Manchester College Education Department Lesson by Mary Jane Dickey

Lesson: Multiplying using the commutative and associative properties

Length: 40-45 minutes

Age or Grade Level Intended: 3rd Grade; Mathematics

<u>Academic Standard(s)</u>: 3.3.4 Understand and use the commutative and associative properties of multiplication.

Performance Objective(s):

Students will use the commutative and associative rules of multiplication to simplify multiplication sentences with three terms with 80% accuracy.

<u>Assessment:</u> Students will be given a worksheet to complete in class. Discussion of answers will occur after students have completed worksheet. Worksheets will then be turned in to be looked over and graded by the teacher.

Advance Preparation by Teacher:

1. Prepare a list of multiplication sentences with three terms in each sentence. Include multiplication sentences that have the numbers in the order that will simplify the multiplication and ones that do not have.

2. Prepare a worksheet with multiplication sentences that students will need to simplify to find the product.

Procedure:

Introduction/ Motivation:

"Today we are going to learn how to make long multiplication sentences simple and easier to figure out using what we know about the commutative property of multiplication and associative property of multiplication."

Ask students to explain the commutative and associative properties to refresh the class's memory.

Bloom's: Knowledge; Level 1/Comprehension; Level 2

Step-by-Step Plan:

1. Have students get the personal dry erase boards out of their desks and a dry erase marker out of their table boxes.

Make two columns on the chalkboard. One side will be for the problems not written in simplest form and the other side will be for problems that are written in simplest form.
Write on the chalkboard one of the multiplication sentences from the prepared list that is *not* written in simplest order. Tell students to work through the multiplication problem on their dry erase boards and raise up the boards to show the teacher when they think they have the correct answer.

Gardner: Logical-Mathematical

4. Discuss answers. Write on the chalkboard one of the multiplication sentences that *is* written in simplest order. Tell students to work through the multiplication problem again on their dry erase boards followed by showing the answer to the teacher. *Gardner: Logical-Mathematical/ Verbal-Linguistic*

5. Continue to write a few more multiplication sentences on the board, going back and forth between the two forms, and have students work through them. Quickly discuss the answers after every problem.

6. Ask students which multiplication sentences were easiest to solve and discuss why those sentences were easier.

Gardner: Verbal-Linguistic Bloom's: Analysis; Level 4/ Evaluation; Level 6

7. As a class, rewrite the more difficult sentences to simplify the multiplication. Ask the class if they are finding the same answers when the multiplication sentences have been reordered. Explain to the class that the order of multiplication is not important in multiplication sentences. Ask students if this they recognize this idea as a property of multiplication and which property it sounds like.

Bloom's: Synthesis; Level 5

9. Hand out the *Making Multiplying Easier* worksheet, and allow students to work on it individually in class. They should be given 10 to 15 minutes to complete.

<u>Closure</u>: After students have completed worksheet discuss answers and any questions students may have with the entire class. When discussion is done call each table group one-by-one to turn their papers into the homework tray.

Adaptations/ Enrichment:

Students with Giftedness: Create a few "extra challenging" problems to include on the worksheet. After handing out worksheets quietly explain to student(s) that they may try the extra problems when they complete the rest of the worksheet.

Student's with Learning Disability in Math Comprehension: Restate the directions as needed. Allow student to work with another student (who is deemed reliable by teacher) on worksheet.

Self-reflection: How many students met the learning objective?

If 90% of students did, then I will consider the lesson successful. For the 10% of students that did not, evaluate why they did not master it. If it is determined that the students really did not understand, incorporate discussions about the multiplication properties during future math lessons when appropriate.

(Lesson plan adapted from the Indiana Department of Education resource at http://www.doe.state.in.us/)