach to non-repeating decimals](#)

[7.NS.A.2d Repeating decimal as approximation](#)

[7.EE.A.1 Writing Expressions](#)

[7.EE.A.2 Ticket to Ride](#)

### Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS

Seventh Grade Math: UNIT 2

**Content Area: Mathematics**

**Unit Title: Expressions and Equations**

**Target Course/Grade Level: 7**

**Unit Summary**

To use properties of operations to generate equivalent expressions and solve real-life and mathematical problems using numerical and algebraic expressions and equations.

**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/>

**21<sup>st</sup> Century Themes:**

The unit will integrate the 21<sup>st</sup> 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.

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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.

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<b>Content Standards</b>	
<b>CONTENT STANDARDS LINK:</b> <a href="http://www.nj.gov/education/cccs/2016/math/">http://www.nj.gov/education/cccs/2016/math/</a>	
<b>Number</b>	<b>New Jersey Student Learning Standard</b>
MA.7.7.EE.A	Use properties of operations to generate equivalent expressions.
MA.7.7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
MA.7.7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, <math>a + 0.05a = 1.05a</math> means that “increase by 5%” is the same as “multiply by 1.05.”</i>
MA.7.7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
MA.7.7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i>
<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● What is a mathematical expression and how is it useful?</li> <li>● What do you know about the solution to an equation? An inequality?</li> </ul>	<p><b>Unit Enduring Understandings</b> <i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>● Write algebraic expressions and equations given real-world situations.</li> <li>● Use inverse operations to solve multi-step equations.</li> </ul>
<p><b>Unit Objectives</b> <i>Students will know...</i></p> <ul style="list-style-type: none"> <li>● How to write and solve inequalities from real- world contexts.</li> <li>● How to translate word phrases into algebraic expressions and equations.</li> <li>● Expressions are simplified by various means.</li> <li>● Equations can be solved using the properties of equality and inverse operations.</li> </ul>	<p><b>Unit Objectives</b> <i>Students will be able to...</i></p> <ul style="list-style-type: none"> <li>● Evaluate expressions using the order of operations.</li> <li>● Evaluate simple algebraic expressions.</li> <li>● Describe the relationships and extend terms in arithmetic and geometric sequences.</li> <li>● Find squares of numbers and square roots of perfect squares.</li> <li>● Estimate square roots.</li> <li>● Solve one, two, and multi-step equations with rational coefficients.</li> <li>● Solve one, two, and multi-step inequalities.</li> </ul>

**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
- Online Assignments
- Self-Assessment

**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 (ELLs, Special Education, 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

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

### English Language Learners :

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

### Gifted and Talented/Honors :

- o Enrichment/Extension Activities
- o Opportunities to provide Peer Tutoring
- o Real world application
- o Rigorous tasks
- o Interest based extension activities
- o Differentiated instruction
- o Organize and offer flexible small group learning activities
- o Provide whole group enrichment explorations
- o Teach cognitive and methodological skills
- o Use centers, stations, or contracts
- o Organize integrated problem-solving simulations
- o Propose interest-based extension activities
- o Small group instruction as needed
- o Effective teacher questioning; ranging from fact recall to higher order critical thinking questions

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

[7.EE.B.3 Discounted Books](#)

[7.EE.B.3 Shrinking](#)

[7.EE.B.4 Fishing Adventures 2](#)

[7.EE.B.4, 7.NS.A.1 Bookstore Account](#)

[7.EE.B.4b Sports Equipment Set](#)

### Teacher Notes:

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### BRICK TOWNSHIP PUBLIC SCHOOLS

#### Seventh Grade Math: UNIT 3

**Content Area: Mathematics**

**Unit Title:** Ratios and Proportional Relationships

**Target Course/Grade Level: 7**

#### **Unit Summary**

To analyze proportional relationships and use them to solve real-world and mathematical 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/>

#### **21<sup>st</sup> Century Themes:**

The unit will integrate the 21<sup>st</sup> Century Life and Career standards:

CRP2. Apply appropriate academic and technical skills.

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#### **Technology connections:**

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<b>Learning Targets</b>	
<b>Content Standards</b>	
<b>CONTENT STANDARDS LINK:</b> <a href="http://www.nj.gov/education/cccs/2016/math/">http://www.nj.gov/education/cccs/2016/math/</a>	
<b>Number</b>	<b>New Jersey Student Learning Standard</b>
MA.7.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
MA.7.7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MA.7.7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.</i>
MA.7.7.RP.A.2	Recognize and represent proportional relationships between quantities.
MA.7.7.RP.A.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
MA.7.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.7.RP.A.2c	Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i>
MA.7.7.RP.A.2d	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.
MA.7.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>
<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● What are ratios, proportions and percents, and how do we use them in our daily lives?</li> <li>● How can you determine if two quantities are proportional?</li> <li>● When is it appropriate to reason proportionally?</li> <li>● Can proportions be used to solve problems involving similar figures?</li> </ul>	<p><b>Unit Enduring Understandings</b></p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>● Apply proportional reasoning and its applications to real-world contexts (ie: sales tax, discounts, tips).</li> <li>● Recognize that proportional relationships exist between two quantities.</li> <li>● Understand that in a proportion, the ratio for two quantities remains constant as the corresponding values of the quantities change.</li> </ul>

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### Unit Objectives

*Students will know...*

- Proportions are comparisons between two quantities.
- How to use proportions to solve problems.
- Unit rates are the slopes of related linear functions.

### Unit Objectives

*Students will be able to...*

- Determine unit rates.
- Identify proportional and non-proportional relationships.
- Use proportions to solve problems.
- Find the percent of a number.
- Estimate percents by using fractions and decimals.
- Solve problems using the percent proportion.
- Solve problems using the percent equation.
- Find the percent of the increase or decrease.
- Solve problems involving sales tax, tips, discounts, and interest.
- Solve problems involving scale drawings.
- Recognize and represent proportional relationships between quantities.
- Solve multistep problems using ratios and proportions.
- Use ratios to solve a wide variety of percent problems.
- Graph proportional relationships.

**BRICK TOWNSHIP PUBLIC SCHOOLS**

**Evidence of Learning**

**Formative Assessments**

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**Modifications (ELLs, Special Education, Gifted and Talented)**

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### Gifted and Talented/Honors :

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- o Propose interest-based extension activities
- o Small group instruction as needed
- o Movement from teacher-directed learning to student-directed learning

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

[7.RP.A.1 Cooking with the Whole Cup](#)

[7.RP.A.2 Sore Throats, Variation 1](#)

[7.RP.A.2 Buying Coffee](#)

[7.RP.A.2c Gym Membership Plans](#)

[7.RP., 7.EE., 7.NS Drill Rig](#)

[7.RP.A.3, 7.EE.B.3.4 Gotham City Taxis](#)

### Teacher Notes:

BRICK TOWNSHIP PUBLIC SCHOOLS

Seventh Grade Math: UNIT 4

**Content Area: Mathematics**

**Unit Title:** Statistics and Probability

**Target Course/Grade Level: 7**

**Unit Summary**

To use random sampling to draw inferences about a population, draw informal comparative inferences about two populations, investigate chance processes, and develop, use, and evaluate probability models.

**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/>

**21<sup>st</sup> Century Themes:**

The unit will integrate the 21<sup>st</sup> 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 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****Seventh Grade**

Aligned to the New Jersey Student Learning Standards

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS**

<b>Learning Targets</b>	
<b>Content Standards</b>	
<b>CONTENT STANDARDS LINK:</b> <a href="http://www.nj.gov/education/cccs/2016/math/">http://www.nj.gov/education/cccs/2016/math/</a>	
<b>Number</b>	<b>New Jersey Student Learning Standard</b>
MA.7.7.SP.A	Use random sampling to draw inferences about a population.
MA.7.7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
MA.7.7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i>
MA.7.7.SP.B	Draw informal comparative inferences about two populations.
MA.7.7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i>
MA.7.7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i>
MA.7.7.SP.C	Investigate chance processes and develop, use, and evaluate probability models.
MA.7.7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.7.7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i>
MA.7.7.SP.C.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

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MA.7.7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</i>
MA.7.7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</i>
MA.7.7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
MA.7.7.SP.8a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
MA.7.7.SP.8b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
MA.7.7.SP.8c	Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</i>
<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● What are some real-world situations in which you can use probability to make predictions?</li> <li>● How can experimental and theoretical probabilities be used to make predictions or to draw conclusions?</li> <li>● How can data samples inform us about a given population?</li> </ul>	<p><b>Unit Enduring Understandings</b></p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>● Develop a sense of the application of probability and data to the surrounding world.</li> <li>● Use random sampling to draw inferences about a population.</li> </ul>
<p><b>Unit Objectives</b></p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>● Which graph most appropriately displays a given set of data.</li> <li>● How to make predictions based on theoretical probability of independent or dependent events.</li> <li>● How to determine the outcomes of an experiment and predict whether events are likely or unlikely and fair or unfair.</li> <li>● Chance events have a probability between 0 and 1.</li> </ul>	<p><b>Unit Objectives</b></p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> <li>● Find the probability of a simple event.</li> <li>● Find the probability of compound events.</li> <li>● Find the probability of chance events.</li> <li>● Find sample spaces and probabilities.</li> <li>● Use multiplication to count outcomes and find probabilities.</li> <li>● Find the probability of independent and dependent events.</li> <li>● Find and compare experimental and theoretical probabilities.</li> </ul>

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	<ul style="list-style-type: none"><li>• Use experimental and theoretical probabilities to decide whether a game is fair or unfair (likely or unlikely).</li><li>• Predict actions of a larger group by using a sample.</li></ul>
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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
- Online Assignments
- Self-Assessment

#### 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 (ELLs, Special Education, Gifted and Talented)

##### Special Education:

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

- o Extra help opportunities provided
- o Allow use of a calculator, when appropriate
- o Modified length and time frame of assignments
- o Alternate assessments with extended time
- o Provide guided notes and study guides as needed

# Brick Township Public Schools MATHEMATICS CURRICULUM

## Seventh Grade

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ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS

- o Preferential Seating
- o Extra Practice
- o Directions repeated, clarified, and reworded
- o Breakdown task into manageable units
- o Differentiated instruction
- o Use of manipulatives
- o Math tool paper available
- o Cooperative learning groups
- o Supplemental books
- o Repeat, reword or clarify directions
- o Small group instruction as needed
- o Instructional technology as needed/required

### English Language Learners :

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

### Gifted and Talented/Honors :

- o Enrichment/Extension Activities
- o Opportunities to provide Peer Tutoring
- o Real world application
- o Rigorous tasks
- o Interest based extension activities
- o Differentiated instruction
- o Organize and offer flexible small group learning activities
- o Provide whole group enrichment explorations
- o Teach cognitive and methodological skills
- o Use centers, stations, or contracts
- o Organize integrated problem-solving simulations
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### Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

[7.SP.A.1 Mr. Briggs Class Likes Math](#)

[7.SP.A.2 Valentine Marbles](#)

[7.SP.B.3,4 College Athletes](#)

[7.SP.B.3,4 Offensive Linemen](#)

[7.SP.C.6 Heads or Tails](#)

[7.SP.C.7, 6 Rolling Dice](#)

[7.SP.C.7a How Many Buttons](#)

[7.SP.C.8 Tetrahedral Dice](#)

[7.SP.C.8 Waiting Times](#)

### Teacher Notes:

## BRICK TOWNSHIP PUBLIC SCHOOLS MATHEMATICS: UNIT 5

**Content Area: Mathematics**

**Unit Title:** Geometry

**Target Course/Grade Level:** 7

### Unit Summary

To draw, construct, and describe geometrical figures and describe the relationships between them. In addition, solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

### 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/>

### 21<sup>st</sup> Century Themes:

The unit will integrate the 21<sup>st</sup> 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 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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<b>Learning Targets</b>	
<b>Content Standards</b>	
<b>CONTENT STANDARDS LINK:</b> <a href="http://www.nj.gov/education/cccs/2016/math/">http://www.nj.gov/education/cccs/2016/math/</a>	
<b>Number</b>	<b>New Jersey Student Learning Standard</b>
MA.7.7.G.A	Draw, construct, and describe geometrical figures and describe the relationships between them.
MA.7.7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
MA.7.7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
MA.7.7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
MA.7.7.G.B	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
MA.7.7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
MA.7.7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
MA.7.7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
<b>Unit Essential Questions</b> <ul style="list-style-type: none"> <li>● How is geometry used in the real-world?</li> <li>● How is finding the volume of a composite figure different than finding the surface area of a composite figure? How is it similar?</li> <li>● How are scales used to reproduce scale drawings?</li> </ul>	<b>Unit Enduring Understandings</b> <i>Students will understand that...</i> <ul style="list-style-type: none"> <li>● Solve real-life and mathematical problems involving angle measure, area, perimeter, surface area, and volume.</li> <li>● Realize that scale drawings have corresponding quantities that vary proportionally.</li> </ul>

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### Unit Objectives

*Students will know...*

- The formulas used to find area, surface area, and volume of figures and circumference of circles.
- How to find unknown measures and the sum of angles in polygons.
- Fundamental angle relationships.
- Changes in dimensions affect area and volume.
- Proportional relationships by using scale drawings.

### Unit Objectives

*Students will be able to...*

- Find the volume of rectangular and triangular prisms.
- Find the volume of cylinders, cones, and pyramids.
- Find the surface area of prisms, cylinders, and pyramids.
- Find the volume and surface area of composite figures.
- Classify and identify angles and find missing measures.
- Classify and identify triangles and find missing measures.
- Classify quadrilaterals and find missing angle measures.
- Solve problems involving scale drawings of geometric figures.

## BRICK TOWNSHIP PUBLIC SCHOOLS

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- 

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### Gifted and Talented/Honors :

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- o Use centers, stations, or contracts
- o Organize integrated problem-solving simulations
- o Propose interest-based extension activities
- o Small group instruction as needed
- o Movement from teacher-directed learning to student-directed learning

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

[7.G.A.1 Floor Plan](#)

[7.G.A.1 Map distance](#)

[7.G.B.4 Wedges of a Circle](#)

[7.G.B.4 Eight Circles](#)

[7.G.B.6, 7.RP.A.3 Sand under the Swing Set](#)

[7.G.A.2 A task related to 7.G.A.2](#)

[7.G.A.3 Cube Ninjas!](#)

### Teacher Notes: