TOWNSHIP OF UNION PUBLIC SCHOOLS

Grade 7 Mathematics

Adopted June 20, 2017

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Mission Statement

The mission of the Township of Union Public Schools is to build on the foundations of honesty, excellence, integrity, strong family, and community partnerships. We promote a supportive learning environment where every student is challenged, inspired, empowered, and respected as diverse learners. Through cultivation of students' intellectual curiosity, skills and knowledge, our students can achieve academically and socially, and contribute as responsible and productive citizens of our global community.

Philosophy Statement

The Township of Union Public School District, as a societal agency, reflects democratic ideals and concepts through its educational practices. It is the belief of the Board of Education that a primary function of the Township of Union Public School System is to formulate a learning climate conducive to the needs of all students in general, providing therein for individual differences. The school operates as a partner with the home and community.

Course Description

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

Recommended Textbook:

Eureka Math – Engage NY Grade 7 Mathematics

Unit 1: Operations on Rational Numbers & Expressions

Unit 2: Percent, Ratios, and Proportional Relationships

Unit 3: Drawing Inferences about Population & Probability Models

Unit 4: Geometry

I. Unit Standards Overview

Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
Unit 1 **Operations on Rational Numbers & Expressions**	■ 7.NS.A.1 ■ 7.NS.A.2 ■ 7.NS.A.3 ■ 7.EE.A.1 ■ 7.EE.A.2	• Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers • Use properties of operations to generate equivalent expressions	
Unit 1: *Suggested Open Educational 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		MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics.
Unit 2 **Equations and Ratio & Proportion**	■ 7.EE.B.3 ■ 7.EE.B.4* ■ 7.RP.A.1 ■ 7.RP.A.2 ■ 7.RP.A.3* ◉ 7.G.A.1	• Solve real-life and mathematical problems using numerical and algebraic expressions and equations • Analyze proportional relationships and use them to solve real-world and mathematical problems • Draw, construct, and describe geometrical figures and describe the relationships between them	MP.5 Use appropriate tools strategically.
Unit 2:	7.EE.B.3 Discounted Books		

Grade 7 Mathematics

Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
Suggested Open Educational Resources	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 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.G.A.1 Floor Plan 7.G.A.1 Map distance		MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
Unit 3 **Drawing Inferences about Populations** **& Probability Models**	☐ 7.SP.A.1 ☐ 7.SP.A.2 ◉ 7.SP.B.3 ◉ 7.SP.B.4 ☐ 7.SP.C.5 ☐ 7.SP.C.6 ☐ 7.SP.C.7 ☐ 7.SP.C.8	• 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	
Unit 3: *Suggested Open Educational Resources*	7.SP.A.1 Mr. Briggs Class Likes Math 7.SP.A.2 Valentine Marbles		MP.1 Make sense of problems and persevere in solving them.
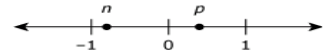
Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
	7.SP.B.3,4 College Athletes 7.SP.B.3,4 Offensive Linemen 7.SP.C.6 Heads or Tails 7.SP.C.7, 6 Rolling Dice 7.SP.C.7a How Many Buttons 7.SP.C.8 Tetrahedral Dice 7.SP.C.8 Waiting Times		MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics.
Unit 4 **Problem Solving with Geometry**	◎ 7.G.B.4 ◎ 7.G.B.5 ◎ 7.G.B.6 ◎ 7.G.A.2 ◎ 7.G.A.3 ■ 7.EE.B.4* ■ 7.RP.A.3*	• Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. • Draw, construct, and describe geometrical figures and describe the relationships between them. • Solve real-life and mathematical problems using numerical and algebraic expressions and equations	MP.5 Use appropriate tools strategically. MP.6 Attend to precision.
Unit 4: *Sample Open Educational Resources*	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! 7.RP, 7.EE, 7.NS Drill Rig		MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.

Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
	7.RP.A.3, 7.EE.B.3,4 Gotham City Taxis		

II.   Units

Unit 1

Unit 1 Operations with Rational Numbers & Expressions			
Content & Practice Standards	**SMP**	**Critical Knowledge & Skills**	**Standard Mastery Examples** Can be used on formative, summative, benchmark, and alternative assessments.
Topic A **7.NS.A.1**. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line. **7.NS.A.1a.** Describe situations in which opposite quantities combine to make 0. 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? **7.NS.A.1b**. Understand $p + q$ as the number located a distance $|q|$	MP.2 MP.3 MP.5 MP.7	Concept(s): ● Opposite quantities combine to make 0 (additive inverses). ● $p + q$ is the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. ● Subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$ ● The product of two whole numbers is the total number of objects in a number of equal groups. Students are able to: ● Represent addition and subtraction on a horizontal number line. ● Represent addition and subtraction on a vertical number line. ● Interpret sums of rational	● Solving what absolute value will give you an answer of 6? **SELECT ALL THAT APPLY!** A. $|-6|$ B. $|6|$ C. $|9| + |-6|$ D. $|-6| + |13|$ E. $|-2| + |4|$ Two numbers, n and p are plotted on the number line shown. The numbers $n - p$, $n + p$, and $p - n$ will be plotted on the number line. Select an expression from each drop-down menu to make this statement true. The number with the least value is [Choose... ▾], and the number with the greatest value is [Choose... ▾] .

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. **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. **7.NS.A.1d.** Apply properties of operations as strategies to add and subtract rational numbers.		numbers in real-world situations. • Show that the distance between two rational numbers on the number line is the absolute value of their difference. **Learning Goal 1:** Describe real-world situations in which (positive and negative) rational numbers are combined, emphasizing rational numbers that combine to make 0. Represent sums of rational numbers $(p + q)$ on horizontal and vertical number lines, showing that the distance along the number line is $|q|$ and including situations in which q is negative and positive, **Learning Goal 2:** Add and subtract (positive and negative) rational numbers, showing that the distance between two points on a number line is the absolute value of their difference and representing subtraction using an additive inverse.	
Topic B **7.NS.A.2.** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide	MP.2 MP.4 MP.7	Concept(s): • Integers can be divided, provided that the divisor is not zero. • If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$.	A ship lowered a device into the ocean to test for the amount of salt in the water. Each time the captain pressed a button, the device was lowered 10 feet. If the button was pressed six times, which integer represents the location of the device under the water?

rational numbers.		Students are able to:	
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.		• Multiply and divide signed numbers. **Learning Goal 3:** Multiply and divide signed numbers, including rational numbers, and interpret the products and quotients using real-world contexts.	
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 $-(p/q) = (-p)/q = p/(-q)$. 2c. Interpret quotients of rational numbers by describing real world contexts.			
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.			
Topic C **7.NS.A.3.** Solve real-world and mathematical problems involving the four operations with rational numbers. **7.NS.A.2**. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.2c.** Apply properties of operations as strategies to multiply and divide rational numbers.	MP.1 MP.2 MP.4 MP.5 MP.6	Concept(s): • The process for multiplying and dividing fractions extends to multiplying and dividing rational numbers. Students are able to: • Add and subtract rational numbers. • Multiply and divide rational numbers using the properties of operations. • Apply the convention of order of operations to add, subtract, multiply and divide rational numbers. • Solve real world problems involving the four operations with rational numbers. **Learning Goal 4:** Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.	The following is an example of the properties and how they are used in this lesson. $-13\frac{5}{7}+6-\frac{2}{7}$ $= -13\frac{5}{7}+6+\left(-\frac{2}{7}\right)$ *Subtracting a number is the same as adding its inverse.* $= -13+\left(-\frac{5}{7}\right)+6+\left(-\frac{2}{7}\right)$ *The opposite of a sum is the sum of its opposite.* $= -13+\left(-\frac{5}{7}\right)+\left(-\frac{2}{7}\right)+6$ *Commutative property of addition* $= -13+(-1)+6$ *Associative property of addition* $= -14+6$ $= -8$

Topic D	MP.1	Concept(s):	Which expressions are equivalent to $3\frac{1}{4} - \left(-\frac{5}{8}\right)$?
7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers. **7.NS.A.2.** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.2c.** Apply properties of operations as strategies to multiply and divide rational numbers.	MP.2 MP.4 MP.5 MP.6	• The process for multiplying and dividing fractions extends to multiplying and dividing rational numbers. Students are able to: • Add and subtract rational numbers. • Multiply and divide rational numbers using the properties of operations. • Apply the convention of order of operations to add, subtract, multiply and divide rational numbers. • Solve real world problems involving the four operations with rational numbers. **Learning Goal 5:** Solve mathematical and real-world problems involving addition, subtraction, multiplication, and division of signed rational numbers.	Select **all** that apply. ☐ A. $3\frac{1}{4} - \left(\frac{5}{8}\right)$ ☐ B. $3\frac{1}{4} + \left(\frac{5}{8}\right)$ ☐ C. $3\frac{1}{4} + \left(-\frac{5}{8}\right)$ ☐ D. $3\frac{1}{4} + \left(+\frac{5}{8}\right)$ ☐ E. $-3\frac{1}{4} + \left(-\frac{5}{8}\right)$ ☐ F. $-3\frac{1}{4} + \left(+\frac{5}{8}\right)$
Topic E **7.EE.A.1.** Apply properties of operations as strategies to add,	MP.2 MP.7	Concept(s): • Rewriting an expression in different forms in a problem context can shed	• Using the Distributive Property **SELECT ALL THE POSSIBLE ANSWERS** that the following expression can be rewritten: 3(n - 5) A) 3n - 5 B) 3n - 15

subtract, factor, and expand linear expressions with rational coefficients. **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.		light on the problem. Students are able to: • Add and subtract linear expressions having rational coefficients, using properties of operations. • Factor and expand linear expressions having rational coefficients, using properties of operations. • Write expressions in equivalent forms to shed light on the problem and interpret the relationship between the quantities in the context of the problem. **Learning Goal 6:** Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **Learning Goal 7:** Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.	C) $3n + 15$ D) $3n + (-15)$ E) $n - 15$ • Simplify $3(4k + 5h) + 12k^2 + 5h - 4k$ A garden is 15-feet long by 5-feet wide. The length and width of the garden will eac[h] increased by the same number of feet. This expression represents the perimeter of larger garden: $(x + 15) + (x + 5) + (x + 15) + (x + 5)$ Which expression is equivalent to the expression for the perimeter of the larger garden? Select **all** that apply. ☐ A. $4x + 40$ ☐ B. $2(2x + 20)$ ☐ C. $2(x + 15)(x + 5)$ ☐ D. $4(x + 15)(x + 5)$ ☐ E. $2(x + 15) + 2(x + 5)$
Topic F **7.EE.B.3.** Solve multi-step real-life and mathematical problems	MP.1 MP.2	Concept(s): • Rational numbers can take different forms.	• Rewrite the following equation without fractions using the algebraic properties: $5/8x + 4 = 3/4$ • Rewrite the following equation without decimals using the algebraic

| posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | MP.3

MP.4

MP.5

MP.6 | Students are able to:

• Solve multi-step real-life problems using rational numbers in any form.
• Solve multi-step mathematical problems using rational numbers in any form.

Learning Goal 8: Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies. | properties:
$$4.5x + 3.25 = 10.5$$ |

Unit 1 Vocabulary
Additive Inverse; Break-Even Point (The break-even point is the point at which there is neither a profit nor loss.); Distance; Loss; Profit; Terminating Decimal; Repeating Decimal (The decimal form of a rational number, for example, 3 = 0. 3.); Absolute Value; Associative Property(of Multiplication and Addition); Commutative Property(of Multiplication and Addition); Credit; Debit; Deposit; Distributive Property (of Multiplication and Addition); Expression; Equation; Integer; Inverse; Multiplicative Inverse; Opposites; Overdraft; Positives; Negatives; Like Terms; Terms; Equation; Expression; Inequality; Inverse operations; Algebraic inequality; Algebraic expression; Compound inequality; Inequality; Solution set; Rational number; Inverse; Reciprocal; Mixed number; Improper fraction; Decimal;

Suggested Activities/Modifications

Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:

1. Activities
   a. Do Now
   b. Use of white boards
   c. One Quiz/One Tests
   d. Review Game
   e. Project

2. English Language Learners.
   a. Read written instructions.
   b. Students may be provided with note organizers / study guides to reinforce key topics.
   c. Model and provide examples
   d. Extended time on assessments when needed.
   e. Establish a non-verbal cue to redirect student when not on task.
   f. Students may use a bilingual dictionary.
   g. Pair Visual Prompts with Verbal Presentations
   h. Highlight Key Words & Formulas

3. Special Education/504 Students.
   a. Students may be provided with note organizers / study guides to reinforce key topics.
   b. Extended time on assessments when needed.
   c. Preferred seating to be determined by student and teacher.
   d. Provide modified assessments when necessary.
   e. Student may complete assessments in alternate setting when requested.
   f. Establish a non-verbal cue to redirect student when not on task.
   g. Maintain strong teacher / parent communication.
   h. Repetition and practice
   i. Pair Visual Prompts with Verbal Presentations
   j. Provide Formulas
   k. Check Use of Agenda

4. Gifted and Talented Students.
   a. Use of Higher Level Questioning Techniques
   b. Extension/Challenge Questions
   c. Provide Assessments at a Higher Level of Thinking
   d. Exploration Problems/Proofs

New Jersey Student Learning Standards - Technology

- 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

Career Readiness Practices

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9. Model integrity, ethical leadership and effective management.
- CRP11. Use technology to enhance productivity.

9.2 Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers
Strand C: Career Preparation

- 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

- 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.
- 9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

Interdisciplinary Connections: Instructional connections through working with authentic scenarios, teachers should help students see how expressions can represent situations in life and will reflect their specific grade-level coursework in other content areas, such as English language arts, reading, science, social studies, world languages, physical education, and fine arts, among others.
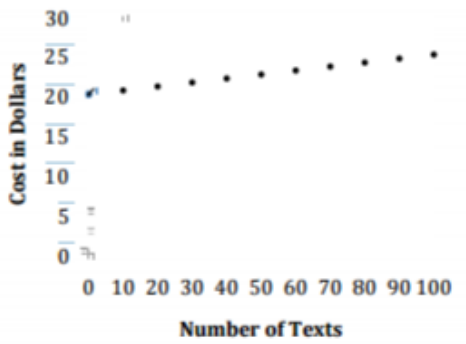
Unit 2 Percent, Ratios, and Proportional Relationships			
Content & Practice Standards	**SMP**	**Critical Knowledge & Skills**	**Standard Mastery Examples** Can be used on formative, summative, benchmark, and alternative assessments.
Topic A **7.RP.A.1**. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	MP.2 MP.4 MP.6	Concept(s): No new concept(s) introduced Students are able to: • Compute unit rates with ratios of fractions. • Compute unit rates with ratios of fractions representing measurement quantities. in both like and different units of measure. **Learning Goal 1:** Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units.	Travis was attempting to make muffins to take to a neighbor that had just moved in down the street. The recipe that he was working with required 3/4 cup of sugar and 1/8 cup of butter. Travis accidentally put a whole cup of butter in the mix. What is the ratio of sugar to butter in the original recipe? What amount of sugar does Travis need to put into the mix to have the same ratio of sugar to butter that the original recipe calls for? If Travis wants to keep the ratios the same as they are in the original recipe, how will the amounts of all the other ingredients for this new mixture compare to the amounts for a single batch of muffins? The original recipe called for 38 cup of blueberries. What is the ratio of blueberries to butter in the recipe? How many cups of blueberries are needed in the new enlarged mixture?
Topic B **7.RP.A.2**. Recognize and represent proportional relationships between quantities. **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	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	Concept(s): • Proportions represent equality between two ratios. • Constant of proportionality Students are able to: • Use tables and graphs to determine if two quantities are in a proportional relationship. • Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	**1)** Nia and Trey both had a sore throat so their mom told them to gargle with warm salt water. Nia mixed 1 teaspoon salt with 3 cups water. Trey mixed 12 teaspoon salt with 112 cups of water. Nia tasted Trey's salt water. She said, "I added more salt so I expected that mine would be more salty, but they taste the same." Explain why the salt water mixtures taste the same. Which of the following equations relates s, the number of teaspoons of salt, with w, the number of cups of water, for both of these mixtures? Choose all that apply.

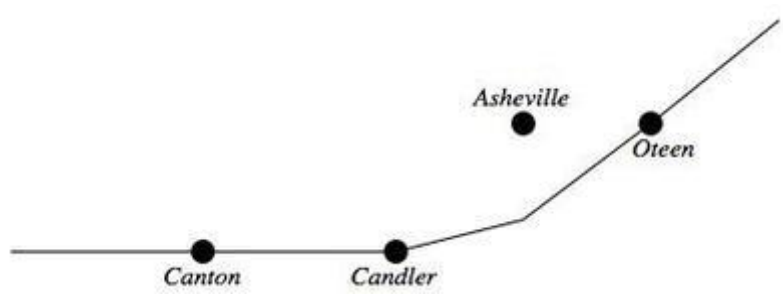|			
origin. **7.RP.A.2b.** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **7.RP.A.2c**. Represent proportional relationships by equations. **7.RP.A.2d.** Explain what a point *(x, y)* on the graph of 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.		• Write equations representing proportional relationships. • Interpret the origin and (1, r) on the graph of a proportional relationship in context. • Interpret a point on the graph of a proportional relationship in context. **Learning Goal 2:** Determine if a proportional relationship exists between two quantities (e.g. by testing for equivalent ratios in a table or graph on the coordinate plane and observing whether the graph is a straight line through the origin). **Learning Goal 3:** Identify the constant of proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions **Learning Goal 4:** Write equations to model proportional relationships in real world problems **Learning Goal 5:** Use the graph of a proportional relationship to interpret the meaning of any point (x, y) on the graph in terms of the situation - including the points (0, 0) and (1, r), recognizing that r is the unit rate.	$s=1/3w$ $s=3w$ $s=1\ 1/2w$ $w=3s$ $w=1/3s$ $w=1/2s$ **2)** Coffee costs $18.96 for 3 pounds. What is the cost for one pound of coffee? At this store, the price for a pound of coffee is the same no matter how many pounds you buy. Let *x* be the number of pounds of coffee and *y* be the total cost of *x* pounds. Draw a graph of the relationship between the number of pounds of coffee and the total cost. Where can you see the cost per pound of coffee in the graph? What is it? **3)** In January, Georgia signed up for a membership at Anytime Fitness. The plan she chose cost $95 in start-up fees and then $20 per month starting in February. Edwin also signed up at Anytime Fitness in January. His plan cost $35 per month starting in February, and his start-up fees were waived. Create tables for both Georgia and Edwin that compare the number of months since January to the total cost of their gym memberships. Continue this table for one year. Decide if either or both gym memberships are described by a proportional relationship, and write an equation representing any such relationship. Explain how parts (a) and (b) could be used to support your answer. **4)** The monthly cost of Jazmine's cell phone plan is graphed on the grid below. Her friend Kiara selected a plan that charges $0.25 per text, with no monthly fee, because she only uses her phone for texting.

Number of Texts

a. Write an equation to represent the monthly cost of Kiara's plan for any number of texts.

b. Graph the monthly cost of Kiara's plan on the grid above.

c. Using the graphs above, explain the meaning of the following coordinate pairs:

(0, 20):

(0, 0):

(10, 2.5):

(100, 25):

d. When one of the girls doubles the number of texts she sends, the cost doubles as well. Who is it? Explain in writing how you know

| **Topic C**

7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7.NS.A.2a. Understand that multiplication is extended from fractions to rational | MP.2

MP.4

MP.7 | Concept(s):

• Every quotient of integers (with non-zero divisor) is a rational number.
• Decimal form of a rational number terminates in 0s or eventually repeats.
• Integers can be divided, provided that the divisor is not zero. | Which of the following is not a terminating or repeating decimal?

$$\frac{3}{8} \quad \frac{1}{4} \quad \frac{1}{3} \quad \frac{7}{11} \quad \frac{7}{17}$$ |

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. **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 $-(p/q) = (-p)/q = p/(-q)$. 2c. Interpret quotients of rational numbers by describing real world contexts. **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.		Students are able to: • Use long division to convert a rational number to a decimal. **Learning Goal 6:** Convert a rational number to a decimal using long division and explain why the decimal is either a terminating or repeating decimal. Convert decimals and fractions to percent's.	Kevin Durant made $\dfrac{9}{11}$ shots in the first quarter of the NBA finals, how is that written as a decimal?

Topic D
 	
7.EE.B.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert
	MP.1
	
	MP.2
	
	MP.3
	
	MP.4
	
	MP.5
		Concept(s):
		
		• Rational numbers can take different forms.
		
		Students are able to:
		
		• Solve multi-step real-life problems using rational numbers in any form.
		• Solve multi-step mathematical problems using rational numbers
			• Katie and Margarita have $20.00 each to spend at Students' Choice book store, where all students receive a 20% discount. They both want to purchase a copy of the same book which normally sells for $22.50 plus 10% sales tax.
			
			    ○ To check if she has enough to purchase the book, Katie takes 20% of$22.50 and subtracts that amount from the normal price. She takes 10% of the discounted selling price and adds it back to find the purchase amount.
			• Margarita takes 80% of the normal purchase price and then computes 110% of the reduced price.
			    ○ Is Katie correct? Is Margarita correct? Do they have enough money to purchase the book?

	MP.6	in any form.	
between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.		• Convert between decimals and fractions and apply properties of operations when calculating with rational numbers. • Estimate to determine the reasonableness of answers. **Learning Goal 7:** Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.	
Topic E **7.RP.A.3.** Use proportional relationships to solve multistep ratio and percent problems. Such as simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	MP.1 MP.2 MP.4 MP.5 MP.6 MP.7	Concept(s): • Recognize percent as a ratio indicating the quantity *per one hundred*. Students are able to: • Use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error. • Use proportions to solve multistep ratio problems. **Learning Goal 8:** Solve multi-step ratio and percent problems using proportional relationships (simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and	• There were 24 boys and 20 girls in a chess club last year. This year the number of boys increased by 25% but the number of girls decreased by 10%. Was there an increase or decrease in overall membership? Find the overall percent change in membership of the club.

		decrease, percent error)	
Topic F **7.RP.A.3:** Use proportional relationships to solve multistep ratio and percent problems. **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.	MP.1 MP.2 MP.4 MP.5 MP.6 MP.7	Concept(s): • Scale and proportion Students are able to: • Use ratios and proportions to create scale drawings. • Reproduce a scale drawing at a different scale. • Computing actual lengths and areas from a scale drawing. • Solve problems involving scale drawings using proportions. **Learning Goal 9:** Use ratio and proportion to solve problems involving scale drawings of geometric figures.	On the map below, 1/4 inch represents one mile. Candler, Canton, and Oteen are three cities on the map. If the distance between the real towns of Candler and Canton is 9 miles, how far apart are Candler and Canton on the map? If Candler and Oteen are 312 inches apart on the map, what is the actual distance between Candler and Oteen in miles?

Unit 2 Vocabulary
Equivalent ratios; Indirect measurement; Proportion; Rate; Scale; Scale drawing; Scale model; Similar; Corresponding sides; Corresponding angles; Percent change; Interest; Percent of decrease; Percent of increase; Principal; Simple interest; Isolate variable; Proportion; Gratuity; Commission; Fee; Tax

Suggested Activities/Modifications

Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:

1. Activities
   a. Do Now activities
   b. Classwork

      c. Homework
      d. Use of white boards
      e. Quizzes/Unit Tests
      f. Review Game
      g. Project
      h. Assistive Technology
      i. PARCC Practice

2. English Language Learners.
    a. Read written instructions.
    b. Students may be provided with note organizers / study guides to reinforce key topics.
    c. Model and provide examples
    d. Extended time on assessments when needed.
    e. Establish a non-verbal cue to redirect student when not on task.
    f. Students may use a bilingual dictionary.
    g. Pair Visual Prompts with Verbal Presentations
    h. Highlight Key Words & Formulas

3. Special Education/504 Students.
    a. Students may be provided with note organizers / study guides to reinforce key topics.
    b. Extended time on assessments when needed.
    c. Preferred seating to be determined by student and teacher.
    d. Provide modified assessments when necessary.
    e. Student may complete assessments in alternate setting when requested.
    f. Establish a non-verbal cue to redirect student when not on task.
    g. Maintain strong teacher / parent communication.
    h. Repetition and practice
    i. Pair Visual Prompts with Verbal Presentations
    j. Provide Formulas
    k. Check Use of Agenda

4. Gifted and Talented Students.
    a. Use of Higher Level Questioning Techniques
    b. Extension/Challenge Questions
    c. Provide Assessments at a Higher Level of Thinking
    d. Exploration Problems/Proofs

New Jersey Student Learning Standards - Technology

- 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

Career Readiness Practices

- CRP2. Apply appropriate academic and technical skills.

- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9. Model integrity, ethical leadership and effective management.

9.2 Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers
Strand C: Career Preparation

- 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

- 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.
- 9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.
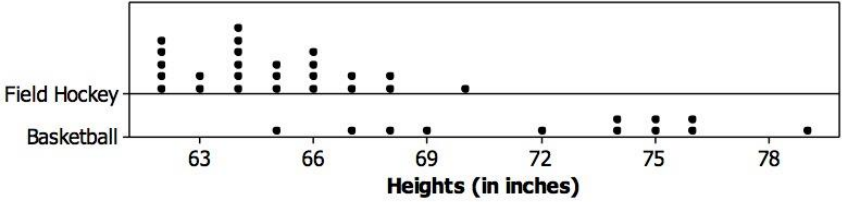
Interdisciplinary Connections:
- Geography: use unit rate to find population density.
- Social Studies: In elections, delegates are proportional to the population in each state.

Unit 3 Drawing Inferences about Populations & Probability Models			
Content & Practice Standards	**SMP**	**Critical Knowledge & Skills**	**Standard Mastery Examples** Can be used on formative, summative, benchmark, and alternative assessments.
Topic A **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.	MP.3 MP.6	Concept(s) - 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. - Random sampling tends to produce representative samples. Students are able to: - Analyze and distinguish between representative and non-representative samples of a population. **Learning Goal 1**: Distinguish between representative and non-representative samples of a population (*e.g. if the class had 50% girls and the sample had 10% girls, then that sample was not representative of the population*).	Your teacher is conducting a survey to determine the average age of students in your class. Which of the following would most likely not result in a representative sample? A. ◯ Your teacher writes everyone's name down on a piece of paper and draws 10 names from a hat to survey. B. ◯ Your teacher chooses only students wearing a red or blue shirt to survey. C. ◯ Neither of these would result in a representative sample D. ◯ Both of these would result in a representative sample
Topic B **7.SP.A.2.** Use data from a random sample to draw inferences about a population with an unknown characteristic of	MP.1 MP.2 MP.3 MP.4	Concept(s): - Inferences can be drawn from random sampling. Students are able to: - Analyze data from a sample to draw inferences about the population.	What is the average amount of time BMS students spend watching TV each week? *the surveying student will randomly ask one student at each cafe. table, during each grade level lunch, how many hours he/she watches TV each week. Based on the average of the data collected we can assume how many hours of TV the

interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *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.*	MP.6	• Generate multiple random samples of the same size. • Analyze the variation in multiple random samples of the same size. **Learning Goal 2:** Use random sampling to produce a representative sample. **Learning Goal 3:** Develop inferences about a population using data from a random sample and assess the variation in estimates after generating multiple samples of the same size.	entire student body at BMS watches.
Topic C **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.	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7	Concept(s): No new concepts introduced Students are able to: • locate, approximately, the measure of center (mean or median) of a distribution • Visually assess, given a distribution, the measure of spread (mean absolute deviation or inter-quartile range). • Visually compare two numerical data distributions and describe the degree of overlap. • Measure or approximate the difference between the measures centers and express it as a multiple of a measure of variability. **Learning Goal 4:** Visually compare the means of two distributions that have	 Based on visual inspection of the dotplots, which group appears to have the larger average height? Which group appears to have the greater variability in the heights? ☐ Compute the mean and mean absolute deviation (MAD) for each group. Do these values support your answers in part (a)? ☐ How many of the 12 basketball players are shorter than the tallest field hockey player? ☐ Imagine that an athlete from one of the two teams told you she needs to go to practice. You estimate that she is about 65 inches tall. If you had to pick, would you think that she was a field hockey player or that she was a basketball player? Explain your reasoning. ☐ The women on the Maryland field hockey team are not a random sample of all female college field hockey players. Similarly, the women on the Maryland basketball team are not a random sample of all female college basketball players. However, for purposes of

		similar variability; express the difference between the centers as a multiple of a measure of variability.	this task, suppose that these two groups can be regarded as random samples of all female college field hockey players and all female college basketball players, respectively. If these were random samples, would you think that female college basketball players are typically taller than female college field hockey players? Explain your decision using answers to the previous questions and/or additional analysis.
Topic D **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.	MP.1 MP.2 MP.3 MP.4 MP.5 MP.6	Concept(s): No new concept(s) introduced Students are able to: • Using measures of center, draw informal inferences about two populations and compare the inferences. • Using measures of variability, draw informal inferences about two populations and compare the inferences. **Learning Goal 5:** Draw informal comparative inferences about two populations using their measures of center and measures of variability.	 **Offensive Linemen - Weight (in pounds)** A. Based on visual inspection of the dot plots, which group appears to have the larger average weight? Does one group seem to have greater variability in its weights than the other, or do the two groups look similar in that regard? B. Compute the mean and mean absolute deviation (MAD) for each group. Do your measures support your answers in part (a)? C. Choose from the following to fill in the blank: "The average Alabama offensive lineman's weight is about _____ than the average Mount Union offensive lineman's weight." 1. 20 pounds lighter 2. 15 pounds lighter 3. 15 pounds heavier 4. 20 pounds heavier D. "This difference in average weights is approximately _____ of either team." 5. About half of the MAD 6. Slightly more than 1 MAD 7. Twice the MAD E. The offensive linemen on the Alabama team are not a random sample from all FBS offensive linemen. Similarly, the offensive linemen on the Mount Union Team are not a random sample from all Division III offensive linemen. However, for purposes of this task, suppose that these two groups can be regarded as random samples of offensive linemen from their respective divisions/subdivisions. If these were random samples, would you think that offensive linemen from FBS schools are typically heavier than offensive linemen from Division III schools? Explain your decision using answers to the previous questions and/or additional analysis.
Topic E **7.SP.C.5.** Understand that the probability of	MP.4 MP.5	Concept(s): • Probability of a chance event is a number between 0 and 1. • Probability expresses the	Decide where each event would be located on the scale from between 0 and 1. Place the letter for each event in the appropriate place on the probability scale. Event: A. You will see a live dinosaur on the way home from school today.

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.	MP.6 MP.7	likelihood of the event occurring. • Larger probability indicates greater likelihood. Students are able to: • Draw conclusions about the likelihood of events given their probability. **Learning Goal 6:** Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event happening is near 0, a likely event is near 1, and 1/2 is neither likely nor unlikely.	B. A solid rock dropped in the water will sink. C. A round disk with one side red and the other side yellow will land yellow side up when flipped. D. A spinner with four equal parts numbered 1–4 will land on the 4 on the next spin. E. Your full name will be drawn when a full name is selected randomly from a bag containing the full names of all of the students in your class. F. A red cube will be drawn when a cube is selected from a bag that has five blue cubes and five red cubes. G. Tomorrow the temperature outside will be −250 degrees.
Topic F **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.	MP.1 MP.2 MP.3 MP.4 MP.5	Concept(s): • Relative frequency • Experimental probability • Theoretical probability Students are able to: • Collect data on chance processes, noting the long-run relative frequency. predict the approximate relative frequency given the theoretical probability **Learning Goal 7:** Approximate the probability of a chance event by collecting data and observing long-run relative frequency; predict the approximate relative frequency given the probability	relative frequency = # of times an event has occurred /# of trials Probability: will it snow Christmas week? Process: the students will check previous years of weather records during Christmas week, then use formula for relative frequency to determine the probability. Then convert fraction into decimal form then into a percentage. To reverse the prob. to relative frequency is to change percentage to a decimal and then to a fraction.
Topic G **7.SP.C.7.** Develop a probability model and	MP.1 MP.2	Concept(s): • Uniform (equally likely) and non-uniform probability models	Problem Set Jerry and Michael played a game similar to Picking Blue! The following results are from

| 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.

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.

7.SP.C.7b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | MP.4

MP.6 | Students are able to:
• Develop a uniform probability model.
• Use a uniform probability model to determine the probabilities of events.
• Develop (non-uniform) probability models by observing frequencies in data that has been generated from a chance process.

Learning Goal 8: Develop a uniform probability model by assigning equal probability to all outcomes; develop probability models by observing frequencies and use the models to determine probabilities of events; compare probabilities from a model to observed frequencies and explain sources of discrepancy when agreement is not good | their research using the same two bags:

Jerry's Research:

Number of Red Chips Picked Bag A   2

Bag B   3

Number of Blue Chips Picked   Bag A   8

Bag B   7

Michael's Research:

Number of Red Chips Picked   Bag A 28

Bag B 22

Number of Blue Chips Picked: Bag A 12

Bag B 18

1. If all you knew about the bags were the results of Jerry's research, which bag would you select for the game?

2. If all you knew about the bags were the results of Michael's research, which bag would you select for the game? Explain your answer.

3. Does Jerry's research or Michael's research give you a better indication of the makeup of the blue and red chips in each bag? Explain why you selected this research.

4. Assume there are 12 chips in each bag. Use either Jerry's or Michael's research to estimate the number of red and blue chips in each bag. Then, explain how you made your estimates.

Bag A   Bag B

Number of red chips: Number of red chips:

Number of blue chips: Number of blue chips:

5. In a different game of Picking Blue!, two bags each contain red, blue, green, and yellow chips. One bag contains the same number of red, blue, green, and yellow chips. In the second bag, half of the chips are blue. Describe a plan for determining which bag has more |

Grade 7 Mathematics

			blue chips than any of the other colors.
Topic H **7.SP.C.8**. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.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. **7.SP.C.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. **7.SP.C.8c.** Design and use a simulation to generate frequencies for compound events	MP.1 MP.2 MP.4 MP.5 MP.7 MP.8	Concept(s): • Just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space. Students are able to: • Use organized lists, tables, and tree diagrams to represent sample spaces. • Given a description of an event using everyday language, identify the outcomes in a sample space that make up the described event. • Design simulations. use designed simulations to generate frequencies for compound events. **Learning Goal 9:** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams, identifying the outcomes in the sample space which compose the event. Use the sample space to find the probability of a compound event. **Learning Goal 10:** Design and use a simulation to generate frequencies for compound events.	A drawer contains 5 brown socks, 6 black socks, and 9 navy blue socks. The power is out. What is the probability that Sam chooses two socks that are both black? The probability that it will snow on Sunday is . The probability that it will snow on both Sunday and Monday is . What is the probability that it will snow on Monday, if it snowed on Sunday?

Unit 3 Vocabulary
Chance Experiment; Chance Process; Event ; Simple event; Sample Space; Frequency of an Event; Population ; Probability Simulation (illustration); Random Sample; Sample Size; Relative Frequency of an Event ; Sample; Mean ; Median; Mode; Range; Box and Whisker plot; Independent event; Dependent event; Combinations; Permutations; Theoretical Probability; Experimental Probability

Suggested Activities/Modifications

Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:

1. Activities
   a. Practice/review games
   b. Task cards
   c. One quiz and one test
2. English Language Learners.
   a. Read written instructions.
   b. Model and provide examples
   c. Extended time on assessments when needed.
   d. Establish a non-verbal cue to redirect student when not on task.
   e. Students may use a bilingual dictionary.
3. Special Education/504 Students.
   a. Students may be provided with note organizers / study guides to reinforce key topics.
   b. Extended time on assessments when needed.
   c. Preferred seating to be determined by student and teacher.
   d. Provide modified assessments when necessary.
   e. Student may complete assessments in alternate setting when requested.
   f. Establish a non-verbal cue to redirect student when not on task.
   g. Maintain strong teacher / parent communication.
4. Gifted and Talented Students.
   a. Probability Games - Spinners
   b. Find the likelihood of inheriting particular traits from different animals around the world with the use of Punnett squares

New Jersey Student Learning Standards - Technology

- 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

Career Readiness Practices

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9. Model integrity, ethical leadership and effective management.

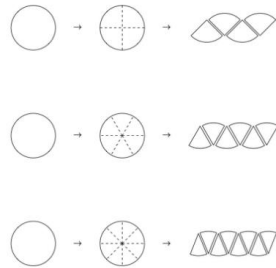**9.2 Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers**
Strand C: Career Preparation

- 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Interdisciplinary Connections:
● Science: Use probability to find out of a group of 1000 people, how many would be colorblind.
● Industry: Use probability to determine how many specific parts of an automobile that are being manufactured could be defective.

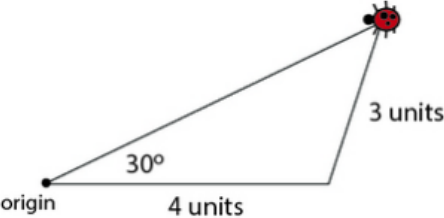| Unit 4 Geometry			
Content & Practice Standards	**SMP**	**Critical Knowledge & Skills**	**Standard Mastery Examples** Can be used on formative, summative, benchmark, and alternative assessments.

Topic G
 	
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.
	MP.1
	
	MP.2
	
	MP.3
	MP.4
	
	MP.5
	
	MP.6
	
	MP.7
	MP.8
		Concept(s):
		  • Circumference
		
		Students are able to:
		  • Solve problems by finding the area and circumference of circles.
		  • Show that the area of a circle can be derived from the circumference.
		
		Learning Goal 9: 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.
			Martin and Muriel finished a project for class showing one way to see why the area of a circle is given by $A=\pi r^2$, if r is the radius of the circle. Muriel is not in class today and Martin is trying to understand the following page of pictures from their project. Help Martin by writing up an explanation of how these pictures could be used to derive the formula for the area of a circle.

Topic H **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.	MP.3 MP.4 MP.5 MP.6 MP.7	Concept(s): No new concept(s) introduced Students are able to: • Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations. • Solve mathematical problems by writing and solving simple algebraic equations based on the relationships between and properties of angles (supplementary, complementary, vertical, and adjacent. **Learning Goal 10:** Write and solve *simple* multi-step algebraic equations involving supplementary, complementary, vertical, and adjacent angles.	$23x - 5$ $21x + 5$ $20x + 5$ $24x - 1$
Topic I **7.G.B.6.** Solve real-world and mathematical problems involving area,	MP.1 MP.2 MP.3	Concept(s): No new concept(s) introduced Students are able to: • Solve real-world	• The 7th graders at Sunview Middle School were helping to renovate a playground for the kindergartners at a nearby elementary school. City regulations require that the sand underneath the swings be at least 15 inches deep. The sand under both swing sets was only 12 inches deep when they started.

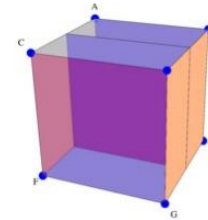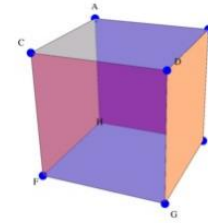|			
volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	MP.4. MP.5 MP.6 MP.7	and mathematical problems involving area of two dimensional objects composed of triangles, quadrilaterals, and polygons. • Solve real-world and mathematical problems involving volume of three dimensional objects composed of cubes and right prisms. • Solve real-world and mathematical problems involving surface area of three-dimensional objects composed of cubes and right prisms. **Learning Goal 11**: 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.	• The rectangular area under the small swing set measures 9 feet by 12 feet and required 40 bags of sand to increase the depth by 3 inches. How many bags of sand will the students need to cover the rectangular area under the large swing set if it is 1.5 times as long and 1.5 times as wide as the area under the small swing set?
Topic J **7.G.A.2.** Draw (with technology, with ruler and	MP.3 MP.5	Concept(s): • Conditions for unique triangles, more than one	**Starting at the origin, a ladybug walked 4 units east. Then she walked a distance of 3 units in an unknown direction. At that time she was 30 degrees to the north of her original walking direction.** The diagram shows one possibility for the ladybug's final location. Find a different final location

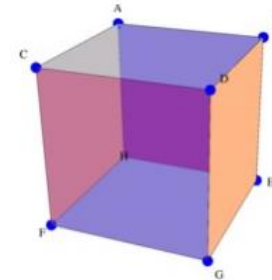|			
protractor as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle	MP.6 MP.7	triangle, and no triangle. Students are able to: • Draw geometric shapes with given conditions, including constructing triangles from three measures of angles or sides. • Recognize conditions determining a unique triangle, more than one triangle, or no triangle. **Learning Goal 12**: Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles.	that is also consistent with the given information, and draw the ladybug there.
Topic K **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.	MP.5 MP.6 MP.7.	Concept(s): • Cross-sections of three-dimensional objects Students are able to: • Analyze three dimensional shapes (right rectangular pyramids and	Imagine you are a ninja that can slice solid objects straight through. You have a solid cube in front of you. You are curious about what 2-dimensional shapes are formed when you slice the cube. For example, if you make a slice through the center of the cube that is parallel to one of the faces, the cross section is a square:

		prisms) by examining and describing all of the 2-dimensional figures that result from slicing it at various angles. **Learning Goal 13**: Describe all of the 2-dimensional figures that result when 3-dimemsional figures are sliced from multiple angles.	 For each of the following slices, (i) describe using precise mathematical language the shape of the cross section. (ii) draw a diagram showing the cross section of the cube. a. A slice containing edge AC and edge EG b. A slice containing the vertices C, B, and G. C. A slice containing the vertex A, the midpoint of edge EG, and the midpoint of edge FG.
Topic M **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	MP.1 MP.2 MP.3 MP.4	Concept(s): No new concept(s) introduced Students are able to: • Compare an arithmetic solution to a word problem to the algebraic solution of the	• Fishing Adventures rents small fishing boats to tourists for day-long fishing trips. Each boat can only carry 1200 pounds of people and gear for safety reasons. Assume the average weight of a person is 150 pounds. Each group will require 200 lbs. of gear for the boat plus 10 lbs. of gear for each person. o Create an inequality describing the restrictions on the number of people possible in a rented boat. Graph the solution set. • Several groups of people wish to rent a boat. Group 1 has 4 people. Group 2 has 5 people. Group 3 has 8 people. Which of the groups, if any, can safely rent a boat? What is the maximum number of people that may rent a boat?

quantities .	MP.5	word problem, identifying the sequence of operations in each solution.	
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. **7.EE.B.4b.** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	MP.6 MP.7	• Write an equation of the form px + q = r or p(x + q)=r in order to solve a word problem. • Fluently solve equations of the form px + q = r and p(x + q)= r. • Write an inequality of the form $px + q > r$, $px + q < r$, $px + q \geq r$ or $px + q \leq r$ to solve a word problem. • Graph the solution set of the inequality. • Interpret the solution to an inequality in the context of the problem. **Learning Goal 15:** Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems. **Learning Goal 16:** Fluently solve equations; solve inequalities, graph the solution set of the	• At the beginning of the month, Evan had $24 in his account at the school bookstore. Use a variable to represent the unknown quantity in each transaction below and write an equation to represent it. Then represent each transaction on a number line. What is the unknown quantity in each case? i. First he bought some notebooks and pens that cost $16. ii. Then he deposited some more money and his account balance was $28. iii. Then he bought a book for English class that cost $34. iv. Then he deposited exactly enough money so that he paid off his debt to the bookstore. • Explain why it makes sense to use a negative number to represent Evan's account balance when he owes money.

		inequality and interpret the solutions in the context of the problem (Equations of the form px + q = r and p(x + q) = r and inequalities of the form px + q > r, px + q ≥r, px+ q ≤ r, or px + q < r, where p, q, and r are specific rational numbers).	

Unit 4 Vocabulary
Circumference; Area; Circle; Cross section; Three dimensional; Supplementary angles; Complementary angles; Vertical angles; Adjacent angles; Triangle; Polygon; Quadrilateral; Composite Shape; Cube; Right Prism; Volume; Surface Area; Rectangular Pyramid

Suggested Activities/Modifications

Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:
1. Activities
   a. Practice/review games
   b. Real-World Applications
   c. One quiz and one test
2. English Language Learners.
   a. Read written instructions.
   b. Model and provide examples
   c. Extended time on assessments when needed.
   d. Establish a non-verbal cue to redirect student when not on task.
   e. Students may use a bilingual dictionary.
   f. Conversion chart
3. Special Education/504 Students.
   a. Extended time on assessments when needed.
   b. Preferred seating to be determined by student and teacher.
   c. Provide modified assessments when necessary.
   d. Student may complete assessments in alternate setting when requested.
   e. Establish a non-verbal cue to redirect student when not on task.

f. Maintain strong teacher / parent communication.
g. Conversion chart
4. Gifted and Talented Students
    a. Exploration of Problems/Proofs
    b. Provide enrichment activities to expand upon the curriculum.
    c. Use higher level questioning techniques in class and on assessments.

New Jersey Student Learning Standards - Technology

- 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

Career Readiness Practices

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9. Model integrity, ethical leadership and effective management.

9.2 Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers
Strand C: Career Preparation

- 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Interdisciplinary Connections:
Architecture- Used to create buildings, sculptures, packages, etc.
Industry-used for packaging items for shipping, label designs, etc.
Carpentry-Determining price of carpeting per square foot, finding cost of paint to cover walls

Global Perspectives
- How geometry is used in building houses: http://www.holistichouseplans.com/
- Geometric images: http://fiveprime.org/hivemind/Tags/geometry.hyperbolic
- China: http://www.math.admu.edu.ph/tsg22/mok.htm
- Incas: geometry from the land of Incas (http://agutie.homestead.com/)
- Research countries where mathematics developed http://www-groups.dcs.st-and.ac.uk/~history/BirthplaceMaps/MapIndex.html

III.   Additional Differentiation/Modifications for Teaching

Research-Based Effective Teaching Strategies	Additional Modifications for G&T	Additional Strategies for Special Education	Additional Strategies for English Language Learners
Questioning techniques to facilitate learning • See also **Five Practices for Orchestrating Math Discussion** Math Discourse • Talk Moves Constructivist learning opportunities • Piaget, Vygotsky, Bruner Multiple Representations Promote linguistic and nonlinguistic representations Various types of feedback • Student to student feedback • Teacher to student feedback Varied opportunities for students to communicate mathematically (orally, writing) Use technological and /or physical tools (manipulatives)	See EngageNY Grade 7 for Classroom Differentiation for Gifted Students.	See EngageNY Grade 7 for Classroom Differentiation for information on Special Need Students.	**Extension**: See EngageNY Grade 7 for Scaffolding Instruction for English Language Learners. **ELD Standard** **Standard 3 - Language of Mathematics** English language learners communicate information, ideas and concepts necessary for academic success in the content area of mathematics.

IV.   Instructional Resources and Materials

Formative Assessment	Summative Assessment	Supplemental Resources		Print Resource
Short constructed responses Extended constructed responses Teacher Observation Checks for understanding Do Now Exit Tickets Problem Sets (EngageNY) Sprints (EngageNY) **Extension** – See additional performance tasks in the **Unit Standards Overview.**	End-of-Module Assessment (EngageNY) Mid-Module Assessment (EngageNY)	**Teacher Resources** Annenberg Learning Mathematics Assessment Projects Achieve the Core Mathplanet.com Interactive Mathematics.com Illustrative Mathematics Inside Mathmatics.org EdConnect.org Prodigy Desmos iReady Khan Academy	**Student Resources** Khan Academy Prodigy iReady Math is Fun (website) Virtual Nerd Engage NY (website) Engage NY (Homework Helpers) A Math Dictionary for Kids	Eureka Math – Engage NY Grade 7 Mathematics

Math 7 Pacing Guide

	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
	Module 1 Ratios and Proportional Relationships **(30 days)** 7.RP.1 7.RP.2 7.RP.3	Module 1 Ratios and Proportional Relationships 7.EE.4 7.G.1 Module 2 Rational Numbers **(30 days)** 7.RP.1 7.RP.2 7.RP.3	Module 2 Rational Numbers 7.NS.1 7.NS.2 7.NS.3	Module 2 Rational Numbers 7.EE.2 7.EE.4 7.NS.1 7.NS.2 7.NS.3 Module 3: Expressions and Equations **(35 days)** 7.EE.1	Module 3: Expressions and Equations 7.EE.2 7.EE.3 7.EE.4	Module 3: Expressions and Equations 7.G.4 7.G.5 7.G.6 Module 4: Percent and Proportional Relationships **(25 days)** 7.RP.1 7.RP.2 7.RP.3	Module 4: Percent and Proportional Relationships 7.EE.3 7.G.1	Module 5: Statistics and Probability **(25 days)** 7.SP.1 7.SP.2 7.SP.3 7.SP.4 7.SP.5	Module 5: Statistics and Probability 7.SP.6 7.SP.7 7.SP.8 Module 6: Geometry **(30 days)** 7.G.2 7.G.3	Module 6: Geometry 7.G.5 7.G.6