Dilation Evidence Lab

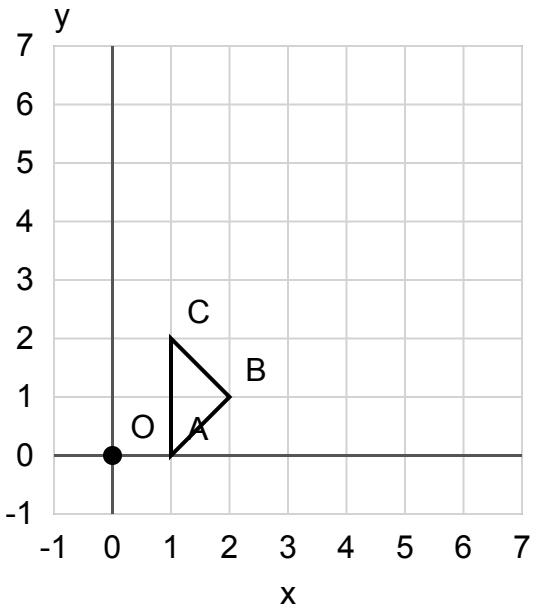
Construct a dilation and test what happens to distances and lines

Name: _____ Date: _____

Part 1 - Construct the image

Materials: pencil and ruler. The grid below is a classroom diagram. Its squares are 1 unit by 1 unit.

Triangle ABC is dilated about center O with scale factor 2. Use a ruler to draw rays from O through A, B, and C. On each ray, plot the image point twice as far from O. Label the image A', B', and C', then connect the image points.



Record your plotted coordinates. A' = _____ B' = _____ C' = _____

Listen as your teacher briefly reviews how to measure a segment on the grid.

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Part 2 - Measure and test the dilation

Measure to the nearest tenth of a unit. Complete the table. A ratio close to 2 is acceptable if your measuring is within about 0.1 unit.

Corresponding measures	Original	Image	Image / original
Center distances: OA and OA'			
Side lengths: AB and A'B'			
Side lengths: BC and B'C'			

1. What do O, A, and A' show about a line that passes through the center?

_____

2. Compare the lines containing BC and B'C'. They do not pass through O. What relationship do they appear to have? _____

3. Use one center-distance measurement and one side-length measurement as evidence that this is a dilation with scale factor 2. Mention any small measurement difference caused by rounding.

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Answer key and teaching notes

Setup and materials: Print and supply all student pages, keeping teacher-key pages separate. Supplied: full-width coordinate grid with original triangle, measurement table, and explanation prompt. Additionally needed: one ruler and pencil per student; optionally project or enlarge the Part 1 grid for modeling. Students work independently or in pairs after the brief demonstration.

Teaching script (read or adapt): “A dilation starts at a center. For scale factor 2, each image point stays on the ray from the center through its original point and is twice as far from the center. We will check two predictions: lines through the center stay on the same line, and lines away from the center become parallel to their images. Measurements can differ slightly because of rounding.”

Observation method: While students work, check that each student (1) draws rays beginning at O, (2) places each prime point on its matching ray, (3) doubles center distance, and (4) uses measurements as evidence rather than only naming a rule. Ask a student whose ratio is outside 1.9-2.1 to recheck ruler placement or plotted points.

Answers:
1. A' = (2, 0), B' = (4, 2), C' = (2, 4).
2. OA = 1.0 and OA' = 2.0, ratio 2.0. AB is about 1.4 and A'B' is about 2.8, ratio 2.0. BC is about 1.4 and B'C' is about 2.8, ratio 2.0.
3. O, A, and A' are collinear; the line through them remains the same line. The lines containing BC and B'C' are parallel.
4. Sample evidence response: “OA doubled from 1.0 to 2.0. Also, AB doubled from about 1.4 to about 2.8. Both ratios are 2, so the image matches a scale factor of 2. A tiny difference could come from measuring and rounding.” Accept equivalent measurements and reasoning within the stated tolerance.

Source credit: New York Next Generation Mathematics Standard GEO-G.SRT.1, “Verify experimentally the properties of dilations given by a center and a scale factor.” https://lessonmakerpro.com/standards/ny-nextgen-math/geo-g-srt-1