Kingsway Regional School District

Committed to Excellence

Course Name: Math 7	**Grade Level(s): 7th**
Department: Mathematics	**Credits:**
BOE Adoption Date: September 22, 2014	**Revision Date(s): October 22, 2015**

ABSTRACT

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. There are four critical areas in which to focus on for Math 7:

Critical Area 1: Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

Critical Area 2: Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction,

multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

Critical Area 3: Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

Critical Area 4: Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

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Mission Statement

The Kingsway Regional School District believes that this school district is responsible for developing and maintaining a comprehensive educational program that will foster the academic, social, and personal growth of all students. The Kingsway Regional School District provides a secure, supportive environment. It also provides high quality resources to challenge and empower each individual to pursue his/her potential, to develop a passion for learning in a diverse and challenging world, to encourage active citizenship, and to reach a high standard of achievement at all grade levels as defined by the New Jersey Core Curriculum Content Standards (NJCCCS) & Common Core State Standards (CCSS).

Curriculum & 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 South Harrison Township Elementary

The ultimate goal of the newly established shared curriculum service with South Harrison Township Elementary is to provide clearly coherent curriculum for grades K-12 to enhance student growth and achievement and provide learning experiences that assist in providing an inherent love of learning. With true vertical and horizontal curricular alignment all students will be effectively prepared for their arrival onto the campus of Kingsway Regional Middle School. Through this shared vision, both school districts are able to work earlier and more productively with students to ensure they are properly equipped with the knowledge and skills necessary to be successful in college and career upon graduation from high school. The alignment of curriculum K-12 safeguards countless benefits for our children; it is the very foundation for the improved teaching and learning that is our goal as educators, parents, and community members. Most notably, an aligned curriculum K-12 creates a common ownership and understanding of what must be taught and learned at each grade level for each subject area. No matter where a student attends, the curriculum requirements are the same across buildings, grade levels and teachers. Additionally, an aligned curriculum serves to provide valuable information to parents who will know what each child is expected to learn while in the classroom.

How to Read this Document

This curricular document contains both *pacing guides* and *curriculum units*. The pacing guides serve to communicate an estimated timeframe as to *when* skills and topics will be taught throughout the year. The pacing, however, may differ slightly depending upon the unique needs of each learner. The *curriculum units* contain more detailed information as to the content, goals, and objectives of the course well as how students will be assessed. The terms and definitions below will assist the reader to better understand 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.

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.

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.

5. **Formative Assessments:** 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.

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 NJCCCS and CCSS 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.

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.

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 Common Core State Standards and New Jersey Core Curriculum Content 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 Assessments:** (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. **Standards:** 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.

- **State:** The New Jersey Core Curriculum Content Standards (NJCCCS) 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.*
- **Common Core:** Standards for mathematics and English-language arts literacy are part of the Common Core State Standards (CCSS) which are nationally adopted standards coordinated by the Council of Chief States School Officers (CCSSO) and the National Governor's Association (NGA) in partnership with other national organizations.

15. **Summative Assessments:** 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 Skills:** 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.

Proficiencies and Pacing: Math 7

Course Title: Math 7
Prerequisite(s): Proficiency with curriculum in grades K-6.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 1: Operations With Integers	3 weeks September	**Mathematics:** *7.NS.1a* *7.NS.1b* *7.NS.1c* *7.NS.1d* *7.NS.2a* *7.NS.2b* *7.NS.2c* *7.NS.3* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** (Teacher) *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	1. Solve real-world problems and mathematical problems involving addition, subtraction, multiplication and division of integers with and without a number line.	• RECOGNIZE the additive inverse property • DESCRIBE opposite quantities • DETERMINE absolute value • UNDERSTAND positive or negative direction on the number line • REPRESENT addition and subtraction with integers on a horizontal or vertical number line. • DESCRIBE and MODEL on the number line real world situations in which integers are combined • SHOW additive inverses • INTERPRET sums in context • CONVERT subtraction statements to equivalent addition statements using additive inverse property • DEVELOP rules for adding integers using absolute value short-cut • DEVELOP the argument that the distance between two points is the absolute value of the distance between their coordinates • ADD and SUBTRACT integers by using the concept of absolute value • APPLY absolute value principle in context • APPLY properties of operations as

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
				strategies to add and subtract integers • MULTIPLY and DIVIDE integers • UNDERSTAND/DEVELOP rules for multiplying signed numbers • UNDERSTAND every quotient of integers with non-zero divisor is a rational number • EXPLAIN why a divisor cannot be zero • INTERPRET products & quotients in context • APPLY properties of operations as strategies to multiply and divide integers • SOLVE real world problems in context o APPLY properties of operations to calculate o ASSESS reasonableness of answers ▪ USE mental computation and estimation strategies
Unit 2: Operations With Rational Numbers	4 weeks October	**Subject Area:** *7.NS.1a* *7.NS.1b* *7.NS.1c* *7.NS.1d* 7.NS.2a 7.NS.2b 7.NS.2c 7.NS.2d	1. Solve real-world problems and mathematical problems involving addition, subtraction, multiplication and division of integers with and without a number line.	• REVIEW adding and subtracting decimals. • REVIEW adding and subtracting fractions and mixed numbers. • REVIEW multiplying fractions and mixed numbers. • REVIEW dividing fractions and mixed numbers

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		7.NS.3 **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*		• REVIEW multiplying and dividing decimals. • IDENTIFY rational numbers • REPRESENT addition and subtraction with rational numbers on a horizontal or vertical number line. • DESCRIBE and MODEL on the number line real world situations in which rational numbers are combined • INTERPRET sums in context • UNDERSTAND rules for adding rational numbers using absolute value short-cut • DEVELOP the argument that the distance between two points is the absolute value of the distance between their coordinates • ADD and SUBTRACT rational numbers by using the concept of absolute value • APPLY absolute value principle in context • APPLY properties of operations as strategies to add and subtract rational numbers • MULTIPLY and DIVIDE rational numbers • UNDERSTAND rules for multiplying signed numbers • CONVERT rational numbers to terminating or repeating decimals • INTERPRET products & quotients in context

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:

				• APPLY properties of operations as strategies to multiply and divide rational numbers
				• SOLVE real world problems in context
				  o APPLY properties of operations to calculate
				  o CONVERT between equivalent forms of rational numbers
				  o ASSESS reasonableness of answers
				  ▪ USE mental computation and estimation strategies

Unit 3: Expressions and Equations	6 weeks November/December	**Mathematics:** *7.EE.1* *7.EE.2* *7.EE.4a* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	1. Students will be able to use properties of operations make equivalent expressions and make sense of real-life situations using expressions. 2. Students will be able to write and solve multi-step equations in real-world situations.	• REVIEW applying the distributive property to produce an equivalent expression • IDENTIFY the commutative, associative, distributive, additive, and multiplicative inverse property • USE variables • IDENTIFY inverse operations • CONSTRUCT simple equations • SOLVE simple equations in context • REASON about quantities • COMPARE solutions • APPLY properties of operations • COMBINE like terms using properties of operations • FACTOR Linear expressions with rational coefficients • EXPAND Linear expressions with rational coefficients • WRITE an expression in different forms

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
				• UNDERSTAND how rewriting an expression in different forms can show how the quantities in a problem are related
Unit 4: Inequalities	3 weeks January	**Mathematics:** *7.EE.4b* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	1. Students will be able to solve and graph word problems leading to inequalities.	• CONSTRUCT simple inequalities • SOLVE Simple inequalities • REASON about quantities • COMPARE solutions • GRAPH inequalities • INTERPRET inequalities
Unit 5: Ratios, Proportions	4 weeks February	**Mathematics:** *7.RP.1* *7.RP.2a* *7.RP.2b* *7.RP.2c* *7.RP.2d* *7.RP.3* *7.G.1* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A,*	1. Students will be able to apply concepts of ratios and proportions to compute unit rate and solve proportions in mathematical and real-world problems, including scale drawings. 2. Students will be able to graph and interpret the unit rate and constant of proportional relationships and compare and contrast proportional	• Proportional relationships • Equivalent ratios o In a table o Straight line through the origin when graphing on a coordinate plane o Equation • Constant of proportionality (unit rate) o Tables o Graphs o Equations o Diagrams o Verbal descriptions • Point (x,y) in terms of situation o (0, 0) o (1, r) where r is the unit rate • Multi-step ratio problems

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		TEC.5-8.8.1.8.E	relationships in real world contexts.	• WRITE ratios for various situations • RECOGNIZE proportional relationships • REPRESENT proportional relationships in table, graph, or equation • DETERMINE if there is a proportional relationship in a table or graph • IDENTIFY the constant of proportionality in a table, graph, or equation • TEST if ratios are equivalent • EXPLAIN point (x,y) • Scale drawings o Scale o Actual lengths and areas • SOLVE multi-step problems involving scale drawings of geometric figures • COMPUTE unit rates • COMPUTE actual lengths/areas from scale drawings • REPRODUCE a scale drawing at a different scale
Unit 6: Percent	5 weeks March	**Mathematics:** *7.RP.3* *7.EE.3* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1*	1. Students will be able to use proportionality to solve percent problems, for example: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	• SOLVE multi-step ratio and percent problems including simple interest, tax, mark-ups and markdowns, gratuities, and commissions, fees, percent increase and decrease, percent error. • WRITE an expression in different forms • UNDERSTAND how rewriting an expression in different forms can show how the quantities in a problem are related • CONVERT between fractions, decimals,

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	2. Students will be able to convert between fractions, decimals and percent to rewrite expressions and explain how the quantities are related and then assess the reasonableness of answers using mental math and estimation strategies.	and percent. • USE the percent proportion to solve real world problems. • APPLY the distributive property to solve percent problems
Unit 7: Probability and Statistics	5 weeks April/May	**Subject Area:** *7.SP.1* *7.SP.2* *7.SP.3* *7.SP.4* *7.SP.5* *7.SP.6* *7.SP.7* *7.SP.8* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	1. Students will be able to develop a probability model and use it to find probabilities of events and utilize organized lists, tables, tree diagrams, or simulation to find the probability of compound events. 2. Students will be able to use random sampling to draw inferences about populations and compare two populations using measuring of center and variability.	• DEVELOP/USE a uniform probability model • DEVELOP/USE a probability model which may not be uniform • FIND probabilities of simple events • FIND probability of compound events using organized lists, tables, tree diagrams and simulation • FIND frequencies for compound events • COMPARE probabilities from a model to observed frequencies • EXPLAIN possible sources of the discrepancy • OBSERVE frequencies in data • UNDERSTAND probability of a chance event is a number between 0 and 1 • UNDERSTAND probability of a compound event is the fraction of outcomes in the sample space • PREDICT approximate relative frequency • REPRESENT sample spaces for

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
				compound events using various methods, e.g., organized lists, tables, tree diagrams • DESIGN/USE a simulation • UNDERSTAND/USE statistics • EXAMINE a sample of a population • GENERALIZE information about a population • DETERMINE if a sample is representative/valid • USE measures of center and measures of variability for numerical data from random samples • DRAW informal comparative inferences • USE data from a random sample • DRAW inferences about a population • GENERATE multiple samples of the same size • GAUGE the variation in estimates or predictions • EXPRESS/CALCULATE the difference between the centers of two numerical data distributions as a multiple of a measure of variability – mean absolute deviation
Unit 8: Two-Dimensional Geometry (Constructions & Circles)	2 weeks May/June	**Mathematics:** *7.G.2* *7.G.4* *7.G.5* *7.G.6* **Interdisciplinary:**	• Students will be able to use facts about supplementary, complementary, vertical, and adjacent angles to write and solve simple equations for an	• Angle relationships o Supplementary o Complementary o Vertical o Adjacent • STATE definitions and measures of supplementary, complementary, and

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		ELA: *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* Geometer's Sketchpad	unknown angle in a figure and use angles to construct geometric shapes. • Students will understand and be able to find the circumference and area of circles and the area of composite figures.	adjacent vertical angles. • USE angle notations to compare and compute supplementary, complementary, and vertical and adjacent angles. • WRITE/SOLVE problems using equations to find an unknown angle in a figure. • Geometric conditions (points, line segments, angles, parallelism, congruence, and perpendicularity.) • USE (ruler, protractor, technology) • CONSTRUCT triangles using given sides and angles. • IDENTIFY when the conditions determine a unique triangle, more than one triangle, or no triangle. • USE Geometer's Sketchpad to construct geometric shapes. • Area o Triangles o Quadrilaterals o Polygons • SOLVE problem involving area of two-dimensional objects composed of triangles, quadrilaterals, and polygons with and without context. • KNOW and DEVELOP formulas for area and circumference of a circle. • Relationship between circumference and area of a circle • COMPUTE the circumference of a circle. • COMPUTE the area of a circle.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
				• COMPUTE the area of two- dimensional figures.
Unit 9: Surface Area & Volume	2 weeks June	**Mathematics:** *7.G.3* *7.G.6* **Interdisciplinary:** **ELA:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* **Technology:** *TEC.58.8.1.8.A,TEC.5-8.8.1.8.E* Geometer's Sketchpad http://www.geogebratube.org/	• Students will be able to solve real-world and mathematical problems involving the surface area and volume of prisms and pyramids.	• Plane sections of three-dimensional figures • Volume o Cubes o Right prisms • Surface Area o Cubes o Right prisms • DESCRIBE the two-dimensional figures that result from slicing three-dimensional figures (right rectangular pyramid and right rectangular prism. • CALCULATE the volume of a cube. • CALCULATE the volume of a right prism. • CALCULATE the surface area of a cube. • CALCULATE the surface area of a right prism. • SOLVE problems involving volume and surface area using formulas.

Unit: 1 – Operations with Integers	Recommended Duration: 3 weeks – September
In this unit, students will apply and extend understandings of integers to add, subtract, multiply and divide in both mathematical problems and real-world situations. Students communicate and engage in discussions about their reasoning using appropriate mathematical language, including but not limited to these terms: absolute value, integers and additive inverse. Students employ the use of both a horizontal and vertical number line to represent addition and subtraction of integers. Student understand that integers can be multiplied and develop rules and strategies to apply the properties of operation (specifically the distributive property); in addition, student apply rules to divide integer and recognize that the divisor cannot be zero. Students will use their understanding of rational numbers and apply them to linear functions.	

Essential Questions:	Enduring Understandings:
1. How can you use integers to represent the real-world situations, such as finance, temperature and speed? 2. What is the relationship between properties of operations and types of numbers? 3. What models can be used to show addition and subtraction of positive and negative integers? 4. What strategies are most useful in helping me develop algorithms for adding, subtracting, multiplying, and dividing positive and negative integers?	1. Positive and negative numbers are often used to solve problems in everyday life. 2. Computation with positive and negative numbers is often necessary to determine relationships between quantities. 3. Models, diagrams, manipulatives and patterns are useful in developing and remembering algorithms for computing with positive and negative numbers. 4. Properties of real numbers hold for all integers.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	• Solve real-world problems and mathematical problems involving addition, subtraction, multiplication and division of integers with and without a number line.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **integer, absolute value, opposites, additive inverse, sum, difference, product, and quotient.** • Define the additive inverse property. • Describe opposite quantities. • Define and find absolute values of numbers.

Relevant Standards:	Learning Goals:	Learning Objectives:
7. NS.1a Describe situations in which opposite quantities combine to make 0. **7.NS.1b** Understand p + q as the number located a distance | q | from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **7. NS.1c** Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. **7. NS.1d** Apply properties of operations as strategies to add and subtract rational numbers. **7. NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.2.a** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such		• Understand positive and negative direction on a number line. • Add integers. • Subtract integers. • Divide integers. • Multiply integers. • Represent addition and subtraction with integers on a number line. • Apply properties of operations as strategies to add, subtract, multiply and divide integers (Commutative, Associative, and Distributive Properties). • Solve real world problems using integers.

Relevant Standards:	Learning Goals:	Learning Objectives:
as (-1)(-1) = 1 and the rules for multiplying signed numbers, interpret products of rational numbers by describing real-world contexts. **7.NS.A.2b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts. **7.NS.A.2c** Apply properties of operations as strategies to multiply and divide rational numbers. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers **Secondary(Supportive):** <u>Standards of Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically.		

Relevant Standards:	Learning Goals:	Learning Objectives:
6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Quizzes/Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Integer Cards, Integer Games, Fluency Activities **Formative Assessment Tasks (from Illustrative Mathematics)** 7.NS Operations on the Number Line 7.NS Distances on the Number Line 2 7.NS, 7.EE Bookstore Account 7.NS Rounding and Subtracting	Unit Tests, Extended Constructed Responses Questions, Projects, Summative Tests	Using Positive & Negative Numbers in Context Task Rational Numbers in Football	Pre-Assessment MAP Test

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Math Stations, Kinesthetic Movement to Model Integers, Guided Practice, Four Corners, Modeling, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds, Using Manipulatives and Other Tools *(Counters, Number Lines, Integer Dice, Integer Cards,),* Re-teaching after a Check for Understanding Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (see resources below), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (such as setting up graphs, solving proportions and calculating unit rate), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: integer, absolute value, opposites, additive inverse, product, quotient, sum, difference, negative, positive, zero pair **Non-Essential:** Associative Property (of Multiplication & Addition), Commutative Property (of Multiplication & Addition),, Distributive Property, Multiplicative Inverse, withdraw, credit, debit, overdraft, deposit, profit, loss

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	Technology: ➢ Online Practice Integers o Sumdog.com o ArcademicSkillBuilders.com o Math Star Integers & Number Line Game o XP Math Integer Subtraction	__✓__ Global Awareness __✓__ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial Literacy __✓__ Health Literacy	__✓__ Creativity & Innovation ____ Media Literacy _✓_ Critical Thinking and Problem Solving _✓___ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓__ Communication & Collaboration __✓___ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	o Integer Frog o XP Math Integer Multiplication o Integer Jeopardy o Rags to Riches Integers o Guess the Number o Fruit Shoot - Game o Number Balls - Game ➢ Online Interactives o Subtracting Integers o Integers and Absolute Value o Adding Integers w/# line o Exploring Integers - Video o Negative Numbers - video o Negative Numbers - video/game ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids		

Resources:
Texts/Materials: Big Ideas Math (Red) – Chapter 1 Resources from Other States: Dept. of Ed Georgia - Unit 1 Tasks Engage NY – Unit 1 Lessons & Tasks **Major Assignments (required):** Pre-Assessment **Major Activities (required):**

Unit: 2 – Operations with Rational Numbers	Recommended Duration: 3 weeks – September/October
In this unit, students apply and extend previous understandings of integers to add, subtract, multiply and divide rational numbers. Students will interpret sums of rational numbers by describing real-world contexts and show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. Students will also develop a conceptual understanding that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. This unit will allow students to interpret products and quotients of rational numbers by describing real-world contexts. Students will gain a conceptual understanding of rational numbers, for example every quotient of integers (with non-zero divisor) is a rational number. Students will convert a rational number to a decimal using long division and know that the decimal form of a rational number terminates in 0's or eventually repeats. Solving real-world and mathematical problems involving the four operations with rational numbers will be an essential skill in this unit. In this unit, students will represent their calculations using number line models, equations or expressions, and real world applications. Students will use their understanding of rational numbers and apply them to linear functions in subsequent units.	

Essential Questions:	Enduring Understandings:
1. How are rational numbers used and applied in real-life and mathematical situations? 2. How can use a number line to order rational numbers? 3. What strategies are most useful in helping me develop algorithms for adding, subtracting, multiplying, and dividing positive and negative rational numbers? 4. How do I use a number line to model addition or subtraction of rational numbers?	1. Students will be able to add, subtract, multiply, and divide rational numbers fluently as well as solve real-world and mathematical problems. 2. Rational numbers use the same properties as whole numbers. 3. Rational numbers are points on the number line. 4. Rational numbers can be used to represent and solve real-life situation problems. 5. Rational numbers can be represented with visuals (including distance models), language, and real-life contexts. 6. A number line model can be used to represent the unique placement of any number in relation to other numbers. 7. There are precise terms and sequence to describe operations with rational numbers.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7. NS.1a** Describe situations in which opposite quantities combine to make 0. **7.NS.1b** Understand p + q as the number located a distance | q | from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **7. NS.1c** Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. **7. NS.1d** Apply properties of operations as strategies to add and subtract rational numbers. **7. NS.2** Apply and extend previous	• Solve real-world problems and mathematical problems involving addition, subtraction, multiplication and division of integers with and without a number line.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **rational number, terminating decimal, repeating decimal, integer, absolute value, opposites, additive inverse, product, quotient, sum, difference, negative, positive, zero pair.** • Review addition and subtraction of fractions and decimals • Review multiplication and division of fractions and decimals. • Write decimals as fractions and fractions as decimals. • Identify rational numbers. • Write rational numbers as decimals. • Write a decimal as a fraction. • Order rational numbers on a number line. • Add rational numbers. • Subtract rational numbers. • Multiply rational numbers. • Divide rational numbers.

Relevant Standards:	Learning Goals:	Learning Objectives:
understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.2.a** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers, interpret products of rational numbers by describing real-world contexts. **7.NS.A.2b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts. **7.NS.A.2c** Apply properties of operations as strategies to multiply and divide rational numbers. **7.NS.A.2d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers **Secondary(Supportive):** <u>Standards of Mathematical Practice:</u>		• Solve real-world problems with rational numbers.

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

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Integer Cards, Integer Games, Fluency Activities, Division Task, Learning	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	A Day Out Task	

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Menu and Choice Assignments			

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Choice Assignments & Menus, Math Stations, Kinesthetic Movement to Model Integers, Guided Practice, Four Corners, Modeling, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds, Using Manipulatives and Other Tools *(Fraction Bars, Counters),* Re-teaching after a Check for Understanding Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (see resources below), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (fractions, mixed numbers, fact families, decimals), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: rational number, terminating decimal, repeating decimal, integer, absolute value, opposites, additive inverse, product, quotient, sum, difference, negative, positive, zero pair **Non-Essential:** evaluate, ratio, simplest form, denominator, least common multiple, common denominator, least common denominator (LCD), reciprocal, divisor, fractions, decimals, Associative Property (of Multiplication & Addition), Commutative Property (of Multiplication & Addition),, Distributive Property, Multiplicative Inverse, withdraw, credit, debit, overdraft, deposit, profit, loss

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	Technology: ➢ Online Practice Integers o Sumdog.com o ArcademicSkillBuilders.com ➢ Math Snacks o Number Rights o Pearl Diver ➢ Online Interactives o Fraction # Balls Fraction Pop Equivalent Fractions - 3 step lesson Intro to Fractions - picture o Fractions between 0 & 1 o Comparing Rational #'s - Game ➢ Video Resources o Ordering Fractions - Interactive video o Equivalent Fractions - Interactive video o Quesadilla Fractions - video o Equivalent Fractions - Interactive video o Fraction to Terminating Decimals o Fractions to Repeating Decimals o Writing Negative Fractions ➢ BrainPop ➢ LearnZillion	___✓__ Global Awareness ___✓__ Civic Literacy ___✓__ Financial, Economic, Business, & Entrepreneurial Literacy ___✓__ Health Literacy	__✓___ Creativity & Innovation ____ Media Literacy _✓__ Critical Thinking and Problem Solving _✓___ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓__ Communication & Collaboration __✓___ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
	➢ Khan Academy ➢ Math Dictionary for Kids		

Resources:
Texts/Materials: Big Ideas Math (Red) Resources from Other States: Dept. of Ed Georgia - Unit 1 Tasks Engage NY – Unit 1 Lessons & Tasks **Major Assignments (required):** **Major Activities (required):**

Unit: 3 – Expressions and Equations	Recommended Duration: 5 weeks – October/November

Students will extend previous knowledge of reading, writing and evaluating numerical expressions involving variables and generating equivalent expressions. The first focus of this unit will require students to simplify linear expressions involving rational coefficients and distributing negative numbers to solve real world and mathematical problems. Building on work in grade 6, where students used order of operations and properties of operations to transform, simple expressions such as $2(3 + 8x)$ or $10p - 2p + 3p$, students now encounter linear expressions with more operations and whose transformation may require an understanding of the rules for multiplying negative numbers, such as $7 - 2(3 - 8x)$. A more complete understanding of order of operations and the properties of operations will lay the foundation for the extensive study of functions next year. Students use variables to represent real-world situations and use the properties of operations to generate equivalent expressions for these situations. As students gain experience with multiple ways of writing an expression, they also learn that different ways of writing expressions can serve different purposes and provide different ways of seeing a problem. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."

Students will also draw on prior learning to read, write, interpret and solve one-variable equations in real-life and mathematical situations. The second half of this unit will focus on reading, writing, interpreting and solving multi-step real-life and mathematical problems using equations. Understanding that equations can have multiple solutions will lay a foundation for the study of solving systems of simultaneous linear equations in grade 8. Students start to see whole numbers, integers, and positive and negative fractions as belonging to a single system of rational numbers, and they solve multi-step problems involving rational numbers presented in various forms. Students use mental computation and estimation to assess the reasonableness of their solutions. In addition, students show the steps in their math work and explain their thinking using the correct terminology for the properties and operations.

Essential Questions:	Enduring Understandings:
1. When and how are expressions and equations applied to real world situations? 2. How can the order of operations be applied to evaluating expressions, and solving from one-step to multi-step equations?	1. Variables can be used to represent numbers in any type of mathematical problem. 2. Expressions are simplified and equations are solved for the variable's value. 3. Write and solve multi-step equations including all rational numbers. 4. Understand the connections between performing the inverse operation and undoing the operations. 5. Some equations may have more than one solution. 6. Properties of operations allow us to add, subtract, factor, and expand linear expressions.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a +0.05a = 1.05a means that "increase by 5% is the same as multiply by 1.05."* **7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **a)** Solve word problems leading to equations of the form *px + q = r and p(x + q) = r*, where *p, q, and r are specific rational numbers. Solve equations of these* *forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example,* *the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* **Secondary(Supportive):** <u>Standards of Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them.	• Students will be able to use properties of operations make equivalent expressions and make sense of real-life situations using expressions. • Students will be able to write and solve multi-step equations in real-world situations.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **expression, equation, variable, term, coefficient, constant, like terms, simplest form , linear, factor out, equivalent equations, distribute, substitute, Property of Equality (Addition, Subtraction, Multiplication, Division) Distributive Property, Commutative Property, Associative Property, Multiplicative Property of Zero** • Apply Commutative, Associative, Distributive, Identity, and Inverse Properties to simplify expressions • Use the properties of operations to add and subtract expressions • Use the properties of operations to factor expressions • Translate words or real-life situations into variable expressions and rewrite an expression • Write simple equations • Solve one-step equations using addition or subtraction. • Solve one-step equations using multiplication or division. • Solve multi-step-step equations. • Construct equations to solve word problems leading to one- or two-step equations.

Relevant Standards:	Learning Goals:	Learning Objectives:
2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests		• Unit 3 Learning Menu

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Kinesthetic Movement to Model Solving Equations, Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds, Using Manipulatives and Other Tools ***(like terms cards, equation mats, algebra tiles)***, Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (fractions, mixed numbers, fact families, decimals), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: expression, equation, variable, term, coefficient, constant, like terms, simplest form, linear, factor out, equivalent equations, distribute, substitute, Property of Equality (Addition, Subtraction, Multiplication, Division) Distributive Property Commutative Property, Associative Property, Multiplicative Property of Zero **Non-Essential:** evaluate, negative, order of operations, least common denominator (LCD), greatest common factor (GCF),

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1,* *LA.6-8.CCSS.ELA-Literacy.CCRA.W.1*	Technology: ➢ Online Practice Expressions & Equations o Sumdog.com	___✓__ Global Awareness __✓__ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial Literacy	__✓__ Creativity & Innovation ____ Media Literacy __✓__ Critical Thinking and Problem Solving __✓__ Life and Career Skills __✓__ Information & Communication

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	o ArcademicSkillBuilders.com o Two-Step Equations Battleship Two-Step Equations Buster Two-Step Equations(Numberballs) Two-Step Equations Basketball ➢ Online Interactives ➢ Video Resources o BrainPop Video: Two- Step Equations o LearnZillion: Solve Equations Using Inverse Operations o LearnZillion: Convert real-world situation into an equation ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids	__✓__ Health Literacy	Technologies Literacy __✓__ Communication & Collaboration __✓__ Information Literacy

Resources:
Texts/Materials: Big Ideas Math (Red) Resources from Other States: Dept. of Ed Georgia - Unit 1 Tasks Engage NY – Unit 1 Lessons & Tasks Algebraic Reasoning Worksheets **Major Assignments (required):** Short Tasks (Novice) **Major Activities (required):** Unit 3 Learning Menu

Unit: 4 – Inequalities	Recommended Duration: 3 weeks – December
In this unit, students draw upon their understanding of expressions and equations to graph, write, and solve inequalities. Students will work with multi-step problem situations that have multiple solutions and therefore can be represented by an inequality. Students set up and solve inequalities, recognizing the ways in which the process of solving them is similar to the process of solving linear equations. Students solve mathematical and real-life inequalities. For example, students use strategic thinking to construct inequalities such as the following problem: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solution. Students also recognize one important new consideration in solving inequalities: multiplying or dividing both sides of an inequality by a negative number reverses the order of the comparison it represents. It is useful to present a context that allows students to make sense of this. For example, If the price of a ticket to a school concert is p dollars then the attendance is $1000 - 50p$. What range of prices ensures that at least 600 people attend? Students recognize that the requirement of at least 600 people leads to inequality $1000 - 50 \geq 600$. Before solving the inequality they use common sense to anticipate that that answer will be of form $\leq$ since higher prices result in lower attendance. Note that inequalities using $\leq$ and $\geq$ are included in this standard in addition to > and <.	

Essential Questions:	Enduring Understandings:
1. When and how are inequalities applied to real world situations? 2. What are some possible real-life situations to which there may be more than one solution? 3. How does the ongoing use of fractions and decimals apply to real-life situations? 4. How do I determine the difference in equations and inequalities? 5. How can you use a number line to represent solutions of an inequality? 6. How do I solve and graph inequalities?	1. Mathematical inequalities and graphs are used to represent and solve real-world and mathematical problems. 2. It is important to understand that values can satisfy an inequality but may not be appropriate for the situation, therefore limiting the solutions for that particular problem. 3. All inequalities have more than one solution. 4. Solving inequalities is similar to solving equations. 5. When you are multiplying or dividing by a negative number, the inequality symbol needs to be reversed.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **b)** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. **Secondary(Supportive):** <u>Standards of Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure.	• Students will be able to solve and graph word problems leading to inequalities.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **inequality, solution, solution set, graph of an inequality, greater than, less than, greater than or equal to, less than or equal to.** • Write and graph inequalities. • Use substitution to check whether a number is a solution of an inequality. • Solve inequalities using addition or subtraction. • Solve inequalities using multiplication or division. • Solve multi-step inequalities. • Solve real-life problems with inequalities.

Relevant Standards:	Learning Goals:	Learning Objectives:
8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	Fishing Adventures	

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Kinesthetic Movement to Model Solving Inequalities Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds, Using Manipulatives and Other Tools ***(number lines, algebra tiles),*** Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (fractions, mixed numbers, fact families, decimals), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: inequality, solution, solution set, graph of an inequality, greater than, less than, greater than or equal to, less than or equal to **Non-Essential:** integers, rational numbers

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	Technology: ➢ Online Practice - Inequalities o Sumdog.com o ArcademicSkillBuilders.com ➢ Online Interactives o Inequalities Flash cards o Inequality Word Problem Game o Inequality Tic-Tac-Toe o Interactive game ➢ Video Resources o Graphing Inequalities Tutorial o LearnZillion Solve Inequalities o LearnZillion Represent a Solution Set on a Number Line o Bitesize: Solving Inequality Tutorial ➢ BrainPop ➢ LearnZillion	___✓__ Global Awareness __✓__ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial Literacy __✓_ Health Literacy	__✓__ Creativity & Innovation ____ Media Literacy _✓_ Critical Thinking and Problem Solving _✓___ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓_ Communication & Collaboration __✓__ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
	➢ Khan Academy ➢ Math Dictionary for Kids		

Resources:
Texts/Materials: Big Ideas Math (Red) – Chapter 4 Resources from Other States: Dept. of Ed Georgia - Unit 2 Tasks Engage NY – Module 3, Topic B Lessons and Tasks **Major Assignments (required):** **Major Activities (required):**

Unit: 5 – Ratios, Proportions and Scale Drawings	Recommended Duration: 4 weeks – January
In Grade 7, students extend their reasoning about ratios and proportional relationships in several ways. Students use ratios in cases that involve pairs of rational number entries, and they compute associated unit rates. They identify these unit rates in representations of proportional relationships. They work with equations in two variables to represent and analyze proportional relationships. Students examine situations carefully, to determine if they describe a proportional relationship. Students must understand the structure of the problem, which includes looking for and understanding the roles of "for every," "for each," and "per." Students recognize that graphs that are not lines through the origin and tables in which there is not a constant ratio in the entries do not represent proportional relationships. As students work with proportional relationships, they write equations of the form $y = cx$, where c is a constant of proportionality, i.e., a unit rate. They see this unit rate as the amount of increase in y as x increases by 1 unit in a ratio table and they recognize the unit rate as the vertical increase in a "unit rate triangle" or "slope triangle" with horizontal side of length 1 for a graph of a proportional relationship. Students connect their work with equations to their work with tables and diagrams. Ultimately, students apply concepts of ratio and unit rate learned in grade 6 to fluently compute unit rates, represent proportional relationships between quantities, and compare and contrast proportional relationships in real world contexts. Students will apply their understanding of ratios and proportionality to situations involving multi-step ratio problems as well as scale drawings.	

Essential Questions:	Enduring Understandings:
1. How do rates, ratios, percentages and proportional relationships apply to our world? 2. When and why do I use proportional comparisons? 3. How does comparing quantities describe the relationship between them? 4. How do graphs illustrate proportional relationships?	1. Rates, ratios, and proportional relationships express how quantities change in relationship to each other. 2. Rates, ratios, and proportional relationships can be represented in multiple ways. 3. Rates, ratios, and proportional relationships can be applied to problem solving situations.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: Primary(Power): **7.RP.1** Compute unit rates associates with rations of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour. **7.RP.2** Recognize and represent proportional relationships between quantities. **a.** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **b.** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **c.** Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. **d**. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. **Secondary(Supportive):**	• Students will be able to apply concepts of ratios and proportions to compute unit rate and solve proportions in mathematical and real-world problems, including scale drawings. • Students will be able to graph and interpret the unit rate and constant of proportional relationships and compare and contrast proportional relationships in real world contexts.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **ratio, rate, unit rate, complex fraction, proportional, proportion, Cross Products Property, rate of change, constant of proportionality, direct variation, greatest common factor, equivalent fractions, equation, inverse operations, properties of equality, origin, steepness, scale, scale drawing, scale factor.** • Find ratios, rates & unit rates. • Find ratios and rates involving ratios of fractions. • Use equivalent ratios to determine whether two ratios form a proportion. • Apply the Cross Products property to determine whether two ratios form a proportion. • Analyze graphs to determine whether two ratios form a proportion. • Interpret graphs if proportional relationships. • Write proportions. • Solve proportions using mental math. • Solve proportions using multiplication or Cross Products Property. • Use scale drawings to find actual distances. • Calculate scale factors. • Investigate scale drawings to find actual perimeters and areas. • Construct scale drawings. • Write the equation of proportional relationship • Find the constant of proportionality of lines. • Interpret the constant of proportionality of lines as unit rate. • Identify direct variation from graphs or equations. • Assess direct variation models to solve problems.

Relevant Standards:	Learning Goals:	Learning Objectives:
7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. <u>Standards of Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No,	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	• <u>Buses Task</u> • <u>Sale! Task</u> • <u>T-Shirt Sale Task</u> • <u>A Golden Crown? Task</u>	• Unit 5 Learning Menu

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments • Designing a Garden (Drawing to Scale) • Real-Life Situations • Modeling: A Race • Sense of Scale • Scale Drawings Worksheet		• Ice Cream Task • Photographs (A)	

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling ***(See Performance Tasks above)***, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds ***(see Formative Assessment Links Above)***, Using Manipulatives and Other Tools ***(rulers, multiplication tables, graphs, visual representations of fractions & ratios)***, Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (fractions, mixed numbers, fact families, decimals), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: ratio, rate, unit rate, complex fraction, proportional, proportion, Cross Products Property, rate of change, constant of proportionality, direct variation,

Unit Vocabulary:
scale, scale drawing, scale factor **Non-Essential:** greatest common factor, equivalent fractions, equation, inverse operations, properties of equality, origin, steepness, slope, scale model

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	Technology: ➢ Online Practice o Sumdog.com o ArcademicSkillBuilders.com ➢ Online Interactives o Ratio interactive games o Ratio/ proportion interactive games o Bitesize ratio and proportion o Ratio and Proportion Recipe Bean counting and ratios Figure This - Problem Solving with Rates Dueling Discounts: 3-step lesson Intro to rates - picture o Rates, Ratios, proportions, scale Jeopardy o Equivalent Ratios - Game ➢ Video Resources o Learnzillion unit rate o Learnzillion-best deal o Learnzillion-amount of change o Ratio & Proportion Videos o Learn Zillion- Similar Figures o Learn Zillion - Proportions in	___✓_ Global Awareness __✓__ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial Literacy __✓_ Health Literacy	__✓__ Creativity & Innovation ____ Media Literacy _✓_ Critical Thinking and Problem Solving _✓____ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓_ Communication & Collaboration __✓__ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
	Graphs o Learn Zillion -Slope o Scale Factor o Math Snacks o Bad Date o Ratey the Cat ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids		

Resources:
Texts/Materials: Big Ideas Math (Red) – Chapter 5 & Section 7.5 Resources from Other States: Dept. of Ed Georgia - Unit 3 Tasks Engage NY – Module 1 **Major Assignments (required):** Unit 5 Test **Major Activities (required):**

Unit: 6 – Percents	Recommended Duration: 5 weeks – February/March
In this unit students will use proportional relationships to solve multi-step ratio and percent problems. Examples include: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error. Students will apply mathematical concepts to real world situations throughout the unit. Students will also gain fluency with modeling percents (percent means out of 100), writing percents using equal ratios. Students will also build connections between percents and decimals and percents and fractions. The use mental math and estimation with percents will increase fluency when calculating percent, part and wholes using proportions. Students will also write and solve percent equations to find tax and tip, commission, percent of increase and decrease.	

Essential Questions:	Enduring Understandings:
1. What is the relationship between fractions, decimals, and percents? 2. How does the ongoing use of fractions and decimals apply to real-life situations? 3. How do percentages apply to our world? 4. How can you use models to estimate percent questions? 5. How can you use a proportion or equation to solve each type of percent problem?	1. Percents can be compared with decimals and fractions. 2. Percent problems can be solved using proportions and equations. 3. Percentages can be utilized to solve real-world problems. 4. Solving percent problems sometimes involves percents of increase and decrease, and simple interest.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: Primary(Power): **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For*	• Students will be able to convert between fractions, decimals and percent to rewrite expressions and explain how the quantities are related and then assess the reasonableness of answers using mental math and estimation strategies. • Students will be able to use proportionality to solve percent problems, for example: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **percent, numerator, denominator, equivalent fractions, proportion, part, whole, percent proportion, percent of change, percent of increase, percent of decrease, discount, markup, interest, simple interest, principal.** • Write percents as decimals • Write decimals as percents. • Solve real-life problems. • Compare and order fractions, decimals, and

Relevant Standards:	Learning Goals:	Learning Objectives:
example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. **7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.* **Secondary(Supportive):** <u>Standards of Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure.	increase and decrease, percent error.	percents. • Apply the percent proportion to find parts, wholes and percents. • Apply the percent equation to find parts, wholes and percents. • Calculate percents of increase and decrease. • Assess percent of discounts to find prices of items. • Compare percent of markups to find selling prices of items. • Apply the simple interest formula to find interest earned or paid, annual interest rates and amounts paid on loans.

Relevant Standards:	Learning Goals:	Learning Objectives:
8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments • **Increasing & Decreasing Quantities by Percent** • **Illustrative Mathematics Tasks** o 7.RP Music Companies, Variation 2 o 7.RP Selling Computers o 7.RP Tax and Tip o 7.RP Friends Meeting on Bikes o 7.RP Comparing Years o 7.RP Chess Club o 7.RP Finding a 10% increase o 7.RP Buying Protein Bars and Magazines o 7.RP and 7.G Sand Under the Swing Set o 7.RP,EE Gotham City Taxis o 7.RP Two-School Dance o 6.EE,RP 7.EE,RP Anna in D.C.	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	• 25% Sale Task • Gas Stations Task	• Department Developed Quizzes • Department Developed Unit Test • Unit 6 Learning Menu

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
o 7.RP The Price of Bread o 7.RP How Fast is Usain Bolt? o 7.RP.3 Lincoln's math problem			

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling ***(See Performance Tasks above)***, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds ***(see Formative Assessment Links Above)***, Using Manipulatives and Other Tools ***(rulers, multiplication tables, visual representations of fractions, percents, decimals & ratios)***, Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (fractions, mixed numbers, fact families, decimals), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: percent, percent proportion, percent of change, percent of increase, percent of decrease, discount, markup, interest, simple interest, principal **Non-Essential:** numerator, denominator, equivalent fractions, proportion, part, whole

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	Technology: ➢ Online Practice o Sumdog.com o ArcademicSkillBuilders.com ➢ Online Interactives o Decimals and Percents - Game o Fraction, Decimal, % Conversion - Game o Fraction, Decimal, % Jeopardy o Percent of a Number - Game o Simple Interest -Game o Sales Tax -Game o Percent Shopping -Game o Tip -Game o Tax, Tip, Discount -Jeopardy o Tax, Tip Word Problems o Fractions to % - Memory Game ➢ Video Resources o Learn Zillion -Tax o Learn Zillion -Tips o Learn Zillion - Amount of Change ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids	___✓___ Global Awareness ___✓___ Civic Literacy ___✓___ Financial, Economic, Business, & Entrepreneurial Literacy ___✓___ Health Literacy	___✓___ Creativity & Innovation ____ Media Literacy ___✓___ Critical Thinking and Problem Solving ___✓___ Life and Career Skills ___✓___ Information & Communication Technologies Literacy ___✓___ Communication & Collaboration ___✓___ Information Literacy

Resources:
Texts/Materials: Big Ideas Math (Red) – Chapter 6 Resources from Other States: Dept. of Ed Georgia - Unit 3 Tasks Engage NY – Module 4 **Major Assignments (required):** Unit 6 Test **Major Activities (required):** Unit 6 Learning Menu

Unit: 7 – Probability & Statistics	Recommended Duration: 5 weeks – March/April

In Grade 7 students develop a general understanding of the likelihood of events occurring by realizing that probabilities fall between 0 and 1. They gather data from simulations to estimate theoretical probability using the experimental probability. Students build their understanding of probability on a relative frequency view of the subject, examining the proportion of "successes" in a chance process—one involving repeated observations of random outcomes of a given event, such as a series of coin tosses. "What is my chance of getting the correct answer to the next multiple choice question if I make a random guess among the four choices?" is a probability question, because the student could set up an experiment of multiple trials to approximate the relative frequency of the outcome; and two students doing the same experiment will get nearly the same approximation. Students begin by relating probability to the long-run (more than five or ten trials) relative frequency of a chance event, using coins, number cubes, cards, spinners, bead bags, and so on. Hands-on activities with students collecting the data on probability experiments are critically important, but once the connection between observed relative frequency and theoretical probability is clear, they will move to simulating probability experiments via technology (graphing calculators or computers). Students will make predictions about the relative frequency of an event by using simulations to collect, record, organize and analyze data. They will develop probability models to be used to find the probability of simple and compound events. Students will determine from each sample space the probability or fraction of each possible outcome.

In the latter half of this unit, students build upon their understanding of statistics by examining how selected data can be used to draw conclusions, make predictions, and compare populations. In earlier grades students used data, both categorical and measurement, to answer simple statistical questions, but paid little attention to how the data were selected. A focus in this unit is the process of selecting a random sample, and the value of doing so. Students realize that conclusions drawn from random samples generalize beyond the sample to the population from which the sample was selected, but a sample statistic is only an estimate of a corresponding population parameter and there will be some discrepancy between the two. Understanding variability in sampling allows the investigator to gauge the expected size of that discrepancy. Students will explore the variability in samples by means of simulation.

Essential Questions:	Enduring Understandings:
1. How are probability and the likelihood of an occurrence related and represented? 2. How is probability approximated? 3. How is a probability model used? 4. How are probabilities of compound events determined? 5. How can two data distributions be compared? 6. How can statistics be used to gain information about a sample population? 7. How can a random sample of a larger population be used to draw inferences?	1. The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. 2. The probability of a chance event is approximated by collecting data on the chance process that produces it, observing its long-run relative frequency, and predicting the approximate relative frequency given the probability. 3. A probability model, which may or may not be uniform, is used to find probabilities of events. 4. Various tools are used to find probabilities of compound events. (Including organized lists, tables, tree diagrams, and simulations.) 5. Statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a

Essential Questions:	Enduring Understandings:
	sample are valid only if the sample is representative of that population. 6. Random sampling tends to produce representative samples and support valid inferences. 7. Two data distributions can be compared using visual and numerical representations based upon measures of center and measures of variability to draw conclusions.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **Secondary(Supportive):** **7.SP.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. **7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of	• Students will be able to develop a probability model and use it to find probabilities of events and utilize organized lists, tables, tree diagrams, or simulation to find the probability of compound events. • Students will be able to use random sampling to draw inferences about populations and compare two populations using measuring of center and variability.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **experiment, outcomes, event, favorable outcome, probability, relative frequency, experimental probability, theoretical probability, sample space, Fundamental Counting Principle, compound event, independent events, dependent events, simulation, unbiased sample, biased sample** • Identify and count the outcomes of experiments. • Understand the concept of probability and the relationship between probability and likelihood. • Find probabilities of events. • Find relative frequencies. • Interpret experimental probabilities to make predictions. • Use theoretical probabilities to find quantities. • Compare experimental and theoretical probabilities • Construct tree diagrams, tables or use a formula to find the number of possible outcomes. • Calculate probabilities of compound events. • Design a simulation to find probabilities of

Relevant Standards:	Learning Goals:	Learning Objectives:
a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. **7.SP.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable. **7.SP.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book. **7.SP.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.		compound events. • Determine when samples are representative of populations. • Identify patterns in data from random samples to make predictions about populations. • Make predictions about populations using multiple samples. • Compare populations using measures of center and variation. • Compare populations using random samples.

Relevant Standards:	Learning Goals:	Learning Objectives:
Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. **7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. **7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. b. Develop a probability model (which may not		

Relevant Standards:	Learning Goals:	Learning Objectives:
be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies? **7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood? **<u>Standards of Mathematical Practice:</u>** 1. Make sense of problems and persevere in solving them.		

Relevant Standards:	Learning Goals:	Learning Objectives:
2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.		

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments **Learning Tasks & Formative Assessment Lessons** *(N-Novice, A-Apprentice, E-Expert)* **Probability Tasks**	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests, Simulation Project	Task: 7.SP.2 Task:7.SP.3 Task: 7.SP.4 Task: 7.SP.5 Task: 7.SP.6 Task:7.SP.7	• Department Developed Quizzes • Department Developed Unit Test

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
• Lottery (E) • Charity Fair (A) • Card Game (A) • Spinner Bingo (E) • 7.SP Stay or Switch? • 7.SP Rolling Dice • 7.SP.6 Tossing Cylinders • 7.SP.6 Heads or Tails • 7.SP Rolling Dice • 7.SP.7a How Many Buttons? • 7.SP Waiting Times • 7.SP Rolling Twice • 7.SP Red, Green, or Blue? • 7.SP Sitting across from Each Other • 7.SP.8 – Tetrahedral Dice • 7.SP Sitting across from Each Other • 7.SP.8 – Tetrahedral Dice **Statistic Tasks** • Counting Trees (E) • Candy Bar (E) • Temperatures (A) • 7.SP Estimating the Mean State Area • 7.SP Election Poll, Variation 2 • 7.SP Election Poll, Variation 3 • 7.SP Election Poll, Variation 1 • 7-SP Mr. Brigg's Class Likes Math • 7.SP.2 – Valentine Marbles • 7.SP.3,4 – Offensive Linemen • 7.SP.3,4 – College Athletes • 7.SP.3,4 – Offensive Linemen • 7.SP.3,4 – College Athletes			

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
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Possible Instructional Modifications /Accommodations/Differentiation:
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Unit Vocabulary:
Essential: experiment, outcomes, event, favorable outcome, probability, relative frequency, experimental probability, theoretical probability, sample space, Fundamental Counting Principle, compound event, independent events, dependent events, simulation, unbiased sample, biased sample, interquartile range (IQR), Mean Absolute Deviation (MAD) **Non-Essential:** fraction, decimal, percent, ratio, equally likely, more likely, less likely, fair, unfair, possible, statistics, box and whisker plot, quartile, mean, median, mode, range, plots, similar, overlap, random, distribution, skewed distribution, prediction, simplest form

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1,* *LA.6-8.CCSS.ELA-Literacy.CCRA.W.1*	Technology: ➢ Online Practice o Sumdog.com o ArcademicSkillBuilders.com	____ Global Awareness __✓__ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial	__✓__ Creativity & Innovation ____ Media Literacy __✓_ Critical Thinking and Problem Solving

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	➢ Online Interactives o Interactive Spinner o Coin/Dice Simulator o Virtual Odd Dice o SKUNK Game-Probability o Compare Theoretical/Experimental Visual o Probability Games o More Probability Games/Experiments o Rock, Paper, Scissors Activity o The Game of Pig-Probability o Let's Make a Deal Game o Finding Outcomes o Independent & Dependent Events o Independent Events o Marble Outcomes o Card Flip ➢ Video Resources o Three Act Lesson: Starburst Probability Video o BBC Bite Size-Probability & Data o Probability-Independent & Dependent o LearnZillion Prob/Stat Video Lessons ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids	Literacy __✓__ Health Literacy	__✓__ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓__ Communication & Collaboration __✓__ Information Literacy

Resources:

Texts/Materials: Big Ideas Math (Red) – Chapter 10
Resources from Other States:
Dept. of Ed Georgia - Unit 4 Tasks
Dept. of Ed Georgia - Unit 6 Tasks
Engage NY – Module 5

Major Assignments (required): Unit 7 Test
Major Activities (required):

Unit: 8 – Two Dimensional Geometry – Constructions & Circles	Recommended Duration: 4 weeks – May
By Grade 7, students' competencies in shape composition and decomposition should be highly developed. These competencies form the foundation for understanding multiplication, formulas for area and volume. The focus of this unit will allow students to begin reasoning about relationships among two-dimensional figures using scale and informal geometric constructions, and gain familiarity with the relationships between angles formed by intersecting lines. Students solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles, quadrilaterals and polygons. The skills and concepts attained in this unit will prepare students for work on congruence and similarity in grade 8. This will lead to readiness to understand and apply the Pythagorean Theorem.	

Essential Questions:	Enduring Understandings:
1. How are forms and objects created or represented? 2. How are specific characteristics and a classification system useful in analyzing and designing structures? 3. How does our understanding of geometry help us to describe real-world objects? 4. What is pi? How does it relate to the circumference and diameter of a circle? 5. What strategies can be used to find area of regular and irregular polygons without having a specific formula?	1. Real world and geometric structures are composed of shapes and spaces with specific properties. 2. Shapes are defined by their properties. 3. Shapes have a purpose for designing structures.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **Secondary(Supportive):** **7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. **7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. **7.G.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. *(in Unit 8 - area of circles)*	• Students will be able to use facts about supplementary, complementary, vertical, and adjacent angles to write and solve simple equations for an unknown angle in a figure and use angles to construct geometric shapes. • Students will understand and be able to find the circumference and area of circles and the area of composite figures.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **adjacent angles, vertical angles, congruent angles, complementary angles, supplementary angles, congruent sides, kite, circle, center, radius, diameter, circumference, pi, semicircle, composite figure.** • Identify adjacent and vertical angles. • Calculate angle measures using adjacent and vertical angles. • Classify pairs of angles as complementary, supplementary or neither. • Find angle measures using complimentary and supplementary angles. • Construct triangles with given angle measures. • Construct triangles with given side lengths. • Understand that the sum of the angle measures of any triangle is 180^{o}. • Fins the missing angle measures in triangles. • Understand that the sum of the angle measures of any quadrilateral is 360^{o}. • Calculate the missing angle measures in quadrilaterals. • Construct quadrilaterals. • Describe a circle in terms of radius and diameter. • Understand the concept of pi. • Find circumferences of circles and perimeters of semicircles. • Find perimeters of composite figures. • Calculate area of circles and semicircles. • Apply concepts to find areas of composite figures and solve real-life problems.

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

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	Triangular Frameworks (Expert)	• Department Developed Quizzes • Department Developed Unit Test • Unit 8 Learning Menu

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Assignments **Learning Tasks & Formative Assessment Lessons** *(Illustrative Mathematics Tasks)* • Measuring the Area of a Circle • The Circumference of a Circle and the Area of the Region it Encloses • Eight Circles • Measuring the area of a circle • Designs • Stained Glass •			

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling ***(See Performance Tasks above)***, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds ***(see Formative Assessment Links Above)***, Using Manipulatives and Other Tools (graph paper, life-size angles, protractor, ruler, shape blocks), Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (measuring angles, drawing angles, classifying two-dimensional shapes, squaring numbers, using order of operations), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: adjacent angles, vertical angles, congruent angles, complementary angles, supplementary angles, congruent sides, kite, circle, center, radius, diameter, circumference, pi, semicircle, composite figure **Non-Essential:** Area, Polygon, Triangle, Angle, Right Angle, Obtuse Angle, Degrees, Acute Angle, Angle Measure, Line Segment

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E* 21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	Technology: ➢ Online Practice o Sumdog.com o ArcademicSkillBuilders.com ➢ Online Interactives o Angles Polygon Capture Game The Polygon Song Similar Triangles Rap o Angles Jeopardy o Identify Shapes - Game o Classify Triangles - Game Lines, Rays, and Segments Review - Game o Missing Length of Triangles and Quadrilaterals o Name, Measure, and Classify Angles ➢ Video Resources o Types of Angles o Complementary and Supplementary Angles o Vertical and Adjacent Angles o Draw Angles o Use Circumference to solve for Area o Find Circumference of a Circle	____ Global Awareness ____ Civic Literacy __✓__ Financial, Economic, Business, & Entrepreneurial Literacy ___ Health Literacy	__✓__ Creativity & Innovation ____ Media Literacy __✓_ Critical Thinking and Problem Solving _✓___ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓_ Communication & Collaboration __✓___ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
	o Find Area of a Circle o Use Area to Solve for Circumference o Area of Composite Figures o Find Missing Side of Composite Figures ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids		

Resources:
Texts/Materials: Big Ideas Math (Red) – Chapter 7 and Chapter 8 (except 7.5) Resources from Other States: Dept. of Ed Georgia - Unit 5 Tasks Engage NY – Module 6 **Major Assignments (required):** Unit 8 Test **Major Activities (required):** Unit 8 Learning Menu

Unit: 9 – Surface Area and Volume	Recommended Duration: 3 weeks – June
In this unit, students analyze, compose and decompose polyhedral solids. As a precursor for learning to describe cross- sections of three-dimensional figures, students use drawings and physical models to learn to identify parallel lines in three-dimensional shapes, as well as lines perpendicular to a plane and lines parallel to a plane. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. Students solve real-world and mathematical problems involving surface area of objects composed of triangles, quadrilaterals, polygons and volume of three-dimensional objects composed of cubes and right prisms.	

Essential Questions:	Enduring Understandings:
1. How are two-dimensional and three-dimensional space related? 2. How does our understanding of geometry help us to describe real-world objects? 3. How can the concepts of surface area and volume be used to solve problems? 4. How can you find surface area of prisms, pyramids, and cylinders? 5. How can you find volume of prisms and pyramids?	1. Three-dimensional figures have relationships to specific two-dimensional figures. 2. Real-world problems can be solved that involve surface areas and volumes of objects composed of prisms, pyramids, and cylinders. 3. Formulas can be used to find the volume of prisms and pyramids.

Relevant Standards:	Learning Goals:	Learning Objectives:
Content Standards: **Primary(Power):** **Secondary(Supportive):** **7.G.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	• Students will be able to solve real-world and mathematical problems involving the surface area and volume of prisms and pyramids.	• Communicate precisely using appropriate mathematical language. The terms students learn to use with increasing precision within this unit are: **lateral surface area, prism, rectangular prism, triangular prism, surface area, base, faces, regular pyramid, slant height, cylinder, volume, cross section** • Represent three-dimensional solids using two-dimensional nets. • Find surface area of rectangular and triangular prisms.

Relevant Standards:	Learning Goals:	Learning Objectives:
7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. **Standards of Mathematical Practice:** 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.		• Find surface area of rectangular pyramids. • Find surface area of cylinders. • Find volume of prisms. • Find volume of pyramids. • Describe the intersection on planes and solids. • Solve real-life problems involving three-dimensional figures.

Formative Assessments	Summative Assessments	Performance Assessments:	Major Activities/ Assignments (required):
Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Student Progress Charts & Reflections, Constructive Quizzes, My Favorite No, Classroom Shuffle, Math "Debates", Sorting Tasks, Class Survey & Defend Your Answer, Comments Only Marking, Learning Menu and Choice Assignments **Learning Tasks & Formative Assessment Lessons** *(Illustrative Mathematics Tasks)* • Cube Ninjas • Drinking the Lake • Sand Under the Swing Set	Unit Tests, Extended Constructed Responses Questions, Projects, Quizzes, Graded Homework, Summative Tests	• Octagon Tile • Roman Mosaic • Fearless Frames • Sports Bag • Yum-Yum Performance Task	• Department Developed Quizzes • Department Developed Unit Test

Possible Assessment Modifications /Accommodations:
Provide Formulas, Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices, Extended Time, Small Group Setting, Rephrase Questions, Reword Problems, Read Question and/or Answer Choices, Provide Examples within Assessment, Alternate Testing Location, Reference Sheet

Instructional Strategies (refer to *Robert Marzano's* 41 Elements):
Choice Assignments & Menus, Math Stations, Four Square (Frayer Model Graphic Organizer), Guided Practice, Four Corners, Modeling ***(See Performance Tasks above)***, Neighbor Check, Peer Experts/Coaches, Think-Pair-Share, Cooperative Groups, Differentiation, Instructional Scaffolds ***(see Formative Assessment Links Above)***, Using Manipulatives and Other Tools (shape nets, three dimensional shape models, measuring tools), Re-teaching after a Check for Understanding, Surveys, Making Cross-Curricular Connections, Celebrating Success, Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Graphic Organizers, Vocabulary Reviews, Examining Errors in Reasoning ("My Favorite No"), Technology to Enhance Instruction (***see resources below***), Video Clips, Content-Related Songs, Exit Slips, Turn to Your Partner, SLOT (Spaced Learning Over Time, i.e. Fair Game Reviews), Using Standards of Mathematical Practice

Possible Instructional Modifications /Accommodations/Differentiation:
Individualized Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (writing ratios, fractions, decimals, percents), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: lateral surface area, prism, rectangular prism, triangular prism, surface area, base, faces, regular pyramid, slant height, cylinder, volume, cross section **Non-Essential:** edges, vertices, faces, height, cubic units, cube, solid, plane, intersection,

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA**:** *LA.6-8.CCSS.ELA-Literacy.CCRA.R.1, LA.6-8.CCSS.ELA-Literacy.CCRA.W.1* Technology: *TEC.5-8.8.1.8.A, TEC.5-8.8.1.8.E*	Technology: ➢ Online Practice o Sumdog.com o ArcademicSkillBuilders.com ➢ Online Interactives o Volume Shape Shoot - Game o Volume/Surface Area Interactive -Game	_✓__ Global Awareness __✓__ Civic Literacy ____ Financial, Economic, Business, & Entrepreneurial Literacy _✓__ Health Literacy	__✓__ Creativity & Innovation ____ Media Literacy _✓_ Critical Thinking and Problem Solving _✓___ Life and Career Skills __✓__ Information & Communication Technologies Literacy __✓ Communication & Collaboration

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
21st Century Life and Careers: *9.1.4.A.1, 9.1.4.A.5, 9.1.12.A.1, 9.1.8.A.2, 9.1.4.B.1, 9.1.8.B.1*	o Surface Area Review - Game o Choose Appropriate Net - Interactive ➢ Video Resources o Surface Area Triangular Prism o Analyze Triangular Prisms o Surface Area Rectangular Prism o Analyze Rectangular Prisms o Volume of a Rectangular Prism o Identify and Label 3D figures ➢ BrainPop ➢ LearnZillion ➢ Khan Academy ➢ Math Dictionary for Kids		__✓__ Information Literacy

Resources:

Texts/Materials: Big Ideas Math (Red) – Chapter 9
Resources from Other States:
Dept. of Ed Georgia - Unit 5 Tasks
Engage NY – Module 6

Major Assignments (required): Unit 9 Test
Major Activities (required):