Curriculum Sample for 6th Grade Math

Grade Level	6th	**Content Area**	Math
Course Title (grades 9-12 Only)	n/a		
Length of Unit	5 days	**Time of Year**	3rd Quarter
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students will know how to add, subtract, multiply, and divide nonnegative rational numbers. . Students will know how to combine like terms. Students will recognize that variables represent numbers. Students will understand that variables can be operated upon in the same way as numbers.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	Students will be taught using scaffolding methods as well as with direct instruction. Through lecture-discussions and demonstrations, students will develop their knowledge while practicing problem-based learning & inquiry activities.		
Standard Number and Description *List the Number* and full description for the required Standard.*	6.EE.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.		
Summative Assessment *Describe a cumulative and comprehensive activity, clearly separate from instruction and guided or independent practice, which allows each student to individually demonstrate mastery of the required Standard. A copy of the summative assessment must be attached to the curriculum sample.*	Students will individually take an assessment that demonstrates whether they can 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.		
Scoring Scale and Mastery Level *Explain how the assessment is scored, to include points per question, how points are awarded, total points possible, criteria necessary to demonstrate mastery, and grading scale. A copy of the answer key and scoring rubric (whichever applicable) must be attached to the curriculum sample.*	This summative assessment math quiz will reflect the students' knowledge of solving 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. There are 14 questions with 18 points possible. Question 1 = 1 point; Question 2 = 1 points; Question 3 = 1 point; Question 4 = 1 point; Question 5= 1 point; Question 6 = 1 point; Question 7 = 1 point; Question 8 = 1 point; Question 9 = 1 point; Question 10 = 1 point; Question 11 = 2 points; Question 12 = 2 points; Question 13 = 2 points; Question 14 = 2 points. The quiz is worth a total of 18 points; 15 points or higher = mastery which is set at 80%.		
Materials/Resources Needed	Teacher's Edition Saxon Math book, Volume 1; Student Saxon books; iPads; a scale; quiz; answer key		

Lesson (add as needed)	**Instruction**	**Student Activities**
1	The teacher explains to the students that they are going to learn how to solve real-world and mathematical problems by writing and solving equations such as x + p = q and px = q. The teacher states, "Today we are going to learn how to solve problems with missing numbers in addition." The teacher writes the following problem on the board in a column: "3 + 4 = 7." Now Teacher covers the 4 with his or her finger and asks, "How can you use the 7 and the 3 to find that the number under your finger is 4?" Teacher waits for Students' responses. Next, Teacher covers the 3 instead of the 4 and asks, "How can you use the other two numbers to find that the number under your finger is 3? Notice that we can find a missing addend by subtracting the known addend from the sum. We will use a letter to stand for a missing number." 3 + y = 7 The teacher writes on the board: "Find the number for *m*: 12 + m = 31." Teacher emphasizes, "One of the addends is missing. The known addend is 12. The sum is 31. If we subtract 12 from 31, we find that the missing addend is 19. We check our answer by using 19 in place of *m* in the original problem. " Next, Teacher writes the following problem on the board: "36 + n = 64." Teacher states, "We find *n* by subtracting 36 from 64, which is 28. We then check our work by using 28 in place of *n* in	Students listen to the teacher's introduction. Students listen to the teacher's explanation on how to solve equations. Students respond to the teacher's questions. Students listen to the teacher's explanation Students listen to the teacher's explanation Students listen to the teacher's explanation.

	the original problem. The teacher then writes the following mathematical problems on the board: 1) s + 12 = 32 2) d + 43 = 56 3) 17 + w = 41 4) 19 + e = 58 5) 32 + q = 88 Students are told to write the first answer on their iPad. The teacher then highlights that each of the questions the students just answered, can be turned into real-world mathematical problems. For example, number 1 could be, "Steve needs 32 boxes to move all of his things, but only has 12. How many more boxes does he need?" Students are told to write in their workbooks a real-world mathematical problem for each of the 5 previous equations.	Student's write their answers by using the whiteboard application on their apps along the lines, s= 20, d = 13, etc. After each question is asked the students hold up their iPad to show their answer and understanding on the standard being taught. This allows the teacher to check for understanding and mastery of the standard. Students write in their workbooks a real-world mathematical problem for each of the 5 previous equations. This allows the teacher to check for understanding and mastery of the standard.
2	Teacher states, "Today we will learn how to solve multiplication problems with missing numbers." Teacher writes on the board: "4 x 3 = 12." Teacher states, "This multiplication fact has three numbers. If one of the factors were missing, we could use the other factor and the product to figure out the missing factor." Teacher continues, "With my finger, I will cover the factors in this multiplication fact one at a time. You can use two uncovered numbers to find the covered number. Notice that we can find a missing factor by dividing the product by the known factor."	Students listen to the teacher's instructions. Students listen to the teacher's instructions.

	Teacher writes on the board: "Find the missing number: A x 6 = 72. " Teacher demonstrates, "The number is a factor. The product is 72. The factor that we know is 6. Dividing 72 by 6, we find that the missing factor is 12. We check our work by using 12 in the original problem. Teacher writes the next problem on the board: "Find the missing number: 6w = 84." Teacher states, "When a number and letter are written side by side, it means that they are to be multiplied. In this problem 6w means '6 times w.' We divide 84 by 6 and find that the missing factor is 14. " The teacher then writes the following mathematical problems on the board and then asks them out loud 1 by 1: 1) 2r = 16 2) 35 = 7t 3) 4e = 48 4) 11w = 55 5) 5q = 25 Students are told to write the first answer on their iPad and so on. The teacher then highlights that each of the questions the students just answered, can be turned into real-world mathematical problems. For example, number 1 could be, "John has 2 tables with an equal number of chairs. There are 16 chairs total. How many chairs on each table?" Students are told to write in their workbooks a real-world mathematical problem for each of the 5 previous equations.	Students listen to the teacher's instructions. Students respond to Teacher's questions by raising their hand and being called upon Student's write their answers by using the whiteboard app on their apps along the lines, r = 8, t = 5 etc. After each question is asked the students hold up their iPad to show their answer and understanding on the standard being taught. This allows the teacher to check for understanding and mastery of the standard. Students write in their workbooks a real-world mathematical problem for each of the 5 previous equations. This allows the teacher to check for understanding and mastery of the standard.

3	The teacher discusses with students that for the past 2 lessons, they have been solving 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. The teacher will then write some examples on the board for the students to copy and solve in their workbooks. The teacher instructs the students to write 3 addition equations, 3 real-life addition equation, 3 multiplication equations, and 3 real-life multiplication equations in their workbooks. Students will then switch their book with a partner and attempt to solve each other's equations. The teacher will then instruct the students to take out their iPads and select the iTooch Math application and then select the algebraic equations section which covers the work done so far. This allows the students to reinforce their learning.	Students listen to the teacher. Students copy and solve the equations from the board in their workbooks. During this time the teacher circulates, which will allow the teacher the opportunity to check for understanding of the required standard for each student. Students will create and write 3 addition equations, 3 real-life addition equation, 3 multiplication equations, and 3 real-life multiplication equations. Students will then switch with a partner and attempt to solve each other's equations. The students work on the iPads and take the test on algebraic equations, showing their result to the teacher.
4	Teacher begins class by discussing how to relate the idea of equations to a balanced scale. Using objects, Teacher has Students balance an actual scale and relates this idea a balanced equation. Teacher starts off with simple true/false equations balanced on a scale. The teacher asks the students, "Does this scale tilt, or is it balanced when I weigh the equations: '8 = 10 – 3 or 6 -3 = 10 – 7.'"	The students listen to the teacher's discussion. The students decide whether or not the scale is balanced and try to solve the teacher's example by raising their hand and being called upon. The teacher allows each student the opportunity to answer to check for understanding of the given standard..

	Teacher then extends the idea of the balance scale to incorporate the idea of performing equations on both sides of the equation to isolate the variable (i.e, x + 5 = 8 remove the 5 from both sides of the balance, which keeps the equation balanced, so x = 3.) The teacher gives examples until the students recognize that both sides of an equation are equal, and whatever operation is performed on one side of the equation must be done on the other side to maintain equality. The teacher has the students get out their iPads and practice solving equations of the x + p = q and px = q for cases in which p, q, and x are all nonnegative rational numbers on the website: http://www.xpmath.com/forums/arcade.php?do=play&gameid=69 After completing activities on this website, Students are instructed to go to the website: http://www.ixl.com/math/grade-6/solve-for-a-variable-using-properties-of-multiplication to continue practicing this skill.	The students decide whether or not the scale is balanced and try to solve the teacher's example. Students go to various websites to practice: http://www.xpmath.com/forums/arcade.php?do=play&gameid=69 and http://www.ixl.com/math/grade-6/solve-for-a-variable-using-properties-of-multiplication.
5	The teacher will instruct the students to take an assessment, individually, on what they learned in class during the past few math lessons. The teacher passes out test. The teacher collects the tests when students are finished.	Students will take the assessment to show competency in solving 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.

Quiz

Name _____Date _____

Directions: Please solve all problems to demonstrate that you know how to 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.

1. 19 + b = 30
2. 22 + d = 68
3. 3a = 12
4. 144 = 6d
5. 360 = 10r
6. 42 + x = 93
7. x + 143 = 324
8. 54 + x = 152
9. 3x = 12
10. 35x = 175

11. There were some grapes on the table. Logan ate 1/6 of them. He ate 5 grapes. Write an equation to represent the situation and solve.

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12. Angela bought 5 shirts that each cost the same amount. She spent $35. How much did she spend on each shirt? (Write and solve an equation to solve the problem.

_____

13. Ronnie earned $25 washing cars, giving her a total of $49. Write an equation and solve it that allows you to find her beginning amount.

_____

14. Steve bought 12 tickets for a concert which cost $264 total. Write an equation and solve it that allows you to find out how much each ticket cost.

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Answer Key/Scoring Rubric:

Answer Key

There are 18 points total possible on the assessment; 15 points or higher = mastery.

1. b = 11 (1 point)
2. d = 46 (1 point)
3. a = 4 (1 point)
4. d = 12 (1 point)
5. m = 6 (1 point)
6. x = 56 (1 point)
7. x = 181 (1 point)
8. x = 98 (1 point)
9. x = 4 (1 point)
10. x = 5 (1 point)
11. 5g = 30; g = 6 (2 points)
12. 5s = 35 = s = 7 (2 points)
13. 25 + c = 49; c = 24 (2 points)
14. 12t = 264; t = 22 (2 points)

Total points = _____/18

Comments:

Points	Percentage
13	72
14	77
15	83 *mastery
16	89 *mastery
17	94 *mastery
18	100 *mastery

Students scoring a minimum of 15/18 will be judged to have mastered the standard.