Name	School	Grade	Course/Subject	Number of Students	Interval of Instruction
		6	Math		Sept. 2015 – Mar. 2016

Standards, Rationale, and Assessment Method

Critical Area(s): (1) Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers, and (3) writing, interpreting, and using expressions and equations

Mathematics | Grade 6

Rationale:

Critical areas are designed to bring focus to the standards in grades 6 by describing the big ideas upon which teachers may build their instruction.

This SGO reflects one of the critical areas within Grade 6 as well as the fluency standards for the grade:

(1) Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios
and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

(2) Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

(3) Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as 3x = y) to describe relationships between quantities.

Standards Addressed within this Student Growth Objective:

6th Grade SGO Standards

CCSS.MATH.CONTENT.6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

CCSS.MATH.CONTENT.6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship.

CCSS.MATH.CONTENT.6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

CCSS.MATH.CONTENT.6.RP.A.3.A Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

CCSS.MATH.CONTENT.6.RP.A.3.B Solve unit rate problems including those involving unit pricing and constant speed.

CCSS.MATH.CONTENT.6.RP.A.3.C Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

CCSS.MATH.CONTENT.6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

CCSS.MATH.CONTENT.6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

CCSS.MATH.CONTENT.6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

CCSS.MATH.CONTENT.6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

CCSS.MATH.CONTENT.6.NS.C.6.A Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.

CCSS.MATH.CONTENT.6.NS.C.6.B Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

CCSS.MATH.CONTENT.6.NS.C.6.C Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

CCSS.MATH.CONTENT.6.NS.C.7 Understand ordering and absolute value of rational numbers.

CCSS.MATH.CONTENT.6.NS.C.7.A Interpret statements of inequality as statements about the relative position of two

numbers on a number line diagram.

CCSS.MATH.CONTENT.6.NS.C.7.B Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 ^{o}C > -7^{o}C to express the fact that -3^{o}C is warmer than -7^{o}C.

CCSS.MATH.CONTENT.6.NS.C.7.C Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

CCSS.MATH.CONTENT.6.NS.C.7.D Distinguish comparisons of absolute value from statements about order.

CCSS.MATH.CONTENT.6.NS.C.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.

CCSS.MATH.CONTENT.6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents.

CCSS.MATH.CONTENT.6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

CCSS.MATH.CONTENT.6.EE.A.2.A Write expressions that record operations with numbers and with letters standing for numbers.

CCSS.MATH.CONTENT.6.EE.A.2.B Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.

CCSS.MATH.CONTENT.6.EE.A.2.C Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

CCSS.MATH.CONTENT.6.EE.A.3 Apply the properties of operations to generate equivalent expressions.

CCSS.MATH.CONTENT.6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

CCSS.MATH.CONTENT.6.EE.B.5 Understand solving an equation or inequality as a process of answering a question

CCSS.MATH.CONTENT.6.EE.B.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.

CCSS.MATH.CONTENT.6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.

CCSS.MATH.CONTENT.6.EE.B.8 Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

CCSS.MATH.CONTENT.6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Assessment Method: Authentic Assessments (Assessment Portfolio) will be used as a tool to measure students' growth. The assessment portfolio incorporates carefully selected practice-forward tasks that reflect higher levels of cognitive complexity. All tasks included in the portfolio will be "practice forward" and rubric-scored.

Starting Points and Preparedness Groupings
Student tiers will be determined using a 4-data point system to develop a baseline index. Each tier will be assigned a target command level.

Data Measures used to Establish Baselines
2014-2015 Unit Assessment Average; weight (.40)
2014-2015 Performance Tasks Average; weight (.10)
2014-2015 Final Grade; weight (.10)
2015-2016 Diagnostic Assessment; weight (.40)

Preparedness Group	Baseline Score
Tier I	< 0.35
Tier 2	0.35 – 0.55
Tier 3	0.55 – 0.75
Tier 4	> 0.75

Student Growth Objective

By March 2016, 70% of students in each preparedness group will meet their assigned target command level for full attainment of the objective as shown in the scoring plan.

Preparedness Group (e.g. 1,2,3)	Number of Students in Each Group	Target Command Level on SGO Assessment Portfolio
Tier 1		2
Tier 2		3
Tier 3		4
Tier 4		4 or 5[1]

[1] It is expected that students in Tier 4 maintain a level of strong command or grow to distinguished command.

Scoring Plan
State the projected scores for each group and what percentage/number of students will meet this target at each attainment level. Modify the table as needed.

Preparedness Group	Student Target Command Level	Teacher SGO Score Based on Percent of Students Achieving Target Score			
		Exceptional (4) **>80%**	Full (3) **70-80%**	Partial (2) **50-69%**	Insufficient (1) **<50%**
Tier 1	2				
Tier 2	3				
Tier 3	4				
Tier 4	4 or 5				

Approval of Student Growth Objective
Administrator approves scoring plan and assessment used to measure student learning.

Teacher _____ Signature_____ Date Submitted_____

Evaluator _____ Signature _____ Date Approved _____

Results of Student Growth Objective
Summarize results using weighted average as appropriate. Delete and add columns and rows as needed.

Preparedness Group	Students at Target Score	Teacher SGO Score	Weight (based on students per group)	Weighted Score	**Total Teacher SGO Score**
Tier 1					
Tier 2					
Tier 3					
Tier 4					

Notes
Describe any changes made to SGO after initial approval, e.g. because of changes in student population, other unforeseen circumstances, etc.

Review SGO at Annual Conference
Describe successes and challenges, lessons learned from SGO about teaching and student learning, and steps to improve SGOs for next year.

Teacher _____ Signature _____ Date _____

Evaluator _____ Signature _____ Date _____