Exploring
Congruent Triangles with GSP

We want to investigate what information is important to know that two triangles are congruent.

**Definition:** **Congruent Triangles -**  Congruent triangles have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sides.

***Do this before you start:*** *Change sketchpad settings to round to the nearest tenth of a degree for angles and the nearest tenth of a cm for length.*

***Construct your triangle:***

1. Draw a circle and label the center and *hide the construction point on the circle*.
2. Construct a ray from point through a point on the circle. Label this point on the circle “H1”
3. Construct a second ray from point through another point on the circle. Label this point on the circle “H2”
4. Hide the circle.
5. Construct segment with endpoints on these two rays.
6. Hide the two rays and draw in segments and .
7. Measure all the angles and side lengths of

We now want to investigate 5 situations where we are given only 3 pieces of information for our triangle. The question we want to answer is:
 “Does this information guarantee that my triangle will be congruent to everyone else’s triangle?”

**Side-Side-Side**

1. Change your triangle so you have
2. Now move the handles to make

Compare your triangle to your neighbors’ triangles. Is your triangle exactly congruent to their triangles?

Does Side-Side-Side guarantee that two triangles are congruent?

**Angle-Angle-Angle**

1. Move the handles to make
2. Move points *B* and *C*  to make

Compare your triangle to your neighbors’ triangles. Is your triangle exactly congruent to their triangles?

Does Angle-Angle-Angle guarantee that two triangles are congruent?

**Side-Angle-Side**

1. Move the handles to make
2. Move points *B* and *C*  to make

Compare your triangle to your neighbors’ triangles. Is your triangle exactly congruent to their triangles?

Does Side-Angle-Side guarantee that two triangles are congruent?

**Side-Side-Angle**

1. Move the handles to make
2. Move points *C*  until you have
3. Move *B* until you have
Compare your triangle to your neighbors’ triangles. Is your triangle exactly congruent to their triangles?

Does Side-Side-Angle guarantee that two triangles are congruent?

**Angle-Side-Angle**

1. Move the handles to make
2. Move points *B* to make
3. Move point *C* to make

Compare your triangle to your neighbors’ triangles. Is your triangle exactly congruent to their triangles?

Does Angle-Side-Angle guarantee that two triangles are congruent?