A.5. CURRICULUM SAMPLE – Fourth Grade Math

Grade Level	Content Area	Course Title	Unit Title
Fourth Grade	**Mathematics**	**N/A**	**Patterns, Algebra, and Functions**

Length of Unit	Time of Year Taught	Expected Prior Knowledge
5 Days	**Second Quarter**	Each student should understand concepts and objectives from the third grade level within Common Core Standards in the subject of mathematics. Students should have some understanding of using symbols to represent unknown quantities with whole numbers from the third grade.

Unit Description

This activity will help students understand what an equation is and what it is not. Students will use algebraic expressions, symbols, and properties of the operations to represent, simplify, and solve mathematical equations and inequalities as well as represent verbal statements of multiplicative comparisons as multiplication equations.

Common Core Standards	**4.OA.1 .** Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
Summative Assessment	Students will use a symbol to represent an unknown quantity in a simple algebraic expression involving all operations. Students will create a definition and example for the vocabulary words used and writ them in notebook. Students will represent verbal and written statements of multiplicative comparisons as multiplication equations. Students will also complete a quiz on equations and find the unknown variable with different operations. Students will also create their own word problems showing mastery. Mastery achieved at 80% accuracy.
Assessment Scoring	Assessment scoring will be 13 points for Sections 1 and 2 of the assessment and 10 points for Section 3.
Materials/Resources Needed	*Safari Park* by Stuart J. Murphy, price sheet from story, whiteboards, markers, chart paper, notebooks, assessment

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Lesson Instruction	**Day 1:** **Objective:** The students will give examples of numbers that can replace operation symbols. Teacher will begin reading the book *Safari Park*, and show the price list for the tickets so the	**Day 2:** **Objective:** The students will create equations with missing or changed variables and analyze them to determine if they are equations or simply a number sentence. Continue reading the	**Day 3:** **Objective:** The students will write equations from verbal multiplicative statements and write the multiplicative comparison to each statement.	**Day 4:** **Objective:** Students will solve equations by finding the missing number, and explain their reasoning. The teacher will briefly review solving equations and writing	**Day 5:** **Objective:** Assign students to create their own list of open equations and instruct them to also include the value of the variable. Use only all

	students can follow the book. Allow the students to talk about what rides they would go on. As the teacher reads the book, the class will stop and discuss *equations.* Teacher will write equations on the board and have the students write them in their notebooks. The teacher will then review vocabulary and help students identify variables. Have the students write *variable* in their notebooks working in pairs and have them give the teacher examples of the word. Teacher will discuss the two words, *variable* and *equation* throughout the day. **Guided Practice:** The teacher will have students give examples of numbers, operation symbols, and the equals sign. The teacher will monitor student understanding throughout the lesson.	book and remind students that they will be using these words throughout the lesson. The students need to know what they mean. Go to the equations from the book and make sure students know how the words apply to them. Show the equations from the book (12+6+2=20) and write both forms on the board (one with the variable and one without). **Guided Practice:** Students will be asked to rewrite the equation, but replace one of the numbers with a number that would imbalance the equation (12+8+2=20). Students will evaluate whether or not each sentence is an equation. Students should say that the second is not an equation. Continue to do other similar examples. The teachers will check for student understanding throughout the lesson.	Teacher will introduce the concept of multiplicative comparisons as multiplication equations. **Guided Practice:** The teacher will say an equation verbally and write it on the board (example **equation** is 15=5x3). Then explain or elicit from the students that the **statement** means *15 is 5 times as many as 3.* Then the teacher should do the same with the **equation** 15=3x5 which should elicit the **statement** that *15 is 3 times as many as 5.* Explain that this is the multiplicative comparison to the previous equation/statement. Put number sentences on the board. Students in groups will discuss whether or not they are multiplicative equations and how they know. Tell students to think out loud while	multiplicative comparisons with the whole class. The teacher will ask: What would happen if they did not know one of the numbers? Could the students figure out what it is? Rewrite the problem, changing one of the numbers to a symbol. Ask the students to talk to their partners and figure out how they would find the unknown number. The teacher will call on a student to explain their reasoning. Teacher will explain that this is an open equation because we do not know if it is correct until we substitute the variable for a number. Teacher will show the students that it could be true or false, but point out that we are always looking for true equations in math. Teacher will tell students that if that process really works, they should be able to solve the following equation (62+?=85). **Guided Practice:**	operations at this time and use two or three numbers. Have students share their equations with their partner and explain that the partner must check to make sure their equations and answers are correct by solving them. Students will then be assessed on their learning's. **Assessment:**

			discussing. The teacher will then pass out whiteboards to all students. **Independent Practice:** The teacher will say a multiplicative statement such as 40 is 5 times as many as 8. The students will write the equation to represent the statement and its multiplicative comparison (40=5x8 and 40=8x5). The teacher will check each whiteboard for accuracy.	Ask students to solve the equation and find out what the question mark equals. Allow time for working and then call on students to explain how they solved their equations. Ask students if they think this would work the same way for multiplicative equations/comparisons. Call on a few students to explain their thinking. **Independent Practice** Write the problem (16=2 x ?) on the board. Have the students solve and then write its comparison. The teacher will monitor student understanding throughout the lesson.	

	Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
Student Activities	Day 1: Students will listen to the teacher read *Safari Park* and note the price list for the tickets so they can follow along. Students will discuss with each other the rides they want to go on. Next the students will discuss what	Day 2: The students will be reminded about variables and equations and be clear on their meanings. Students will learn how the words apply to the lesson by doing the equations from the book. Students will copy equation and write	Day 3: Students will tell the teacher what the equations mean and participate in the discussion. Students will write equations on whiteboards as they hear the teacher say verbal multiplicative statements. Students	Day 4: Students will take questions from the teacher and answer appropriately. Example questions will be: What would happen if they did not know one of the numbers? Can the students figure out what it is? Students will work	Day 5: At this time students are ready to create their own list of open equations and include the value of the variable. All students will share their equations with their partner and double check they

	equations are and how they work. Students will write equations in their notebooks. Students will identify variables and review the vocabulary contained in the book. Students will work in pairs and give examples to the teacher. Following these activities the students will study the operation symbols and give examples of numbers. The word equation and variable will be used throughout the whole day.	both forms in their notebooks and then rewrite the equation with variable missing or changed. The students will then decide if the number sentence is actually an equation. The students will continue doing different types of equations to see if they are in fact equations or simply a number sentence.	will also write the multiplicative comparison to each statement.	out equations after the teacher changes them around. It could be a number change or simply a symbol change such as equals or adding and subtracting. Students will discuss with their partners and find unknown numbers. The students will then explain how they came up with their answers. Students will listen to the teacher explain the reasoning and pull feedback from the students. Students will be told that these are open equations because we do not know if the equation is correct. Students will solve the equations given by the teacher and be expected to answer the missing number, example: (62+?=85). The students will have time to finish and explain reasoning.	know exactly how their equations work. Students will have 15 minutes to prepare for the assessment. After the time allotted students will take the assessment.

Patterns, Algebra, and Functions
Assessment (with answers)

Name_____

1. Find the missing number. Solve for n.
   a) 16 + n = 34 n = ?

   b) 14 + n = 28 n = ?

   c) 21 – n = 18 n = ?

   d) 12 x n = 48 n = ?

   e) 36 – n = 20 n = ?

   f) 16 x n = 48 n = ?

   g) 23 + n = 40 n = ?

2. Read each statement and then write the equation and multiplicative comparison it represents.

   h) 56 is 8 times as many as 7. _____

   _____

   i) 32 is 4 times as many as 8. _____

   _____

   j) 63 is 7 times as many as 9. _____

   _____

3. Create one word problem using addition and subtraction by finding the unknown.

4. Create one word problem using multiplication by finding the unknown.

4th Grade Math Assessment Key:

a. n=18 b. n=14 c. n=3 d. n=4 e. n=16 f. n=3 g. n=17

h. 56=8 x 7, 56=7 x 8 j. 63 = 7 x 9, 63 = 9 x 7

i. 32= 4 x 8, 32=8 x 4 k and l : answers will vary