

Grade, Subject/Course: 7th grade/7th grade Math	
Unit: Rational Numbers	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Integers are part of the rational number system and can be used to represent and compare quantities in real-world situations. Understanding how to operate with integers using number lines and properties of operations helps us make sense of positive and negative values in everyday contexts.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.A-N.1.1.1 Apply properties of operations to add and subtract rational numbers, including real-world contexts. M07.A-N.1.1.2 Represent addition and subtraction on a horizontal or vertical number line. M07.A-N.1.1.3 Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats. M07.B-E.2.1.1 Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. Example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50 an hour (or $1.1 * \$25 = \$27.50$) M07.B-E.2.3.1 Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is $9 \frac{3}{4}$ inches long in the center of a door that is $27 \frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation	<u>Interdisciplinary Standards (if applicable):</u>

<u>Essential Questions:</u> • How are operations with rational numbers similar to and different from operations with whole numbers? • How can number lines and visual models help us understand operations with rational numbers? • What patterns occur when we convert rational numbers to decimals? • How can we apply operations with rational numbers to solve real-world problems?	<u>Understandings:</u> • Rational numbers can be operated on using the same properties as whole numbers, with attention to signs. • The position of numbers on a number line helps determine the result of addition or subtraction. • Rational numbers always produce either a repeating or terminating decimal when expressed as a decimal. • Rational number operations are used in everyday contexts like finances, measurements, and temperature.
<u>Knowledge:</u> • Rational numbers include integers, fractions, and terminating/repeating decimals. • Properties of operations (commutative, associative, distributive, identity, inverse). • A rational number can be written as a fraction. Decimal representations of rational numbers either terminate or repeat.	<u>Do/Skills:</u> • Add, subtract, multiply, and divide positive and negative rational numbers. • Use number lines to model the addition and subtraction of rational numbers. • Convert fractions to decimals and determine if the decimal terminates or repeats. • Solve word problems involving all four operations with rational numbers. • Use properties of operations to justify steps in simplifying expressions and solving problems.
<u>Vocabulary:</u> • Rational number • Integer • Absolute value • Opposites • Terminating decimal • Repeating decimal • Properties of operations • Additive inverse • Commutative, associative, distributive • Horizontal/vertical number line	<u>Core Resources:</u> • Unit note packet • Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Expressions	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Algebraic expressions can be written in different but equivalent forms using the properties of operations. This flexibility allows us to simplify expressions, recognize patterns, and solve real-world problems efficiently.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.B-E.1.1.1 Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. Example 1: The expression $\frac{1}{2} \cdot (x + 6)$ is equivalent to $\frac{1}{2} \cdot x + 3$. Example 2: The expression $5.3 - y + 4.2$ is equivalent to $9.5 - y$ (or $-y + 9.5$). Example 3: The expression $4w - 10$ is equivalent to $2(2w - 5)$.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • How do the properties of operations help us rewrite algebraic expressions? • What does it mean for two expressions to be equivalent? • How can factoring and expanding help us understand the structure of an expression? • How are rational numbers used when combining like terms?	<u>Understandings:</u> • Expressions can be rewritten in simpler or more useful forms using properties of operations. • Factoring and expanding are inverse processes. • Using rational numbers in algebraic expressions requires applying fraction and decimal operations accurately. • Equivalent expressions are different ways of showing the same value.

<u>Knowledge:</u> ● Rational coefficients include integers, fractions, and decimals. ● Like terms can be combined using addition or subtraction. ● The distributive property is used to expand expressions. ● Factoring is the reverse of expanding an expression. ● Equivalent expressions represent the same quantity.	<u>Do/Skills:</u> ● Combine like terms with rational coefficients. ● Use the distributive property to expand linear expressions. ● Factor linear expressions with rational coefficients. ● Identify and justify whether two expressions are equivalent. ● Apply these skills in real-world and mathematical problem-solving contexts.
<u>Vocabulary:</u> ● Expression ● Coefficient ● Rational number ● Like terms ● Distributive property ● Factor ● Expand ● Equivalent expressions	<u>Core Resources:</u> ● Unit note packet ● Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Equations	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Equations are powerful tools for modeling and solving real-world situations involving unknown quantities. By translating situations into algebraic equations, we can use inverse operations and reasoning to find solutions.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.B-E.2.2.1 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. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • How can real-world problems be represented with algebraic equations? • What strategies can I use to solve one-step and two-step equations with rational numbers? • Why is it important to check if a solution makes sense in the context of the problem?	<u>Understandings:</u> • Word problems can be converted into solvable equations using key details and mathematical relationships. • Solving linear equations involves undoing operations to isolate the variable • Solutions to equations should be interpreted in terms of the original question. • Equations can involve all rational numbers—positive, negative, fractions, and decimals.
<u>Knowledge:</u> • Linear equations represent relationships between quantities. • Rational numbers can be used as coefficients and constants in equations. • Inverse operations are used to isolate variables and solve equations. • Real-world problems often involve quantities such as perimeter, cost, distance, etc.	<u>Do/Skills:</u> • Translate real-world situations into equations of the form: ○ $px + q = r$ ○ $p(x + q) = r$ • Solve equations with rational coefficients and constants. • Interpret the meaning of the solution within the context of the problem. • Use the distributive property and properties of equality to solve equations.

<u>Vocabulary:</u> • Equation • Variable • Coefficient • Constant • Rational number • Inverse operations • Distributive property • Solution • Perimeter, area (as context clues)	<u>Core Resources:</u> • Unit note packet • Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Inequalities	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Inequalities model situations where there is a range of possible solutions. Understanding how to represent, solve, and graph inequalities allows us to describe real-world constraints and goals using mathematics.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.B-E.2.2.2 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, and graph the solution set of the inequality. Example: A salesperson is paid \$50 per week plus \$3 per sale. This week she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • How can inequalities represent real-world situations where there is more than one possible solution? • What are the steps for solving and graphing linear inequalities? • How does the solution to an inequality differ from the solution to an equation? • How can a graph show all possible answers to a problem?	<u>Understandings:</u> • Inequalities describe situations where multiple values satisfy a condition (not just one solution). • Solving inequalities requires understanding how operations affect the relationship between numbers. • Graphs of inequalities visually represent all possible values that make the inequality true. • The direction of the inequality determines the shading and interpretation on a number line.

<u>Knowledge:</u> • Inequalities use symbols to show comparisons: $<$, $>$, $\leq$, $\geq$. • Solving inequalities follows similar steps to solving equations. • Multiplying or dividing both sides by a negative number reverses the inequality symbol. • Graphing an inequality shows a range of solutions on a number line.	<u>Do/Skills:</u> • Translate real-world situations into inequalities of the form $px + q > r$ or $px + q < r$. • Solve inequalities that include rational numbers. • Correctly reverse the inequality sign when multiplying or dividing by a negative. • Graph solutions on a number line and interpret the graph in context. • Use open and closed circles to show whether endpoints are included.
<u>Vocabulary:</u> • Inequality • Greater than / Less than • At least / At most • Solution set • Number line • Open circle / Closed circle • Rational number • Reverse the inequality	<u>Core Resources:</u> • Unit note packet • Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Ratios and Proportions	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Proportional relationships describe how two quantities change in relation to each other, and understanding unit rates—especially through tables, graphs, equations, and real-world contexts—allows us to model, interpret, and solve problems involving ratios, rates, and percents.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.A-R.1.1.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. Example: If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. M07.A-R.1.1.2 Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin). M07.A-R.1.1.3 Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. M07.A-R.1.1.4 Represent proportional relationships by equations. Example: If total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$. M07.A-R.1.1.5 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.	<u>Interdisciplinary Standards (if applicable):</u>

<u>Essential Questions:</u> 1. What does it mean for two quantities to be in a proportional relationship? 2. How can you recognize and represent a proportional relationship using tables, graphs, and equations? 3. What does the unit rate tell us about a real-world situation? 4. How can we use proportional reasoning to solve problems involving percents like tax, tips, and discounts? 5. What is the significance of the points (0,0) and (1,r) on the graph of a proportional relationship? 6. How are unit rates involving fractions similar to or different from those involving whole numbers?	<u>Understandings:</u> 1. Ratios and unit rates describe the relationship between two quantities and help make comparisons in meaningful ways. 2. Unit rates can be computed even when ratios involve fractions, and this allows for deeper understanding of real-world measurement and comparison scenarios. 3. Proportional relationships can be identified by a constant rate of change and are represented by a straight line through the origin on a graph. 4. The constant of proportionality is the value that defines a proportional relationship and can be found in tables, graphs, equations, and word problems. 5. Equations can be used to represent proportional relationships, helping to solve problems efficiently. 6. Graphical points such as (0, 0) and (1, r) carry contextual meaning and reflect the structure of a proportional situation. 7. Understanding proportionality is essential to solving multi-step problems involving percentages, such as discounts, taxes, interest, and markups.
<u>Knowledge:</u> • The definition of ratio, rate, unit rate, and proportionality. • How to compute unit rates from complex fractions (e.g., $\frac{1}{2} \div \frac{1}{4}$). • The characteristics of proportional relationships in tables and graphs. • That proportional relationships have a constant unit rate and pass through the origin on a graph. • How to write equations representing proportional relationships (e.g., $t = pnt = pnt = pn$). • How to interpret points (0,0) and (1,r) on a graph in context. • How percent applications (e.g., tax, discounts, interest) relate to proportions.	<u>Do/Skills:</u> • Compute and interpret unit rates from ratios of fractions. • Determine whether two quantities are proportionally related using tables and graphs. • Identify the constant of proportionality in various representations. • Write equations to represent proportional relationships. • Interpret key points on graphs of proportional relationships. • Apply proportional reasoning to solve real-world ratio and percent problems.

<u>Vocabulary:</u> ● Ratio ● Rate ● Unit Rate ● Proportional Relationship ● Constant of Proportionality ● Equation ● Coordinate Plane ● Origin (0,0) ● Linear Relationship ● Complex Fraction ● Percent ● Markup / Markdown ● Gratuity ● Simple Interest ● Tax / Commission / Fees	<u>Core Resources:</u> ● Unit note packet ● Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Percents	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Percent relationships are proportional and can be used to solve real-world problems involving increases, decreases, and comparisons in financial and everyday contexts.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.A-R.1.1.6 Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> 1. What does a percent represent and how is it used in real life? 2. How can proportional reasoning be used to solve percent problems? 3. What strategies can help solve problems when the percent, part, or whole is unknown? 4. How are percent increase and decrease used to describe changes in quantities? 5. In what ways are taxes, discounts, tips, and interest applications of percent? 6. How can diagrams, equations, and proportions help us understand and solve percent problems?	<u>Understandings:</u> 1. Percent problems can be represented and solved using proportional relationships. 2. Solving percent problems requires understanding the part-whole relationship and identifying what is being asked (e.g., finding a percent, the whole, or the part). 3. Many real-world contexts—including tax, discounts, interest, tips, and commissions—involve multi-step percent reasoning. 4. Diagrams, tables, and equations can help organize information and simplify percent problem-solving. 5. Percent increase and decrease describe how quantities change over time or due to circumstances like sales or markups.

<u>Knowledge:</u> • A percent is a ratio comparing a number to 100. • Percent problems can involve increases, decreases, and part-whole relationships. • How to convert between fractions, decimals, and percents. • Percent applications are proportional relationships. • The formulas for simple interest, tax, discounts, markups, and commissions. • The meaning of percent change and how to calculate it.	<u>Do/Skills:</u> • Solve percent problems using proportions and equations. • Calculate the percent of a number. • Solve for an unknown percent or unknown total. • Use models (double number lines, bar diagrams, percent tables) to visualize percent relationships. • Solve multi-step percent word problems including: ○ Tax ○ Tip ○ Markup/Markdown ○ Commission ○ Fees ○ Percent increase/decrease ○ Simple interest • Explain the steps and reasoning used to solve percent problems.
<u>Vocabulary:</u> • Percent • Rate • Base • Proportion • Simple Interest • Tax • Tip (Gratuity) • Markup / Markdown • Discount • Commission • Fee • Percent Increase / Percent Decrease • Principal • Interest Rate • Time (in years)	<u>Core Resources:</u> • Unit note packet • Various digital resources

<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>
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<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Angles and Triangles	☒ Essential ☐ Important ☐ Compact
<u>Big Idea:</u> Geometric relationships and properties help us describe, compare, and analyze two- and three-dimensional shapes. Scale, side length, and angle relationships reveal important patterns in geometry and help solve real-world problems.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.C-G.2.1.1 Identify and use properties of supplementary, complementary, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure. M07.C-G.2.1.2 Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding). M07.C-G.1.1.1 Solve problems involving scale drawings of geometric figures, including finding length and area. M07.C-G.1.1.2 Identify or describe the properties of all types of triangles based on angle and side measures. M07.C-G.1.1.3 Use and apply the triangle inequality theorem. M07.C-G.1.1.4 Describe the two-dimensional figures that result from slicing three-dimensional figures. Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • How do scale drawings represent real-life objects and situations? • What can side and angle measures tell us about different types of triangles?	<u>Understandings:</u> • Real-world objects can be represented and analyzed with scale drawings. • Triangles have predictable relationships among their sides and angles. • Not all combinations of three side lengths will form a triangle.

• How does the triangle inequality theorem help determine whether three side lengths form a triangle? • What happens when a three-dimensional figure is sliced?	• Slicing a 3D figure results in 2D cross-sections with different shapes depending on the cut.
<u>Knowledge:</u> • How to read and interpret a scale in scale drawings. • Classifications of triangles by sides (scalene, isosceles, equilateral) and angles (acute, right, obtuse). • The triangle inequality theorem: the sum of any two sides must be greater than the third. • Names and characteristics of 3D figures: prisms, pyramids, cones, cylinders, spheres. • How slicing affects the shape of a 3D object (cross-sections).	<u>Do/Skills:</u> • Use proportions to find actual lengths and areas in scale drawings. • Classify triangles based on angle and side measures. • Apply the triangle inequality theorem to determine if a triangle can be formed. • Identify and describe the shape formed by slicing a 3D figure horizontally, vertically, or diagonally.
<u>Vocabulary:</u> • Scale drawing • Proportion • Triangle (acute, right, obtuse; scalene, isosceles, equilateral) • Triangle inequality theorem • Cross-section • Prism, pyramid, cylinder, cone, sphere	<u>Core Resources:</u> • Unit note packet • Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Circles	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Circles have unique properties that distinguish them from other shapes. Understanding and applying the formulas for area and circumference allows us to solve real-world problems involving circular objects and spaces.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.C-G.2.2.1 Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • What do area and circumference tell us about a circle? • How are the radius, diameter, and π related to a circle's measurements? • How can the formulas for area and circumference be applied to real-world situations?	<u>Understandings:</u> • The circumference is the distance around a circle; area is the space inside the circle. • Both formulas are built around π and the radius or diameter. • Real-world applications of circles include construction, design, and measurement. • Choosing the correct formula depends on what is given (radius or diameter) and what is asked (area or circumference).
<u>Knowledge:</u> • Formulas: ◦ Circumference: $C = \pi d$ or $C = 2\pi r$ ◦ Area: $A = \pi r^2$ • The diameter is twice the radius; the radius is half the diameter. • The value of π (pi) is approximately 3.14 or $\frac{22}{7}$ and represents the ratio of circumference to diameter. • Units of measurement for circumference (linear) and area (square).	<u>Do/Skills:</u> • Identify and use radius and diameter in formulas. • Calculate the circumference and area of a circle using provided formulas. • Solve multi-step word problems involving circular objects (e.g., tracks, pizzas, wheels). • Interpret solutions in context and use appropriate units.

<u>Vocabulary:</u> ● Circle ● Radius ● Diameter ● Circumference ● Area ● π (pi) ● Square units / linear units ● Formula	<u>Core Resources:</u> ● Unit note packet ● Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Surface Area and Volume	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Real-world objects have measurable dimensions that can be broken down into simpler shapes. By understanding how to find area, surface area, and volume, students can solve complex problems in real-life contexts involving composite two- and three-dimensional figures.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.C-G.2.2.2 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. Formulas will be provided.	<u>Interdisciplinary Standards (if applicable):</u>
<u>Essential Questions:</u> • How can composite shapes be broken into simpler shapes to find area or volume? • How are area, surface area, and volume different, and when is each used? • What strategies help solve real-world problems involving three-dimensional figures? • How does the geometry of a shape affect its surface area and volume?	<u>Understandings:</u> • Composite shapes can be separated into simpler shapes to calculate total area, volume, or surface area. • Volume measures how much space an object takes up; surface area measures how much material is needed to cover it. • Formulas work across multiple shape types and can be adapted using visual models (nets, diagrams). • Real-world geometry problems often involve measurement, estimation, and reasoning.

<u>Knowledge:</u> • Area formulas for triangles, rectangles, parallelograms, trapezoids, and composite 2D figures. • Volume formulas for cubes and right prisms: $V=B \cdot h$ $V=B \cdot h$, where B is the area of the base. • Surface area formulas for cubes and right prisms (using nets or formulas). • Difference between area (2D), volume (3D space), and surface area (3D covering). • How to decompose composite figures into known shapes.	<u>Do/Skills:</u> • Use appropriate formulas to calculate area, volume, and surface area. • Break down complex shapes into simpler components (triangles, rectangles, etc.). • Solve multi-step word problems involving measurements and formulas. • Apply measurements to real-world contexts, including cost, packaging, or space.
<u>Vocabulary:</u> • Area • Volume • Surface area • Base • Height • Composite figure • Cube • Right prism • Face, edge, vertex • Net • Square units / cubic units	<u>Core Resources:</u> • Unit note packet • Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>

<u>Grade, Subject/Course:</u> 7th grade/7th grade Math	
<u>Unit:</u> Statistics – Drawing Inferences from Data	<u> X </u> Essential <u> </u> Important <u> </u> Compact
<u>Big Idea:</u> Data from samples helps us understand and make inferences about larger populations. By using measures of center and variability, we can compare and draw conclusions from real-world data.	
<u>PA Core Content Standards/Anchors (or National Standards):</u> M07.D-S.1.1.1 Determine whether a sample is a random sample given a real-world situation. M07.D-S.1.1.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Example 1: Estimate the mean word length in a book by randomly sampling words from the book. Example 2: Predict the winner of a school election based on randomly sampled survey data. M07.D-S.2.1.1 Compare two numerical data distributions using measures of center and variability. Example 1: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team. This difference is equal to approximately twice the variability (mean absolute deviation) on either team. On a line plot, note the difference between the two distributions of heights. Example 2: 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. M07.D-S.3.1.1 Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., 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). M07.D-S.3.2.1 Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.	<u>Interdisciplinary Standards (if applicable):</u>

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. M07.D-S.3.2.2 Find the probability of a simple event, including the probability of a simple event not occurring. Example: What is the probability of not rolling a 1 on a number cube? M07.D-S.3.2.3 Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.	
<u>Essential Questions:</u> • How do we know if a sample is representative of a population? • What can a random sample tell us about an entire population? • How do we compare different sets of data? • Why is variability important when interpreting data?	<u>Understandings:</u> • Random samples increase the accuracy and reliability of predictions about populations. • A sample statistic (like a mean or MAD) can give insight into a population parameter. • Variability helps determine how significant differences between data sets really are.
<u>Knowledge:</u> • Definitions and characteristics of random samples. • Population vs. sample. • Measures of center: mean, median, mode. • Measures of variability: range, interquartile range (IQR), mean absolute deviation (MAD). • How to draw inferences and make comparisons based on data.	<u>Do/Skills:</u> • Identify whether a given sample is random or biased. • Use sample data to estimate population characteristics. • Compare two distributions using both center and spread. • Draw conclusions about data using real-world examples (e.g., predicting elections, word lengths, sports stats).

<u>Vocabulary:</u> ● Probability ● Outcome ● Event ● Simple event / compound event ● Independent events ● Complement ● Relative frequency ● Tree diagram ● Organized list ● Simulation	<u>Core Resources:</u> ● Unit note packet ● Various digital resources
<u>Common Assessment(s):</u>	<u>Supplemental Resources:</u>