**Teaching The Core: Math Lesson Plan**

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| **School Name:** Caughlin Ranch Elementary | **Teacher Name:** Katy Scherr |
| **Date:** 2/4/14 | **Period/Time:** 9:15 am – 10:15 am |
| **Room Number:** C-3 | **Grade Level:** Third Grade |
| **Demographics of the Class:** 31 students (18 boys/13 girls); SPED students- 16%; RTI students - 10%; Gifted and Talented students – 26%; and Caucasian students – 55%, Hispanic students – 26%, Asian students – 9.5%, and Multiracial students – 9.5% | |

**CCSS Math Standard:**

**3.OA.A.3 Represent and solve problems involving multiplication and division:** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Aspects of rigor called for by the standard being addressed in this lesson:

* Application – primary
* Conceptual Understanding – secondary

**Lesson Plan**

**Materials:**

* Student Math Journals
* Math tools: Base Ten blocks, grid paper, geoboards, etc.
* Chart paper – problem to solve
* Individual stickers with problem for Student Math Journals

**Learning Goals:**

* To persevere in solving math problems that involves finding equal groups.
* To use drawings, equations, and/or math tools to solve math problems that involve finding equal groups.
* To use mathematical vocabulary such as factors, product, and array in justifying answers in math solutions.
* To justify answers in math solutions.

**Student Objectives:**

* To identify as many equal groups possible to a number using a method of choice to assist a student in solving the problem. (e.g., arrays, counters, pictures, etc.)
* To find multiple answers to a problem.
* To engage in a partner, small group, and whole class discussion explaining and justifying students’ math thinking.

**Problem to Solve:**

A teacher wants to place her 36 students into groups with an equal number in each group. How many different ways can the teacher group the students?

**Lesson:**

1. Begin the lesson with discussing the following with students:
   1. We have been working on persevering in solving math problems.
   2. Today we will be working on a specific problem with the expectation that you will persevere and also be able to explain your thinking in the process.
   3. Our learning goal is to: (written on the board)
      1. To persevere in solving math problems that involves finding equal groups.
      2. To use drawings, equations, and/or math tools to solve math problems that involve finding equal groups.
      3. To use mathematical vocabulary such as factors, product, and array in justifying answers in math solutions.
      4. To justify answers in math solutions.
   4. You will be asked to record your thinking and reasoning in your Math Journal.
2. Pose the problem to the class:

*A teacher wants to place her 36 students into groups with an equal number in each group. How many different ways can the teacher group the students?*

1. As students begin solving the problem, give each student a label with the problem on it for the label to be placed in their Math Journal.
2. While students work through the problem, walk around the room to observe student thinking and problem solving.
3. Once students have begun problem solving, ask individual students to explain his/her thinking to you.
   1. Look for – math tool (student choice) for solving, persevering to find all the different ways to equal groups of 36, and/or student thinking and reasoning.
      1. Groups of 36: 1 x 36 = 36, 36 x 1 = 36, 2 x 13 = 36, 13 x 2 = 36, 3 x 12 = 36, 12 x 3 = 36, 4 x 9 = 36, 9 x 4 = 36, and 6 x 6 = 36.
4. Discussion of Solutions and Strategies:
   1. Invite different students to present their solutions and/or strategies to the problem.
   2. As a student presents, open class to a Whole Class Discussion to ask questions for clarification, understanding, and/or extensions to a solution/strategy.
   3. Present patterns to solutions and discuss with the class.
      1. Look for levels in problem representation and solution (as stated in the Progression Documents:
         1. Level 1: Making and counting all quantities in multiplication and division with objects or a diagram. Student uses either the objects or diagram to explain thinking. This would include arrays and counting of objects.
         2. Level 2: Repeated counting on by a given number, such as 4, 8, 12, 16, 20, 24, 28, 32, 36. Student counts by fours and tracks how many fours are used. In this case it would be 9 fours are used to make 36. Equations may also count in this category such as 4 x 9 = 36. Using a number line may also be an option.
         3. Level 3: Use of the associative or distributive property to compose and decompose numbers in finding a solution. For example: 3 x 12 = 3 x (3 x 4) = (3 x 3) x 4 = 36. Students may decompose a product they do not know to one that they do know and then build from there. Students may also know a product 1 or 2 ahead or behind a given product and say: I know 3 x 11 = 33, so 3 x 12 is 33 + 3.
5. Review the learning goal:
   1. Ask: What was the first step you took in solving this problem of finding equal groups? Have students partner share and then call on one/two students to share.
   2. Ask: Give an example of how you persevered when finding as many equal groups possible? Students will share with a partner and one/two will share with whole class.
   3. Ask: What helped you persevere? Select a few students to share.
   4. Ask: Describe one or two things you learned from another person’s justification. Again, have students share with a partner and ask a few students to share with whole class.
   5. Ask: Was a solution or strategy presented today that you had not thought about using that you might use the next time you will find equal groups?
      1. Have those students share their thinking.
6. Highlight a few moments from the lesson that I observed students either persevering or using a solution/strategy.
7. Closing:
   1. As a class, we will continue to find equal groups in real world problems and I encourage you to build upon your knowledge from your work today to help you with future problems.

**Core Action Indicators:**

1. Core Action 1: Ensure the work in the lesson reflects the shifts required by the CCSS for Mathematics is being addressed in this lesson.
2. Core Action 2: Employ instructional practices that allow students to master the content of the lesson is the main focus of this lesson.
   1. Indicators A, B, C, and D are addressed.
   2. Indicator E - checking will occur throughout the lesson with intervening as needed.
   3. Indicator F will be highlighted possibly throughout the session with emphasis on summarizing at the end during Whole Class Discussions.
3. Core Action 3: Provide all students with opportunities to exhibit mathematical practices in connection with the content of the lesson.
   1. Indicator A will be the goal throughout the lesson. There are many students that have difficulty in pursuing all answer choices, so I will continue to encourage those students.
   2. Indicator B has been a goal throughout the school year. We have been using Accountable Talks stems to help students critique the math and not the student. This can be a very difficult concept for eight year olds. I hope this is apparent in this lesson.
   3. Indicator C continues to be another goal throughout the year. I move students’ seating around to help find that best match for students to talk about each other’s thinking. Having said this, student personalities and the large number of students make this the biggest challenge for me. I will be interested to see what really happens during this lesson.
   4. Indicator D will be led by the students throughout the lesson.
   5. Indicator E has been discussed as students have a variety of math tool options to use based on the student’s comfort level in using and explaining. Math tools have been introduced to students in explicit lessons to help them choose which tool can help.

**Important Facts:**

* Student grouping has been strategic. There is a high group that continues to possess productive challenges amongst themselves that has been intriguing to observe. There are a few struggling students in persevering that have been grouped together so they have to rely on him/herself to find a solution. The goal is to help these students build confidence as well as persevering. Some students have been grouped with a partner that they feel most comfortable with for discussion/explanation.