Grade 7 Math: Instructional Focus and Fluency

Transitioning to the NYS Next Generation Math Learning Standards for Grades K-8, Effective September 2022

Instructional Focus	Developmental Focus	Instructional Consideration (via Standards)

Develop understanding of and applying proportional relationships develop understanding of proportionality to solve single- and multi-step problems.	➤ Use ratios and proportionality to solve a wide variety of percent problems
	   ➢simple interest
	   ➢tax
	   ➢markups and markdowns
	   ➢gratuities and commissions
	   ➢percent increase/decrease, percent error
	
	➤ Solve problems about scale drawings (corresponding lengths between the objects/relationships of lengths within an object are preserved in similar objects)
	   ➤ ratios of lengths, areas
	   ➤ ratio of quantities measured in like/different units (including across measurement systems).
	
	➤ Graph proportional relationships, understand unit rate informally as a measure of the steepness of the related line
	   ➤ identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal descriptions
	
	➤ Differentiate between proportional and nonproportional relationships
	   ➤ test for equivalence through tables and graphs
		NY-7.RP.1 Compute unit rates associated with ratios of fraction.
		
		NY-7.RP.2 Recognize and represent proportional relationships between quantities.
		
		NY-7.RP.3 Use proportional relationships to solve multistep ratio and percent problems.

Instructional Focus	Developmental Focus	Instructional Consideration (via Standards)

Develop understanding of operations with rational numbers and working with expressions and linear equations.	➤ Recognize fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers
	
	➤ Extend addition, subtraction, multiplication, and division to all rational numbers
	  ➢ 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.
	  ➢ understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$.
	
	➤ Explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers
	  ➢ apply properties of operations (particularly the distributive property) as strategies to add, subtract, multiply and divide rational numbers.
	  ➢ If p and q are integers, then
	    $-(\frac{p}{q}) = \frac{-p}{q} = \frac{p}{-q}$.
	  ➢ interpret answers by describing real-world contexts.
		NY-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.
		
		NY-7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
		
		NY-7.NS.2d Convert a fraction to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
		
		NY-7.EE.1 Add, subtract, factor, and expand linear expressions with rational coefficients by applying the properties of operations.
		
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Instructional Focus	Developmental Focus	Instructional Consideration (via Standards)
Develop understanding of operations with rational numbers and working with expressions and linear equations continued…	➤ Using rational numbers, formulate expressions and equations in one variable and use these equations to solve problems ➢ *If a woman making $25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or $2.50, for a new salary of $27.50.* ➢ *If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar <u>about</u> 9 inches from each edge; this estimate can be used as a check on the exact computation."*	**NY-7.EE.3** Solve multi-step real-world 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. Assess the reasonableness of answers using mental computation and estimation strategies

Draw inferences about populations based on samples.	➤ Compare two data distributions and address questions about differences between populations
	     ➢ examine degree of visual overlap
	
	 ➤ Work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences
	     ➢ interpret (not construct) box-plots that may contain outliers
	
	 ➤ Calculate probabilities of compound events
	     ➢ know that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs
	     ➢ use organized lists, tables, tree diagrams, and simulations to represent sample spaces for compound events
		NY-7.SP.1 Construct and interpret box-plots, find the interquartile range, and determine if a data point is an outlier.
		
		 NY-7.SP.4 Use measures of center and measures of variability for quantitative data from random samples or populations to draw informal comparative inferences about the populations.
		
		 NY-7.SP.8 Find probabilities of compound events using organized lists, sample space tables, tree diagrams, and simulation.

Fluency	Fluency development	Fluency Standard
Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are rational numbers. Solve equations of these forms fluently (*procedural*).	➤ Students may need to simplify and/or combine like terms on the same side of an equation. ➤ Students will need practice constructing equations from word problems.	**NY-7.EE.4a** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are 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.