**Lesson: Grades 3-5 (Session 1, Oct. 2013)**

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| **Unit Title:**Operations and Algebraic Thinking**Lesson:** Multiplicative Comparison | Approx. time:90 minutes | **CCSS-M Standards:** 4.O A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the  |
| A. **Focus and Coherence**Students will know that a multiplicative equation represents an amount that is a so many times as a starting value (multiplicative comparison). Students will be able to recognize a multiplicative comparison situation with a multiplication equation.Student prior knowledge: Products are the total number of objects in some groups of some objects each. Determine the unknown in a multiplication equation relating three whole numbers.Which math concepts will this lesson lead to? Understanding the operation of multiplication and when it is an appropriate choice to represent a context. | B. **Evidence** of Math Practices*What will students produce when they are making sense, persevering, attending to precision and/or modeling, in relation to the focus of the lesson?*  |
| **Essential Question(s)** Why is multiplication a scalar operation (multiplicative comparison)? |
| **Formative Assessments**1. Represent the total number of wheels when the number of wheels per bike (scaling factor) is two times the number of bikes
2. Represent the total number of wheels when the number of wheels per trike (scaling factor) is three times the number of bikes
3. Ability to connect the numbers to the context of the problem.
4. Ability to recontextualize the answer
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| **Anticipated Student Preconceptions/Misconceptions** |
| **Materials/Resources**Bikes and Trikes task |
| C. **Rigor**: Conceptual Understanding, Procedural Skills and Fluency, and Application*What are the learning experiences that provide for rigor? What are the learning experiences that provide for evidence of the Math Practices? (Detailed Lesson Plan)***Warm Up –** Draw a picture that represents the following problem and use your drawing to determine the answer. A recipe calls for 2 cups of flour for a cake. How many cups of flour will we need if we are going to make 5 cakes?**Lesson –** 1. Working in pairs, students will work on problem #1 in Bikes and Trikes. Each person will record the work on their own sheet of paper.
2. Student pairs will explain their answer and their reasoning to another pair. Student pairs will revise their work as necessary.

*Strategic sharing:* Pairs will be strategically chosen to present their thinking. Mathematical language will be emphasized as per the standard: \_\_\_\_\_\_ is \_\_\_\_\_ times as many as \_\_\_\_\_\_ using the context of the problem as referents.1. Student pairs will work on problem #2 in Bikes and Trikes. Each person will record the work on their own sheet of paper.
2. Student pairs will explain their answer and their reasoning to another pair. Student pairs will revise their work as necessary.

 *Strategic sharing:* Pairs will be strategically chosen to present their thinking. Mathematical language will be emphasized as per the standard: \_\_\_\_\_\_ is \_\_\_\_\_ times as many as \_\_\_\_\_\_ using the context of the problem as referents.**Closure –** The equation $20=5 x 4 represents the following problem:$If each of Robert’s shirts has 4 buttons, then how many buttons are on 5 of his shirts? Draw a picture to represent the problem and then explain how the equation, your picture and the problem are related.Work individually. Explain your work and your thinking to your partner. Be prepared to share it with the class.**Suggested Homework/Independent Practice-**Write a problem that could be represented by the equation, $6 x 4=24. Draw a picture that could be used to represent the problem.$ |