

# Identify Similar Figures

## Summary

Decide if figures are similar using corresponding sides and angles. Determine whether two triangles are similar.

## Materials

Square hamburger patty paper for each student, (or thin tracing paper)

Ruler and protractor for each pair

- [Two-Column overhead](#)

Worksheets: [Similar Figures](#), [Relationships With Similar Figures](#)

Journal page: [Defining Similar Figures](#)

## Background for Teachers

Enduring Understanding (Big Ideas):

If two figures are similar, corresponding angles are congruent and corresponding sides are in proportion.

Essential Questions:

How can I identify corresponding parts in similar figures?

What is the relationship between the corresponding angles two similar figures?

What is the relationship between the corresponding sides in two similar figures?

How can I determine whether or not two triangles are similar?

Skill Focus:

Find corresponding parts

Check for proportionality of sides and congruency of angles

Vocabulary Focus:

Similar figure, corresponding angles, corresponding sides

Ways to Gain/Maintain Attention (Primacy):

Writing, measuring, comparing, cooperative structures

## Instructional Procedures

Starter:

Write a ratio comparing the length of the small rectangle to the length of the larger.

Write a ratio comparing the width of the small rectangle to the width of the larger.

Explain how the two ratios compare.

Compute each without a calculator:

$$-3 + -6$$

$$-3 -- (-6)$$

$$-3(-6)$$

$$-6/-3$$

Lesson Segment 1: Similar figures are a different size but the same shape.

Put the Two-Column Comparison on the overhead. Have students look at the pairs of figures in the left column asking them what they notice about the figures. Have students look at the figures in the right column asking them what they notice about the pairs of figures. Ask students to give a rule for sketching pairs of figures in the left column and a rule for the right column based on the pattern they see. The pairs on the left are congruent figures. The pairs on the right are similar figures. Point to these words on the Word Wall. ? Remind students (This was part of 6th and 7th grade cores.) that figures which are exactly the same size are said to be "*congruent figures*" Figures which are not

exactly the same size, but are exactly the same shape are said to be "*similar figures*".

Have students trace their hand on a piece of paper. Q. Is the tracing exactly the same size as your hand? Q. Is the tracing the same shape as your hand "Similar" in conversational language has a different meaning than similar in a mathematical sense. To illustrate this, have the students compare their tracing with those of other team members asking them to suggest whether or not the tracings seem congruent or similar. No two people have hands that are exactly the same shape. Discuss that even though hands may look like hands, they are still not exactly the same shape, so they are not similar in a mathematical sense.

Give students the *Congruent and Similar Figures* worksheet and have them work with a partner to complete a-h. Have each pair then compare with another pair to see if they all agree. As they compare ask them to discuss the following question:

Q. How did you know which were congruent? Which were similar? Why are B and D neither congruent nor similar? Discuss this as a class.

Lesson Segment 2: How can I identify corresponding parts in similar figures?

Tell students that in order to determine whether two figures are really similar, not just by looking, but by actually knowing, we need to be able to compare parts of the figures. The parts we need to compare are called *corresponding sides* or *corresponding angles*.

One of the most difficult things for students to do when working with similar figures is to identify corresponding parts. The Patty Paper activity will help them begin to do this.

Patty Paper Corresponding Triangles Activity: Have student fold hamburger patty paper or other very thin paper in quadrants as shown on the worksheet. Have them sketch a small right scalene triangle in quadrant II. They should then fold vertically to sketch another right scalene triangle in quadrant I by tracing just about a half centimeter larger frame around the original triangle. Next, fold the paper horizontally to sketch a right scalene triangle in quadrant III by tracing just about 1 cm larger frame around the perimeter over the original triangle. Last, fold diagonally to trace a figure about 1.5 cm larger around in quadrant IV.

Label each angle of each triangle using a different number, so you have 1, 2, 3, on the smallest, 4, 5, 6, on the next larger, 7, 8, 9 on the next larger, and 10, 11, 12 on the largest triangle. Don't place every third number purposely on a corresponding angle, or students will look for number pattern rather than looking for corresponding sides. Help student identify the corresponding angles by looking for angle measures as well as length of sides included sides. List the 4 corresponding sets of angles. Label each side of each triangle using a different letter, so you have a, b, c, on the smallest, d, e, f, on the next larger, g, h, i on the next larger, and j, k, l on the largest triangle. Don't place every third letter purposely on a corresponding side, or students will look for letters pattern rather than looking for corresponding sides. Help student identify the corresponding sides by looking for side measures: shortest, middle length, and longest. List the 4 corresponding sets of sides.

Have student pairs work together to list the corresponding parts asked for in # 3 then measure the angles for # 4. They should compare with the other pair of students on their team. Then, do Think-Write-Share for #4. Have them repeat this routine, labeling the sides for question # 5 and 6. In Think-Write-Share, students think about a question individually, write about that item on their own, and then check with their team to discuss differences. One or two students are chosen to describe what they have done and explain why for the class.

Lesson Segment 3: What is the relationship between the corresponding angles in two similar figures? What is the relationship between the corresponding sides in two similar figures?

The remaining items on the Similar Figures worksheet help students identify corresponding parts of similar figures and investigate the relationships among corresponding angles and corresponding sides. Help students complete worksheet as you discuss the ideas on it with the class. You may want to have students work with pairs, small groups or with a Smart Pal to show the whole class in order to get discourse during the investigation.

#### Lesson Segment 4: Summary and Practice:

Work with students to complete the Frayer Model for vocabulary, "Defining Similar Figures". Assign the Relationships With Similar Figures worksheet. Students will need a protractor.

#### Assessment Plan

performance, question responses, Foldable notes

#### Bibliography

This lesson plan was created by Linda Bolin.

#### Authors

[Utah LessonPlans](#)