

LESSON **Technology Lab Recording Sheet** pp. 250–251
4-5 **Predict Other Triangle Congruence Relationships**

Try This

Activity 1

1. Construct $\angle CAB$, measuring 45° , and $\angle EDF$, measuring 110° .
2. Move $\angle EDF$ so that \overrightarrow{DE} overlays \overrightarrow{BA} . Label the intersection of \overrightarrow{DF} and \overrightarrow{AC} as G . Measure $\angle DGA$.
3. Move $\angle CAB$ to the left and right, without changing the measures of the angles. Observe what happens to the size of $\angle DGA$.

4. Measure the distance from A to D . Try to change the shape of the triangle without changing AD and the measures of $\angle A$ and $\angle D$.

Sketch of Construction:

Try This

1. Repeat Activity 1 using angle measures of your choice.
 Are your results the same? _____
 Explain.

2. Do the results change if one of the given angles measures 90° ?

3. What theorem proves that the measure of $\angle DGA$ in Step 2 will always be the same?

4. In Step 3 of the activity, the angle measures in $\angle ADG$ stayed the same as the size of the triangle changed. Does Angle-Angle-Angle, like Side-Side, make only one triangle? _____
 Explain.

Sketch of Construction:

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Predict Other Triangle Congruence Relationships continued

5. Repeat Step 4 of the activity but measure the length of \overline{AG} instead of \overline{AD} . Are your results the same?

Does this lead to a new congruence postulate or theorem?

6. If you are given two angles of a triangle, what additional piece of information is needed so that only one triangle is made?

Make a conjecture based on your findings in Step 5.

Activity 2

7. In Step 4 of the activity, how many different triangles were possible?

Does Side-Side-Angle make only one triangle?

8. Repeat Activity 2 using an angle measure of 90° in Step 2 and a circle with a radius of 7 cm in Step 3.

How many different triangles are possible in Step 4?

9. Repeat the activity again using a measure of 90° in Step 2 and a circle with a radius of 4.25 cm in Step 3.

Classify the resulting triangle by its angle measures.

10. Based on your results, complete the following conjecture.

In a Side-Side-Angle combination, if the corresponding nonincluded angles are _____, then only one triangle is possible.