MATH 7

Curriculum/Content Area: Mathematics	**Course Length:** 1 year
Course Title: Math 7	**Date last reviewed:** 2014/15
Prerequisites: Math 5 or Math 6	**Board approval date:** 8/2020
Primary Resource: REVEAL Math Course 2	

Desired Results

Course description and purpose: In this course students will analyze proportional relationships and use them to solve real-world and mathematical problems; apply and extend previous understandings of operation with fractions to add, subtract, multiply, and divide rational numbers; use properties of operations to generate equivalent expressions; and solve real-life and mathematical problems using numerical and algebraic expressions and equations. Communication (both written and oral), connections, problem solving, reasoning abstractly and quantitatively, construction of viable arguments, and real life problems are also integral parts of each lesson.

Enduring Understandings:	Essential Questions:
Mathematicians make sense of problems and persevere in solving them.	a. How do we as mathematicians analyze the problem in order to choose the best strategy(ies) or resource to make sense of the problem? b. How do we as mathematicians persevere in solving problems?
Mathematicians attend to precision.	How do we as mathematicians know if we fully & accurately answered the problem and does the results make sense in the context of the problem?
Mathematicians reason abstractly and quantitatively.	How do we as mathematicians make sense of quantities and situations symbolically?
Mathematicians construct viable arguments and critique the reasoning of others.	a. How can we as mathematicians justify our answer(s)? b. How can we as mathematicians evaluate and question whether a mathematical argument is accurate?
Mathematicians model with mathematics.	a. What model(s) can we as mathematicians use to solve a problem? b. How can we as mathematicians determine an effective model to use to solve a problem?
Mathematicians use appropriate tools strategically.	What tools are available and efficient for us as mathematicians to use while solving a problem?
Mathematicians look for and make use of structure	How can we as mathematicians use and apply patterns and structures to solve problems?

Mathematicians look for and express regularity in repeated reasoning.	How can we as mathematicians create and apply generalizations from repeated reasoning?

Mathematical Practice Standards

The Standards for Mathematical Practice are central to the teaching and learning of mathematics. These practices describe the behaviors and habits of mind that are exhibited by students who are mathematically proficient. Mathematical understanding is the intersection of these practices and mathematics content. It is critical that the Standards for Mathematical Practice are embedded in daily mathematics instruction.

Mathematical Practice Standards		**Grade Level/Course**
Habits of Mind	MP.1 Make sense of problems and persevere in solving them	Understand the meaning of a problem and look for entry points to its conclusion. Analyze information (givens, constraints, relationships, goals. Make conjectures and plan a solution pathway. Monitor and evaluate the progress and change course as necessary Check answers to problems and ask, “Does this make sense?”
	MP.6 Attend to precision.	Communicate precisely using clear definitions. State the meaning of symbols, carefully specifying units of measure, and providing accurate labels. State the meaning of symbols, carefully specifying units of measure, and providing accurate labels. Calculate accurately and efficiently, expressing. numerical answers with a degree of precision. Provide carefully formulated explanations. Label accurately when measuring and graphing.
Reasoning & Explaining	MP.2 Reason abstractly and quantitatively.	Make sense of quantities and relationships in problem situations. Represent abstract situations symbolically and understand the meaning of quantities. Create a coherent representation of the problem at hand. Consider the units involved. Flexibility use properties of operations.
	MP.3 Construct viable arguments and critique the reasoning of others.	Use definitions and previously established causes/effects (results) in constructing arguments. Make conjectures and use counterexamples to build a logical progression of statements to explore and support ideas. Communicate and defend mathematical reasoning

		using objects, drawings, diagrams, and/or actions. Listen to or read the arguments of others. Decide if the arguments of others make sense and ask probing questions to clarify or improve the arguments.
Modeling & Using Tools	MP.4 Model with mathematics.	Apply prior knowledge to solve real world problems. Identify important quantities and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts, and/or formulas.Use assumptions and approximations to make a problem simpler. Check to see if an answer makes sense within the context of a situation and change a model when necessary.
	MP.5 Use appropriate tools strategically.	Make sound decisions about the use of specific tools (examples might include: calculator, concrete models, digital, technologies, pencil/paper, ruler, compass, protractor) Use technology tools to visualize the results of assumptions, explore consequences, and compare predictions with data. Identify relevant external math resources (digital content on a website) and use them to pose or solve problems. Use technological tools to explore and deepen understanding of concepts.
Seeing Structure & Generalizing	MP.7 Look for and make use of structure.	Look for patterns or structure, recognizing that quantities can be represented in different ways. Recognize the significance in concepts and models and use the patterns or structure for solving related problems. View complicated quantities both as single objects or compositions of several objects and use operations to make sense of problems.
	MP.8 Look for and express regularity in repeated reasoning.	Notice repeated calculations and look for general methods and shortcuts. Continually evaluate the reasonableness of intermediate results (comparing estimates), while attending to details, and make generalizations based on findings.

Priority Standard Clusters

7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.

- *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.
- *7.RP.A.2* Recognize and represent proportional relationships between quantities.
- *7.RP.A.2.a* Decide whether two quantities are in a proportional relationship.
- *7.RP.A.2.b* Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- *7.RP.A.2.c* Represent proportional relationships by equations.
- *7.RP.A.2.d* 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.
- *7.RP.A.3* Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

7.NS.A Apply and extend previous understandings of operation with fractions to add, subtract, multiply, and divide rational numbers.

- *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 diagram.
- *7.NS.A.1.a* Describe situations in which opposite quantities combine to make 0.
- *7.NS.A.1.b* Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
- *7.NS.A.1.c* 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.1.d* Apply properties of operations as strategies to add and subtract 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.2.a* 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.
- *7.NS.A.2.b* Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.
- *7.NS.A.2.c* Apply properties of operations as strategies to multiply and divide rational numbers.
- *7.NS.A.2.d* 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.
- *7.NS.A.3* Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.A Use properties of operations to generate equivalent expressions.

- *7.EE.A.1* Apply properties of operations as strategies to add, 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.

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- *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 between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
- *7.EE.B.4* Use variables to represent quantities in a real-world or mathematical problem, and construct

simple equations and inequalities to solve problems by reasoning about the quantities.

- *7.EE.B.4.a* 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.4.b* 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.

Supporting Standard Clusters

7.SP.A Use random sampling to draw inferences about a population.

- *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.
- *7.SP.A.2* Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

7.SP.B Draw informal comparative inferences about two populations.

- *7.SP.B.3* Informally assesses 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.
- *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.

7.SP.C Investigate chance processes and develop, use, and evaluate probability models.

- *7.SP.C.5* Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely or likely, and a probability near 1 indicates a likely event.
- *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.
- *7.SP.C.7* Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
- *7.SP.C.7.a* Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
- *7.SP.C.7.b* Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
- *7.SP.C.8* Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- *7.SP.C.8.a* 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.8.b* 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.8.c* Design and use a simulation to generate frequencies for compound events.

7.G.A Draw construct, and describe geometrical figures and describe the relationships between them.

- *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.
- *7.G.A.2* Draw (freehand, with ruler and protractor, and with technology) 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.
- *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.

7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- *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.
- *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.
- *7.G.B.6* Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Unit 1 - Proportional Relationships

Essential Questions:

1. How do we as mathematicians make sense of quantities and situations symbolically?
2. What model(s) can we as mathematicians use to solve a problem?
3. *What does it mean for two quantities to be in a proportional relationship?*

Unit Standards

Priority Standards

7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.
- *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.
- *7.RP.A.2* Recognize and represent proportional relationships between quantities.
    - *7.RP.A.2.a* Decide whether two quantities are in a proportional relationship.
    - *7.RP.A.2.b* Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
    - *7.RP.A.2.c* Represent proportional relationships by equations.
    - *7.RP.A.2.d* 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.
- *7.RP.A.3* Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Learning Targets

- I can find unit rates when one or both quantities are fractions. (L1-1)
    - I discover that the structure of computing unit rates with whole numbers is the same concept as unit rates with ratios of fractions.
    - I compute unit rates in real-world problems that involve complex fractions
    - I explain, in writing, the errors that can be made when computing unit rates with complex fractions and unlike units.
    - I translate a proportional relationship from a verbal description into a diagram and explain in writing how the diagram shows a proportional relationship.
- I can use a model and a ratio reasoning to understand how a proportional relationship can exist

between quantities. (L1-2)
    - I communicate that a proportion is a statement of two equivalent ratios.
- I can analyze the relationship between two quantities represented in tables to determine proportionality. (L1-3)
    - I sort real-world examples of proportional relationships from non-examples.
    - I communicate that a proportion is a statement of two equivalent ratios.
    - I model proportional relationships by creating tables and determine if a proportional relationship exists from a given table.
    - I determine the unit rate from equations, graphs, **tables**, diagrams, and verbal descriptions of a proportional relationship.
- I can analyze the relationship between two quantities graphed on a coordinate plane to determine proportionality. (L1-4)
    - I sort real-world examples of proportional relationships from non-examples.
    - I model relationships on graphs to determine if they are proportional.
    - I determine whether a proportional relationship exists between two points on the lines graphed.
    - I determine the unit rate from equations, **graphs,** tables, diagrams, and verbal descriptions of a proportional relationship.
    - I explain the meaning of a point on a graph in the context of the situation.
    - I discover that graphed proportional relationships are straight lines (goes through the origin).
- I can write equations to represent proportional relationships. (L1-5)
    - I determine the unit rate from **equations**, graphs, tables, diagrams, and verbal descriptions of a proportional relationship.
    - I discover that the unit rate (constant of proportionality) is the numerical coefficient in the equation of a proportional relationship.
    - I model proportional relationships presented as tables, verbal descriptions, and graphs in equation form.
    - I justify, in writing, the reasoning used in creating an equation for a given proportional relationship expressed verbally.
- I can solve problems involving proportional relationships. (L1-6)
    - I model proportional relationships several different ways.
    - I model proportional relationships presented as tables, verbal descriptions, and graphs in equation form.
    - I justify, in writing, the reasoning used in creating an equation for a given proportional relationship expressed verbally.
    - I solve problems involving proportions using cross-multiplication.

Assessment Evidence

Performance Assessment Options & Rubrics *May include, but are not limited to the following:*	**Other assessment options** *May include, but are not limited to the following:*
● Math 7 Feedback & Scoring Rubric based on Priority Standards ● Module Pre-Test ● End of Unit Assessment (3 versions) ● End of Unit Assessment (3 versions - differentiation) ● Mid-unit checks/quizzes	● Entrance or Exit Tickets/Warm Up ● ALEKS Assessment ● Pulling it together - mid quizzes ● Student work samples ● REVEAL performance tasks ● LEARN Checks ● Extension ● Dynamic Practice

	● AVID Strategies ○ Quick Writes ○ KWL Chart - (What I Know, Want to know, Learned) ○ Marking Text ○ Learning Log Reflection - Daily/Weekly ○ I-Chart - Gather/Organize Information on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- Aleks
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 2 - Solve Percent Problems

Essential Questions:

1. How do we as mathematicians make sense of quantities and situations symbolically?
2. How do we as mathematicians analyze the problem in order to choose the best strategy(ies) or resource to make sense of the problem?
3. *How can percent describe the change of a quantity?*

Unit Standards

Priority Standards

7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.

- *7.RP.A.3* Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

7.EE.A Use properties of operations to generate equivalent expressions.

- *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.

Also Addressed

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- *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 between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

Learning Targets

- I can solve problems involving percent of increase and percent of decrease. (L2-1)
  - I solve problems involving percent error and **percent increase/decrease.**
- I can solve multi-step ratio and percent problems involving taxes. (L2-2)
  - I solve problems involving percent error and **percent increase/decrease**.
  - I model contextual problems with variable expressions.
- I can solve multi-step ratio and percent problems involving tips and markups. (L2-3)
  - I solve problems involving percent error and **percent increase/decrease**.
  - I model contextual problems with variable expressions.
- I can solve multi-step ratio and percent problems involving discounts. (L2-4)
  - I solve problems involving percent error and **percent increase/decrease**.
  - I model contextual problems with variable expressions.
- I can solve problems involving simple interest. (L2-5)
  - I solve problems involving percent error and **percent increase/decrease**.
- I can solve problems involving commission and fees. (L2-6)
  - I solve problems involving percent error and **percent increase/decrease**.
- I can solve problems involving percent error. (2-7)
  - I solve problems involving **percent error** and percent increase/decrease.
  - I explain, using precise mathematical vocabulary, how expressions relate the quantities.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
  - Quick Writes
  - KWL Chart - (What I Know, Want to know, Learned)
  - Marking Text
  - Learning Log Reflection - Daily/Weekly
  - I-Chart - Gather/Organize Information on a topic
  - Focused Note Taking
  - CSG - Collaborative Study Groups

	○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 3 - Operations with Integers

Essential Questions:

- How do we as mathematicians make sense of quantities and situations symbolically?
- What model(s) can we as mathematicians use to solve a problem?
- *How are operations with integers related to operations with whole numbers?*

Unit Standards

Priority Standards

7.NS.A Apply and extend previous understandings of operation with fractions to add, subtract, multiply, and divide rational numbers.

- *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 diagram.
  - *7.NS.A.1.a* Describe situations in which opposite quantities combine to make 0.
  - *7.NS.A.1.b* Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
  - *7.NS.A.1.c* 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.1.d* Apply properties of operations as strategies to add and subtract 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.2.a* 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.
  - *7.NS.A.2.b* Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.

    - 7.NS.A.2.c Apply properties of operations as strategies to multiply and divide rational numbers
- 7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- 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 between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

Learning Targets

- I can solve problems adding integers. (L3-1)
    - I find real-world examples in terms as positive and negative.
    - I represent multiple "zeroes" by combining the same number of positive and negative counters (Algebra Tiles).
    - I use a number line to show how a certain number of moves in a positive direction from zero combined with the same number of moves in the opposite direction ends at zero.
    - I model positive and negative combining to make zero in real-world situations.
    - I communicate their understanding of positive, negative, and zero orally and in writing.
    - I demonstrate an understanding of additive inverse by developing examples.
    - I model, using mats, number lines, counters, equations, and so on, different combinations of positive and negative integers and explain how they reason their solution.
    - I solve equations using number lines, counters, and/or rules developed for addition of rational numbers.
- I can solve problems subtracting integers. (L3-2)
    - I discover that subtraction and adding with an additive inverse provide the same results.
    - I clarify my reasoning about the subtraction and additive inverse through oral and/or written communication.
    - I discover that the solutions to real-world subtraction problems using the absolute value of the distance between two rational numbers on the number line give the same result as subtracting through other examples.
- I can solve problems multiplying integers. (L3-3)
    - I discover the rules for multiplying integers by reasoning from real-world examples.
    - I use different interpretations for the (-) sign such as "negative" or "the opposite of" to make sense of real-world contexts using integers.
    - I conclude that the properties of the operations for multiplication hold for integer multiplication.
    - I use properties of the operations to explain the solutions to real-world problems.
    - I clarify my understanding of properties of operations by explaining my reasoning.
    - I practice use of appropriate mathematical vocabulary in discussion.
- I can solve problems dividing integers. (L3-4)
    - I discover that division as the inverse of multiplication holds true with integers.
    - I generalize rules for division with signed numbers from examples.
    - I use $p \div (-q)$ and $p/-q$ notations interchangeably.
    - I use properties of the operations to explain the solutions to real-world problems.
    - I clarify my understanding of properties of operations by explaining my reasoning.
    - I practice use of appropriate mathematical vocabulary in discussion.
- I can solve problems by applying all operations to integers. (L3-5)
    - I solve numerical addition and subtraction equations using the properties of the operations.

- I use properties of the operations to explain the solutions to real-world problems.
- I clarify my understanding of properties of operations by explaining my reasoning.
- I practice use of appropriate mathematical vocabulary in discussion.
- I solve multi-step real-world and mathematical problems with precision.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
  - Quick Writes
  - KWL Chart - (What I Know, Want to know, Learned)
  - Marking Text
  - Learning Log Reflection - Daily/Weekly
  - I-Chart - Gather/Organize Information on a topic
  - Focused Note Taking
  - CSG - Collaborative Study Groups
  - Socratic Seminar
  - Philosophical Chairs
  - Think/Pair/Share
  - Talking Trios
  - World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 4 - Operations with Rational Numbers

Essential Questions:

1. How do we as mathematicians know if we fully & accurately answered the problem and does the results make sense in the context of the problem?

2. How do we as mathematicians make sense of quantities and situations symbolically?
3. *How are operations with rational numbers related to operations with integers?*

Unit Standards

Priority Standards

7.NS.A Apply and extend previous understandings of operation with fractions to add, subtract, multiply, and divide rational numbers.

- *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 diagram.
    - *7.NS.A.1.a* Describe situations in which opposite quantities combine to make 0.
    - *7.NS.A.1.b* Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
    - *7.NS.A.1.c* 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.1.d* Apply properties of operations as strategies to add and subtract 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.2.a* 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.
    - *7.NS.A.2.b* Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.
    - *7.NS.A.2.c* Apply properties of operations as strategies to multiply and divide rational numbers
    - *7.NS.A.2.d* 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.
- 7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- *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 between forms as

Learning Targets

- I can identify terminating and repeating decimals, and use long division to convert rational numbers to decimals. (L4-1)
    - I interpret a rational quotient in a real-world context.
    - I develop fluency through practice with multiplication and **division** of rational numbers.
    - I use long division to convert rational numbers from fraction form to decimal form.
    - I explain why and how a long division quotient will repeat
    - I sort the decimal form of rational numbers into two types, ending in 0, terminating or repeating.

    - I select an appropriate estimation strategy and apply it to a problem.
- I can demonstrate application of the additive inverse, and an understanding of addition of rational numbers.(4-2)
    - I apply the properties of operations to addition and subtraction of rational numbers by identifying examples and non-examples.
    - I use a number line to show how a certain number of moves in a positive direction from zero combined with the same number of moves in the opposite direction ends at zero.
    - I model positive and negative combining to make zero in real-world situations.
    - I demonstrate an understanding of additive inverse by developing examples.
    - I solve equations using number lines, counters, and/or rules developed for addition of rational numbers.
    - I discover and apply formal rules for adding rational numbers with different signs.
    - I communicate reasoning for addition through writing.
    - I clarify my understanding of the properties of operations as they apply to **addition** and subtraction of rational numbers.
    - I solve numerical **addition** and subtraction equations using the properties of the operations.
    - I communicate their understanding of positive, negative, and zero orally and in writing.
    - I solve multi-step real-world and mathematical problems with precision.
    - I select an appropriate estimation strategy and apply it to a problem.
    - I justify the estimation process used by explaining how it proved the answer to be reasonable or lead to an accurate answer.
- I can demonstrate understanding of subtraction of rational numbers as adding the additive inverse and apply it to solving real-world problems. (L4-3)
    - I model real-world contexts that involve subtraction of rational numbers using a number line. (*Not addressed in Reveal)*
    - I discover that the solutions to real-world subtraction problems using the absolute value of the distance between two rational numbers on the number line give the same result as subtracting through other examples. (*Not addressed in Reveal)*
    - I clarify my understanding of the properties of operations as they apply to addition and **subtraction** of rational numbers.
    - I solve numerical addition and **subtraction** equations using the properties of the operations.
    - I solve multi-step real-world and mathematical problems with precision.
    - I select an appropriate estimation strategy and apply it to a problem.
    - I justify the estimation process used by explaining how it proved the answer to be reasonable or lead to an accurate answer.
- I can apply understanding of multiplication to rational numbers, and use the order of operations to solve real-world problems. (L4-4)
    - I discover the rules for multiplying rational numbers by reasoning from real-world examples. (*Not addressed in Reveal)*
    - I conclude that the properties of the operations for multiplication hold for rational number multiplication.
    - I use properties of the operations to explain the solutions to real-world problems.
    - I clarify my understanding of properties of operations by explaining my reasoning.
    - I practice use of appropriate mathematical vocabulary in discussion.
    - I select an appropriate estimation strategy and apply it to a problem.
    - I justify the estimation process used by explaining how it proved the answer to be reasonable or lead to an accurate answer.
- I can apply understanding of division to rational numbers, and use the order of operations to solve real-world problems. (4-5)
    - I discover that division as the inverse of multiplication holds true with integers.
    - I interpret a rational quotient in a real-world context.
    - I clarify my understanding of the relationship between multiplication and division of rational numbers through writing.

- I develop fluency through practice with multiplication and **division** of rational numbers.
- I use properties of the operations to explain the solutions to real-world problems.
- I clarify my understanding of properties of operations by explaining my reasoning.
- I practice use of appropriate mathematical vocabulary in discussion.
- I compute with complex fractions.
- I select an appropriate estimation strategy and apply it to a problem.
- I justify the estimation process used by explaining how it proved the answer to be reasonable or lead to an accurate answer.

- I can apply understanding of the four operations with rational numbers to evaluate mathematical expressions. (4-6)
  - I clarify my understanding of properties of operations by explaining my reasoning.
  - I practice use of appropriate mathematical vocabulary in discussion.
  - I apply operations with rational numbers to problems that involve the order of operations.
  - I solve mathematical problems that use the four operations with rational numbers.
  - I solve real-world problems that involve the four operations with rational numbers.
  - I select an appropriate estimation strategy and apply it to a problem.
  - I justify the estimation process used by explaining how it proved the answer to be reasonable or lead to an accurate answer.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
  - Quick Writes
  - KWL Chart - (What I Know, Want to know, Learned)
  - Marking Text
  - Learning Log Reflection - Daily/Weekly
  - I-Chart - Gather/Organize Information on a topic
  - Focused Note Taking
  - CSG - Collaborative Study Groups
  - Socratic Seminar
  - Philosophical Chairs
  - Think/Pair/Share
  - Talking Trios
  - World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 5 - Simplify Algebraic Expressions

Essential Questions:

1. What model(s) can we as mathematicians use to solve a problem?
2. How do we as mathematicians make sense of quantities and situations symbolically?
3. *Why is it beneficial to rewrite expressions in different forms?*

Unit Standards

Priority Standards

7.EE.A Use properties of operations to generate equivalent expressions.

- *7.EE.A.1* Apply properties of operations as strategies to add, 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.

Learning Targets

- I can simplify algebraic expressions by combining like terms and using the Distributive Property. (L5-1)
    - I change an expression into an equivalent expression using properties of operations, combining like terms.
    - I communicate using precise mathematical vocabulary how an equivalent expression is created.
    - I explain, using precise mathematical vocabulary, how two equivalent expressions relate the quantities.
    - I model contextual problems with multiple variable expressions.
    - I explain, using precise mathematical vocabulary, how two equivalent expressions relate the quantities.
- I can add linear expressions and express the sum in simplest form. (L5-2)
    - I discover that there can be more than one expression equivalent to a given expression.
    - I change an expression into an equivalent expression using properties of operations, combining like terms.
    - I represent real-world problems with equivalent expressions using properties of operations, combining like terms, and substitution, and solve them.
    - I communicate using precise mathematical vocabulary how an equivalent expression is created.
- I can subtract linear expressions and express the difference in simplest form. (L5-3)

    - I reason to identify sets of equivalent expressions.
    - I discover that there can be more than one expression equivalent to a given expression.
    - I change an expression into an equivalent expression using properties of operations, combining like terms.
    - I represent real-world problems with equivalent expressions using properties of operations, combining like terms, and substitution, and solve them.
    - I communicate using precise mathematical vocabulary how an equivalent expression is created.
- I can find the GCF of monomials and factor algebraic expressions. (L5-4)
    - I reason to identify sets of equivalent expressions.
    - I discover that there can be more than one expression equivalent to a given expression.
    - I change an expression into an equivalent expression using properties of operations, combining like terms.
    - I communicate using precise mathematical vocabulary how an equivalent expression is created.
    - I model contextual problems with multiple variable expressions.
- I can combine operations to simplify linear expressions. (L5-5)
    - I reason to identify sets of equivalent expressions.
    - I discover that there can be more than one expression equivalent to a given expression.
    - I change an expression into an equivalent expression using properties of operations, combining like terms.
    - I represent real-world problems with equivalent expressions using properties of operations, combining like terms, and substitution, and solve them.
    - I communicate using precise mathematical vocabulary how an equivalent expression is created.
    - I defend why two expressions are or are not equivalent.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
    - Quick Writes
    - KWL Chart - (What I Know, Want to know, Learned)
    - Marking Text
    - Learning Log Reflection - Daily/Weekly
    - I-Chart - Gather/Organize Information

	on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 6 - Write and Solve Equations

Essential Questions:

- How do we as mathematicians make sense of quantities and situations symbolically?
- How can we as mathematicians determine an effective model to use to solve a problem?
- *How can equations be used to solve everyday problems?*

Unit Standards

Priority Standards

7.NS.A Apply and extend previous understandings of operation with fractions to add, subtract, multiply, and divide rational numbers.

- *7.NS.A.3* Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- *7.EE.B.4* Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
  - *7.EE.B.4.a* 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.

Learning Targets

- I can write and solve one-step equations with rational numbers. (L6-1)
  - I solve mathematical problems that use the four operations with rational numbers.
  - I solve real-world problems that involve the four operations with rational numbers.
  - I compute with complex fractions.
  - I compare algebraic equations with arithmetic solutions for the same problem using precise

mathematical vocabulary.

- I can solve two-step equations of the form $px + q = r$ (L6-2)
  - I model word problems with equations in the forms
    - ***px + q = r*** and $p(x + q) = r$.
  - I fluently solve equations of the forms
    - ***px + q = r*** and $p(x + q) = r$.
  - I compare algebraic equations with arithmetic solutions for the same problem using precise mathematical vocabulary.
- I can write and solve two-step equations of the form $px + q = r$ (L6-3)
  - I model word problems with equations in the forms
    - ***px + q = r*** and $p(x + q) = r$.
  - I fluently solve equations of the forms
    - ***px + q = r*** and $p(x + q) = r$.
  - I compare algebraic equations with arithmetic solutions for the same problem using precise mathematical vocabulary.
- I can solve two-step equations of the form $p(x + q) = r$. (L6-4)
  - I model word problems with equations in the forms
    - $px + q = r$ and ***p(x + q) = r***.
  - I fluently solve equations of the forms
    - $px + q = r$ and ***p(x + q) = r***.
  - I compare algebraic equations with arithmetic solutions for the same problem using precise mathematical vocabulary.
- I can write and solve two-step equations of the form $p(x + q) = r$. (L6-5)
  - I model word problems with equations in the forms
    - $px + q = r$ and ***p(x + q) = r***.
  - I fluently solve equations of the forms
    - $px + q = r$ and ***p(x + q) = r***.
  - I compare algebraic equations with arithmetic solutions for the same problem using precise mathematical vocabulary.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
  - Quick Writes
  - KWL Chart - (What I Know, Want to know, Learned)
  - Marking Text
  - Learning Log Reflection - Daily/Weekly
  - I-Chart - Gather/Organize Information

	on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 7 - Write and Solve Inequalities

Essential Questions:

- How can we as mathematicians evaluate and question whether a mathematical argument is accurate?
- How can we as mathematicians determine an effective model to use to solve a problem?
- *How are the solutions to inequalities different from the solutions to equations?*

Unit Standards

Priority Standards

7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- *7.EE.B.4* Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
  - *7.EE.B.4.b* 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.

Learning Targets

- I can solve and graph one-step addition and subtraction inequalities. (7-1)
  - I recognize whether a word problem can be represented with an equation or an inequality.
  - I solve inequalities that contain the symbols $<$, $>$, $\leq$, $\geq$.
  - I check answers with substitution.
  - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.
- I can write and solve one-step addition and subtraction inequalities. (7-2)
  - I recognize whether a word problem can be represented with an equation or an inequality.
  - I solve inequalities that contain the symbols $<$, $>$, $\leq$, $\geq$.

        - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.
- I can solve and graph one-step multiplication and division inequalities with positive coefficients. (7-3)
    - I recognize whether a word problem can be represented with an equation or an inequality.
    - I solve inequalities that contain the symbols <, >, ≤, ≥.
    - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.
- I can solve and graph one-step multiplication and division inequalities with negative coefficients. (7-4)
    - I recognize whether a word problem can be represented with an equation or an inequality.
    - I solve inequalities that contain the symbols <, >, ≤, ≥.
    - I check answers with substitution.
    - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.
- I can write and solve one-step multiplication and division inequalities. (7-5)
    - I recognize whether a word problem can be represented with an equation or an inequality.
    - I solve inequalities that contain the symbols <, >, ≤, ≥.
    - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.
- I can write and solve two-step inequalities. (7-6)
    - I recognize whether a word problem can be represented with an equation or an inequality.
    - I create inequalities of the forms $px + q > r$ and $px + q < r$.
    - I solve inequalities that contain the symbols <, >, ≤, ≥.
    - I check answers with substitution.
    - I graph solutions to inequalities on number lines and discuss whether all of the answers in the solution set make sense in the context of the problem.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
    - Quick Writes
    - KWL Chart - (What I Know, Want to know, Learned)
    - Marking Text
    - Learning Log Reflection - Daily/Weekly

	○ I-Chart - Gather/Organize Information on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 8 - Geometric Figures

Essential Questions:

- What model(s) can we as mathematicians use to solve a problem?
- What tools are available and efficient for us as mathematicians to use while solving a problem?
- *How does geometry help to describe objects?*

Unit Standards

Supporting Standards

7.G.A Draw construct, and describe geometrical figures and describe the relationships between them.

- *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.
- *7.G.A.2* Draw (freehand, with ruler and protractor, and with technology) 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.
- *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.

7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

- *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.

Learning Targets

- I can identify vertical and adjacent angles and use what they know to find missing values. (8-1)
  - I discover the definitions of supplementary, complementary, **vertical**, and **adjacent** angles.
  - I solve multi-step problems by applying what they know about the types of angles.
  - I clarify my understandings of the terms supplementary, complementary, **vertical**, and **adjacent** angles in my own words.

        - I solve multi-step real-world and mathematical problems with precision.
        - I fluently solve equations of the forms
            - ***px + q = r*** and *p(x + q) = r*.
- I can identify complementary and supplementary angles and use what they know to find missing values. (8-2)
    - I discover the definitions of **supplementary**, **complementary,** vertical, and adjacent angles.
    - I solve multi-step problems by applying what they know about the types of angles.
    - I clarify my understandings of the terms **supplementary**, **complementary**, vertical, and adjacent angles in my own words.
    - I solve multi-step real-world and mathematical problems with precision.
    - I fluently solve equations of the forms
        - ***px + q = r*** and *p(x + q) = r*.
- I can draw triangles with and without tools. (8-3)
    - I draw multiple geometric shapes using a variety of tools.
    - I select the appropriate tools for drawing triangles in a given situation.
    - I discover, through examples, whether the given information about triangles can create one, more than one, or no triangles.
- I can solve problems involving scale drawings.
    - I read and create scale drawings from familiar settings.
    - I use precise math language when presenting solutions to scale drawing problems to the class.
    - I calculate actual measures such as **area**, **perimeter**, and volume from scale drawings using appropriate measurement units.
    - I redraw a scale drawing using a different scale.
- I can analyze three-dimensional figures. (8-5)
    - I discover the two-dimensional shapes that result from slicing a three-dimensional figure.
    - I develop three-dimensional visualization skills as they see the resulting two-dimensional shapes.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
- AVID Strategies
    - Quick Writes
    - KWL Chart - (What I Know, Want to know, Learned)
    - Marking Text
    - Learning Log Reflection - Daily/Weekly
    - I-Chart - Gather/Organize Information on a topic

	○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 9 - Measure Figures

Essential Questions:

- How do we as mathematicians analyze the problem in order to choose the best strategy(ies) or resource to make sense of the problem?
- How can we as mathematicians determine an effective model to use to solve a problem?
- *How can we measure objects to solve problems?*

Unit Standards

Supporting Standards

7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

- *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.
- *7.G.B.6* Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Learning Targets

- I can use radius and diameter to find circumference. (9-1)
  - I explain the relationship between circumference and diameter of a circle using correct math vocabulary.
  - I solve math and real-world problems by applying the area of a circle and circumference formula.
  - I discover through hands-on experience, and explain the relationship between the circumference and area of a circle.
- I can find the area of circles. (9-2)
  - I solve math and real-world problems by applying the area of a circle and circumference formula.
  - I discover through hands-on experience, and explain the relationship between the

circumference and area of a circle.

- I can find the area of composite figures. (9-3)
  - I solve a variety of real-world and math problems involving geometry concepts such as **area**, volume, and surface area for **two-** and three-dimensional objects.
  - I communicate orally and in writing solutions, including justifications for those solutions.
- I can find the volume of prisms and pyramids. (9-4)
  - I calculate actual measures such as area, perimeter, and **volume** from scale drawings using appropriate measurement units.
  - I solve a variety of real-world and math problems involving geometry concepts such as area, **volume**, and surface area for two- and three-dimensional objects.
  - I communicate orally and in writing solutions, including justifications for those solutions.
- I can find the surface area of prisms and pyramids. (9-5)
  - I solve a variety of real-world and math problems involving geometry concepts such as area, volume, and **surface area** for two- and **three-dimensional** objects.
  - I communicate orally and in writing solutions, including justifications for those solutions.
- I can find the volume and surface area of composite figures. (9-6)
  - I solve a variety of real-world and math problems involving geometry concepts such as area, volume, and surface area for two- and three-dimensional objects.
  - I communicate orally and in writing solutions, including justifications for those solutions.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice
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  - Quick Writes
  - KWL Chart - (What I Know, Want to know, Learned)
  - Marking Text
  - Learning Log Reflection - Daily/Weekly
  - I-Chart - Gather/Organize Information on a topic
  - Focused Note Taking
  - CSG - Collaborative Study Groups
  - Socratic Seminar
  - Philosophical Chairs
  - Think/Pair/Share
  - Talking Trios
  - World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 10 - Probability

Essential Questions:

1. How can we as mathematicians use and apply patterns and structures to solve problems?
2. How can we as mathematicians determine an effective model to use to solve a problem?
3. How can probability be used to predict the future?

Unit Standards

Supporting Standards

7.SP.C Investigate chance processes and develop, use, and evaluate probability models.

- *7.SP.C.5* Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely or likely, and a probability near 1 indicates a likely event.
- *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.
- *7.SP.C.7* Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
- *7.SP.C.7.a* Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
- *7.SP.C.7.b* Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
- *7.SP.C.8* Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- *7.SP.C.8.a* 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.8.b* 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.8.c* Design and use a simulation to generate frequencies for compound events.

Learning Targets

- I can solve problems that classify the likelihood of simple events. (L10-1)
    - I understand that probabilities are numbers from 0-1 that express the likelihood of the event occuring and probabilities closer to 1 are likely, and those closer to 0 are unlikely.
    - I use reasoning to determine where a probability lies on the scale when the probability lies on the scale when the probability is expressed as a fraction such as 5/8.

    - I understand that the probability of 1 is certain and 0 is impossible.
    - I justify the categorization of events as likely, unlikely, or neither likely nor unlikely and use appropriate vocabulary and the concept of probability being from 0-1.
    - I conduct simple experiments and calculate probabilities.
- I can find the relative frequency of simple events and compare relative frequency to experimental probability. (10-2)
    - I collect/use data on chance events (hands-on events such as spinning a spinner and simulations) and approximate the relative frequency of an event given the probability.
- I can solve problems involving theoretical probability of simple events and their complements. (10-3)
    - I determine the probability of events by developing uniform (and non-uniform) probability models (theoretical probability).
    - I understand that probabilities are numbers from 0-1 that express the likelihood of the event occuring and probabilities closer to 1 are likely, and those closer to 0 are unlikely.
    - I understand that the probability of 1 is certain and 0 is impossible.
- I can solve problems that compare probabilities and relative frequencies of simple events. (10-4)
    - I explain the difference between experimental and theoretical probability using appropriate vocabulary and examples. *Reveal needs additional supplementation.*
    - I collect/use data on chance events (hands-on events such as spinning a spinner and simulations) and approximate the relative frequency of an event given the probability.
    - I compare the models to the observed frequency and explain their reasoning, orally and in writing, for the discrepancy between the model and the observed frequency using appropriate vocabulary.
    - I develop probability models by observing frequencies and approximating the probability using hands-on experiments and simulations.
- I can solve problems involving the probability of compound events. (10-5)
    - I explain orally and in writing the similarities and differences between single and compound events.
    - I **read** and create sample spaces as organized lists, tables, or tree diagrams to determine the probability of a compound event.
- I can solve problems by simulating compound probability events. (10-6)
    - I read and **create** sample spaces as organized lists, tables, or tree diagrams to determine the probability of a compound event.
    - I select the appropriate tools for a simulation for a compound event and use the data it generates to approximate the probability of an event.
    - I explain orally and/or in writing: *Not addressed in Reveal*
        - how the simulation was selected
        - why it models a compound event and not a single event
        - the data it generated
        - how the probability was approximated

Assessment Evidence

Performance Assessment Options & Rubrics *May include, but are not limited to the following:*	**Other assessment options** *May include, but are not limited to the following:*
● Math 7 Feedback & Scoring Rubric based on Priority Standards ● Module Pre-Test ● End of Unit Assessment (3 versions) ● End of Unit Assessment	● Entrance or Exit Tickets/Warm Up ● ALEKS Assessment ● Pulling it together - mid quizzes ● Student work samples ● REVEAL performance tasks

(3 versions - differentiation) ● Mid-unit checks/quizzes	● LEARN Checks ● Extension ● Dynamic Practice ● AVID Strategies ○ Quick Writes ○ KWL Chart - (What I Know, Want to know, Learned) ○ Marking Text ○ Learning Log Reflection - Daily/Weekly ○ I-Chart - Gather/Organize Information on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe

Digital Tools & Supplementary Resources

- ALEKS
- Web Sketch Pad
- Learnsmart
- REVEAL performance tasks
- Illustrative (secondary resource)

Unit 11 - Sampling and Statistics

Essential Questions:

1. How can we as mathematicians justify our answer(s)?
2. How can we as mathematicians evaluate and question whether a mathematical argument is accurate?
3. *How can you use a sample to gain information about a population?*

Unit Standards

Supporting Standards

7.SP.A Use random sampling to draw inferences about a population.

- *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.
- *7.SP.A.2* Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

7.SP.B Draw informal comparative inferences about two populations.

- *7.SP.B.3* Informally assesses 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.
- *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.

Learning Targets

- I can identify samples as biased or unbiased and determine whether inferences from the samples are valid.
    - I critique examples of random sampling as statistical tools using precise mathematical vocabulary: random sampling, population, valid generalization/inference
    - I design random samplings to collect the data given statistical questions. Defend the samplings as random. *Not addressed in Reveal*
- I can make predictions based on data gathered using a valid sampling method. (11-2)
    - I draw valid inferences and generalizations from random samplings of populations and justify their inferences and generalizations as valid using appropriate vocabulary.
- I can understand that taking multiple samples can help them gauge the variation of their predictions. (11-3)
    - I explain the variability in multiple random samples and gauge how far off an estimate may be.
- I can make comparative inferences about two populations based on the data from random samples. (11-4)
    - I select the correct measure(s) of center or variability in comparing two data sets.
    - I draw valid comparative inferences for two data sets.
    - I identify valid inferences and justify why they are valid (or why other inferences are not valid).
- I can informally assess the degree of visual overlap between two distributions. (11-5)
    - I compare two data sets for variability by comparing graphs.
    - I explain orally and/or in writing why it makes sense that the greater the variability, the more visible the overlap on graphs presenting two numerical data sets.
    - I use statistical functions on graphing calculators for large data sets. *Not addressed in Reveal*
    - I use models and compare two real-world data sets by measuring the difference between centers and expressing it as a multiple of a measure of variability.

Assessment Evidence

Performance Assessment Options & Rubrics
May include, but are not limited to the following:

- Math 7 Feedback & Scoring Rubric based on Priority Standards
- Module Pre-Test
- End of Unit Assessment (3 versions)
- End of Unit Assessment (3 versions - differentiation)
- Mid-unit checks/quizzes

Other assessment options
May include, but are not limited to the following:

- Entrance or Exit Tickets/Warm Up
- ALEKS Assessment
- Pulling it together - mid quizzes
- Student work samples
- REVEAL performance tasks
- LEARN Checks
- Extension
- Dynamic Practice

	● AVID Strategies ○ Quick Writes ○ KWL Chart - (What I Know, Want to know, Learned) ○ Marking Text ○ Learning Log Reflection - Daily/Weekly ○ I-Chart - Gather/Organize Information on a topic ○ Focused Note Taking ○ CSG - Collaborative Study Groups ○ Socratic Seminar ○ Philosophical Chairs ○ Think/Pair/Share ○ Talking Trios ○ World Cafe
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● ALEKS ● Web Sketch Pad ● Learnsmart ● REVEAL performance tasks ● Illustrative (secondary resource)	