

Welcome to Sixth Grade Mathematics!

Our journey through the NC revised 6th Grade Mathematics Standard Course of Study will include:

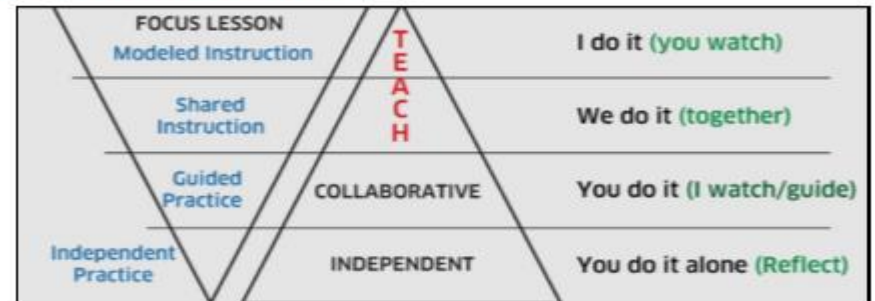
1. The planning of lessons organized by “conceptual” categories (or themes): **Ratios and Proportional Relationships, The Number System, Expressions and Equations, Geometry and Statistics and Probability**
2. Eight Mathematical Practices which are the behaviors (or habits of mind) that are developed to achieve mathematical proficiency throughout the school year.
3. Teacher implements the required “**I Do; We Do; You Do**” Instructional Approach (**Figure 1/Link**) and models concepts systematically & explicitly using the Concrete → Representational → Abstract Modeling Method (**Figure 2/Link**).

Road to Mastery Includes:

- Follow the 6th Grade Math Pacing Guide
(**Note: Number** means quarter taught; **X** means quarters NOT taught; **P** means performed in small group or independent practice to establish mastery and fluency)
- Instructional block consists of a minimum of 60 minutes
- Teacher clusters math standards to create 2-week units to accomplish all standards.
- Lesson plan includes whole group & daily small group instruction
- Appropriate hands-on manipulatives are utilized during guided practice
- Student engagement includes intellectually independent & collaborative computation & problem-solving tasks
- Data-driven Remediation Plan (includes scaffolding of content; direct instruction & anchor chart(s); use of other supplemental intervention resources)
- Daily 2-minute drills in building fluent retrieval of basic math algorithms
- Formative bi-weekly unit assessments: quizzes, tests
- Cumulative review prior to summative benchmark assessments

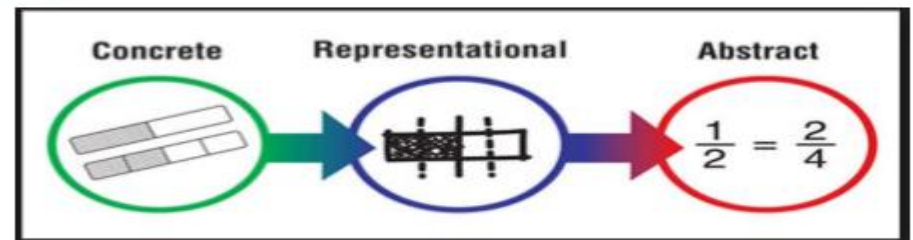
- All students must be able to conceptualize math concepts, follow procedural algorithms and apply essential understanding in the context of the learning; therefore, teachers are asked to consider the learners when selecting an approach to close academic gaps. The implementation of the required “**I Do; We Do; You Do**” (gradual release) instructional approach shown in “Figure 1/Link” ensures academic clarity in the processing of new content. The modeling of concepts systematically & explicitly using the:

Figure 1: I Do; We Do; You Do Instructional Approach



Link: <https://strategiesforspecialinterventions.weebly.com/i-do-we-do-you-do.html>

Figure 2: Concrete to Representational to Abstract Modeling Method



Link: <http://fcit.usf.edu/mathvids/strategies/category.html#teacher>

“Best regards for a successful school year!
“Charting a New Course”
Halifax County Schools
2018-2019 Curriculum Support Team

6th Grade At-a-Glance

Ratios and Proportional Relationships	Quarter			
Understand ratio concepts and use ratio reasoning to solve problems.	1	2	3	4
NC.6.RP.1 Understand the concept of a ratio and use ratio language to: <ul style="list-style-type: none"> Describe a ratio as a multiplicative relationship between two quantities. Model a ratio relationship using a variety of representations. 	X	2	P	P
NC.6.RP.2 Understand that ratios can be expressed as equivalent unit ratios by finding and interpreting both unit ratios in context	X	2	P	P
NC.6.RP.3 Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: <ul style="list-style-type: none"> Creating and using a table to compare ratios. Finding missing values in the tables. Using a unit ratio. Converting and manipulating measurements using given ratios. Plotting the pairs of values on the coordinate plane. 	X	2	P	P
NC.6.RP.4 Use ratio reasoning to solve real-world and mathematical problems with percents by: <ul style="list-style-type: none"> Understanding and finding a percent of a quantity as a ratio per 100. Using equivalent ratios, such as benchmark percents (50%, 25%, 10%, 5%, 1%), to determine a part of any given quantity. Finding the whole, given a part and the percent. 	X	2	P	P
The Number System	Quarters			
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	1	2	3	4
NC.6.NS.1 Use visual models and common denominators to: <ul style="list-style-type: none"> Interpret and compute quotients of fractions. Solve real-world and mathematical problems involving division of fractions 	X	2	P	P
Compute fluently with multi-digit numbers and find common factors and multiples	1	2	3	4
NC.6.NS.2 Fluently divide using long division with a minimum of a four-digit dividend and interpret the quotient and remainder in context.	1	P	P	P
NC.6.NS.3 Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.	1	P	P	P
NC.6.NS.4 Understand and use prime factorization and the relationships between factors to: <ul style="list-style-type: none"> Find the unique prime factorization for a whole number. Find the greatest common factor of two whole numbers less than or equal to 100. Use the greatest common factor and the distributive property to rewrite the sum of two whole numbers, each less than or equal to 100. Find the least common multiple of two whole numbers less than or equal to 12 to add and subtract fractions with unlike denominators. 	1	P	P	P
Apply and extend previous understandings of numbers to the system of rational numbers.	1	2	3	4
NC.6.NS.5 Understand and use rational numbers to: <ul style="list-style-type: none"> Describe quantities having opposite directions or values. Represent quantities in real-world contexts, explaining the meaning of 0 in each situation. Understand the absolute value of a rational number as its distance from 0 on the number line to: <ul style="list-style-type: none"> Interpret absolute value as magnitude for a positive or negative quantity in a real-world context. Distinguish comparisons of absolute value from statements about order 	1	P	P	P

<p>NC.6.NS.6 Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane.</p> <p>a. On a number line:</p> <ul style="list-style-type: none"> ○ Recognize opposite signs of numbers as indicating locations on opposite sides of 0 and that the opposite of the opposite of a number is the number itself. ○ Find and position rational numbers on a horizontal or vertical number line. <p>b. On a coordinate plane:</p> <ul style="list-style-type: none"> ○ Understand signs of numbers in ordered pairs as indicating locations in quadrants. ○ Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ○ Find and position pairs of rational numbers on a coordinate plane. 	1	P	P	P
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The Number System	Vetted: 8-23-2019			
Apply and extend previous understandings of numbers to the system of rational numbers.	Quarters			
	1	2	3	4
<p>NC.6.NS.7 Understand ordering of rational numbers.</p> <p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.</p> <p>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.</p>	1	P	P	P
<p>NC.6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.</p>	X	2	P	P
<p>NC.6.NS.9 Apply and extend previous understandings of addition and subtraction.</p> <ul style="list-style-type: none"> • Describe situations in which opposite quantities combine to make 0. • Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on the sign of q. Show that a number and its additive inverse create a zero pair. • Understand subtraction of integers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two integers on the number line is the absolute value of their difference. • Use models to add and subtract integers from -20 to 20 and describe real-world contexts using sums and differences. 	1	P	P	P
Expressions and Equations	Quarters			
Expressions and equations apply and extend previous understandings of arithmetic to algebraic expressions.	1	2	3	4
<p>NC.6.EE.1 Write and evaluate numerical expressions, with and without grouping symbols, involving whole-number exponents</p>	X	2	P	P
<p>NC.6.EE.2 Write, read, and evaluate algebraic expressions.</p> <ul style="list-style-type: none"> • Write expressions that record operations with numbers and with letters standing for numbers. • Identify parts of an expression using mathematical terms and view one or more of those parts as a single entity. • Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems 	X	X	3	P
<p>NC.6.EE.3 Apply the properties of operations to generate equivalent expressions without exponents</p>	X	X	3	P
<p>NC.6.EE.4 Identify when two expressions are equivalent and justify with mathematical reasoning.</p>	X	X	3	P
<p>NC.6.EE.5 Use substitution to determine whether a given number in a specified set makes an equation true</p>	X	X	3	P
<p>NC.6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem</p>	X	X	3	P
<p>NC.6.EE.7 Solve real-world and mathematical problems by writing and solving equations of the form:</p> <ul style="list-style-type: none"> • $x + p = q$ in which p, q and x are all nonnegative rational numbers; and, • $p \cdot x = q$ for cases in which p, q and x are all nonnegative rational numbers 	X	X	3	P

NC.6.EE.8 Reason about inequalities by: <ul style="list-style-type: none"> Using substitution to determine whether a given number in a specified set makes an inequality true. Writing an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognizing that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions. Representing solutions of inequalities on number line diagrams. 	X	X	3	P
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Expressions and Equations	Vetted: 11/15/18			
Represent and analyze quantitative relationships between dependent and independent variables.	Quarters			
	1	2	3	4
NC.6.EE.9 Represent and analyze quantitative relationships by: <ul style="list-style-type: none"> Using variables to represent two quantities in a real-world or mathematical context that change in relationship to one another. Analyze the relationship between quantities in different representations (context, equations, tables, and graphs). 	X	2	P	P
Geometry	Quarters			
Solve real-world and mathematical problems involving area, surface area, and volume.	1	2	3	4
NC.6.G.1 Create geometric models to solve real-world and mathematical problems to: <ul style="list-style-type: none"> Find the area of triangles by composing into rectangles and decomposing into right triangles. Find the area of special quadrilaterals and polygons by decomposing into triangles or rectangles. 	X	X	3	P
NC.6.G.2 Apply and extend previous understandings of the volume of a right rectangular prism to find the volume of right rectangular prisms with fractional edge lengths. Apply this understanding to the context of solving real-world and mathematical problems.	X	X	X	4
NC.6.G.3 Use the coordinate plane to solve real-world and mathematical problems by: <ul style="list-style-type: none"> Drawing polygons in the coordinate plane given coordinates for the vertices. Using coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. 	X	X	X	4
NC.6.G.4 Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use nets to find the surface area of these figures. Apply these techniques in the context of solving real world and mathematical problems.	X	X	X	4
Statistics and Probability	Quarters			
Develop understanding of statistical variability.	1	2	3	4
NC.6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	X	X	X	4
NC.6.SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	X	X	X	4
NC.6.SP.3 Understand that both a measure of center and a description of variability should be considered when describing a numerical data set. <ol style="list-style-type: none"> Determine the measure of center of a data set and understand that it is a single number that summarizes all the values of that data set. <ol style="list-style-type: none"> Understand that a mean is a measure of center that represents a balance point or fair share of a data set and can be influenced by the presence of extreme values within the data set. Understand the median as a measure of center that is the numerical middle of an ordered data set. Understand that describing the variability of a data set is needed to distinguish between data sets in the same scale, by comparing graphical representations of different data sets in the same scale that have similar measures of center, but different spreads. 	X	X	X	4
NC.6.SP.4 Display numerical data in plots on a number line. <ul style="list-style-type: none"> Use dot plots, histograms, and box plots to represent data. Compare the attributes of different representations of the same data. 	X	X	X	4

NC.6.SP.5 Summarize numerical data sets in relation to their context.

X X X 4

a. Describe the collected data by:

- Reporting the number of observations in dot plots and histograms.
- Communicating the nature of the attribute under investigation, how it was measured, and the units of measurement.

b. Analyze center and variability by:

- Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations.
- Justifying the appropriate choice of measures of center using the shape of the data distribution.

Note: Both independent and collaborative student tasks should engage the following 8 Mathematical Practices as often as possible to develop math proficiency:

Eight Mathematical Practices:

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.