TITLE OF LESSON

Geometry Unit 1 Lesson 17 – Geometric Concepts: Angles IV
Prove it! What's on the outside? What's on the inside? Of Geometry

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Geometry

Introductory lesson necessary for:
4.0 Students prove basic theorems involving congruence and similarity.
5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.
6.0 Students know and are able to use the triangle inequality theorem.
7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

MATERIALS

Questions Lesson 17 – Student Page

LESSON OBJECTIVES

- To solve problems related to vertical, congruent, complimentary and supplementary angles
- To associate angle types with sounds, movements, color and other modes of learning
- To promote group learning

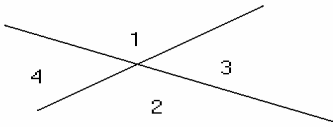
FOCUS AND MOTIVATE STUDENTS

1) Homework Check – Stamp/initial complete homework assignment. Pass back graded work and have students place in the appropriate sections of their binders.
2) Agenda – Have students copy the agenda.
3) Present Homework – (10 minutes) Have each student go to the board and draw the appropriate diagram for one of the homework problems. Each student should label the diagram with the angle measurement and write the appropriate angle type next to the diagram.

ACTIVITIES – INDIVIDUAL AND GROUP

1. Vertical Angles – (5 minutes) Problems associated with vertical angles: Ask for a volunteer to state the definition. It is acceptable to read from notes. *Vertical angles are two non-adjacent angles formed by two intersecting lines.* Draw the following diagram on the board.

   (In this drawing angles 1 and 2 are vertical angles and 4 and 3 are vertical angles. 1 and 3, 3 and 2, 2 and 4, and 4 and 1 are all pairs of adjacent angles. This is review. Elicit this fact from the students. An important fact about vertical angles is that they are equal in size to each other.) Ask the following questions: If angle 3 is 20° what type of angle is angle 4? (Acute) What is its measurement? (20°). If angle 2 is 120° what type of angle is angle 1? (Obtuse) What is its measurement (120°). Have a student go to the board erase your drawing and redraw the same drawing with the numeric labels (1, 2, 3, 4) and the label the vertical angles. Ask some additional questions of the same sort by simply changing the size of the angles in the question. Have different students draw the answer at the board.



2. Congruent Angles – (5 minutes) Problems associated with congruent angles: Ask for a volunteer to state the definition. It is acceptable to read from notes. *Congruent angles are angles that have equal measurements.* Review this concept. Ask the following questions: If I have a angle that is 60° and I wish to divide the angle into 2 congruent angles what are the sizes of the two angles I have created by the division? (30°). If I have a right angle and I wish to divide it into two equal angles, what are the sizes of the two angles I have created by the division? (45°) Have a student draw the diagram on the board for each of these two examples. What are the congruent angles created by two intersecting lines? Have some students form the appropriate configuration by standing in the room. Identify the congruent angles. Ask some additional questions of the same sort by simply changing the size of the angles in the question. Have different students draw the answers at the board.

3. Complimentary Angles – (5 minutes) Problems associated with complimentary angles: Ask for a volunteer to state the definition. It is acceptable to read from notes. *Complimentary angles are two angles that measure a total of 90°.*
   Ask the following questions: If an angle measures 45° what is the measurement of its compliment. That is to say: Angle A added to angle B equals 90°, which means that they are compliments. Angle A measures 45°. What is the measure of angle B? Ask some additional questions of the same sort by simply changing the size of the angles in the question. Have different students draw the answers at the board. If two angles are compliments what type of angles are they? (They are both acute since the two angles must both be less than 90°.)
   Is it possible for a complimentary angle to be obtuse? (No)

4. Supplementary Angles – (5 minutes) Problems associated with supplementary angles: Ask for a volunteer to state the definition. It is acceptable to read from notes. *Supplementary angles are two angles that measure a total of 180°.* Have someone go to the board and demonstrate this concept. Ask the following questions: If an angle measures 90° what is the measurement of its supplement. That is to say: Angle A added to angle B equals 180°, which means that they are supplements. Angle A measures 90°. What is the measure of angle B? (90°) Ask some additional questions of the same sort by simply changing the size of the angles in the question. Have different students draw the answer at the board.

   If two angles are acute is it possible for them to be supplements? (No)
   If two angles are obtuse is it possible for them to be supplements? (No)
   If two angles are supplements what type of angles are they? (One must be acute and the other obtuse or else they must both be right angles.) Have someone demonstrate this by two drawings on the board.

5. Group Work – (20 minutes) Divide the class into small groups. Ask them to assign roles (see *Group Roles* below). Have each group discuss the ideas in **Questions Lesson 17** and come up with group suggestions. Have them spend the entire time discussing these ideas. Someone should be the scribe and keep notes but each student should keep track of what ideas they have discussed. For homework, each student will write down a short answer to one set of the questions not answered by the group. We will spend the first 15 minutes of tomorrow's class going over their ideas.

HOMEWORK

Continue with activity 5 at home. Answer one more set of the unanswered questions from today's class.

GROUP ROLES

Facilitator – Your job is to keep the group on task.
Recorder — Your job is to make sure *all* group are ideas are recorded.
Illustrator— Your job is to illustrate each agreed upon idea.
Composer— You are responsible for recording (writing down somehow) any sounds or music that the group creates.

DOCUMENTATION FOR PORTFOLIO

None