

MATH-ESE Workshop
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COVER SHEET

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Lesson #1: Identifying Pairs of Angles Formed by Transversals (Mastering Math Vocabulary Lesson)

This lesson identifies troublesome mathematics vocabulary and develops a strategy to help students assimilate new vocabulary. By having the students check their quiz by the note cards they had made and studied by, they were given the opportunity to reflect on their work.

Lesson #2: The Student-Generated Word Problems

This lesson develops higher-level knowledge of math content for the public schools, develops their reading comprehension of math problems because they have to make up their own. They have to apply math skills to real-life situations and put that situation into words.

Name: Ellen Montgomery

Grade Level/Subject: Algebra

Topic: The Student-Generated Word Problem

Taken from MPJ's Ultimate Math Lessons

Objectives (P.A.S.S.): Process Standard 1: Problem Solving

1. Apply a wide variety of problem-solving strategies to solve problems from within and outside mathematics.

2. Identify the problem from a described situation, determine the necessary data and apply appropriate problem-solving strategies.

Standard 2: Communication

2. Demonstrate mathematical ideas orally and in writing.

Content Standard 1

1. Translate word phrases and sentences into expressions and equations and vice versa

Introduction: One of the reasons students have a tough time learning to solve equations is that many do not really what the algebraic equations represent. In particular, they do not understand the concept of a variable. The student is asked to write a word problem that can be solved by using an equation, write and solve the equation relating the solution to the original word problem.

Instructional process:

Question #1: You have three boxes of pencils and you lose 5 pencils. You then buy another box. If you now have a total of 37 pencils, how many are in each box?

Equation #1: $3x - 5 + x = 37$

Question # 2: The length of a rectangle is 2 more than 3 times the width. If the perimeter is 36, what are the dimensions of the rectangle?

Equation #2: $2w = 2(3w + 2) = 36$

The students were familiar with a variety of word problems for which they would be asked to write and solve the equations. Our fear was that they would simply copy one and submit it. Here is what we received instead:

Student #1: I have 5 Great Danes and 4 Poodles. I get another Great Dane. How many dogs do I have?

Equation #1: $5g + 4p + 1g$

Answer #1: 10

Student #2: I have 4 shirts. I buy three more. I sell ten. I get left with 4 shirts. How did I get 4?

Equation #2: $4s + 3s - 10 = 4$

Answer #2: $s = 2$

In the first example, the student created a logical question that did not need algebra to solve. The second student created an illogical question, then correctly solved an unrelated equation. In both cases, there was no cognitive connection among the word problem, the equation, and the solution.

This assignment told us volumes about how little our students really understood algebra, even if they could do algebra.

Consequently, we offered them equations for which they were required to write a problem. Eventually our students developed a stronger understanding as demonstrated below.

Equation: $5x - 3 = 3x + 10$

Answer: On Monday Joe bought 5 boxes of apples and ate three on the way home. On Tuesday, he bought 3 boxes and a friend gave him 10 more. He noticed that at the end of each day he had the same amount of apples. How many apples were in each box?

Closure: Through these assignments, the students' understanding of the word problems improved, as did their ability to solve algebraic equations.

Assessment: The Student-Generated Word Problem was not only a powerful assessment tool, it proved to be an effective instructional instrument as well.

Modifications/Accommodations: Since the capabilities of the student can be identified by the difficulty of the algebraic problems they have been solving, I would begin with those kinds of problems and allow them to determine what they could actually do.

Reflection: Though I have not used this in my Algebra class, I have found that younger students found this exercise quite engaging. It made them think on a higher level, as well as drawing on their creativity.