

Grade 6 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)
Connect ratio and rate to whole number multiplication and division and use concepts of ratio and rate to solve problems.	<ul style="list-style-type: none"> ▶ Understand equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table ▶ Analyze simple drawings indicating the relative size of quantities ▶ Solve real and mathematical problems including: <ul style="list-style-type: none"> ➢ unit rate problems ➢ percent of a quantity as a rate per 100 ➢ finding the whole given a part and the percent ➢ finding a part of a whole given the percent ➢ convert of units within a given measurement system 	<p>NY-6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</p> <p>NY-6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems.</p>
Complete understanding of division of fractions and extend the notion of number to the system of rational numbers, which includes negative numbers.	<ul style="list-style-type: none"> ▶ Explain why the procedures for dividing fractions make sense <ul style="list-style-type: none"> ➢ Include word problems ▶ Extend previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers/negative integers 	<p>NY-6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.</p> <p>NY-6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.</p>

Instructional Focus	Developmental Focus	Instructional Consideration (via Standards)
<p><i>Complete understanding of division of fractions and extend the notion of number to the system of rational numbers continued...</i></p>	<ul style="list-style-type: none"> ▶ Write, interpret, explain order of rational numbers in real world contexts <ul style="list-style-type: none"> ➤ use inequalities to determine position of rational numbers ➤ understand absolute value as the distance from zero ▶ Identify/plot the location of points on a coordinate plane 	<p>NY-6.NS.7 Understand ordering and absolute value of rational numbers.</p> <p>NY-6.NS.6 Understand a rational number as a point on the number line. Use number lines and coordinate axes to represent points on a number line and in the coordinate plane with negative number coordinates.</p>
<p>Write, interpret, and use expressions and equations.</p>	<ul style="list-style-type: none"> ▶ Use variables to represent an unknown <ul style="list-style-type: none"> ➤ identify the parts of an expression: coefficient, sum, difference, product, factor, quotient ▶ Use the properties of operations to rewrite and evaluate expressions in equivalent forms 	<p>NY-6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.</p> <p>NY-6.EE.3 Apply the properties of operations to generate equivalent expressions.</p> <p>NY-6.EE.4 Identify when two expressions are equivalent.</p>
<p><i>Write, interpret, and use expressions and equations continued...</i></p>	<ul style="list-style-type: none"> ▶ Solve simple one-step equations using properties of equality <div data-bbox="562 959 1157 1414" style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Analogous arithmetical and algebraic solutions</p> <p>J. bought three packs of balloons. He opened them and counted 12 balloons. How many balloons are in a pack?</p> <p><i>Arithmetical solution</i> If three packs have twelve balloons, then one pack has $12 \div 3 = 4$ balloons.</p> <p><i>Algebraic solution</i> Defining the variable: Let b be the number of balloons in a pack. Writing the equation: $3b = 12$ Solving (mirrors the reasoning of the numerical solution): $3b = 12 \rightarrow \frac{3b}{3} = \frac{12}{3}$ $b = 4.$</p> </div>	<p>NY-6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem. Understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</p> <p>NY-6.EE.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$; $x - p = q$; $px = q$; and $\frac{x}{p} = q$ for cases in which p, q, and x are all nonnegative rational numbers.</p>

Instructional Focus	Developmental Focus	Instructional Consideration (via Standards)
<p>Deepen understanding of area, surface area and volume.</p>	<ul style="list-style-type: none"> ▶ Use fractional side lengths for the volume of a right rectangular prism <ul style="list-style-type: none"> ➢ use area models to understand perfect squares and volume models to understand perfect cubes ▶ Find areas of polygons, surface areas of prisms 	<p>NY-6.G.2 Find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p>NY-6.G.1 Find the area of triangles, trapezoids, and other polygons by composing into rectangles or decomposing into triangles and quadrilaterals. Apply these techniques in the context of solving real-world and mathematical problems.</p>
<p>Develop understanding of simple probabilities and statistical thinking.</p>	<ul style="list-style-type: none"> ▶ Describe and summarize numerical data sets - identifying clusters, peaks, gaps, and symmetry <ul style="list-style-type: none"> ➢ measures of center are mean, median, and mode. The measure of variation is the range. ▶ <i>(POST-TEST)*</i> Understand the probability of a chance event and develop probability models for simple events <i>Example: The probability of rolling a six-sided fair number cube and landing on a 2 is $\frac{1}{6}$. The probability of landing on an even number is $\frac{3}{6}$.</i> 	<p>NY-6.SP.2 Understand that a set of quantitative data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</p> <p>NY-6.SP.3 Recognize that a measure of center for a quantitative data set summarizes all of its values with a single number while a measure of variation describes how its values vary with a single number.</p> <p>NY-6.SP.6 <i>(POST-TEST)*</i> Understand that the probability of a chance event is a number between 0 and 1 inclusive, that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p>

Fluency	Fluency development	Fluency Standard
Fluently (<i>procedural</i>) divide multi-digit numbers using a standard algorithm.	<ul style="list-style-type: none"> ▶ Understand how and why an algorithm works ▶ Students will need practice on selected problems to establish procedural fluency. 	NY-6.NS.2 Fluently divide multi-digit whole numbers using a standard algorithm.
Fluently (<i>procedural</i>) add, subtract, multiply, and divide multi-digit decimals using a standard algorithm for each operation.	<ul style="list-style-type: none"> ▶ Students are fluent in the steps involved in the algorithm and why the algorithm works. 	NY-6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm for each operation.

(POST-TEST) refers to standards content that is taught **after the NYS grade 3-8 assessment. This time typically occurs late April - June.*