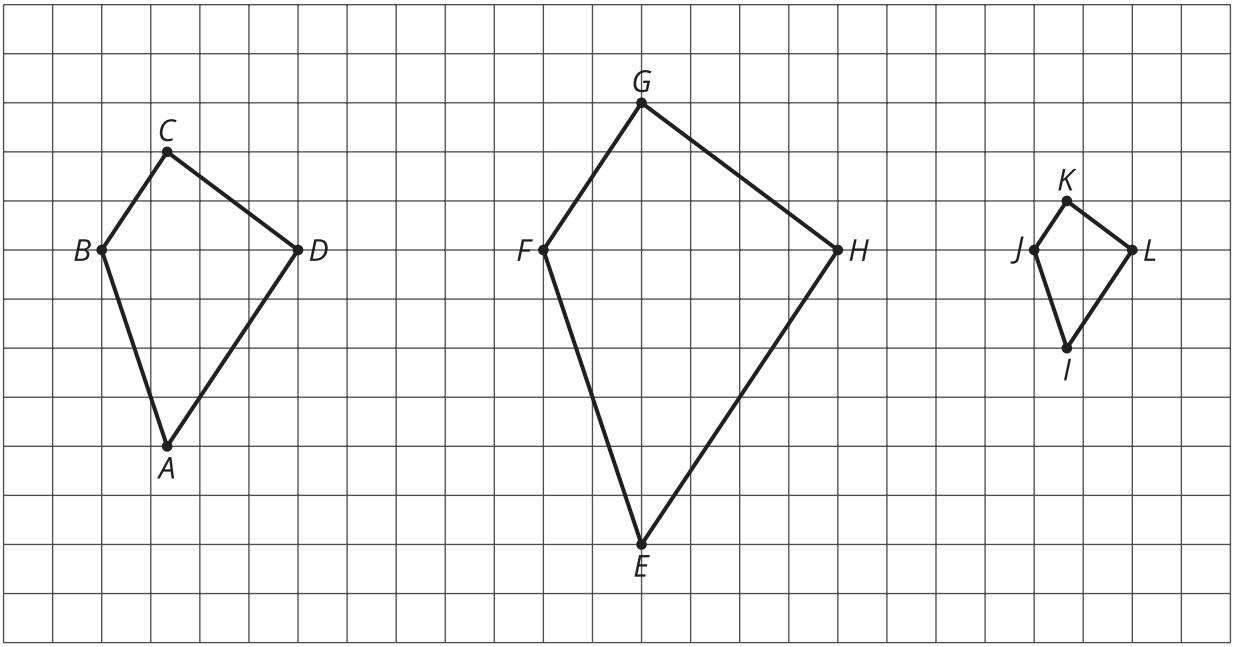
Unit 1, Lesson 4

Scaled Relationships

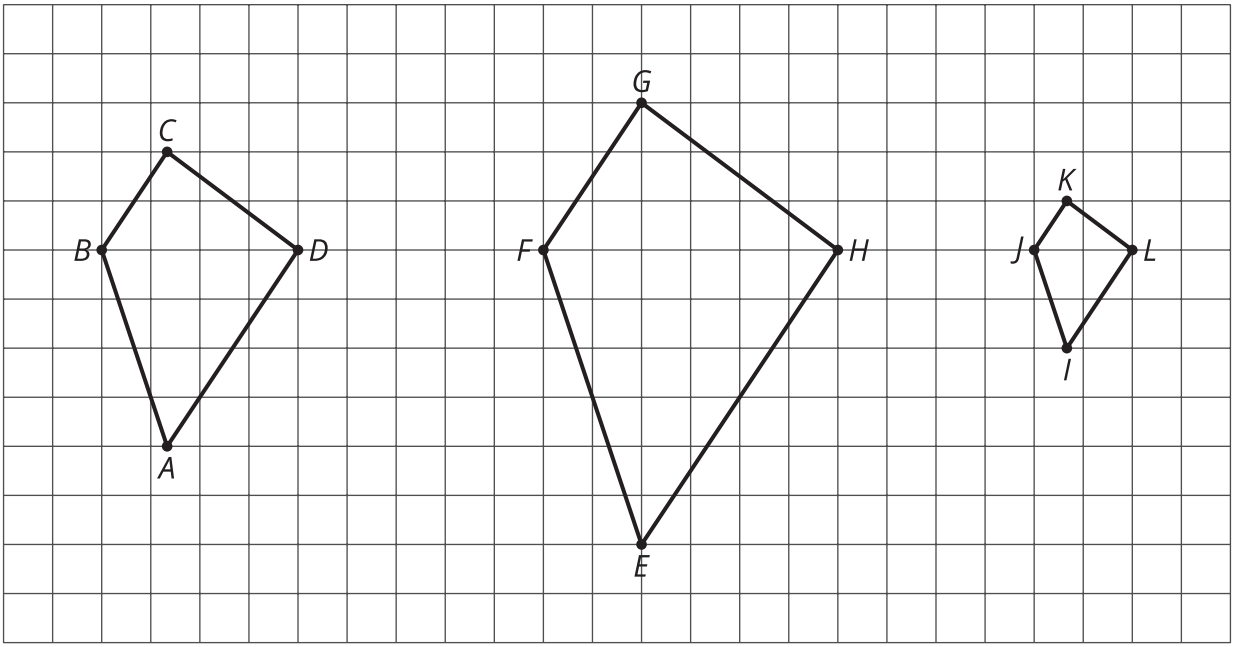
Let's find relationships between scaled copies.

4.1 Notice and Wonder: Three Quadrilaterals

What do you notice? What do you wonder?



4.2 Measuring the Three Quadrilaterals



1. Measure at least one set of corresponding angles using a protractor. Record your measurements to the nearest 5°.

2. What do you notice about the angle measures?

Pause here so your teacher can review your work.

3. The side lengths of the polygons are hard to tell from the grid, but there are other corresponding distances that are easier to compare. Identify the distances in the other two polygons that correspond to DB and AC, and record them in the table.

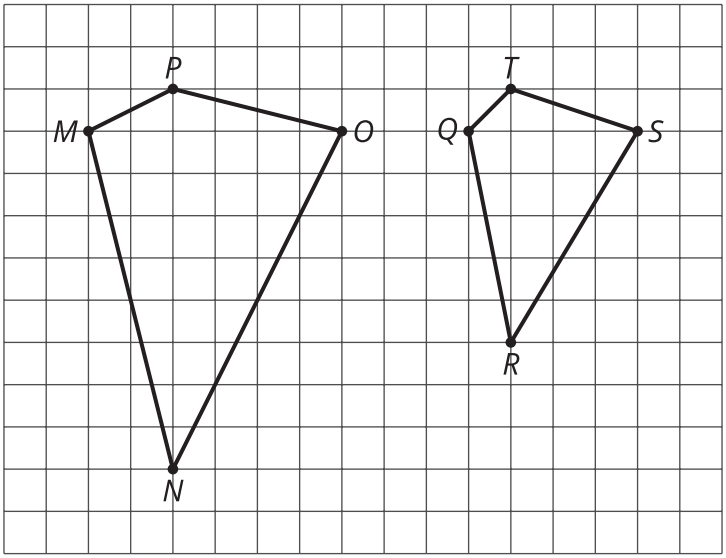
quadrilateral	distance that corresponds to DB	distance that corresponds to AC
$ABCD$	$DB = 4$	$AC = 6$
$EFGH$		
$IJKL$		

4. Look at the values in the table. What do you notice?

5. Are these three quadrilaterals scaled copies? Explain your reasoning.

4.3 Scaled or Not Scaled?

Here are two quadrilaterals.



1. Mai says that polygon $QRST$ is a scaled copy of polygon $MNOP$, but Noah disagrees. Do you agree with either of them? Explain or show your reasoning.

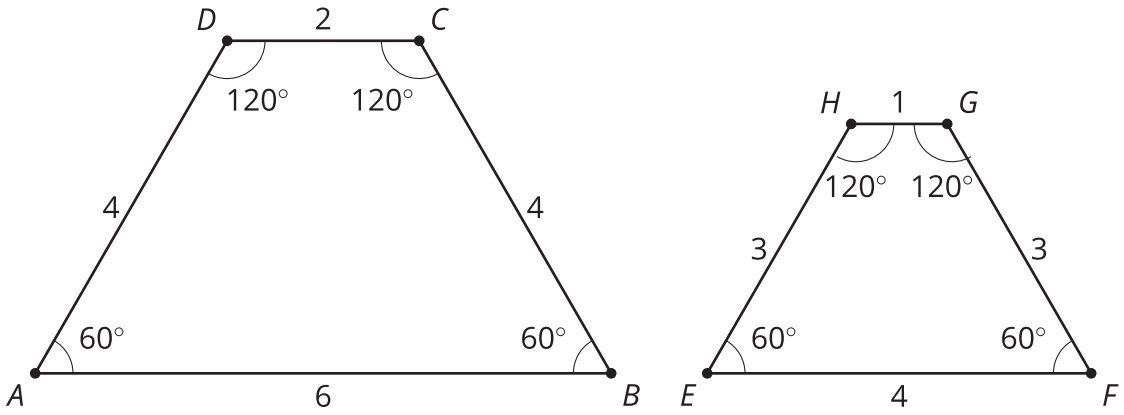
2. Record the corresponding distances in the table. What do you notice?

quadrilateral	horizontal distance	vertical distance
$MNOP$	$MO =$	$NP =$
$QRST$	$QS =$	$RT =$

3. Measure at least three pairs of corresponding angles in $MNOP$ and $QRST$ using a protractor. Record your measurements to the nearest 5°. What do you notice?

4. Do these results change your answer to the first question? Explain.

5. Here are two more quadrilaterals.



Kiran says that polygon $EFGH$ is a scaled copy of $ABCD$, but Lin disagrees. Do you agree with either of them? Explain or show your reasoning.

Are you ready for more?

All side lengths of Quadrilateral Y are 2, and all side lengths of Quadrilateral Z are 3. Does Quadrilateral Y have to be a scaled copy of Quadrilateral Z? Explain your reasoning.

4.4 Comparing Pictures of Birds

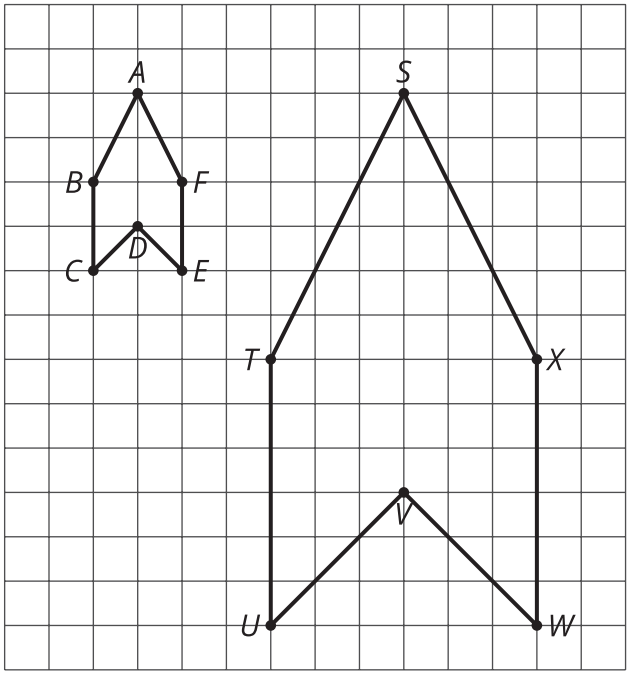
Here are two pictures of a bird. Find evidence that one picture is not a scaled copy of the other. Be prepared to explain your reasoning.

Lesson 4 Summary

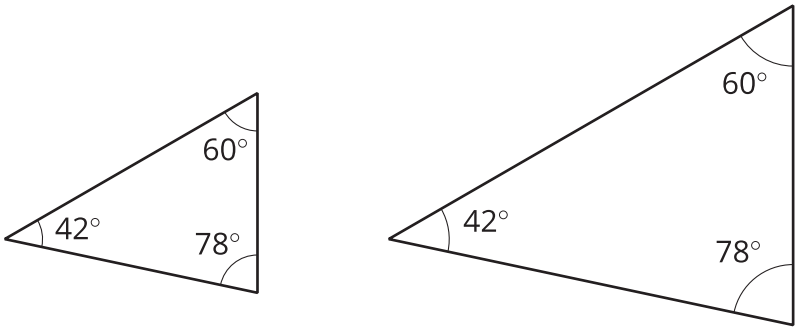
When a figure is a scaled copy of another figure, we know that:

- All distances in the copy can be found by multiplying the *corresponding distances* in the original figure by the same scale factor, whether or not the endpoints are connected by a segment.

  For example, Polygon $STUVWX$ is a scaled copy of Polygon $ABCDEF$. The scale factor is 3. The distance from T to X is 6, which is three times the distance from B to F.



- All angles in the copy have the same measure as the corresponding angles in the original figure, as in these triangles.



These observations can help explain why one figure is *not* a scaled copy of another.

For example, the second rectangle is not a scaled copy of the first rectangle, even though their corresponding angles have the same measure. Different pairs of corresponding lengths have different scale factors, $2 \cdot \frac{1}{2} = 1$ but $3 \cdot \frac{2}{3} = 2$.