South Harrison Township Elementary School District

Committed to Excellence

Course Name: Mathematics	**Grade Level(s): 6**
BOE Adoption Date: October 2017	**Revision Date(s):**

ABSTRACT

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.
2. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.

Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

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Mission Statement

The primary goal of the South Harrison Township Elementary School District is to prepare each student with the real life skills needed to compete in a highly competitive global economy. This will be achieved by providing a comprehensive curriculum, the integration of technology, and the professional services of a competent and dedicated faculty, administration, and support staff.

Guiding this mission will be Federal mandates, including the Every Student Succeeds Act (ESSA), the New Jersey Student Learning Standards, and local initiatives addressing the individual needs of our students as determined by the Board of Education. The diverse resources of the school district, which includes a caring Home and School Association (HSA) and active adult community, contribute to a quality school system. They serve an integral role in supporting positive learning experiences that motivate, challenge and inspire children to learn.

Curriculum and Instruction Goals

Goal(s):

1. To ensure students are college and career ready upon graduation
2. To vertically and horizontally align curriculum K-12 to ensure successful transition of students at each grade level
3. To identify individual student strengths and weaknesses utilizing various assessment measures (formative, summative, alternative, etc.) so as to differentiate instruction while meeting the rigor of the applicable content standards
4. To improve student achievement as assessed through multiple measures including, but not limited to, state testing, local assessments, and intermediate benchmarking

Philosophy of the Shared Curriculum Service with Kingsway Regional School District

Together in its partnership with the South Harrison Township Elementary School District, the Kingsway Curriculum & Instruction Department is committed to providing all students grades K-12 with an engaging and quality curricular experience that aligns with the New Jersey Student Learning Standards (NJ SLS) for mathematics and English-Language Arts as well as the New Jersey Student Learning Standards (NJ SLS) for all other core disciplines. It is the goal of this shared service to provide students with curricular and educational experiences that allows them to succeed as they move on to the middle and high school level. Through this shared service, both horizontal and vertical alignment is stressed at and within each grade level with the aim of developing life-long learners who are college and career ready upon graduation from high school. Additionally, classroom instruction will be designed to meet the unique learning desires of all children and will be differentiated according to the needs of each learner. Whether through added support or enrichment activities, it is the role of the educator in the classroom to ensure students are reaching their highest level of social, emotional, and academic growth each school year. A combination of summative, formative, and performance-based

assessments will be used to assess students' understanding and acquisition of necessary concepts and skills. Group work, projects, and a variety of co-curricular activities will make mathematics more meaningful and aid in the understanding of its application across all disciplines as well as in life.

How to Read this Document

This document contains a pacing guide and curriculum units. The pacing guides serve to deliver an estimated timeframe as to when noted skills and topics will be taught. The pacing of each course, however, will differ slightly depending upon the unique needs of each class. The curriculum units contain more detailed information as to the specific skills and concepts that are introduced as well as how students will be assessed. The terms and definitions below will assist the reader in better understanding the sections and components of this curriculum document.

Terms to Know

1. **Accommodation(s):** The term "accommodation" may be used to describe an *alteration* of environment, curriculum format, or equipment that allows an individual with a disability to gain access to content and/or complete assigned tasks. They allow students with disabilities to pursue a regular course of study. The term accommodation is often used interchangeable with the term modification. However, it is important to remember that modifications change or modify the intended learning goal while accommodations result in the same learning goal being expected but with added assistance in that achievement. Since accommodations do not alter what is being taught, instructors should be able to implement the same grading scale for students with disabilities as they do for students without disabilities.

2. **Differentiated Instruction:** Differentiation of instruction relies on the idea that instructional approaches should be tailored to each individual student's learning needs. It provides students an array of options during the learning process that allows them make sense of ideas as it relates to them. The integration of differentiated instructional techniques is a curriculum design approach to increase flexibility in teaching and decrease the barriers that frequently limit student access to materials and learning in classrooms. http://www.udlcenter.org/aboutudl

3. **Enduring Understanding:** Enduring understandings (aka big ideas) are statements of understanding that articulate deep conceptual understandings at the heart of each content area. Enduring understandings are noted in the alongside essential questions within each unit in this document. http://www.ascd.org

4. **Essential Question:** These are questions whose purpose is to stimulate thought, to provoke inquiry, and to spark more questions. They extend beyond a single lesson or unit. Essential questions are noted in the beginning of each unit in this document. http://www.ascd.org

5. **Formative Assessment(s):** Formative assessments monitor student learning to provide ongoing feedback that can be used by (1) instructors to improve teaching and (2) by students to improve their learning. Formative assessments help identify students' strengths and weaknesses and address problems immediately.

6. **Learning Activity(s):** Learning activities are those activities that take place in the classroom for which the teacher facilitates and the students participate in to ensure active engagement in the learning process. (Robert J. Marzano, *The Art and Science of Teaching*)

7. **Learning Assignment(s):** Learning assignments are those activities that take place independently by the student inside the classroom or outside the classroom (i.e. homework) to extend concepts and skills within a lesson. http://www.marzanocenter.com

8. **Learning Goal(s):** Learning goals are broad statements that note what students "should know" and/or "be able to do" as they progress through a unit. Learning goals correlate specifically to the NJSLS (New Jersey Student Learning Standards) are noted within each unit.

9. **Learning Objective(s):** Learning objectives are more specific skills and concepts that students must achieve as they progress towards the broader learning goal. These are included within each unit and are assessed frequently by the teacher to ensure students are progressing appropriately. http://www.marzanoresearch.com

10. **Model Assessment:** Within the model curriculum, model assessments are provided that included assessments that allow for measuring student proficiency of those target skills as the year of instruction progresses. http://www.state.nj.us/education/modelcurriculum/

11. **Model Curriculum:** The model curriculum has been provided by the state of New Jersey to provide a "model" for which districts can properly implement the NJSLS (New Jersey Student Learning Standards) by providing an example from which to work and/or a product for implementation.

12. **Modification(s):** The term "modification" may be used to describe a *change* in the curriculum. Modifications are typically made for students with disabilities who are unable to comprehend all of the content an instructor is teaching. The term modification is often used interchangeable with the term accommodations. However, it is important to remember that modifications change or modify the intended learning goal while accommodations result in the same learning goal being expected but with assistance in that achievement.

13. **Performance Assessment(s): (**aka alternative or authentic assessments) Performance assessments are a form of assessment that requires students to perform tasks that generate a more authentic evaluation of a student's knowledge, skills, and abilities. Performance assessments stress the application of knowledge and extend beyond traditional assessments (i.e. multiple-choice question, matching, true & false, etc.).

14. **Standard(s):** Academic standards, from which the curriculum is built, are statements that of what students "should know" or "be able to do" upon completion of a grade-level or course of study. Educational standards help teachers ensure their students have the skills and knowledge they need to be successful by providing clear goals for student learning. http://www.state.nj.us/njded/cccs/

    - **State:** The New Jersey Student Learning Standards (NJSLS) include Preschool Teaching and Learning Standards as well as K-12 standards for: *Visual and Performing Arts; Comprehensive Health and Physical Education; Science; Social Studies; World Languages; Technology; and 21st-Century Life and Careers.*

15. **Summative Assessment(s):** Summative assessments evaluate student learning at the end of an instructional time period by comparing it against some standard or benchmark. Information from summative assessments can be used formatively when students or faculty use it to guide their efforts and activities in subsequent courses.

16. **21st Century Skill(s):** These skills emphasis the growing need to focus on those skills that prepare students successfully by focusing on core subjects and 21st century themes; learning and innovation skills; information, media and technology skills; and life and career skills. These concepts are embedded in each unit of the curriculum. http://www.p21.org/our-work/p21-framework

Proficiencies and Pacing:

Unit Title	Duration/Month(s)	Related Standards	Learning Goals	Topics and Skills
Unit 1 Operations and Reasoning about Ratios	September - November	NJ SLS 6.NS.A.1 9/11-9/15 NJ SLS 6.NS.B.2 9/18-9/22 NJ SLS 6.RP.A.1 9/25-10/2 NJ SLS 6.RP.A.2 10/3-10/10 NJ SLS 6.RP.A.3* 10/11-10-17 NJ SLS 6.NS.B.3 10/18-10/25 NJ SLS 6.NS.B.4 10/26-11/1 Interdisciplinary standards **Technology** 8.1.8.D.2 Demonstrate the application of appropriate citations to digital content. 8.1.8.D.4 Assess the credibility and accuracy of digital content. **Career Ready Practices** CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. **Financial Literacy** 9.1.8.E.1 Explain what it means to be a responsible consumer and the factors to consider when making consumer decisions. **Career explorations** 9.2.8.B.1 Research careers within th	Learning Goal 1: NJ SLS 6.NS.A.1 Compute quotients of fractions. 2 days Learning Goal 2: NJ SLS 6.NS.A.1 Construct visual fraction models to represent quotients of fractions and use the relationship between multiplication and division to explain division of fractions. 2 days Learning Goal 3: NJ SLS 6.NS.A.1 Solve real-world problems involving quotients of fractions and interpret the solutions in the context given. 1 day Learning Goal 4: NJ SLS 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithms 1 week Learning Goal 5: NJ SLS 6.RP.A.1 Explain the relationship of two quantities in given ratio using ratio language 1 week Learning Goal 6: NJ SLS 6.RP.A.2 Use rate language, in the context of the ratio relationship, to describe a unit rate. 1 week	NJ SLS 6.NS.A.1 Compute quotients of fractions. NJ SLS 6.NS.A.1 Solve word problems involving the division of fractions. NJ SLS 6.NS.A.1 Draw a visual fraction model to illustrate the quotient of two fractions. NJ SLS 6.NS.A.1 Apply the relationship between multiplication and division to justify your answer. NJ SLS 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm. NJ SLS 6.RP.A.1 Describe relationships between two quantities using the concept of a ratio and vocabulary. NJ SLS 6.RP.A.1 Explain verbally the relationship between two quantities represented in a ratio. NJ SLS 6.RP.A.2 Convert a ratio to a unit rate written as a fraction. (denominator not equal to zero) NJ SLS 6.RP.A.2 Define a unit rate in terms of a ratio relationship. NJ SLS 6.RP.A.3 Construct a table of equivalent

		e 16 Career Clusters® and determine attributes of career success 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career. **Health** 2.1.6.A.3 - Determine factors that influence the purchase of healthcare products and use of personal hygiene practices **ELA** NJ SLS RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. NJ SLS RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. NJ SLS RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. NJ SLS WHST.6-8.1 Write arguments focused on discipline content.	Learning Goal 7: NJ SLS 6.RP.A.3 Create and complete tables of equivalent ratios to sole real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100. 3 days Learning Goal 8: NJ SLS 6.RP.A.3Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities. 2 days Learning Goal 9: NJ SLS 6.NS.B.3 Fluently add, subtract, multiply and divide multi-digit decimals. 1 week Learning Goal 10: NJ SLS 6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two numbers less than or equal to 12. 1 week	ratios relating to whole-number measurement quantities. NJ SLS 6.RP.A.3 Compute the missing value in a table of equivalent ratios. NJ SLS 6.RP.A.3 Write a proportion and solve problems with unit rates. NJ SLS 6.RP.A.3 Write a percent as a fraction out of 100. NJ SLS 6.RP.A.3 Solve percent word problems. NJ SLS 6.RP.A.3 Convert measurement units using ratios and proportions. NJ SLS 6.NS.B.3 Add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. NJ SLS 6.NS.B.4Compute the greatest common factor (GCF) of two whole numbers less than or equal to 100. NJ SLS 6.NS.B.4Compute the least common multiple (LCM) of two whole numbers less than or equal to 12.

		NJ SLS WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. NJ SLS WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. **Science** NGSS MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. NGSS MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.		
Unit 2 Expressions and 2-D Geometry	November -January	NJ SLS 6.EE.A.1 11/13 -11/17 NJ SLS 6.EE.A.2 11/20-11/27 NJ SLS 6.EE.A.3 11/28 -12/1 NJ SLS 6.EE.A.4 12/4 – 12/8 NJ SLS 6.EE.B.6 12/11 – 12/15 NJ SLS 6.G.A.1 1/2 -1/5 NJ SLS 6.G.A.3 1/8-1/12	Learning Goal 1: NJ SLS 6.EE.A.1 Write and evaluate numerical expressions involving whole number exponents. 1 week Learning Goal 2: NJ SLS 6.EE.A.2 Use mathematical language to	NJ SLS 6.EE.A.1 Evaluate numerical expressions with whole-number exponents. NJ SLS 6.EE.A.1 Write numerical expressions with whole-number exponents. NJ SLS 6.EE.A.3

		Interdisciplinary standards **Technology** 8.1.8.B.1 Synthesize and publish information about a local or global issue or event (ex. tele collaborative project, blog, school web). 8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse. **Career ready practices** CRP4. Communicate clearly and effectively and with reason. CRP6. Demonstrate creativity and innovation. **Financial Literacy** 9.1.8.E.3 Compare and contrast product facts versus advertising claims. **Career Explorations** 9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurric ular activities for use in a career. **Science** MS-PS2-1. Apply Newton's Third Law	identify parts of an expression. 1 week Learning Goal 3: NJ SLS 6.EE.A.2 Write and evaluate algebraic expressions involving exponents (include evaluating formulas). 1 week Learning Goal 4: : NJ SLS 6.EE.A.3 & NJ SLS 6.EE.A.4 Apply properties of operations (factor, distribute, and combine like terms) to generate equivalent expressions and to identify when two expressions are equivalent. 1 week Learning Goal 5: NJ SLS 6.EE.B.6 Use variables to represent numbers and write expressions when solving real world or mathematical problems. 1 week Learning Goal 6: NJ SLS 6.G.A.3 Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate. 1 week Learning Goal 7: NJ SLS 6.G.A.1 Find	Apply properties of operations to rewrite expressions. NJ SLS 6.EE.A.3 Explain why an expression that is rewritten is equivalent to the original expression. NJ SLS 6.EE.A.4 Identify when two expressions are equivalent (one expression is the simplified version of the other one). NJ SLS 6.EE.A.4 Explain why two expressions are equivalents regardless of the number that is substituted for the variable. NJ SLS 6.EE.B.6Write expressions with variables to represent numbers in a real-world problem. NJ SLS 6.EE.B.6Define a variable as a representation of an unknown number or numbers in a set. NJ SLS 6.G.A.3 Graph polygons in the coordinate plane given the vertices. NJ SLS 6.G.A.1Calculate the length of a side of a polygon graphed in the coordinate plane where the vertices have the same x-value or same y-value. NJ SLS 6.G.A.1Calculate the area of right triangles and other types of triangles.

		to design a solution to a problem involving the motion of two colliding objects. MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles. 1 week	NJ SLS 6.G.A.1Calculate the area of special quadrilaterals and polygons by composing them into rectangles or decomposing them into triangles. NJ SLS 6.G.A.1Apply techniques of finding the area of polygons to solve real-world problems
Unit 3 Equations, The Rational Number System and 3-D Geometry	January – March	NJ SLS 6.EE.B.5 1/22 – 1/26 NJ SLS 6.EE.B.7 1/29 -2/2 NJ SLS 6.NS.C.5 2/5 – 2/9 NJ SLS 6.NS.C.6 2/12 -2/15 NJ SLS 6.NS.C.7 2/20 – 2/22 NJ SLS 6.EE.B.8 2/23- 2/27 NJ SLS 6.NS.C.8* 2/27 -3/5 NJ SLS 6.G.A.2 3/6 – 3/12 NJ SLS 6.G.A.4 3/13 -3/16 Interdisciplinary standards **Technology** 8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision. 8.2.8.B.4 Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.	Learning Goal 1: NJ SLS 6.EE.B.5 Use substitution to determine whether a given number makes an equation or inequality true. 1 week Learning Goal 2: NJ SLS 6.EE.B.7 Solve real world problems by writing and solving equations of the form $x + p = q$ and $px = q$ (p, q, and x are non-negative rational numbers). 1 week Learning Goal 3: NJ SLS 6.NS.C.5 Use positive and negative numbers to represent quantities in real-world situations, explaining the meaning of zero in the context of the real-world situation. 1 week Learning Goal 4: NJ SLS 6.NS.C.6 Locate rational numbers and their opposites on horizontal and vertical number line; explain their relation of the opposites to zero. 1 week	NJ SLS 6.EE.B.5 Solve an equation or inequality by determining for which values of a set make the equation or inequality true. NJ SLS 6.EE.B.5, NJ SLS 6.EE.B.7 Substitute a given number into an equation or inequality to see if it makes the equation/inequality true. NJ SLS 6.NS.C.5 Write and solve one-step equations with non-negative rational numbers from real-world problems. NJ SLS 6.NS.C.5 Define positive and negative numbers in terms of direction and value. NJ SLS 6.NS.C.5 Describe real-world situations where positive and negative numbers are used. NJ SLS 6.NS.C.6 Explain the meaning of 0 with positive and negative integers. NJ SLS 6.NS.C.6 Define the opposite of the opposite of a number is the number itself.

		Career ready practices CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. **Financial Literacy** 9.1.8.E.3 Compare and contrast product facts versus advertising claims. **Career Explorations** 9.2.8.B.2 Develop a Personalized Stu dent Learning Plan with the assistan ce of an adult mentor that includes information about career areas of interest, goals and an educational plan**.** **Science** MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	Learning Goal 5: NJ SLS 6.NS.C.6 Plot pairs of positive and negative rational numbers in the coordinate plane; describe two ordered pairs that differ only by signs as reflections across one or both axes. 1 week Learning Goal 6: NJ SLS 6.NS.C.7 Use statements of inequality to determine relative positions of two rational numbers on a number line; write and explain statements of order for rational numbers in real-world contexts. 3 days Learning Goal 7*:* NJ SLS 6.NS.C.7 Explain the meaning of absolute value of a rational number as distance from zero on the number line and as magnitude for a positive or negative quantity in a real-world situation. 2 days Learning Goal 8: NJ SLS 6.EE.B.8 Write an inequality of the form x > c or x < c to represent a constraint or condition in a real world or mathematical problem and represent them on a number line. 3 days Learning Goal 9: NJ SLS 6.NS.C.8* Solve real world and mathematical	NJ SLS 6.NS.C.6 Define the opposite of 0 as itself. NJ SLS 6.NS.C.6 Graph ordered pairs in a coordinate plane. NJ SLS 6.NS.C.6 NJ SLS 6.NS.C.6 Locate positive and negative numbers in a coordinate plane. NJ SLS 6.NS.C.6 Describe that when two ordered pairs only differ by their signs, they are reflections across the x-axis, y-axis, or both axes. NJ SLS 6.NS.C.6 Identify the four quadrants on a coordinate plane. NJ SLS 6.NS.C.6 Plot and locate integers and rational numbers on vertical and horizontal number lines. NJ SLS 6.NS.C.6 Plot and locate integer and rational number pairs on the coordinate plane. NJ SLS 6.NS.C.7 Compare rational numbers on a number line. NJ SLS 6.NS.C.7 Plot two numbers on a number line to describe the relationship between them in terms of less than, greater than, or equal to. NJ SLS 6.NS.C.7 Write and explain statements of order for rational numbers in real-world contexts.

			problems by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate. 1 week Learning Goal 10: NJ SLS 6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes and show that the volume is the same as it would be if found by multiplying the edge lengths; apply volume formulas to right rectangular prisms with fractional edge lengths. 1 week Learning Goal 11: NJ SLS 6.G.A.4 Represent three dimensional figures objects with nets made of rectangles and triangles, and use the nets to find the surface area of the figures in order to solve real world and mathematical problems. 3 days	NJ SLS 6.NS.C.7 Explain how positive and negative rational numbers are used in real-world contexts. NJ SLS 6.NS.C.7 Define the absolute value of a rational number as a distance from 0 on a number line. NJ SLS 6.NS.C.7 Explain the absolute value of a positive or negative quantity in a real-world situation as magnitude/length. NJ SLS 6.EE.B.8 Write an inequality to represent a real-world condition or constraint. NJ SLS 6.EE.B.8 Define inequalities as having infinitely many solutions. NJ SLS 6.EE.B.8 Graph solutions to inequalities on number lines. NJ SLS 6.NS.C.8* Graph points in all four quadrants. NJ SLS 6.NS.C.8* Calculate the distance between two points graphed on a coordinate plane (vertical or horizontal lines only). NJ SLS 6.NS.C.8*, NJ SLS 6.G.A.3 Calculate the distance between two points with the same x-value or the same y-value. NJ SLS 6.G.A.2 Calculate the volume of a right rectangular prism with fractional side lengths.

				NJ SLS 6.G.A.2 Compare finding the volume of a right rectangular prism by packing it with unit cubes to finding the volume by multiplying the side lengths. NJ SLS 6.G.A.4Calculate the surface area of a 3-dimensional figure by using nets made up of rectangles and triangles. NJ SLS 6.G.A.4Solve real-world problems involving surface area of 3-dimensional figure
Unit 4 Variability, Distributions, and Relationships between Quantities	March – May	NJ SLS 6.EE.C.9 3/22 – 4/4 NJ SLS 6.SP.A.1 4/5 – 4/11 NJ SLS 6.SP.A.2 4/12 – 4/18 NJ SLS 6.SP.A.3 4/19 – 4/25 NJ SLS 6.SP.B.4 5/1 – 5/8 NJ SLS 6.SP.B.5 5/9 – 5/15 NJ SLS 6.RP.A.3* 5/16 – 5/22 NJ SLS 6.NS.C.8* -5/22 Interdisciplinary standards **Technology** 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results 8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.	Learning Goal 1: NJ SLS 6.EE.C.9 Write an equation using two variables (independent and dependent) to represent two quantities that change in relationship to one another in a real world problem. 1 week Learning Goal 2: NJ SLS 6.EE.C.9 Analyze the relationship between the dependent and independent variables and relate the equation to a given graph and to its table of values. 1 week Learning Goal 3: NJ SLS 6.SP.A.1 Distinguish questions that are statistical (anticipate variability in data) from those that are not. 1 week Learning Goal 4: NJ SLS 6.SP.A.2,	NJ SLS 6.EE.C.9 Write an equation to represent two variables, one dependent and one independent. NJ SLS 6.EE.C.9 Analyze the relationship between independent and dependent variables using graphs, tables, and equations. NJ SLS 6.EE.C.9 List and graph ordered pairs and write the equation to represent the relationship. NJ SLS 6.SP.A.1 Identify statistical questions. NJ SLS 6.SP.A.1 Contrast statistical and non-statistical questions. NJ SLS 6.SP.A.1 Define a statistical question as a question that allows for the gathering of variable data. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS

		Career ready practices CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence **Financial Literacy** 9.1.8.E.1 Explain what it means to be a responsible consumer and the factors to consider when making consumer decisions. 9.1.8.E.8 Recognize the techniques and effects of deceptive advertising. **Career Exploration** 9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally. 9.2.8.B.7 Evaluate the impact of onli ne activities and social media on em ployer decisions. **ELA** NJ SLS RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. NJ SLS WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through	NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context. 1 week Learning Goal 5: NJ SLS 6.SP.B.5 Summarize numerical data in relation to their context by identifying the number of observations and describing how the data was measured. 1 week Learning Goal 6: NJ SLS 6.SP.B.5 Calculate, and interpret measures of center (mean and median) and variability (interquartile range and mean absolute deviation); report measures of center and variability appropriate to the shape of the distribution and context. 1 week Learning Goal 7*: NJ SLS 6.RP.A.3* Create and complete tables of equivalent ratios to sole real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100. 1 week Learning Goal 8: NJ SLS 6.RP.A.3 Use ratio and rate reasoning to convert	6.SP.B.4 Describe a set of data in terms of its center (mean, median), spread (range, interquartile range, mean absolute deviation), and overall shape. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Define measure of center for a data set as the summary of all its values as one number. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Define measure of variation for a data set as how the data varies as one number. Display numerical data as plots on a number line. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Display numerical data as plots in a dot plot. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Display numerical data in a histogram. NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Display numerical data in a box plot (box-and-whisker plot). NJ SLS 6.SP.B.5Record the number of observations within a numerical data set. NJ SLS 6.SP.B.5Describe how a data set was

		the selection, organization, and analysis of relevant content. NJ SLS WHST.6-8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. NJ SLS SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. **Science** NGSS MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. NGSS MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. NGSS MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	measurement units and to transform units appropriately when multiplying or dividing quantities. 1 week Learning Goal 9: NJ SLS 6.NS.C.8*Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane; use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate. 1 week	measured and its units of measurement. NJ SLS 6.RP.A.3* Construct a table of equivalent ratios relating to whole-number measurement quantities. NJ SLS 6.RP.A.3* Compute the missing value in a table of equivalent ratios. NJ SLS 6.RP.A.3* Write a proportion and solve problems with unit rates. NJ SLS 6.RP.A.3* Write a percent as a fraction out of 100. NJ SLS 6.RP.A.3* Solve percent word problems. NJ SLS 6.RP.A.3* Convert measurement units using ratios and proportions. NJ SLS 6.NS.C.8*Graph points in all four quadrants. NJ SLS 6.NS.C.8*Calculate the distance between two points graphed on a coordinate plane (vertical or horizontal lines only). NJ SLS 6.NS.C.8*Calculate the distance between two points with the same x-value or the same y-value.

Unit 1: Operations and Reasoning about Ratios	Recommended Duration: September – November
Unit Description: Students will apply and extend previous understanding of multiplication and division to divide fractions by fractions, compute fluently with multi-digit numbers and find common factors and multiples, understand ratio concepts and use ratio reasoning to solve problems.	

Essential Questions	Enduring Understandings
• How do you know which operations to choose when solving real life problems? • Without dividing, how can you tell when a number is divisible by another number? • What does it mean to multiply fractions? • How can you represent a relationship between two quantities? • How can you find two ratios that describe the same relationship? • How can you use rates to describe changes in real life problems? • How can you compare lengths between the customary and metric system?	• Procedures used for dividing fractions can be logically explained in several ways • Relations between two quantities can often be expressed as ratios and can be explained using ratio language. • Multiplication and division can be used to solve ratio and rate problems. • Ratio and rates apply to real life situations Percent is a rate of the number in units per 100. • Multiplication and division can be used to generate equivalent ratios and rates • A number of mathematical connections link ratios and fractions: Ratios are often expressed in fraction notation, although ratios and fractions do not have identical meaning. Ratios are often used to make "part-part" comparisons, but fractions are not. Ratios and fraction can be thought of as overlapping sets. Ratios can often be meaningfully reinterpreted as fractions. Ratios can be meaningfully reinterpreted as quotients.

Essential Questions	Enduring Understandings
	• Proportional reasoning is complex and involves understanding that: Equivalent ratios can be created by iterating and/or partitioning a composed unit: If one quantity in a ratio is multiplied or divided by a particular factor, then the other quantity must be multiplied or divided by the same factor to maintain the proportional relationship; and The two types of ratios - composed units and multiplicative comparisons - are related. • A rate is set of infinitely many equivalent ratios. • Several ways of reasoning, all grounded in sense making, can be generalized into algorithms for solving proportion problems. • Forming a ratio as a measure of a real-world attribute involves isolating that attribute from other attributes and understanding the effect of changing each quantity on the attribute of interest. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.NS.A.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3	Learning Goal 1: NJ SLS 6.NS.A.1. Compute quotients of fractions. .5 weeks Learning Goal 2: NJ SLS 6.NS.A.1. Construct visual fraction models to represent quotients of fractions and use the relationship between multiplication and division to explain division of fractions. .5 week Learning Goal 3: NJ SLS 6.NS.A.1. Solve real-world problems involving quotients of fractions and	Students will able to compute quotients of fractions. Students will able to solve word problems involving the division of fractions. Students will able to draw a visual fraction model to illustrate the quotient of two fractions. Students will able to apply the relationship between multiplication and division to justify your answer. Students will able to fluently divide multi-digit numbers using the standard algorithm.

Relevant Standards	Learning Goals	Learning Objectives
people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? **NJ SLS 6.NS.B.2.** Fluently divide multi-digit numbers using the standard algorithm. **NJ SLS 6.RP.A.1.** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." **NJ SLS 6.RP.A.2.** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." **NJ SLS 6.RP.A.3.** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. *(benchmarked) **NJ SLS 6.RP.A.3a.** Make tables of equivalent ratios relating quantities with whole number	interpret the solutions in the context given. .5 week Learning Goal 4: NJ SLS 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithms. 1 week Learning Goal 5: NJ SLS 6.RP.A.1 Explain the relationship of two quantities in given ratio using ratio language. 1 week Learning Goal 6: NJ SLS 6.RP.A.2 Use rate language, in the context of the ratio relationship, to describe a unit rate. 1 weeks Learning Goal 7: NJ SLS 6.RP.A.3 Create and complete tables of equivalent ratios to sole real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100. .5 week Learning Goal 8: NJ SLS 6.RP.A.3 Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities. .5 week Learning Goal 9: NJ SLS 6.NS.B.3 Fluently add, subtract, multiply and divide multi-digit decimals. 1 week Learning Goal 10: NJ SLS 6.NS.B.4 Find the greatest common factor of two whole numbers less than or	Students will able to describe relationships between two quantities using the concept of a ratio and vocabulary. Students will able to explain verbally the relationship between two quantities represented in a ratio. Students will able to convert a ratio to a unit rate written as a fraction. (denominator not equal to zero) Students will able to define a unit rate in terms of a ratio relationship. Students will able to construct a table of equivalent ratios relating to whole-number measurement quantities. Students will able to compute the missing value in a table of equivalent ratios. Students will able to write a proportion and solve problems with unit rates. Students will able to write a percent as a fraction out of 100. Students will able to solve percent word problems. Students will able to convert measurement units using ratios and proportions. Students will able to add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Relevant Standards	Learning Goals	Learning Objectives
measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. **NJ SLS 6.RP.A.3b.** Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? **NJ SLS 6.RP.A.3c.** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. **NJ SLS 6.RP.A.3d.** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **NJ SLS 6.NS.B.3.** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation **NJ SLS 6.NS.B.4.** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.	equal to 100 and the least common multiple of two numbers less than or equal to 12. 1 week	Students will able to compute the greatest common factor (GCF) of two whole numbers less than or equal to 100. Students will able to compute the least common multiple (LCM) of two whole numbers less than or equal to 12.

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
Prodigy Report on Standards Puzzle time Skills sheets Journal Warm ups Exit slips Homework Class room games Clock Activity Toy Sorting Activity Academic games Allowance game Fraction Rummy Fraction Pizza Fraction Choice Factor jump	CSA Unit 1 Choice Board NJSLS 6.RP.A.1 NJSLS 6.RP.A.2 NJSLS 6.RP.A.3 Choice Board NJSLS 6.NS.A.1 NJSLS 6.NS.B.2 NJSLS 6.NS.B.4	News Articles Task Cards Bed Bath & Beyond Activity Performance Task NJSLS 6.NS.A.1 Amusement Park NJSLS 6.NS.B.2 Festival Treats NJSLS 6.RP.A.1 Ships NJSLS 6.RP.A.2 Factory Production NJSLS 6.RP.A.3 Wind Mills NJSLS 6.NS.B.4 Fruit	Building a Bakery CSA Unit 1 Choice Board NJSLS 6.RP.A.1 NJSLS 6.RP.A.2 NJSLS 6.RP.A.3 Choice Board NJSLS 6.NS.A.1 NJSLS 6.NS.B.2 NJSLS 6.NS.B.4

Possible Assessment Modifications /Accommodations			
Special Education Learners • Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available	**English Language Learners** • Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	**At Risk Learners** • Make all or part of the exam oral • Give directions in small units • Modified length of test	**Advanced Learners** • Individualized assessment/Independent study • Have students answer open ended questions • Additional research into topics

Possible Assessment Modifications /Accommodations			
• Use manipulatives such as fractions tiles • Use mnemonic devices for division such as “Does McDonalds Serve Cheeseburgers” –Divide, multiply, subtract, check			

Instructional Strategies (refer to *Robert Marzano’s* 41 Elements)

Venn Diagram will be used to find GCF, comparing numbers
Prodigy to review and record progress for standards NJSLS 6.NS.A.1, NJSLS 6.NS.B.2, NJSLS 6.RP.A.1, NJSLS 6.RP.A.2, NJSLS 6.RP.A.3, NJSLS 6.NS.B.4
News articles reviews will be used for reading and writing about math news articles change each month to follow current events
Class movement will be used to compare students to introduce ratios
Learning groups students will work in groups to complete activities. Students will rotate team leader each activity to make sure all have voice.
Instructional Games will be used to reinforce skills learned
Journal writing will be used to analyze and critique word problems weekly
Homework will be used to review information learned during class

- Structured Overview
- Reading
- Brainstorming
- Think, Pair, Share
- Writing to Inform
- Essays
- Research Projects
- Assigned Questions
- Simulations
- Explaining
- Levels of Questions
- Identifying similarities and differences
- Reinforcing effort, recognition
- Homework, practice
- Nonlinguistic representations
- Cooperative learning

Instructional Strategies (refer to *Robert Marzano's* 41 Elements)
• Setting objectives, feedback • Generating, testing hypotheses • Cues/questions/ advance organizers

Possible Instructional Modifications /Accommodations/Differentiation			
Special Education Learners	**English Language Learners**	**At Risk Learners**	**Advanced Learners**
• Provide opportunities for students to connect using manipulatives • Use project-based learning to connect • Structure the learning around explaining or solving a social or community-based issue. • Modify pace of instruction to allow additional processing time.	• Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). • Provide ELL students with multiple literacy strategies. • Cooperative learning	• Collaborate with after-school programs or clubs to extend learning opportunities. • Developing realistic, hopeful pathways for learning	• Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings in math. • Have students answer open ended questions • Assign alternate assignments for in class work • Encourage students to explore concepts in depth and encourage independent studies or investigations.

Unit Vocabulary	
Unit Vocabulary: Factor pair Factor tree Venn diagram Common factors Greatest common factor Common multiples Least common multiple Reciprocals	Distributive Property Like terms Factoring expressions Ratio Equivalent ratios Ratio table Rate Unit rate Equivalent rates

Unit Vocabulary	
Prime factorization	

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
ELA NJ SLS W.6.1.B - Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. **Science** MS-LS3-2. - Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. **Health** 2.1.6.A.3 - Determine factors that influence the purchase of healthcare products and use of personal hygiene practices.	**Online Practice Integers** ➢ Sumdog.com (M) ➢ Math Star Integers & Number Line Game (S) ➢ Integer Jeopardy (S) ➢ Rags to Riches Integers (S) **Online Interactives & Videos** ➢ Subtracting Integers (S) ➢ Integers and Absolute Value (M) ➢ Adding Integers w/# line(S) ➢ Exploring Integers - Video(S) ➢ Negative Numbers - video/game (M) ➢ Fraction Pop Equivalent Fractions - 3 step lesson (A) ➢ Intro to Fractions - picture (S) ➢ Fractions between 0 & 1 (A) ➢ Comparing Rational #'s - Game (S) ➢ Number Rights (S) ➢ Pearl Diver (A) ➢ Ordering Fractions - Interactive video	__✓__ Financial, Economic, Business, & Entrepreneurial Literacy *Establish an understanding that career-ready individuals take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.*	_✓_ Critical Thinking and Problem Solving *Students engage with real world situations involving rational numbers. Students carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.* _✓___ Life and Career Skills *Students make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.* Technologies Literacy __✓_ Communication & Collaboration *Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. Students collaborate via the integer game, number line discussions and problem solving real world situations involving rational numbers.*

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
	➢ Equivalent Fractions - Interactive video ➢ Fraction to Terminating Decimals ➢ Fractions to Repeating Decimals ➢ Writing Negative Fractions ➢ **General Tech Resources** ➢ BrainPop(A/M) ➢ LearnZillion(S/A/M) ➢ Khan Academy(S/A/M) ➢ Math Dictionary for Kids (A)		

Resources
Texts/Materials: ***Textbook:*** ***Big Ideas*** ***https://www.bigideasmath.com*** **National Library of Virtual Manipulatives (http://nlvm.usu.edu/en/nav/vlibrary.html)** **https://nj.pbslearningmedia.org** **https://www.illustrativemathematics.org** **Video** **https://www.opened.com/video/flocabulary-dividing-fractions-keep-change-flip/2893530** **https://www.opened.com/video/the-steps-to-long-division/64006** **https://www.opened.com/video/math-snacks-bad-date/115604** **https://nj.pbslearningmedia.org/resource/vtl07.math.measure.rate.fastbroom/the-fastest-broom/#.WSRCZGgrJ1s**

Resources
Materials: Math Scholastic news – math in the news Dogonews.com – daily articles for math in the news articles

Unit 2: **Expressions and 3-D Geometry**	**Recommended Duration:** **November - January**
Unit Description: Students will apply and extend previous understandings of arithmetic to algebraic expressions, reason about and solve one-variable equations and inequalities, solve real world mathematical problems involving area, surface area and volume.	

Essential Questions	**Enduring Understandings**
• How can you use repeated factors in real life situations? • What is the effect of inserting parenthesis into a numerical expression? • How can you write an expression that represents an unknown quantity? • How can you derive a formula for the area of a parallelogram • How can you derive a formula for the area of a triangle? • How can you derive a formula for the area of a trapezoid? • How can you find the lengths of line segments on a coordinate plane? • How can you write and evaluate an expression that represents a real-life problem?	• Expressions are powerful tools for exploring, reasoning about, and representing situations. • Two or more expressions may be equivalent, even when their symbolic forms differ. A relatively small number of symbolic transformations can be applied to expressions to yield equivalent expressions. • Variables have many different meanings, depending on context and purpose. • Using variables permits writing expressions whose values are not known or vary under different circumstances • Decomposing and rearranging provide a geometric way of both *seeing that* a measurement formula is the right one and *seeing why* it is the right one. • In addition to decomposing and rearranging, shearing provides another geometric way of both *seeing that* a measurement formula is the right one and *seeing why* it is the right one. • Geometric awareness develops through practice in visualizing, diagramming, and constructing. • Conjectures can emerge out of a problem-posing process that generates claims that need to be justified.

Essential Questions	Enduring Understandings
	• Functions can be represented in multiple ways-in algebraic symbols, graphs, verbal descriptions, tables, and so on-and these representations, and the links among them, are useful in analyzing patterns of change. • Geometric images provide the content in relation to which properties can be noticed, definitions can be made, and invariances can be discerned.

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.EE.A.1. Write and evaluate numerical expressions involving whole-number exponents **NJ SLS 6.EE.A.2.** Write, read, and evaluate expressions in which letters stand for numbers **NJ SLS 6.EE.A.2a.** Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 - y.* **NJ SLS 6.EE.A.2b.** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms* **NJ SLS 6.EE.A.2c.** Evaluate expressions at	Learning Goal 1: NJ SLS 6.EE.A.1 Write and evaluate numerical expressions involving whole number exponents. Learning Goal 2: NJ SLS 6.EE.A.2 Use mathematical language to identify parts of an expression. Learning Goal 3: NJ SLS 6.EE.A.2 Write and evaluate algebraic expressions involving exponents (include evaluating formulas). Learning Goal 4: NJ SLS 6.EE.A.3 & NJ SLS 6.EE.A.4 Apply properties of operations (factor, distribute, and combine like terms) to generate equivalent expressions and to identify when two expressions are equivalent. Learning Goal 5: NJ SLS 6.EE.B.6. Use variables to represent numbers and write expressions when solving real world or mathematical problems. Learning Goal 6: NJ SLS 6.G.A.3 Solve real world and mathematical problems by graphing points in	Students will able to evaluate numerical expressions with whole-number exponents. Students will able to write numerical expressions with whole-number exponents. Students will able to apply properties of operations to rewrite expressions. Students will able to explain why an expression that is rewritten is equivalent to the original expression. Students will able to identify when two expressions are equivalent (one expression is the simplified version of the other one). Students will able to explain why two expressions are equivalents regardless of the number that is substituted for the variable. Students will able to write expressions with variables to represent numbers in a real-world problem.

Relevant Standards	Learning Goals	Learning Objectives
specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length s = ½* **NJ SLS 6.EE.A.3.** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y* **NJ SLS 6.EE.A.4.** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for* **NJ SLS 6.EE.B.6.** Use variables to represent numbers and write expressions when solving a	all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate. Learning Goal 7: NJ SLS 6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles	Students will able to define a variable as a representation of an unknown number or numbers in a set. Students will able to graph polygons in the coordinate plane given the vertices. Students will able to calculate the length of a side of a polygon graphed in the coordinate plane where the vertices have the same x-value or same y-value. Students will able to calculate the area of right triangles and other types of triangles. Students will able to calculate the area of special quadrilaterals and polygons by composing them into rectangles or decomposing them into triangles. Students will able to apply techniques of finding the area of polygons to solve real-world problems.

Relevant Standards	Learning Goals	Learning Objectives
real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. **NJ SLS 6.G.A.3.** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. **NJ SLS 6.G.A.1.** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.		

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
Prodigy Report on Standards	CSA Unit 2	News Articles	CSA Unit 2
Puzzle time		Task Cards	
Skills sheets spiraling standards	Choice Board NJ SLS 6.EE.A.1	Bed Bath & Beyond Activity	Choice Board NJ SLS 6.EE.A.1
Journal word problem	NJ SLS 6.EE.A.2	Performance Task	NJ SLS 6.EE.A.2
assessment weekly	NJ SLS 6.EE.A.3	NJ SLS 6.EE.A.1 Band Competition	NJ SLS 6.EE.A.3
Warm ups	NJ SLS 6.EE.A.4	NJ SLS 6.EE.A.2 Geometry	NJ SLS 6.EE.A.4
Exit slips	NJ SLS 6.EE.A.6	NJ SLS 6.EE.A.3 Lacrosse	NJ SLS 6.EE.A.6
Homework		NJ SLS 6.EE.A.4 Perimeter of Geometric	

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
Class room Centers Academic games A trick for you Lets race Tic Tac Toe Pick your polygon Picture this It's all about the details		Figures NJ SLS 6.EE.B.6 Earnings NJ SLS 6.G.A.1 Concert Stages NJ SLS 6.G.A.3 Facial Recognition	

Possible Assessment Modifications /Accommodations			
Special Education Learners • Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use manipulatives such as fractions tiles • Use mnemonic devices for division such as "Does McDonalds Serve Cheeseburgers" –Divide, multiply, subtract, check	**English Language Learners** • Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	**At Risk Learners** • Make all or part of the exam oral • Give directions in small units • Modified length of test	**Advanced Learners** • Individualized assessment/Independent study • Have students answer open ended questions • Additional research into topics

Instructional Strategies (refer to *Robert Marzano's* 41 Elements)
Venn Diagram will be used to compare figures Prodigy to review and record progress for standards News articles reviews will be used for reading and writing about math news articles change each month to follow current events Class movement – will create large scale coordinate grid students will plot points accordingly Use classroom cabinets, doors, smartboard etc. to find area Learning groups students will work in groups to complete activities. Students will rotate team leader each activity to make sure all have voice. Instructional Games will be used to reinforce skills learned Journal writing will be used to analyze and critique word problems weekly Homework will be used to review information learned during class • Structured Overview • Reading • Brainstorming • Think, Pair, Share • Writing to Inform • Essays • Research Projects • Assigned Questions • Simulations • Explaining • Levels of Questions • Identifying similarities and differences • Reinforcing effort, recognition • Homework, practice • Nonlinguistic representations • Cooperative learning • Setting objectives, feedback • Generating, testing hypotheses • Cues/questions/ advance organizers

Possible Instructional Modifications /Accommodations/Differentiation			
Special Education Learners	**English Language Learners**	**At Risk Learners**	**Advanced Learners**
• Allow extra time for task completion as needed	• Simplify instructions • Give students extra time to	• Make all or part of the exam oral	• Individualized assessment/Independent

Possible Instructional Modifications /Accommodations/Differentiation			
• Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use geometric shapes, geo boards • Use mnemonic devices for order of operations such as PEMDAS	complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	• Give directions in small units • Modified length of test	study • Have students answer open ended questions • Additional research into topics • Building 3-D city

Unit Vocabulary	
Power	Polygon
Exponent	Parallelogram
Base	Triangle
Perfect square	Trapezoid
Numerical expression	Composite figure
Evaluate	Base
Order of operations	Height
Equivalent Expressions	Area

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
W.6.2.A - Introduce a topic; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.	**Online Practice Integers** ➢ Sumdog.com (M) ➢ Math Star Integers & Number Line Game (S) ➢ Integer Jeopardy (S) ➢ Rags to Riches Integers (S) **Online Interactives & Videos** ➢ Subtracting Integers (S) ➢ Integers and Absolute Value (M) ➢ Adding Integers w/# line(S) ➢ Exploring Integers - Video(S) ➢ Negative Numbers - video/game (M) ➢ Fraction Pop Equivalent Fractions - 3 step lesson (A) ➢ Intro to Fractions - picture (S) ➢ Fractions between 0 & 1 (A) ➢ Comparing Rational #'s - Game (S) ➢ Number Rights (S) ➢ Pearl Diver (A) ➢ Ordering Fractions - Interactive video ➢ Equivalent Fractions - Interactive video ➢ Fraction to Terminating Decimals ➢ Fractions to Repeating Decimals ➢ Writing Negative Fractions ➢ **General Tech Resources** ➢ BrainPop(A/M)	__✓__ Financial, Economic, Business, & Entrepreneurial Literacy *Establish an understanding that career-ready individuals take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.*	__✓__ Critical Thinking and Problem Solving *Students engage with real world situations involving rational numbers. Students carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.* _✓___ Life and Career Skills *Students make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.* Technologies Literacy __✓__ Communication & Collaboration *Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. Students collaborate via the integer game, number line discussions and problem solving real world situations involving rational numbers.*

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
	➢ LearnZillion(S/A/M) ➢ Khan Academy(S/A/M) ➢ Math Dictionary for Kids (A)		

Resources
Texts/Materials: ***Textbook:*** ***Big Ideas*** ***https://www.bigideasmath.com*** **National Library of Virtual Manipulatives (http://nlvm.usu.edu/en/nav/vlibrary.html)** **https://nj.pbslearningmedia.org** **https://www.illustrativemathematics.org** **Video** **https://www.opened.com/video/flocabulary-dividing-fractions-keep-change-flip/2893530** **https://www.opened.com/video/the-steps-to-long-division/64006** **https://www.opened.com/video/math-snacks-bad-date/115604** **https://nj.pbslearningmedia.org/resource/vtl07.math.measure.rate.fastbroom/the-fastest-broom/#.WSRCZGgrJ1s** **https://www.ixl.com/math/grade-6/identify-equivalent-expressions** **https://learnzillion.com/lesson_plans/8904-read-and-write-equivalent-expressions-with-variables-and-exponents** **https://www.youtube.com/watch?v=UqY0DDjxLGY** **Materials:** Math Scholastic news – math in the news Dogonews.com – daily articles for math in the news articles

Unit 3: Equations, The Rational Number System and 2-D Geometry	Recommended Duration: January - March
Unit Description: Students will reason about and solve one-variable equations and inequalities, apply and extend previous understandings of numbers to the systems of rational numbers, solve real world and mathematical problems involving area, surface area and volume.	

Essential Questions	Enduring Understandings
• How can you represent numbers that are less than 0? • How can you describe how far an object is from sea level? • How can you graph and locate points that contain negative numbers in a coordinate plane? • How can you use a number line to represent solutions of an inequality? • How can you use addition or subtraction to solve an inequality? • How can you use multiplication or division to solve an inequality? • How can you find the area of the entire surface of a prism? • How can you use a net to find the surface area of prisms? • How can you find the volume of a rectangular prism with fractional edge lengths?	• Rational numbers and integers allow us to represent quantities in situations that we could not represent with only whole numbers. • Number lines help students model the magnitude and distance of situations involving rational numbers. • Rational numbers can be represented in multiple ways and are useful when examining situations involving numbers that are not whole.

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.EE.B.5. Understand solving an	Learning Goal 1: NJ SLS 6.EE.B.5 Use substitution	Students will able to solve an equation or inequality

Relevant Standards	Learning Goals	Learning Objectives
equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. **NJ SLS 6.EE.B.7.** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. **NJ SLS 6.NS.C.5.** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **NJ SLS 6.NS.C.6.** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **NJ SLS 6.NS.C.6a.** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that	to determine whether a given number makes an equation or inequality true. Learning Goal 2: NJ SLS 6.EE.B.7 Solve real world problems by writing and solving equations of the form $x + p = q$ and $px = q$ (p, q, and x are non-negative rational numbers). Learning Goal 3: NJ SLS 6.NS.C.5 Use positive and negative numbers to represent quantities in real-world situations, explaining the meaning of zero in the context of the real-world situation. Learning Goal 4: NJ SLS 6.NS.C.6 Locate rational numbers and their opposites on horizontal and vertical number line; explain their relation of the opposites to zero. Learning Goal 5: NJ SLS 6.NS.C.6 Plot pairs of positive and negative rational numbers in the coordinate plane; describe two ordered pairs that differ only by signs as reflections across one or both axes. Learning Goal 6: NJ SLS 6.NS.C.7Use statements of inequality to determine relative positions of two rational numbers on a number line; write and explain statements of order for rational numbers in real-world contexts. Learning Goal 7*:* NJ SLS 6.NS.C.7 Explain the meaning of absolute value of a rational number as distance from zero on the number line and as	by determining for which values of a set make the equation or inequality true. Students will able to substitute a given number into an equation or inequality to see if it makes the equation/inequality true. Students will able to write and solve one-step equations with non-negative rational numbers from real-world problems. Students will able to define positive and negative numbers in terms of direction and value. Students will able to describe real-world situations where positive and negative numbers are used. Students will able to explain the meaning of 0 with positive and negative integers. Students will able to define the opposite of the opposite of a number is the number itself. Students will able to define the opposite of 0 as itself. Students will able to graph ordered pairs in a coordinate plane. Students will able to locate positive and negative numbers in a coordinate plane. Students will able to describe that when two ordered pairs only differ by their signs, they are reflections

Relevant Standards	Learning Goals	Learning Objectives
the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite. **NJ SLS 6.NS.C.6b.** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. **NJ SLS 6.NS.C.6c.** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. **NJ SLS 6.NS.C.7.** Understand ordering and absolute value of rational numbers. **NJ SLS 6.NS.C.7a.** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* **NJ SLS 6.NS.C.7b.** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 °C > –7 °C to express the fact that –3 °C is warmer than –7 °C.*	magnitude for a positive or negative quantity in a real-world situation. Learning Goal 8: NJ SLS 6.EE.B.8 Write an inequality of the form x > c or x < c to represent a constraint or condition in a real world or mathematical problem and represent them on a number line. Learning Goal 9: NJ SLS 6.NS.C.8 & NJ SLS 6.G.A.3 Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate. Learning Goal 10: NJ SLS 6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes and show that the volume is the same as it would be if found by multiplying the edge lengths; apply volume formulas to right rectangular prisms with fractional edge lengths. Learning Goal 11: NJ SLS 6.G.A.4 Represent three dimensional figures objects with nets made of rectangles and triangles, and use the nets to find the surface area of the figures in order to solve real world and mathematical problems.	across the x-axis, y-axis, or both axes. Students will able to identify the four quadrants on a coordinate plane. Students will able to plot and locate integers and rational numbers on vertical and horizontal number lines. Students will able to plot and locate integer and rational number pairs on the coordinate plane. Students will able to compare rational numbers on a number line. Students will able to plot two numbers on a number line to describe the relationship between them in terms of less than, greater than, or equal to. Students will able to write and explain statements of order for rational numbers in real-world contexts. Students will able to explain how positive and negative rational numbers are used in real-world contexts. Students will able to define the absolute value of a rational number as a distance from 0 on a number line. Students will able to explain the absolute value of a positive or negative quantity in a real-world situation as magnitude/length.

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.NS.C.7c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.* **NJ SLS 6.NS.C.7d.** Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.* **NJ SLS 6.EE.B.8.** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams **NJ SLS 6.NS.C.8.** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. **NJ SLS 6.G.A.2.** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the		Students will able to write an inequality to represent a real-world condition or constraint. Students will able to define inequalities as having infinitely many solutions. Students will able to graph solutions to inequalities on number lines. Students will able to graph points in all four quadrants. Students will able to calculate the distance between two points graphed on a coordinate plane (vertical or horizontal lines only). Students will able to calculate the distance between two points with the same x-value or the same y-value. Students will able to calculate the volume of a right rectangular prism with fractional side lengths. Students will able to compare finding the volume of a right rectangular prism by packing it with unit cubes to finding the volume by multiplying the side lengths. Students will able to calculate the surface area of a 3-dimensional figure by using nets made up of rectangles and triangles. Students will able to solve real-world problems

Relevant Standards	Learning Goals	Learning Objectives
volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = B\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. **NJ SLS 6.G.A.4.** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.		involving surface area of 3-dimensional figures

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
Prodigy Report on Standards Puzzle time Skills sheets spiraling standards Journal word problem assessment weekly Warm ups Exit slips Homework Class room games Clock Activity Toy Sorting Activity Academic games Factor jump	CSA Unit 3 Choice Board NJ SLS 6.EE.B.5 NJ SLS 6.EE.B.7 NJ SLS 6.EE.B.8 Choice Board NJ SLS 6.NS.C. NJ SLS 6.NS.C.6 NJ SLS 6.NS.C. NJ SLS 6.NS.C.8* Scrapbook Project NJ SLS 6.G.A.2	News Articles Task Cards Performance Task NJ SLS 6.EE.B.5 Bees NJ SLS 6.EE.B.7 Dinosaurs NJ SLS 6.NS.C.5 Lakes of North America NJ SLS 6.NS.C.6 Temperature NJ SLS 6.NS.C.7 Temperature on Planets NJ SLS 6.EE.B.8 County Fair NJ SLS 6.NS.C.8* Paintball NJ SLS 6.G.A.2 Money NJ SLS 6.G.A.4 Tents	Scrapbook Project NJ SLS 6.G.A.2 NJ SLS 6.G.A.4 NJ SLS 6.G.A.1 (started unit 2) NJ SLS 6.G.A.3 (started unit 2) CSA Unit 3 Choice Board NJ SLS 6.EE.B.5 NJ SLS 6.EE.B.7 NJ SLS 6.EE.B.8 Choice Board NJ SLS 6.NS.C.

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
	NJ SLS 6.G.A.4 NJ SLS 6.G.A.1 NJ SLS 6.G.A.3		NJ SLS 6.NS.C.6 NJ SLS 6.NS.C. NJ SLS 6.NS.C.8*

Possible Assessment Modifications /Accommodations			
Special Education Learners • Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use manipulatives such as fractions tiles • Use mnemonic devices for division such as "Does McDonalds Serve Cheeseburgers" –Divide, multiply, subtract, check	**English Language Learners** • Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	**At Risk Learners** • Make all or part of the exam oral • Give directions in small units • Modified length of test	**Advanced Learners** • Individualized assessment/Independent study • Have students answer open ended questions • Additional research into topics

Instructional Strategies (refer to *Robert Marzano's* 41 Elements)
Graphic organizers will be used to compare types of numbers Prodigy to review and record progress for standards News articles reviews will be used for reading and writing about math news articles change each month to follow current events Class movement – will create number line and students are point on number line Learning groups students will work in groups to complete activities. Students will rotate team leader each activity to make sure all have voice. Instructional Games will be used to reinforce skills learned Journal writing will be used to analyze and critique word problems weekly Homework will be used to review information learned during class • Structured Overview • Reading • Brainstorming • Think, Pair, Share • Writing to Inform • Essays • Research Projects • Assigned Questions • Simulations • Explaining • Levels of Questions • Identifying similarities and differences • Reinforcing effort, recognition • Homework, practice • Nonlinguistic representations • Cooperative learning • Setting objectives, feedback • Generating, testing hypotheses • Cues/questions/ advance organizers

Possible Instructional Modifications /Accommodations/Differentiation			
Special Education Learners • Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use geometric shapes, geo boards • Use mnemonic devices for order of operations such as PEMDAS	**English Language Learners** • Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	**At Risk Learners** • Make all or part of the exam oral • Give directions in small units • Modified length of test	**Advanced Learners** • Individualized assessment/Independent study • Have students answer open ended questions • Additional research into topics • Building 3-D city

Unit Vocabulary	
Positive Number Negative Number Opposites Integers Absolute value Coordinate plane Origin Quadrants reflections Solution Inverse operations Inequality	Solution of an inequality Solution set Graph of an inequality Solid Face Polyhedron Vertex Edge Prism Pyramid Surface area Net Volume

Interdisciplinary Connections (Applicable Standards)	**Integration of Technology**	**21st Century Themes**	**21st Century Skills**
Social Studies: MS-ESS3-5. - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	**Online Practice Integers** ➢ Sumdog.com (M) ➢ Math Star Integers & Number Line Game (S) ➢ Integer Jeopardy (S) ➢ Rags to Riches Integers (S) **Online Interactives & Videos** ➢ Subtracting Integers (S) ➢ Integers and Absolute Value (M) ➢ Adding Integers w/# line(S) ➢ Exploring Integers - Video(S) ➢ Negative Numbers - video/game (M) ➢ Fraction Pop Equivalent Fractions - 3 step lesson (A) ➢ Intro to Fractions - picture (S) ➢ Fractions between 0 & 1 (A) ➢ Comparing Rational #'s - Game (S) ➢ Number Rights (S) ➢ Pearl Diver (A) ➢ Ordering Fractions - Interactive video ➢ Equivalent Fractions - Interactive video ➢ Fraction to Terminating Decimals ➢ Fractions to Repeating Decimals ➢ Writing Negative Fractions ➢ **General Tech Resources** ➢ BrainPop(A/M)	__✓__ Financial, Economic, Business, & Entrepreneurial Literacy *Establish an understanding that career-ready individuals take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.*	__✓__ Critical Thinking and Problem Solving *Students engage with real world situations involving rational numbers. Students carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.* _✓___ Life and Career Skills *Students make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.* Technologies Literacy __✓__ Communication & Collaboration *Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. Students collaborate via the integer game, number line discussions and problem solving real world situations involving rational numbers.*

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
	➢ LearnZillion(S/A/M) ➢ Khan Academy(S/A/M) ➢ Math Dictionary for Kids (A)		

Resources

Texts/Materials: ***Textbook:***
Big Ideas
https://www.bigideasmath.com

National Library of Virtual Manipulatives (http://nlvm.usu.edu/en/nav/vlibrary.html)
https://nj.pbslearningmedia.org
https://www.illustrativemathematics.org

Video
https://www.opened.com/video/flocabulary-dividing-fractions-keep-change-flip/2893530
https://www.opened.com/video/the-steps-to-long-division/64006
https://www.opened.com/video/math-snacks-bad-date/115604
https://nj.pbslearningmedia.org/resource/vtl07.math.measure.rate.fastbroom/the-fastest-broom/#.WSRCZGgrJ1s
https://www.ixl.com/math/grade-6/identify-equivalent-expressions
https://learnzillion.com/lesson_plans/8904-read-and-write-equivalent-expressions-with-variables-and-exponents
https://www.youtube.com/watch?v=UqY0DDjxLGY
https://www.mathsisfun.com/numbers/absolute-value.html
https://www.brainpop.com/math/numbersandoperations/absolutevalue/
https://www.youtube.com/watch?v=wrof6Dw63Es

Materials:
Math Scholastic news – math in the news
Dogonews.com – daily articles for math in the news articles

Unit 4: Variability, Distributions and relationships between Quantities	Recommended Duration: March - May
Unit Description: Students will represent and analyze quantitative relationships between dependent and independent variables, develop understanding of statistic variability, summarize and describe distributions, understand ratio concepts and use ratio reasoning to solve problems, apply and extend previous understandings of numbers to the system of rational numbers.	

Essential Questions	Enduring Understandings
• What types of questions will result in statistical variability? • How can relevant data be collected, organized, and displayed to address statistical questions? • What are appropriate displays for categorical data? What are appropriate displays for quantitative data? • What can the shape of a statistical graph (dot plot, histogram, or box plot) reveal about the data? • What do the measures of center (mean and median) reveal about the data? • When is it median or mean to describe data? When is it not appropriate? • What does the range and interquartile range reveal about the data? • What does the mean absolute deviation reveal about the data? • How can outliers affect data? • What information can be gathered from a dot plot, a histogram, or a box plot? • What inferences and predictions can be made based on the data set as a whole?	• Formulating questions, designing studies, and collecting data about a characteristic shared by two populations or different characteristics with one population. • Selecting, creating, and using appropriate graphical representations of data, including histograms, box plots, and scatter plots. • Finding, using, and interpreting measure of center and spread, including mean and inter-quartile range. • Discussing and understanding the correspondence between data sets and their graphical representations, especially histograms, and scatter plots. • Using observations about differences between two or more samples to make conjectures about the populations from which samples were taken. • Making conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit. • Using conjectures to formulate new questions and plan new studies to answer them. • Understanding and using appropriate terminology to describe complementary and mutually exclusive events. • Using proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.EE.C.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time*. **NJ SLS 6.SP.A.1.** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* **NJ SLS 6.SP.A.2.** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. **NJ SLS 6.SP.A.3.** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values	Learning Goal 1: NJ SLS 6.EE.C.9 Write an equation using two variables (independent and dependent) to represent two quantities that change in relationship to one another in a real world problem. Learning Goal 2: NJ SLS 6.EE.C.9 Analyze the relationship between the dependent and independent variables and relate the equation to a given graph and to its table of values. Learning Goal 3: NJ SLS 6.SP.A.1 Distinguish questions that are statistical (anticipate variability in data) from those that are not. Learning Goal 4: NJ SLS 6.SP.A.2, NJ SLS 6.SP.A.3, NJ SLS 6.SP.B.4 Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context. Learning Goal 5: NJ SLS 6.SP.B.5 Summarize numerical data in relation to their context by identifying the number of observations and describing how the data was measured. Learning Goal 6*:* NJ SLS 6.SP.B.5 Calculate, and interpret measures of center (mean and median) and variability (interquartile range and mean absolute deviation); report measures of center and variability appropriate to the shape of the distribution and context.	Students will able to write an equation to represent two variables, one dependent and one independent. Students will able to analyze the relationship between independent and dependent variables using graphs, tables, and equations. Students will able to list and graph ordered pairs and write the equation to represent the relationship. Students will able to identify statistical questions. Students will able to contrast statistical and non-statistical questions. Students will able to define a statistical question as a question that allows for the gathering of variable data. Students will able to describe a set of data in terms of its center (mean, median), spread (range, interquartile range, mean absolute deviation), and overall shape. Students will able to define measure of center for a data set as the summary of all its values as one number. Students will able to define measure of variation for a data set as how the data varies as one number. Students will able to display numerical data as plots on a number line. Students will able to display numerical data as plots in a dot plot.

Relevant Standards	Learning Goals	Learning Objectives
vary with a single number. **NJ SLS 6.SP.B.4.** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. **NJ SLS 6.SP.B.5.** Summarize numerical data sets in relation to their context, such as by: 6.SP.B.5a. Reporting the number of observations. **NJ SLS 6.SP.B.5b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. **NJ SLS 6.SP.B.5c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. **NJ SLS 6.SP.B.5d.** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. **NJ SLS 6.RP.A.3.** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	Learning Goal 7*:* NJ SLS 6.RP.A.3 Create and complete tables of equivalent ratios to sole real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100. Learning Goal 8: NJ SLS 6.RP.A.3 Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities. Learning Goal 9: NJ SLS 6.NS.C.8 Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane; use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate.	Students will able to display numerical data in a histogram. Students will able to display numerical data in a box plot (box-and-whisker plot). Students will able to decord the number of observations within a numerical data set. Students will able to describe how a data set was measured and its units of measurement. Students will able to donstruct a table of equivalent ratios relating to whole-number measurement quantities. Students will able to compute the missing value in a table of equivalent ratios. Students will able to write a proportion and solve problems with unit rates. Students will able to write a percent as a fraction out of 100. Students will able to solve percent word problems. Students will able to convert measurement units using ratios and proportions. Students will able to graph points in all four quadrants.

Relevant Standards	Learning Goals	Learning Objectives
NJ SLS 6.RP.A.3a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. **NJ SLS 6.RP.A.3b.** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* **NJ SLS 6.RP.A.3c.** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. **NJ SLS 6.RP.A.3d.** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **NJ SLS 6.NS.C.8.** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.		Students will able to calculate the distance between two points graphed on a coordinate plane (vertical or horizontal lines only). Students will able to calculate the distance between two points with the same x-value or the same y-value.

Formative Assessments	Summative Assessments	Performance Assessments	Major Activities/ Assignments (required)
Prodigy Report on Standards Puzzle time Skills sheets spiraling standards Journal word problem assessment weekly Warm ups Exit slips Homework Class room games Academic games Six in a row Fidget Spinner activity Cup stacking activity	CSA Unit 4 Choice Board NJ SLS 6.SP.A.1 NJ SLS 6.SP.A.2 NJ SLS 6.SP.A.3 NJ SLS 6.SP.B.4 NJ SLS 6.SP.B.5	News Articles Task Cards Performance Task NJ SLS 6.EE.C.9 Hiking NJ SLS 6.SP.A.1 Softball NJ SLS 6.SP.A.2 Movies NJ SLS 6.SP.A.3 Olympic Medals NJ SLS 6.SP.B.4 Game Show NJ SLS 6.SP.B.5 Speed NJ SLS 6.RP.A.3* Windmills NJ SLS 6.NS.C.8* Paintball	CSA Unit 4 Choice Board NJ SLS 6.SP.A.1 NJ SLS 6.SP.A.2 NJ SLS 6.SP.A.3 NJ SLS 6.SP.B.4 NJ SLS 6.SP.B.5

Possible Assessment Modifications /Accommodations			
Special Education Learners • Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete	**English Language Learners** • Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of	**At Risk Learners** • Make all or part of the exam oral • Give directions in small units • Modified length of test	**Advanced Learners** • Individualized assessment/Independent study • Have students answer open ended questions • Additional research into

Possible Assessment Modifications /Accommodations			
classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use manipulatives such as fractions tiles • Use mnemonic devices for division such as "Does McDonalds Serve Cheeseburgers" –Divide, multiply, subtract, check	classroom tests/quizzes as needed and/or available		topics

Instructional Strategies (refer to *Robert Marzano's* 41 Elements)
Class movement – will create number line and students are point on number line Learning groups students will work in groups to complete activities. Students will rotate team leader each activity to make sure all have voice. Instructional Games will be used to reinforce skills learned Journal writing will be used to analyze and critique word problems weekly Homework will be used to review information learned during class • Structured Overview • Reading • Brainstorming • Think, Pair, Share • Writing to Inform • Essays • Research Projects • Assigned Questions • Simulations • Explaining • Levels of Questions • Identifying similarities and differences • Reinforcing effort, recognition

Instructional Strategies (refer to *Robert Marzano's* 41 Elements)
• Homework, practice • Nonlinguistic representations • Cooperative learning • Setting objectives, feedback • Generating, testing hypotheses • Cues/questions/ advance organizers

Possible Instructional Modifications /Accommodations/Differentiation			
Special Education Learners	**English Language Learners**	**At Risk Learners**	**Advanced Learners**
• Allow extra time for task completion as needed • Allow for oral follow-up for student to expand on written response • Additional time to complete classroom tests/quizzes • Simplify task directions • Small group administration of classroom tests/quizzes as needed and/or available • Use geometric shapes, geo boards • Use mnemonic devices for order of operations such as PEMDAS	• Simplify instructions • Give students extra time to complete tests • Make all or part of the exam oral • Small group administration of classroom tests/quizzes as needed and/or available	• Make all or part of the exam oral • Give directions in small units • Modified length of test	• Individualized assessment/Independent study • Have students answer open ended questions • Additional research into topics • Building 3-D city

Unit Vocabulary	
Equation in two variables Solution of an equation in two variables Independent variable Dependent variable Statistics	Quartiles 1st quartile 3rd Quartile Interquartile range Mean absolute deviation

Unit Vocabulary	
Statistical question Mean Outlier Measure of center Median Mode Measure of variation Range	Stem-and-leaf plot Stem Leaf Frequency table Frequency Histogram Skewed Left Skewed right Symmetric

Interdisciplinary Connections (Applicable Standards)	**Integration of Technology**	**21st Century Themes**	**21st Century Skills**
ELA: RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-PS1-2),(MSPS1-3) RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). WHST.6-8.7 Conduct short research projects to answer a question	**Online Practice Integers** ➢ Sumdog.com (M) ➢ Math Star Integers & Number Line Game (S) ➢ Integer Jeopardy (S) ➢ Rags to Riches Integers (S) **Online Interactives & Videos** ➢ Subtracting Integers (S) ➢ Integers and Absolute Value (M) ➢ Adding Integers w/# line(S) ➢ Exploring Integers - Video(S) ➢ Negative Numbers - video/game (M) ➢ Fraction Pop Equivalent Fractions - 3 step lesson (A) ➢ Intro to Fractions - picture (S) ➢ Fractions between 0 & 1 (A) ➢ Comparing Rational #'s - Game (S)	__✓__ Financial, Economic, Business, & Entrepreneurial Literacy *Establish an understanding that career-ready individuals take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.*	_✓_ Critical Thinking and Problem Solving *Students engage with real world situations involving rational numbers. Students carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.* _✓___ Life and Career Skills *Students make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.* Technologies Literacy __✓_ Communication & Collaboration *Career-ready individuals communicate thoughts, ideas, and action plans with*

Interdisciplinary Connections (Applicable Standards)	Integration of Technology	21st Century Themes	21st Century Skills
(including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS1-6) 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.	➢ Number Rights (S) ➢ Pearl Diver (A) ➢ Ordering Fractions - Interactive video ➢ Equivalent Fractions - Interactive video ➢ Fraction to Terminating Decimals ➢ Fractions to Repeating Decimals ➢ Writing Negative Fractions ➢ **General Tech Resources** ➢ BrainPop(A/M) ➢ LearnZillion(S/A/M) ➢ Khan Academy(S/A/M) ➢ Math Dictionary for Kids (A)		*clarity, whether using written, verbal, and/or visual methods. Students collaborate via the integer game, number line discussions and problem solving real world situations involving rational numbers.*

Resources
Texts/Materials: ***Textbook:*** ***Big Ideas*** ***https://www.bigideasmath.com*** **National Library of Virtual Manipulatives (http://nlvm.usu.edu/en/nav/vlibrary.html)** **https://nj.pbslearningmedia.org** **https://www.illustrativemathematics.org** **Video** **https://www.opened.com/video/flocabulary-dividing-fractions-keep-change-flip/2893530** **https://www.opened.com/video/the-steps-to-long-division/64006** **https://www.opened.com/video/math-snacks-bad-date/115604** **https://nj.pbslearningmedia.org/resource/vtl07.math.measure.rate.fastbroom/the-fastest-broom/#.WSRCZGgrJ1s**

Resources
https://www.ixl.com/math/grade-6/identify-equivalent-expressions **https://learnzillion.com/lesson_plans/8904-read-and-write-equivalent-expressions-with-variables-and-exponents** **https://www.youtube.com/watch?v=UqY0DDjxLGY** **https://www.mathsisfun.com/numbers/absolute-value.html** **https://www.brainpop.com/math/numbersandoperations/absolutevalue/** **https://www.youtube.com/watch?v=wrof6Dw63Es** **https://blog.buzzmath.com/2013/12/10/new-buzzmath-activity-range-interquartile-range-and-box-plots/** **https://www.youtube.com/watch?v=5C9LBF3b65s (mean, median and mode toads)** **Materials:** Math Scholastic news – math in the news Dogonews.com – daily articles for math in the news articles