EDUC 315
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Lesson Plan by: Meganmarie Pinkerton

Lesson: Fact Families **Length:** 50 minutes

Age or Grade Intended: 5th Grade

Academic Standard(s):

5.1.1 Convert between numbers in words and numbers in figures, for numbers up to millions and decimals to thousandths.

5.2.1 Solve problems involving multiplication and division of any whole numbers.

Performance Objectives: Given simple math problems at their appropriate level students will be able to solve the problems with 90% accuracy.

Given a list of equations students will determine which mathematical property is used to solve the problem with 80% accuracy.

Given written equations, students will read the equation out loud with 85% accuracy.

Advanced Preparation by the Teacher: The teacher will need to provide multiple copies of different levels of the speed tests in a box where students can easily locate their needed level of test. The teacher will need to have copies of a blank math vocabulary table for each student. The teacher will also need chalk, a chalk board, a clock, and large blow up numbered dice.

Procedure:

Introduction/Motivation: Tell students that you will be starting out with the speed tests today. They will need to get as much of their tests complete in five minutes as possible and they can complete whatever is left at home. Then you will work on their math vocabulary and word families and their math oral practices to finish up.

Step-by-Step Plan:

1. Instruct students to set up their testing stations (open folders and binders vertically on their desk to make a small cubical, to block out distractions around them). Tell them to get out the last speed test that they were working on and to start working on it. They have five minutes. If they finish one test they are to go over to the testing box and pull out the next test to work on. (Gardner's mathematical, and intrapersonal intelligences)
2. Call out the time as each minute passes and write down how many minutes they have left on the board. Walk around the room to make sure each student is working on their own work.
3. When five minutes is up instruct the students to place the finished test in the turn in box and put any unfinished test in their take home folder to finish as homework. (Gardner's kinesthetic intelligence)

4. Return graded speed test and instruct students to record their grades on their grade sheets. Ask a volunteer to pass out the math vocabulary worksheet while others are recording their grades.
5. Draw a replica of the first row of boxes from the math vocabulary worksheet on the board then fill out as lesson progresses (see attached example). Explain that you will be working with math families, instruct students to copy all the information you write on the board onto their vocabulary worksheets (Gardner's visual intelligence). Say that the first member of the first family will be a one and this is the dad. Then roll the inflatable dice for the second family member (example: 3 this is the mom). Write these in the first box on the board. Then write and math problem; 1x3 or 3x1 have the students orally repeat what you wrote then ask them what the answers are. (Bloom's knowledge and application, Gardner's mathematical intelligence) Then explain that this is the Identity property, this means that if 1 is multiplied with another number then the answer always equals the second number (ex: 3). Then have the students orally repeat what you just said and say it with them. (Gardner's linguistic intelligence)
6. Next add a son into the second box the son is 0. Then write equations using the numbers from the first box and 0 (ex: 1x0 and 3x0) ask the students what the answers are. (Bloom's knowledge and application, Gardner's mathematical intelligence) Then explain that this is the zero property. Write that down and explain that whenever zero is multiplied by another number the answer is always zero. Then have the students orally repeat what you just said and say it with them. (Gardner's linguistic intelligence)
7. Next roll the dice for the daughter number in the third box (ex. 2) Write an equation using the mom and dad numbers and put parentheses around two of the numbers (ex. 1x(3x2)=) Have them complete what is in the parentheses first (1x(6)=6) Then switch the parentheses around ((1x3)x2=(3)x2=6). (Bloom's knowledge and application, Gardner's mathematical intelligence) Explain that this is the associative property, which states that no matter what there grouping is in multiplication the answer is always the same. Then have the students orally repeat what you just said and say it with them. (Gardner's linguistic intelligence)
8. This is the last family for the day. You have 2 newcomers a new family in the neighborhood. Roll the dice two times (ex. 3 and 4), then write two new equations in the box (4x3 and 3x4) then ask the students what the answers are. (Bloom's knowledge and application, Gardner's mathematical intelligence) They are both the same. This is the commutative property which says that in multiplication the numbers can be interchanged and you still get the same answer. Then have the students orally repeat what you just said and say it with them. (Gardner's linguistic)
9. Ask the students to come up with some other examples of equations that would use these properties. Then write a few of the examples on the board and go over them and their corresponding properties in class. (Bloom's comprehension, Gardner's visual and mathematical intelligence)

10. Now instruct students to put away their vocabulary sheets and take out their oral math practice sheets. Then go around the room and have each student read one of the written equations out loud to the class. (Gardner's linguistic and interpersonal)

Closure: Tell students that tomorrow they will be working on solving the equations that they read out loud. Remind them to complete their speed test at home so that they can move on to the next one the next day. Tell them to make sure all of their things are in their math binder and walk them to the next class.

Adaptations/Enrichment: There were many adaptations integrated into this lesson already. I think that the speed tests are a great way for students to work on their own at the level the best fits them. If they have trouble with certain tests then they can pick more tests like that one to work on those skills. This is great for students with learning disabilities and MiMH, as-well-as advanced students, because they can work at their own level and their own speed with out worrying where other students are. I think that the timed part of the test, and creating their own working cubicles may be good for students with emotional disabilities and ADHD because it decreases the amount of distractions during the test and the timing helps to remind them to stay on task for a short period of time. Although announcing the remaining time out loud may distract some students. I think that it might be helpful to reinforce the new vocabulary a little more. After the class lecture on the vocabulary the students could work in pairs or groups on a work sheet determining what equations would use certain properties (Gardner's interpersonal intelligence). This would help the students reinforce the new information. I also think that the oral practice part of the lesson could cause many students with learning disabilities, MiMH, ADHD, and emotional disorders some distress or make them uncomfortable. If these students are having trouble determining how to say each equation they could become subject to criticism if they read it incorrectly. Also some students might refuse to speak in front of the whole class. I think that this part of the exercise would be better handled if students could work on reading and copying the read equations with partners rather than as a whole class. That way students won't feel as much pressure and they can help each other out.

Self-Reflection: I will know the lesson was successful if…

-The students continue to progress in their speed tests.
-The students understand the new vocabulary.
-The students can orally read written equations.
-The students enjoyed and actively participated in the lesson.

I will assess this lesson by…

-Checking their accuracy and progression through the speed tests.
-Listening to them orally read written equations.
-Providing follow up worksheets or equations utilizing the new property concepts.