7.RP Ratios and Proportional Relationships

☐ Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. (7.RP.A.1)

☐ Recognize and represent proportional relationships between quantities. (7.RP.A.2)

☐ Use proportional relationships to solve multistep ratio and percent problems. Use proportional relationships to solve multistep ratio and percent problems. (7.RP.A.3)

Essential Questions	**Enduring Understandings**
How do you know when to use ratios? What determines an appropriate representation of a number? How is the probability of an event determined and described? Does changing the scale affect how data is communicated? Are there advantages and disadvantages in ways that data is presented? How are quadratic functions graphed?	Fractions, decimals, and percents can be used interchangeably; Fractions, decimals, and percents express a relationship between two numbers; Data representation is not always accurate.
Suggested Activities and Resources (in addition to guided reading and leveled materials)	**Suggested Assessments**
Literature Connection: *If you Hopped Like a Frog* (Schwartz, 1999) – contains 12 situations that use proportional reasoning to determine what it would be like if people had the powers or dimensions of various familiar animals;	Students take turns, take a picture, & name the use(s) of number that are depicted. Then ask the other students to signal if they agree or disagree, or see another use depicted; Create a set of pictures showing the different uses of number (or you can use pictures already created or cut out of magazines by students).

7.NS The Number System

- ☐ Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers (7.NS.A.1)
- ☐ Represent addition and subtraction on a horizontal or vertical number line diagram. (7.NS.A.1)
- ☐ Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (7.NS.A.2)
- ☐ Solve real-world and mathematical problems involving the four operations with rational numbers. (7.NS.A.3)

Essential Questions	**Enduring Understandings**
How does expressing numbers in different forms make your mathematical life easier? When is it appropriate to use fractions? How does the knowledge of GCF and LCM help in comparing fractions? How are variables used in math and life? Why are mathematical rules necessary?	Data representation is not always accurate; Different ways of representing numbers; Math gives us the skills to solve problems effectively.
Suggested Activities and Resources **(in addition to guided reading and leveled materials)** Provide ongoing opportunities for students to solve a given problem using more than one computational method; Challenge students to apply the same rule when using any computational method—if you use it, you must understand why it works & be able to explain what you did	**Suggested Assessments** During/after appropriate activities, ask students to explain the rationale they used as they completed the task & why this makes sense out of the math at hand;

7.EE Expressions and Equations

☐ Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. (7.EE.A.1)

☐ Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. (7.EE.A.2)

☐ Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form tools strategically. (7.EE.B.3)

☐ Apply properties of operations to calculate with numbers in any form. (7.EE.B.3)

☐ Convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (7.EE.B.3)

☐ Use variables to represent quantities in a real-world or mathematical problem. (7.EE.B.4)

☐ Construct simple equations and inequalities to solve problems by reasoning about the quantities. (7.EE.B.4)

Essential Questions	Enduring Understandings
How does solving equations help us problem solve in real life? In what situations would you use an inequality rather then an equation? What is the purpose of estimation? What determines a reasonable estimation for a given situation?	Algebraic representations can be used to solve real-life problems; Computational estimations produce approximate results; There are many procedures to problem solving.
Suggested Activities and Resources **(in addition to guided reading and leveled materials)** Fraction Notation -- instead of focusing on having students memorize the terms, focus them on investigating the functions of the numerator & denominator - What does the top number in a fraction tell us? What does the bottom number in a fraction tell us? *(it tells what's being counted)*	**Suggested Assessments** Students match the correct picture to an oral description. Example - Which picture show a half of a candy bar? Which show a whole candy bar?

7.G Geometry

- ☐ Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. (7.G.A.1)

- ☐ Draw geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. (7.G.A.2)

- ☐ Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. (7.G.A.3)

- ☐ Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. (7.G.B.4)

- ☐ Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. (7.G.B.5)

- ☐ 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. (7.G.B.6)

Essential Questions	**Enduring Understandings**
Why do we study geometry? How do patterns help us interpret the world around us? Where do we see patterns?	Points, lines, and planes are the foundations of geometry; All geometric figures have properties that make them unique; Understanding these properties can help us solve problems in the real world.
Suggested Activities and Resources **(in addition to guided reading and leveled materials)** Challenge students with "if-then" or "true-false" reasoning; Pass around models of 3-D shapes. Ask students questions relative to (a) characteristics of particular types of shapes & (b) similarities & differences among shapes. Also have them find real-life examples of the various shapes; Instructional activities relative to points, lines, line segments, rays, & angles should focus on helping students develop a growing under-standing of them & of geometric applications relative to them. ; Teacher Resource: *Creative Constructions* by S. Schadler	**Suggested Assessments** Ongoing observation, questioning, & review of student work in order to determine pupil progress relative to –identifying & describing relation-ships for 2 or more objects in space, which characteristics students can use without prompting, use of appropriate language when describing/ discussing geometric shapes/relationships

7.SP   Statistics and Probability

- ☐ Understand that statistics can be used to gain information about a population by examining a sample of the population. (7.SP.A.1)
- ☐ Understand that random sampling tends to produce representative samples and support valid inferences. (7.SP.A.1)
- ☐ Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. (7.SP.A.2)
- ☐ Generate multiple samples of the same size to gauge the variation in estimates or predictions. (7.SP.A.2)
- ☐ Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities (7.SP.B.3)
- ☐ Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. (7.SP.B.4)
- ☐ Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. (7.SP.C.5)
- ☐ Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency. (7.SP.C.6)
- ☐ Predict the approximate relative frequency given the probability. (7.SP.C.6)
- ☐ Develop a probability model and use it to find probabilities of events. (7.SP.C.7)
- ☐ Compare probabilities from a model to observed frequencies. (7.SP.C.7)
- ☐ Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. (7.SP.C.8)

Essential Questions	Enduring Understandings
What are some ways to organize data? Are there advantages and disadvantages in ways that data is presented? How is the probability of an event determined and described? Why make predictions? Does changing the scale affect how data is communicated?	The expected outcome of an event might actually happen in the future; The probability is the mathematics of chance; Data representation is not always accurate; Statistical measures provide a numeric picture of the shape of the data.
Suggested Activities and Resources **(in addition to guided reading and leveled materials)** Use a leveling perspective to help students gain a better understanding of one interpretation of the "mean" – have students make cube towers of different heights to record data, then have students manipulate & level the cubes to ascertain the mean. This can then be connected to the standard averaging paper-and-pencil procedure.	**Suggested Assessments** Ongoing observation & questioning in order to ascertain group & individual pupil progress in - understanding the data collection & analysis process, constructing meaning for terms & concepts related to data collection & analysis, constructing meaning for & applying measures