"Supplementary, Complementary and Vertical Angles"

Lesson Plan By: Kelly R. Plank

Lesson: Supplementary, Complementary and Vertical angles

Length: 30 minutes

Class Intended: 6th Grade Mathematics

Academic Standards: Standard 4 Geometry
Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.
6.4.1 Identify and draw vertical*, adjacent*, complementary*, and supplementary* angles and describe these angle relationships.
6.4.2 Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle. Justify solutions.

Performance Objectives:
All students, given a set of angles on the homework, will be able to tell which ones are supplementary, complementary, and vertical until it is mastered.
All students, given a set of angles on the homework, will be able to solve missing measurements based on the properties of supplementary, complementary, and vertical angles with a score of 85% or higher.

Assessment:
The first assessment is done by looking for participation of students. All students will be cutting out circles, drawing, and writing on the circles.
The second assessment is turning in their homework assignment on time from the previous day. If they do not have it, it will be a noon detention.
The final assessment will be by the homework assignment.

Advanced Preparation by Teacher:
- Create the warm-up problems for the students to do at the beginning of class.
- Have specific examples or types of problems that I want to show to make sure that students grasp it.
- Have a paper with three circles for them to cut out.
- Provide scissors, protractors, and straight edges for all students.
- Create a homework worksheet and answer key.
- Look over the homework problems to help foresee any problems or questions that might arise.

Procedure:
Introduction/Motivation:

Today I decided not to have a warm up. I thought to make sure that we don't run short on time; I would have the students cut the three circles. Then, they will be ready for the lesson a little faster.

Step-by-Step Plan:
1. After the warm up is over I will have everyone get out the homework worksheet. The students will trade their worksheet with someone else to grade. I will put the answers up on the overhead. Once the grading is done the homework will be passed up to be collected.
2. I will start by saying how we have been having troubles remembers supplementary, complementary, and vertical angles. Today we are going to spend a little more time on it, so that hopefully it will stick with you a little better.
3. With the one circle, fold it in half. The half should be the diameter of the circle.
   a. How many degrees are in ½ of a circle? (Knowledge)
   b. Would the degrees of the ½ circle change if a radius was drawn in? (Analysis)
4. Go ahead and draw in a radius on the ½ circle. Label one angle as 1 and the other as 2.
   a. How many degrees are there if we add angle 1 and angle two? (Knowledge)
5. On that circle write out angle 1 + angle 2 = 180 degrees. These two angles are supplementary. Any two angles that add up to 180 degrees are call supplementary angles. I remember it as supplementary is semi-circle. Because we all know that ½ of a circle is 180 degrees.
   a. What if I had an angle of 45 degrees, how would we go about trying to find it's supplement? (Comprehension)
   b. What is the supplement of an angle with 45 degrees? (Application)
6. Go to circle two. Fold this circle into fourths, and cut along those fourths.
   a. How many degrees are in ¼ of a circle? (Knowledge)
7. Draw in a ray in one quarter of your circle. Label these angles as 3 and 4 (just to keep it different). Angles 3 and 4 add up to 90 degrees. Write down that equation in the quarter. Angles 3 and 4 are complementary angles. I remember complementary angles and cutting a supplementary angle. It is ½ of a supplementary angle.
   a. If I had one angle that was 35 degrees, what would its complement be? (Application)
8. Third circle draw in two diameters. You can fold it in half once (draw that line in) and fold it in half another way (draw that line in). Label the angles 5, 6, 7, and 8. Angles 5 and 7 are vertical angles, and angles 6 and 8 are vertical angles. Vertical angles are equal to each other.
9. Both figures that I just put up on the overhead are going to be like what will show up for your writing prompt. We are going to figure out some angle measurements of them. Let's look at the top figure here. We have 4 different angles to find the measurements of.

        a.   Where do we want to start at? (Evaluation)
        b.   What is the supplement of 120 degrees? (Application)
        c.   How many degrees are in a triangle? (Knowledge)
10. Looking at the bottom figure.
        a.   What angles are going to equal each other (hint they are vertical angles)? (Knowledge)

Closure:
        Real fast before we put the boards away. How many degrees do supplementary angles add up to? How many degrees do complementary angles add up to? Remember supplementary is a semi circle and complementary cuts it in half. Put your boards away on the way to get the homework. Homework is to be completed by the beginning of next class period.

Adaptations/Enrichment:
        There are none for this lesson.

Self-Reflection:
- Did it help writing out both and equation and the label to each angle?
- Did cutting out the circles and cutting the circles up take too much time from the lesson?
- Was the activity a distraction for some?
- What else can be done, so that they remember the different types of angles?
- Were students willing to participate?