

# North Hampton School Report Card

## Supporting Document

7<sup>th</sup> Grade- ELA- 1<sup>st</sup> Trimester

The *Common Core State Standards for English Language Arts* guides the development and implementation of curriculum in the areas of reading, writing, speaking and listening, and language development. Reading is broken into two parts, the reading of literature and the reading of informational texts. Written expression is broken into three common types: narrative, informational and argumentative.

During the first trimester, students participate in curriculum that focuses on several elements of literacy. Students complete a *Hero's Journey Unit*, which includes the creation of a visual **literary analysis**, and a **narrative piece**. This unit is built around the reading of *The Hobbit*, J.R.R. Tolkien. Students also read a variety of short stories while studying the elements of fiction. They will have the chance to alter the ending of a short story of their choosing. Students also acquire new **vocabulary** through the *Wordly Wise* language program and the anchor exemplar texts provided. Along with these texts, students read books of their own choosing, with the goal of reading a variety of genre and text complexity.

### Reading and Responding to Literature

During the *Hero's Journey Unit*, students hear parts of *The Hobbit* read out loud to model strategies for accessing complex texts. Students are encouraged to observe the development of the main character, Bilbo Baggins, as he slowly becomes the hero he was meant to be. They share their thoughts through discussion, written comprehension questions and reenactments of critical scenes.

The *Short Story Unit* is a way for students to experience and learn the different techniques that a short story writer uses by reading a range of short stories. Each student then has the opportunity to try the techniques they observed and write their own *alternative ending of a short story* that they have read.

The exemplar texts are *The Monkey's Paw* and *The Necklace* and have been selected because they best illustrate the learning targets for the unit. The authors include: W.W. Jacobs and Guy de Maupassant.

In the *Short Story Unit*, students work to accurately identify the central ideas and details in a variety of texts, including texts of different lengths and complexity. Within this goal, students are encouraged to see multiple themes and explore how they develop across a text. Students can identify and describe multiple points of view within a story. Students question the role and reliability of the narrator. They also observe and describe techniques that create tension and suspense.

### Language

During the 7<sup>th</sup> grade year, students are developing their vocabulary in two different ways. They gather and learn vocabulary words from the exemplar texts that we read, and we study the unit words from *Wordly Wise*, a vocabulary program used from grades 6-8. While studying new vocabulary words, students reinforce their knowledge of Standard English grammar and conventions (i.e. parts of speech, punctuation, commas, semicolons...)

### Writing Practices

All year long, students use writing as a tool to share their thoughts and observations and to gain a deeper understanding of the content, themselves, and others. Students are active members of a community of writers that share and celebrate written work.

Students participate in a writing process model to: brainstorm and generate ideas, gather information and access resources, draft written pieces of varying length, edit and revise with peer and adult feedback, evaluate impact on intended audience, and publish completed assignments. Students reflect on growth and self-assess the product and their process. Students are expected to participate in regular writing workshop time where they are expected to sustain their writing, revise their work, and use peer conferencing. Specific emphasis is placed on the craft of writing: "writing like a reader" and "reading like a writer" method uses exemplar texts to model mastery.

The first trimester of seventh grade the students write for many different purposes, whether it is a short answer question on a comprehension assessment, a homework assignment that requires them to summarize or analyze a reading, or in class writing to prepare for class discussions or group work or more long term process writing pieces that reflect growth, revision, feedback and multiple drafts.

The Hero's Journey Unit is a multi-genre project that includes a visual analysis of *The Hobbit*, and a narrative piece that puts a hero that they design on a journey. This project is integrated within their art class as well as Language Arts class.

The Short Story Unit is an opportunity for students to learn about the use of tension and suspense by studying Edgar Allen Poe and then trying it themselves!

### Reading Practices

Free Choice reading continues as well throughout the term, with students using their weekly reading logs to record at least four (4) times for thirty (30) minutes, with a minimum goal of reading a book a month.

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## 7<sup>th</sup>/8<sup>th</sup> Grade 1<sup>st</sup> Trimester

### Science

#### Earth's Systems

- Students focused on the rock cycle, the different forms of rock, and processes such as melting, cooling and hardening, and weathering and erosion that result in the change of one rock to another. Students then focused in on the weathering and erosion part of the rock cycle - mechanical and chemical weathering, and erosion by wind, ice, water, and gravity. That study led to student-designed inquiry - students generated questions, developed hypotheses, designed procedures, conducted the labs, collected data, analyzed the data and created graphs in Excel, and synthesized the results in written conclusions. Students had the opportunity to discuss their work for the inquiry in a student-led seminar. The work for that lab is in the students' science journals.
- Students explored plate tectonics and how those motions slowly lead to changes on Earth's surface. They studied convergent, divergent, and transform plate boundaries. They also explored how earthquakes can quickly change Earth's surface by investigating the types of energy waves released during earthquakes (p- and s-waves) and how the waves influence both Earth's surface and structures on the surface.
- Students plotted earthquakes using real-time data from the USGS (U.S. Geological Survey) website to help illustrate that a majority of earthquakes occur along plate boundaries.
- \*Students engaged in engineering design during their work with earthquake-resistant structures. Students began by researching current technology used in buildings constructed in earthquake-prone areas. Students worked in groups to design structures made of certain materials - the structures had to meet specific building codes and groups had to work within a limited budget.

#### Science Practices

##### Develops and Uses Models

Develop a model to predict and/or describe phenomena.

##### Analyzes and Interprets Data

Analyze and interpret data to determine similarities and differences in findings.

##### Plans and Carries Out Investigations

Undertake a design project, engaging in the design cycle, to construct and/or implement a

##### Obtaining, Evaluating, and Communicating Information

Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are/not supported by evidence.

#### Matter and Its Interactions

- Students began their study of matter by looking at individual elements on the periodic table. Each student studied at least one element, learned about its properties, the origin of its name, its symbol, where it can be found, how much it costs if for sale, common uses, who discovered it and when. Students then took that information and created element interpretations (8" x 8" cards) that visually represent what they learned.
- Students studied the concepts of atom, element, molecule, and compound and what those terms imply at an atomic level.
- Students examined prefixes and suffixes common in chemistry and used them to decipher ingredients on common household items.
- Students researched properties of individual elements and the properties of compounds composed of those elements to see that when elements combine to form compounds, their properties differ greatly from the properties of the elements from which they are made.
- Students began working with chemical reactions and will continue to do so throughout the remainder of this unit. They will examine evidence of chemical reactions, how to write chemical reactions using the reactants and products, interpret data collected during chemical reactions (i.e., change in temperature, change in pH), and design another inquiry lab based on a chemical reaction activity they do in class.

#### Learning Habits

##### Active Engagement in Learning

You work hard to wisely use class time by staying focused on the task at hand, asking meaningful questions, utilizing resources, feedback and direct instruction. You are able to work independently and collaboratively.

##### Organization

You work hard to maintain an organizational system for your notes, work and handouts so you can easily reference them. You are prepared for every class with the materials and homework that you need.

##### Conscientiousness

You approach all your work with your best effort and pay close attention to quality.

##### Commitment/ Perseverance

You seek and initiate meaningful challenges. You stay with the work when it is difficult or when you meet an obstacle and being that academic task to completion.

## 7th Grade Social Studies- Term I Supporting Document

The first term of Social Studies will be dedicated to understanding our US Constitution, the federal government, and our NH government. Topics will include the Bill of Rights, the Preamble, voting rights, the branches of government, the balance of power, individual rights, media literacy, and citizenship. We'll focus on understanding how our Constitution attempts to create and maintain balance in a lot of different ways and the roles that citizens have in our government.



Students will also work on a variety of skills including:

- Non-fiction reading and interpretation
- Presenting information in an organized way
- Generating and following through on research topics
- Research skills including using a variety of sources and choosing the best resource
- Gathering and evaluating information from charts, graphs, maps, etc.
- Evaluating sources of information for bias and validity
- Using primary source documents
- Forming arguments and supporting them with well-reasoned logic and valid information
- An understanding of content-specific vocabulary

### **COMMON CORE CURRICULUM STANDARDS**

CCSS.ELA-LITERACY.RH.6-8.1 Cite specific textual evidence to support analysis of primary and secondary sources.

CCSS.ELA-LITERACY.RH.6-8.2 Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

CCSS.ELA-LITERACY.RH.6-8.6 Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

CCSS.ELA-LITERACY.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

CCSS.ELA-LITERACY.RH.6-8.8 Distinguish among fact, opinion, and reasoned judgment in a text.

CCSS.ELA-LITERACY.RH.6-8.9 Analyze the relationship between a primary and secondary source on the same topic.

CCSS.ELA-LITERACY.WHST.6-8.1 Write arguments focused on *discipline-specific content*.

CCSS.ELA-LITERACY.WHST.6-8.1.A Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

CCSS.ELA-LITERACY.WHST.6-8.1.B Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCSS.ELA-LITERACY.WHST.6-8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

CCSS.ELA-LITERACY.WHST.6-8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

CCSS.ELA-LITERACY.WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

CCSS.ELA-LITERACY.WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

CCSS.ELA-LITERACY.WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

### **STATE OF NEW HAMPSHIRE SOCIAL STUDIES GRADE SPAN EXPECTATIONS (GSE)**

SS:CV:8:1.1: Explain why limiting the powers of government is essential for the protection of individual rights. (Themes: B: Civic Ideals, Practices, and Engagement, E: Cultural Development, Interaction, and Change, H: Individualism, Equality and Authority)

SS:CV:8:1.2: Analyze the major arguments for and against representative government as distinguished from direct democracy, and discuss how, in a representative democracy, minority rights are protected.

SS:CV:8:2.1: Define the organization and responsibilities of federal government that are set forth in the New Hampshire Constitution, the United States Constitution and their amendments, e.g., Separation of Powers, Division of Powers, or the Bill of Rights. (Themes: B: Civic Ideals, Practices, and Engagement)

SS:CV:8:2.2: Compare and contrast the structure and major responsibilities and services of government at the local, state, and federal levels as set forth in the New Hampshire Constitution and the United States Constitution, e.g., taxation, transportation, or education. (Themes: B: Civic Ideals, Practices, and Engagement)

SS:CV:8:2.3: Describe ways in which particular events and documents contributed to the evolution of American government, e.g., states' rights, universal suffrage, or civil rights. (Themes: E: Cultural Development, Interaction, and Change, H: Individualism, Equality and Authority)

SS:CV:8:4.1: Describe and analyze ways Americans can effectively participate in civic and political life at the local, state, and federal levels, e.g., problem solving, public engagement, or voting.

SS:HI:8:1.1: Examine how suffrage expanded to various groups of citizens, e.g.,

SS:HI:8:1.1: Describe the role New Hampshire voters have played in our nation's presidential primaries and elections.

SS:HI:8:1.4: Analyze the tension between states' rights and national authority, e.g., the nullification crisis of 1832 or school integration of the 1960's

### **ASSESSMENT:**

Students will be assessed this term on their understanding of the GSE curriculum content as well as the skills outlined in the Common Core Curriculum Standards using the following methods:

Written work- both short responses and longer pieces with revision

Classroom participation in a variety of activities including whole class lecture, group discussions, presentations, etc.

Projects- both group and individual, in-class and as homework

Quizzes and Tests of a variety of formats including multiple choice, short answer, essay, etc.

## **7th Grade Math Course Syllabus**

Seventh grade is the last year in which there is a large focus on students' foundation in number and is an important year for students on the path towards algebra. Learning math this year will require thought, questioning, wondering, connecting, and most importantly hard work. In math class students share their ideas and thinking with each other through discussion, group work, reflection, and review. Since students are expected to apply concepts that they learn to new situations, see that problems can be solved in many ways, and make connections. It is important they understand how a math concept works as well as demonstrate the procedure/strategy for solving it.

### **Course Expectations:**

In middle school mathematics, students are more responsible for their own learning. There will be opportunities provided for every type of learner and enrichment is available for students willing to seek it out and work for it. Students are expected to show up for class every day ready to engage and make the most out of their learning opportunities. Students are expected to interact with one another in ways that build confidence in themselves and others and in ways that help them to understand the content that we are studying. Students are expected to show respect for themselves and the learning community by being where the learning is. Lastly, students are expected to be open to new ideas and to one another.

Homework can be expected weekly and quizzes will occur approximately once every two weeks with lots of small check-ins in between. Tests will be administered at the end of each unit with a minimum of one week's notice given. All quizzes and tests can be retaken by appointment once students review their work.

### **The Standards for Mathematical Practice:**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

In other words, Students will:

- Communicate their understanding of mathematics
- Create and use representations to communicate mathematical ideas to solve problems
- Recognize, explore, and develop mathematical connections
- Use problem-solving strategies to investigate and understand increasingly complex mathematical content
- Use mathematical reasoning and/or proof throughout the study of geometry and algebra

- Apply mathematical concepts and skills to solve problems across the content areas of number operations, algebra, geometry, and probability and statistics
- Demonstrate the skills to work independently
- Demonstrate the skills to work collaboratively
- Organize and evaluate information for its relevance to a question or problem

## **Course Content:**

### **7.1 Scale Drawings**

In this unit, students learn to understand and use the terms “scaled copy,” “to scale,” “scale factor,” “scale drawing,” and “scale,” and recognize when two pictures or plane figures are or are not scaled copies of each other. They use tables to reason about measurements in scaled copies, and recognize that angle measures are preserved in scaled copies, but lengths are scaled by a scale factor and areas by the square of the scale factor. They make, interpret, and reason about scale drawings. These include maps and floor plans that have scales with and without units.

- I can tell whether or not a figure is a scaled copy of another figure.
- I can describe some characteristics of a scaled copy.
- In a pair of figures, I can identify corresponding points, corresponding segments, and corresponding angles.
- I can describe what the scale factor has to do with a figure and its scaled copy.
- I know what operation to use on the side lengths of a figure to produce a scaled copy.
- I can draw a scaled copy of a figure using a given scale factor.
- I can use corresponding distances and corresponding angles to tell whether one figure is a scaled copy of another.
- When I see a figure and its scaled copy, I can explain what is true about corresponding angles.
- When I see a figure and its scaled copy, I can explain what is true about corresponding distances.
- I can describe the effect on a scaled copy when I use a scale factor that is greater than 1, less than 1, or equal to 1.
- I can explain how the scale factor that takes Figure A to its copy Figure B is related to the scale factor that takes Figure B to Figure A.
- I can describe how the area of a scaled copy is related to the area of the original figure and the scale factor that was used.
- I can explain what a scale drawing is, and I can explain what its scale means.
- I can use a scale drawing and its scale to find actual distances.
- I can use actual distances and a scale to find scaled distances.
- I can use a map and its scale to solve problems about traveling.
- When I know the actual measurements, I can create a scale drawing at a given scale.
- I know how different scales affect the lengths in the scale drawing.
- I can determine the scale of a scale drawing when I know lengths on the drawing and corresponding actual lengths.

### **7.2 Introducing Proportional Relationships**

In this unit, students learn to understand and use the terms “proportional,” “constant of proportionality,” and “proportional relationship,” and recognize when a relationship is or is not proportional. They represent proportional relationships with tables, equations, and graphs. Students use these terms and representations in reasoning about situations that involve constant speed, unit pricing, and measurement conversions.

- I can use equivalent ratios to describe scaled copies of shapes.
- I know that two recipes will taste the same if the ingredients are in equivalent ratios.
- I understand the terms proportional relationship and constant of proportionality.
- I can use a table to reason about two quantities that are in a proportional relationship.
- I can find missing information in a proportional relationship using a table.
- I can find the constant of proportionality from information given in a table.
- I can write the the constant of proportionality as an entry in a table.
- I can write an equation of the form  $y=kx$  to represent a proportional relationship described by a table or a story.
- I can find two constants of proportionality for a proportional relationship.
- I can write two equations representing a proportional relationship described by a table or story.
- I can relate all parts of an equation like  $y=kx$  to the situation it represents.
- I can find missing information in a proportional relationship using the constant of proportionality.
- I can decide if a relationship represented by a table could be proportional and when it is definitely not proportional.
- I can decide if a relationship represented by an equation is proportional or not.
- I can ask questions about a situation to determine whether two quantities are in a proportional relationship.
- I can solve all kinds of problem involving proportional relationships.
- I know that the graph of a proportional relationship lies on a line through  $(0,0)$ .
- I understand the information given by graphs of proportional relationships that are made of up of points or a line.
- I can find the constant of proportionality from a graph.
- I can draw the graph of a proportional relationship given a single point on the graph (other than the origin).
- I know that the steeper graph of two proportional relationships has a larger constant of proportionality.
- I can compare two, related proportional relationships based on their graphs.
- I can interpret a graph of a proportional relationship using the situation.
- I can write an equation representing a proportional relationship from a graph.
- I can use units to help me understand information about proportional relationships.
- I can make connections between the graphs, tables, and equations of a proportional relationship.
- I can answer a question by representing a situation using proportional relationships.
- I understand that it can be difficult to measure the quantities in a proportional relationship accurately.
- I can examine quotients and use a graph to decide whether two associated quantities are in a proportional relationship.

### 7.3 Measuring Circles

In this unit, students learn to understand and use the term “circle” to mean the set of points that are equally distant from a point called the “center.” They gain an understanding of why the circumference of a circle is proportional to its diameter, with constant of proportionality  $\pi$ . They see informal derivations of the fact that the area of a circle is equal to  $\pi$  times the square of its radius. Students use the relationships of circumference, radius, diameter, and area of a circle to find lengths and areas, expressing these in terms of  $\pi$  or using appropriate approximations of  $\pi$  to express them numerically.

- I can identify the diameter, center, radius, and circumference of a circle.
- I can describe the characteristics that make a shape a circle.
- I can describe the relationship between circumference and diameter of any circle.
- I can explain what  $\pi$  means.
- I can choose an approximation for  $\pi$  based on the situation or problem.
- If I know the radius, diameter, or circumference of a circle, I can find the other two.
- If I know the radius or diameter of a wheel, I can find the distance the wheel travels in some number of revolutions.
- I can calculate the area of a complicated shape by breaking it into shapes whose area I know how to calculate.
- If I know a circle’s radius or diameter, I can find an approximation for its area.
- I know whether or not the relationship between the diameter and area of a circle is proportional and can explain how I know.
- I can explain how the area of a circle and its circumference are related to each other.
- I know the formula for area of a circle.
- I can write exact answers in terms of  $\pi$ .
- I can calculate the area of more complicated shapes that include fractions of circles.
- I can decide whether a situation about a circle has to do with area or circumference.
- I can use formulas for circumference and area of a circle to solve problems.
- I can apply my understanding of area and circumference of circles to solve more complicated problems.

### 7.4 Proportional Relationships and Percentages

In this unit, students use ratios, scale factors, unit rates (also called constants of proportionality), and proportional relationships to solve multi-step, real-world problems that involve fractions and percentages. They use long division to write fractions presented in the form  $\frac{a}{b}$  as decimals, e.g.,  $\frac{1130}{3000} = 0.376\overline{6}$ . They learn to understand and use the terms “repeating decimal,” “terminating decimal,” “percent increase,” “percent decrease,” “percent error,” and “measurement error.” They represent amounts and corresponding percent rates with double number line diagrams and tables. They use these terms and representations in reasoning about situations involving sales taxes, tips, markdowns, markups, sales commissions, interest, depreciation, and scaling a picture. Students use equations to represent proportional relationships in which the constant of proportionality arises from a percentage, e.g., relationship between price paid and amount of sales tax paid.

- I remember how to compute percentages.

- I can find dimensions on scaled copies of a rectangle.
- I can solve problems about ratios of fractions and decimals.
- When there is a constant rate, I can identify the two quantities that are in a proportional relationship.
- I can use a table with 2 rows and 2 columns to find an unknown value in a proportional relationship.
- I understand that “half as much again” and “multiply by 32” mean the same thing.
- I can use the distributive property to rewrite an expression like  $x+12x$  as  $(1+12)x$ .
- I can write fractions as decimals.
- I can use the distributive property to rewrite an equation like  $x+0.5x=1.5x$ .
- I understand that “half as much again” and “multiply by 1.5” mean the same thing.
- I can draw a tape diagram that represents a percent increase or decrease.
- When I know a starting amount and the percent increase or decrease, I can find the new amount.
- When I know the new amount and the percentage of increase or decrease, I can find the original amount.
- I understand that if I know how much a quantity has grown, then the original amount represents 100%.
- I can use a double number line diagram to help me solve percent increase and decrease problems.
- I can solve percent increase and decrease problems by writing an equation to represent the situation and solving it.
- I understand that to find 0.1% of an amount I have to multiply by 0.001.
- I can find percentages of quantities like 12.5% and 0.4%.
- I understand and can solve problems about sales tax and tip.
- I understand and can solve problems about commission, interest, markups, and discounts.
- I can find the percentage increase or decrease when I know the original amount and the new amount.
- I understand that all measurements include some error.
- I can represent measurement error as a percentage of the correct measurement.
- I can solve problems that involve percent error.
- I can find a range of possible values for a quantity if I know the maximum percent error and the correct value.
- I can write and solve problems about real-world situations that involve percent increase and decrease.

## 7.5 Rational Number Arithmetic

In this unit, students interpret signed numbers in contexts (e.g., temperature, elevation, deposit and withdrawal, position, direction, speed and velocity, percent change) together with their sums, differences, products, and quotients. (“Signed numbers” include all rational numbers, written as decimals or in the form  $ab$ .) Students use tables and number line diagrams to represent sums and differences of signed numbers or changes in quantities represented by signed numbers such as temperature or elevation, becoming more fluent in writing different numerical addition and subtraction equations that express the same relationship. They compute sums and differences of signed numbers. They plot points in the plane

with signed number coordinates, representing and interpreting sums and differences of coordinates. They view situations in which objects are traveling at constant speed (familiar from previous units) as proportional relationships. For these situations, students use multiplication equations to represent changes in position on number line diagrams or distance traveled, and interpret positive and negative velocities in context. They become more fluent in writing different numerical multiplication and division equations for the same relationship. Students extend their use of the “next to” notation (which they used in expressions such as  $5x$  and  $6(3+2)$  in grade 6) to include negative numbers and products of numbers, e.g., writing  $-5x$  and  $(-5)(-10)$  rather than  $(-5)\square(x)$  and  $(-5)\square(-10)$ . They extend their use of the fraction bar to include variables as well as numbers, writing  $-8.5\div x$  as well as  $-8.5x$ .

- I can compare rational numbers.
- I can use rational numbers to describe temperature and elevation.
- I can use a number line to add positive and negative numbers.
- I understand how to add positive and negative numbers in general.
- I understand what positive and negative numbers mean in a situation involving money.
- I can use a number line to subtract positive and negative numbers.
- I can explain the relationship between addition and subtraction of rational numbers.
- I can find the difference between two rational numbers.
- I understand how to subtract positive and negative numbers in general.
- I can solve problems that involve adding and subtracting rational numbers.
- I can multiply a positive number with a negative number.
- I can use rational numbers to represent speed and direction.
- I can explain what it means when time is represented with a negative number in a situation about speed and direction.
- I can multiply two negative numbers.
- I can solve problems that involve multiplying rational numbers.
- I can divide rational numbers.
- I can solve problems that involve negative rates.
- I can solve problems that involve multiplying and dividing rational numbers.
- I can add, subtract, multiply, and divide rational numbers.
- I can evaluate expressions that involve rational numbers.
- I can solve problems using the four operations with rational numbers.
- I can represent situations with expressions that include rational numbers.
- I can solve equations that include rational numbers and have rational solutions.
- I can write and solve equations to represent situations that involve rational numbers.
- I can explain what the solution to an equation means for the situation.
- I can solve problems about the stock market using rational numbers and percentages.

## 7.6 Expressions, Equations, and Inequalities

In this unit, students solve equations of the forms  $px+q=r$  and  $p(x+q)=r$  where  $p$ ,  $q$ , and  $r$  are rational numbers. They draw, interpret, and write equations in one variable for balanced “hanger diagrams,” and write expressions for sequences of instructions, e.g., “number puzzles.” They use tape diagrams together

with equations to represent situations with one unknown quantity. They learn algebraic methods for solving equations. Students solve linear inequalities in one variable and represent their solutions on the number line. They understand and use the terms “less than or equal to” and “greater than or equal to,” and the corresponding symbols. They generate expressions that are equivalent to a given numerical or linear expression. Students formulate and solve linear equations and inequalities that represent real-world situations.

- I can think of ways to solve some more complicated word problems.
- I can explain how a tape diagram represents parts of a situation and relationships between them.
- I can use a tape diagram to find an unknown amount in a situation.
- I can match equations and tape diagrams that represent the same situation.
- If I have an equation, I can draw a tape diagram that shows the same relationship.
- I can draw a tape diagram to represent a situation where there is a known amount and several copies of an unknown amount and explain what the parts of the diagram represent.
- I can find a solution to an equation by reasoning about a tape diagram or about what value would make the equation true.
- I can draw a tape diagram to represent a situation where there is more than one copy of the same sum and explain what the parts of the diagram represent.
- I can find a solution to an equation by reasoning about a tape diagram or about what value would make the equation true.
- I understand the similarities and differences between the two main types of equations we are studying in this unit.
- When I have a situation or a tape diagram, I can represent it with an equation.
- I can find an unknown weight on a hanger diagram and solve an equation that represents the diagram.
- I can write an equation that describes the weights on a balanced hanger.
- I can explain how a balanced hanger and an equation represent the same situation.
- I can explain why some balanced hangers can be described by two different equations, one with parentheses and one without.
- I can explain how a balanced hanger and an equation represent the same situation.
- I can write an equation that describes the weights on a balanced hanger.
- I can find an unknown weight on a hanger diagram and solve an equation that represents the diagram.
- I can use the idea of doing the same to each side to solve equations that have negative numbers or solutions.
- For an equation like  $3(x+2)=15$ , I can solve it in two different ways: by first dividing each side by 3, or by first rewriting  $3(x+2)$  using the distributive property.
- For equations with more than one way to solve, I can choose the easier way depending on the numbers in the equation.
- I can solve story problems by drawing and reasoning about a tape diagram or by writing and solving an equation.
- I can solve story problems about percent increase or decrease by drawing and reasoning about a tape diagram or by writing and solving an equation.
- I understand what it means for a number to make an inequality true.

- I can explain what the symbols  $\leq$  and  $\geq$  mean.
- I can represent an inequality on a number line.
- I can write an inequality to represent a situation.
- I can describe the solutions to a inequality by solving a related equation and then reasoning about values that make the inequality true.
- I can solve inequalities by solving a related equation and then checking which values are solutions to the original inequality.
- I can graph the solutions to an inequality on a number line.
- If I have a situation and an inequality that represents it, I can explain what the parts of the inequality mean in the situation.
- I can match an inequality to a situation it represents, solve it, and then explain what the solution means in the situation.
- I can use what I know about inequalities to solve real-world problems.
- I can re-write subtraction as adding the opposite and then rearrange terms in an expression.
- I can organize my work when I use the distributive property.
- I can organize my work when I use the distributive property.
- I can use the distributive property to rewrite expressions with positive and negative numbers.
- I understand that factoring and expanding are words used to describe using the distributive property to write equivalent expressions.
- When possible, I can write an equivalent expression that has fewer terms.
- I can figure out whether two expressions are equivalent to each other.
- When possible, I can write an equivalent expression that has fewer terms.
- I am aware of some common pitfalls when writing equivalent expressions, and I can avoid them.
- Given an expression, I can use various strategies to write an equivalent expression.
- When I look at an expression, I can notice if some parts have common factors and make the expression shorter by combining those parts.

## 7.7 Angles, Triangles, and Prisms

**In this unit, students investigate whether sets of angle and side length measurements determine unique triangles or multiple triangles, or fail to determine triangles. Students also study and apply angle relationships, learning to understand and use the terms “complementary,” “supplementary,” “vertical angles,” and “unique.” The work gives them practice working with rational numbers and equations for angle relationships. Students analyze and describe cross-sections of prisms, pyramids, and polyhedra. They understand and use the formula for the volume of a right rectangular prism, and solve problems involving area, surface area, and volume.**

- I can find unknown angle measures by reasoning about adjacent angles with known measures.
- I can recognize when an angle measures  $90^\circ$ ,  $180^\circ$ , or  $360^\circ$ .
- I can recognize when adjacent angles are complementary or supplementary.
- I can find unknown angle measures by reasoning about complementary or supplementary angles.
- I can determine if angles that are not adjacent are complementary or supplementary.
- I can explain what vertical angles are in my own words.
- I can reason through multiple steps to find unknown angle measures.

- I can recognize when an equation represents a relationship between angle measures.
- I can write an equation to represent a relationship between angle measures and solve the equation to find unknown angle measures.
- I can show that the 4 side lengths that form a quadrilateral can be rearranged to form different quadrilaterals.
- I can show that the 3 side lengths that form a triangle cannot be rearranged to form a different triangle.
- I can show whether or not 3 side lengths will make a triangle.
- I can reason about a figure with an unknown angle.
- I understand that changing which sides and angles are next to each other can make different triangles.
- Given two angle measures and one side length, I can draw different triangles with these measurements or show that these measurements determine one unique triangle or no triangle.
- Given two side lengths and one angle measure, I can draw different triangles with these measurements or show that these measurements determine one unique triangle or no triangle.
- I can picture different cross sections of prisms and pyramids.
- I can explain that when a three dimensional figure is sliced it creates a face that is two dimensional.
- I can explain why the volume of a prism can be found by multiplying the area of the base and the height of the prism.
- I can calculate the the volume of a prism with a complicated base by decomposing the base into quadrilaterals or triangles.
- I can picture the net of a prism to help me calculate its surface area.
- I can find and use shortcuts when calculating the surface area of a prism.
- I can decide whether I need to find the surface area or volume when solving a problem about a real-world situation.
- I can solve problems involving the volume and surface area of children’s play structures.
- I can build a triangular prism from scratch.

## **7.8 Probability and Sampling**

In this unit, students understand and use the terms “event,” “sample space,” “outcome,” “chance experiment,” “probability,” “simulation,” “random,” “sample,” “random sample,” “representative sample,” “overrepresented,” “underrepresented,” “population,” and “proportion.” They design and use simulations to estimate probabilities of outcomes of chance experiments and understand the probability of an outcome as its long-run relative frequency. They represent sample spaces (that is, all possible outcomes of a chance experiment) in tables and tree diagrams and as lists. They calculate the number of outcomes in a given sample space to find the probability of a given event. They consider the strengths and weaknesses of different methods for obtaining a representative sample from a given population. They generate samples from a given population, e.g., by drawing numbered papers from a bag and recording the numbers, and examine the distributions of the samples, comparing these to the distribution of the population. They compare two populations by comparing samples from each population.

- I can get an idea for the likelihood of an event by using results from previous experiments.

- I can describe the likelihood of events using the words impossible, unlikely, equally likely as not, likely, or certain.
- I can tell which event is more likely when the chances of different events are expressed as fractions, decimals, or percentages.
- I can use the sample space to calculate the probability of an event when all outcomes are equally likely.
- I can write out the sample space for a simple chance experiment.
- I can explain whether certain results from repeated experiments would be surprising or not.
- I can estimate the probability of an event based on the results from repeating an experiment.
- I can explain why results from repeating an experiment may not exactly match the expected probability for an event.
- I can calculate the probability of an event when the outcomes in the sample space are not equally likely.
- I can simulate a real-world situation using a simple experiment that reflects the probability of the actual event.
- I can use a simulation to estimate the probability of a multi-step event.
- I can write out the sample space for a multi-step experiment, using a list, table, or tree diagram.
- I can use the sample space to calculate the probability of an event in a multi-step experiment.
- I can design a simulation to estimate the probability of a multi-step real-world situation.
- I can calculate the difference between two means as a multiple of the mean absolute deviation.
- When looking at a pair of dot plots, I can determine whether the distributions are very different or have a lot of overlap.
- I can explain why it may be useful to gather data on a sample of a population.
- When I read or hear a statistical question, I can name the population of interest and give an example of a sample for that population.
- I remember that when a distribution is not symmetric, the median is a better estimate of a typical value than the mean.
- I can determine whether a sample is representative of a population by considering the shape, center, and spread of each of them.
- I know that some samples may represent the population better than others.
- I know that selecting a sample at random is usually a good way to get a representative sample.
- I can describe ways to get a random sample from a population.
- I can consider the variability of a sample to get an idea for how accurate my estimate is.
- I can estimate the mean or median of a population based on a sample of the population.
- I can estimate the proportion of population data that are in a certain category based on a sample.
- I know that as the sample size gets bigger, the sample mean is more likely to be close to the population mean.
- I can use the means from many samples to judge how accurate an estimate for the population mean is.
- I can determine whether there is a meaningful difference between two populations based on a sample from each population.
- I can calculate the difference between two medians as a multiple of the interquartile range.

- I can decide what information I need to know to be able to compare two populations based on a sample from each.
- I can compare two groups by taking a random sample, calculating important measures, and determining whether the populations are meaningfully different.