Year at a Glance: Math - Gr. 7 Student Learning Objectives Clustered by Unit

DOCUMENT KEY: WALT (That) ... indicates a concept. WALT (To) ... indicates a skill.

Key	
	Focus - Explicit Instruction and Assessment
	Revisited and Reinforced
	Not Addressed in the Unit

			Unit 1		Unit 2			Unit 3			Unit 4	
			Operations with Rational Numbers		Equations, Inequalities, and Two-Dimensional Geometric Concepts			Proportionality and Three-Dimensional Geometric Concepts			Probability and Statistics	
NJSLS	**SLO**	**Units**	**1A**	**1B**	**2A**	**2B**	**2C**	**3A**	**3B**	**3C**	**4A**	**4B**
RATIOS and PROPORTIONAL RELATIONSHIPS												
7.RP.A.1	WALT compute unit rates involving ratios of fractions (complex fractions) in											
7.RP.A.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.	WALT decide whether two quantities show a proportional relationship by testing for equivalent ratios in a table											
	WALT decide whether two quantities show a proportional relationship by graphing on a coordinate plane and observing whether the graph is a straight line through the origin											
	WALT identify the constant of proportionality (unit rate) in equations and verbal descriptions of proportional relationships											
	WALT identify the constant of proportionality (unit rate) in tables, graphs, and diagrams											
	WALT represent proportional relationships by equations using the constant of proportionality (unit rate)											
	WALT explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate											
7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	WALT solve multistep ratio and percent problems using proportional											
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	WALT solve multistep ratio and percent problems using proportional											
THE NUMBER SYSTEM												
to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts.	WALT apply previous understandings of addition to add rational numbers											
	WALT describe situations in which opposites combine to make zero											
	WALT show by modeling, a number and its opposite have a sum of zero											
	WALT p + q is the number located a distance $\|q\|$ from p, in the positive or											
	WALT represent addition and subtraction of signed rational numbers on a											
	WALT interpret sums of rational numbers in real world situations											
	WALT apply previous understandings of subtraction to subtract rational											
	WALT subtraction of rational numbers is the same as adding the additive											
	WALT show by modeling on a number line that the distance between two											
	WALT apply properties of operations as strategies to add and subtract rational											

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7.NS.A.2 Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers. 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. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If *p* and *q* are integers, then *-(p/q) = (-p)/q = p/(-q)*. Interpret quotients of rational numbers by describing real world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	WALT apply previous understandings of multiplication of fractions to multiply signed rational numbers											
	WALT operations on signed rational numbers continue to satisfy the properties of operations											
	WALT the distributive property, leading to products such as *(-1)(-1) = 1* and the rules for multiplying signed numbers											
	WALT interpret the products of signed rational numbers in real world situations											
	WALT apply previous understandings of division of fractions to divide signed rational numbers											
	WALT integers can be divided as long as the divisor is not zero											
	WALT division of integers results in a signed rational number											
	WALT If *p* and *q* are integers, then *-(p/q) = (-p)/q = p/(-q)*											
	WALT interpret quotients of signed rational numbers by describing real world contexts											
	WALT apply properties of operations as strategies to multiply and divide signed rational numbers											
	WALT convert a rational number to a decimal using long division											
	WALT the decimal form of a rational number terminates in zeros or eventually repeats											
7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.	WALT solve real-world and mathematical problems involving the four											
	WALT solve real-world and mathematical problems involving the four											
EXPRESSIONS and EQUATIONS												
7.EE.A.1	WALT apply the properties of operations as strategies to add, subtract, factor,											
7.EE.A.2	WALT rewriting an expression in different forms can clarify the problem and											
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.	WALT convert between forms (fractions, decimals, and whole numbers) as											
	WALT apply the properties of operations to calculate with numbers in any form when solving multi-step real-life and mathematical problems, and assess the reasonableness of answers using mental computation and estimation strategies											
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?* 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.	WALT solve world problems by reasoning about their quantities and											
	WALT compare an algebraic solution to an arithmetic solution, identifying the											
	WALT solve equations of the form *px + q = r* and *p(x + q) = r*, where *p, q,* and											
	WALT solve world problems by reasoning about their quantities and											
	WALT use variables to represent unknown quantities in mathematical problems											
	WALT describe the solution of an inequality using a graph and inequality statement and interpret its meaning in the context of the problem											

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GEOMETRY												
7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	WALT solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale											
7.G.A.2 Draw (with technology, with ruler and protractor, as well as freehand) 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.	WALT draw geometric shapes with given conditions with technology, with											
	WALT construct triangles from three measures of angles or sides using											
	WALT construct triangles from three measures of angles or sides using rulers											
7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	WALT describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids											
7.G.B.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.	WALT know the formulas for area and circumference of a circle											
	WALT solve problems using the formula for circumference of a circle and for											
	WALT informally derive the relationship between the circumference and area											
7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	WALT supplementary angles are two angles whose sum is 180 degrees and complementary angles are two angles whose sum is 90 degrees											
	WALT vertical angles, the pairs of opposite angles made by two intersecting											
	WALT adjacent angles are two angles that share a vertex and a side											
	WALT use facts about supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure											
7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	WALT solve real-world and mathematical problems involving volume and											
	WALT solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles, quadrilaterals, and polygons											
STATISTICS and PROBABILITY												
7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	WALT statistics is used to gain information about a population by examining a sample of the population											
	WALT generalizations about a population from a sample are valid only if the sample is representative of that population											
	WALT random sampling tends to produce representative samples of the population and support valid inferences											

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7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	WALT use data from a random sample to make inferences about a population with an unknown characteristic											
	WALT generate multiple samples, or simulated samples, of the same size to gauge variation in estimates or predictions											
7.SP.B.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.*	WALT informally gauge the extent of visual overlap between two numerical distributions with similar variabilities, measure the difference between the centers and express the difference as a multiple of the measure of variability											
7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *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.*	WALT draw informal comparative inferences about two populations by using the measures of center (mean and median) and measures of variability (interquartile range and mean absolute deviation) from random samples**											
7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	WALT the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event											
7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *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.*	WALT approximate the probability of a chance event by collecting data on the chance process that it produces observing long run relative frequency											
	WALT predict the approximate relative frequency											
7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	WALT develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events											

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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 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?*	WALT develop a probability model, which may not be uniform, by observing frequencies in data generated from a chance process											
	WALT compare probabilities from a model to observed frequencies and explain possible sources of the discrepancy if the agreement is not good											
7.SP.C.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?*	WALT the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs											
	WALT represent the sample space for a compound event using various methods such as, organized lists, tables, and tree diagrams											
	WALT identify the outcomes in the sample space which compose an event that has been described in everyday language											
	WALT design and use a simulation to generate frequencies for compound events											