More Dilations

Lesson 5

Addressing

8.G.A Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

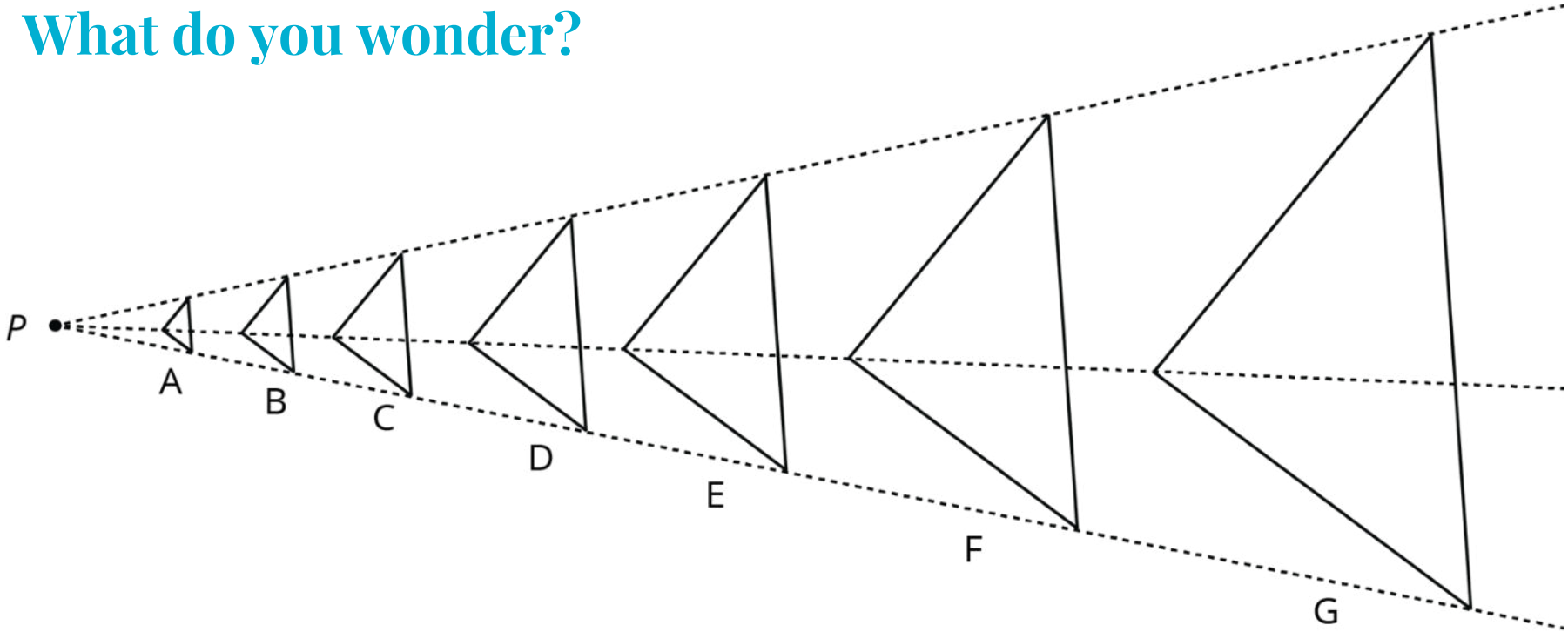
Let's look at dilations in the coordinate plane!

Many Dilations of a Triangle

Warm Up 5.1

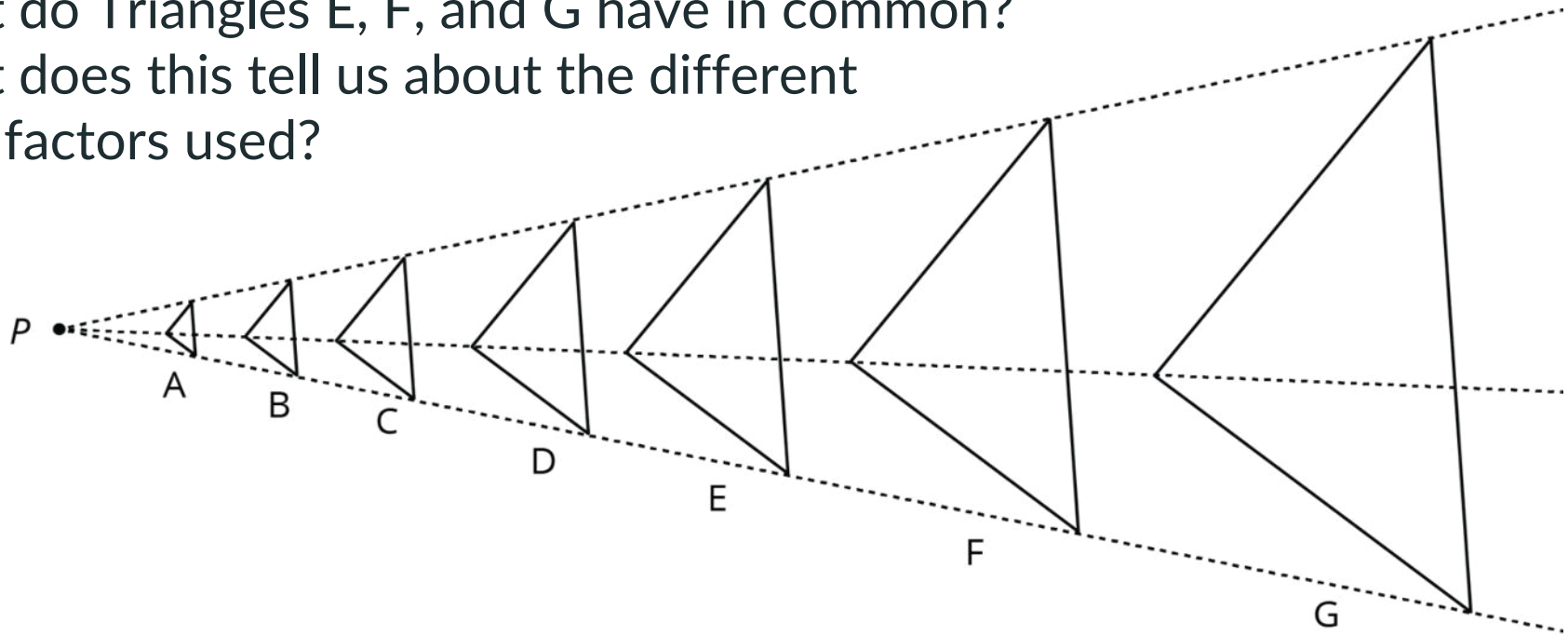
Notice and Wonder

What do you notice?
What do you wonder?

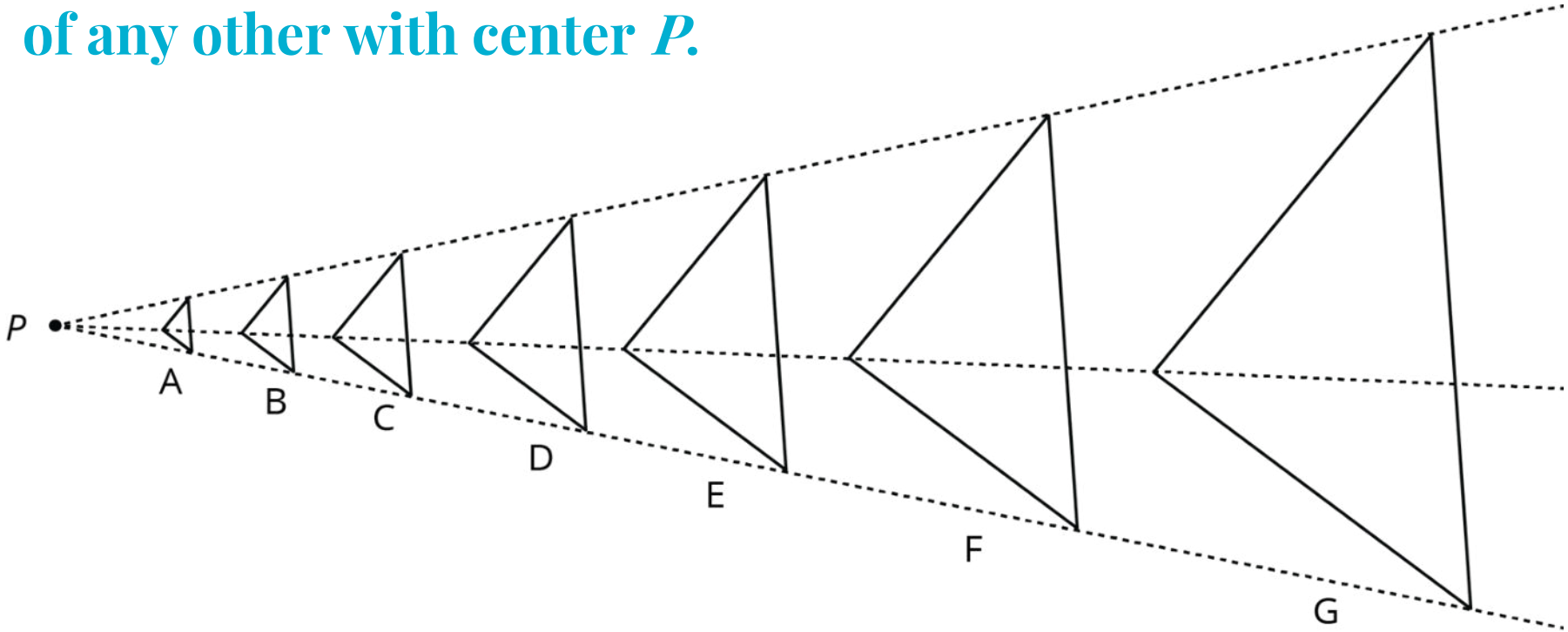


All of the triangles are dilations of Triangle D. The dilations use the same center *P*, but different scale factors.

What do Triangles A, B, and C have in common?
What do Triangles E, F, and G have in common?
What does this tell us about the different scale factors used?



Note: Any of these triangles is a dilation of any other with center *P*.



Info Gap: Dilations

Activity 5.2

- Information Gap
- Collect and Display

Let’s continue to practice describing and drawing dilations using coordinates!

You will be given a problem card or a data card.

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Do not show your card to your partner.

If you have a data card:

1. Silently read the info. on your card.
2. Ask your partner: **What info. do you need?** Wait for your partner to ask for info. Only give info. that is on your card.
3. Before telling your partner the info., ask, "**Why do you need that information?**"
4. After your partner solves the problem, ask them to explain their reasoning. Listen.

If you have a problem card:

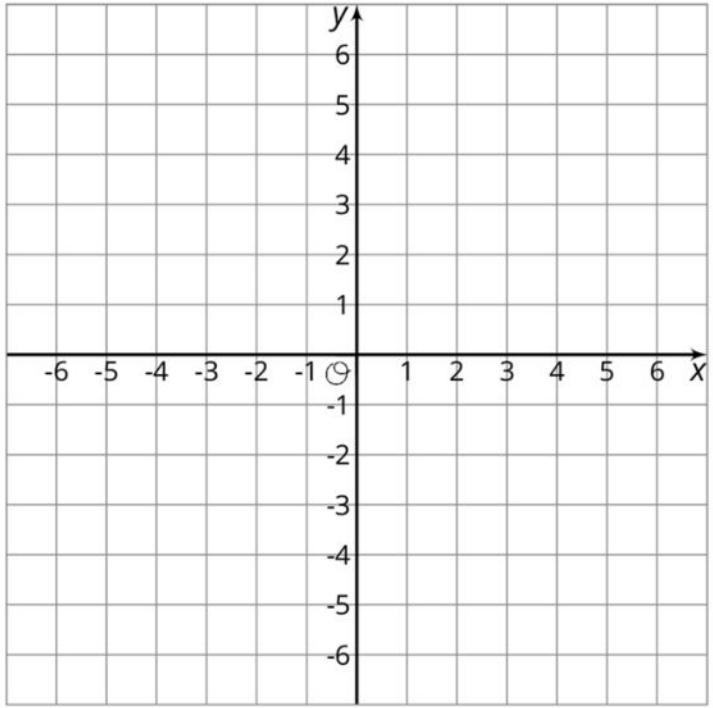
1. Silently read your card and think about what you need to know to answer the question.
2. Ask your partner for specific info. you need.
3. Explain to your partner how you are using the info. to solve the problem.
4. Solve the problem and explain your reasoning to your partner.

Info Gap: Dilations

Problem Card 1

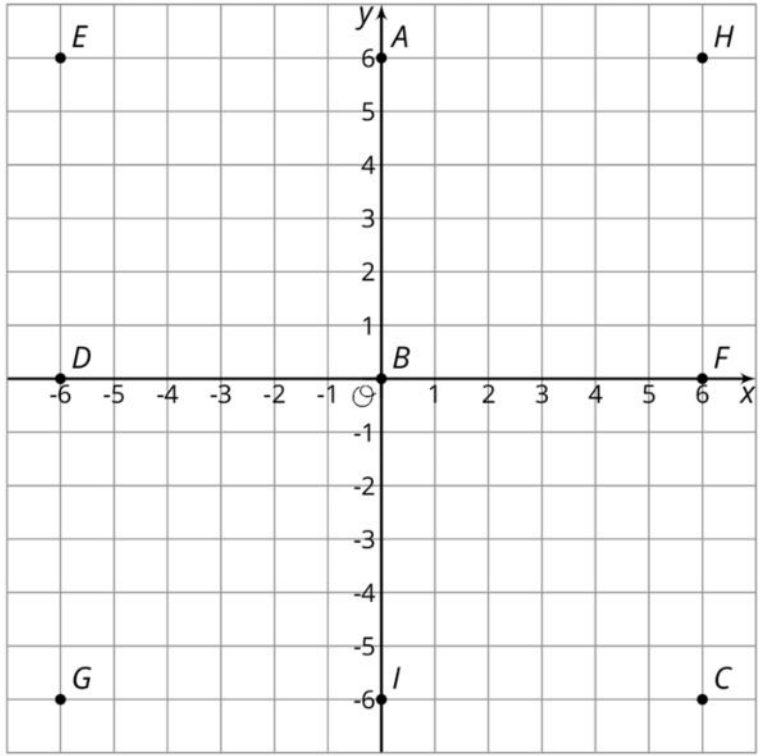
Polygon *AFID* is dilated.

Draw the image of *AFID* under this dilation.



Info Gap: Dilations

Data Card 1



Center of Dilation: (0, 0)

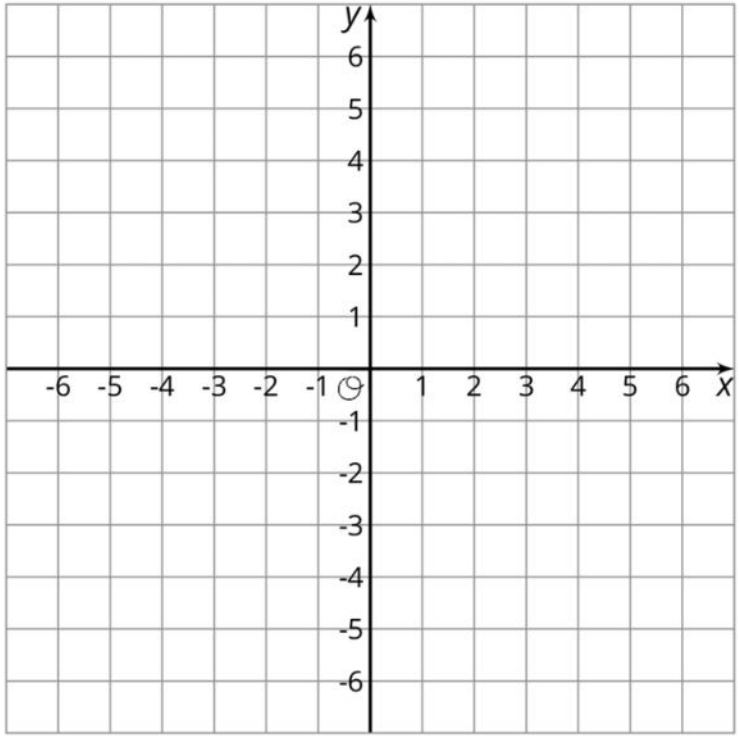
Scale Factor: $\frac{1}{3}$

Info Gap: Dilations

Problem Card 2

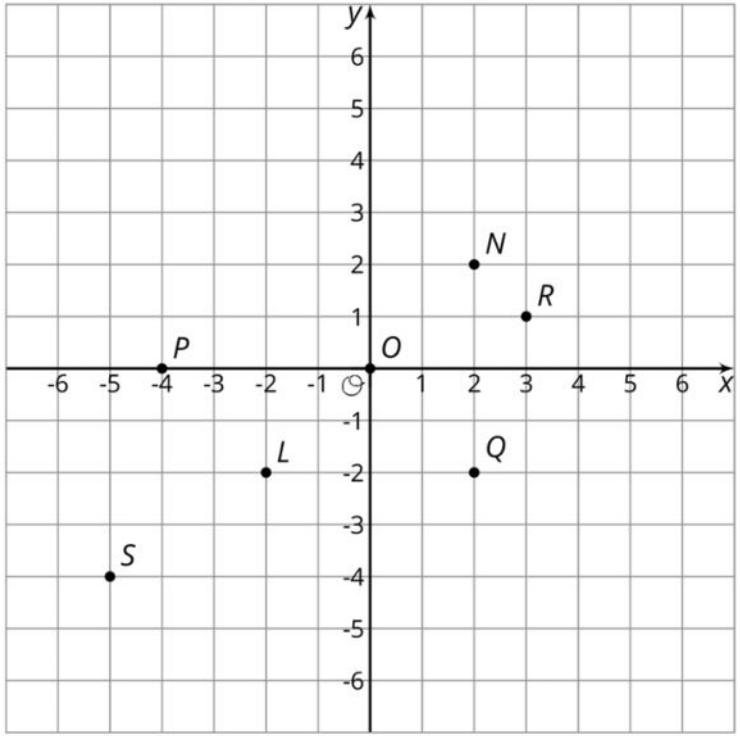
Polygon *ONPQ* is dilated.

Draw the image of *ONPQ* under this dilation.



Info Gap: Dilations

Data Card 2

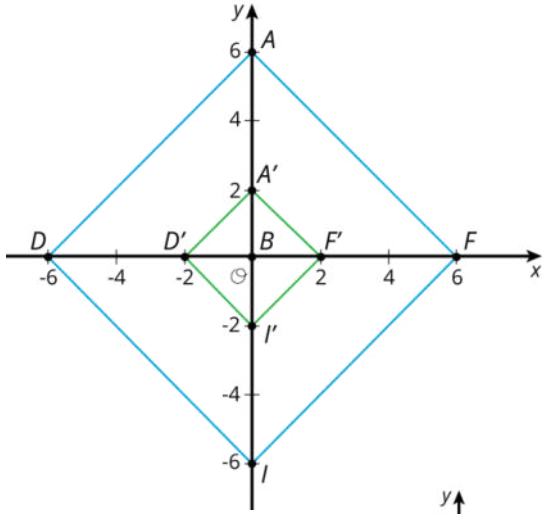


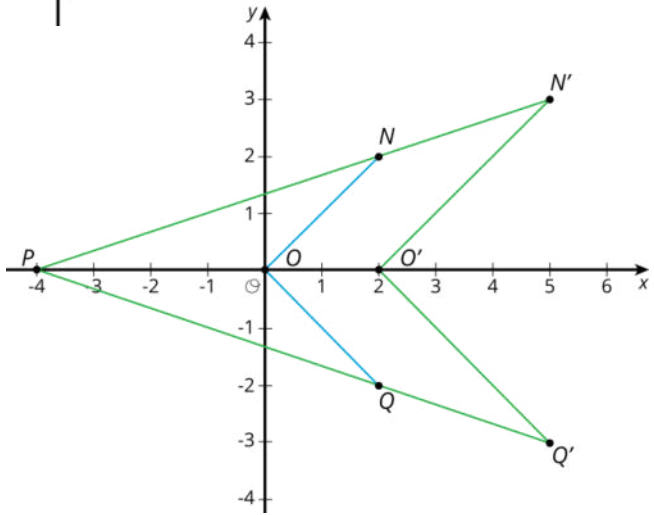
Center of Dilation: (-4, 0)

Scale Factor: $\frac{3}{2}$

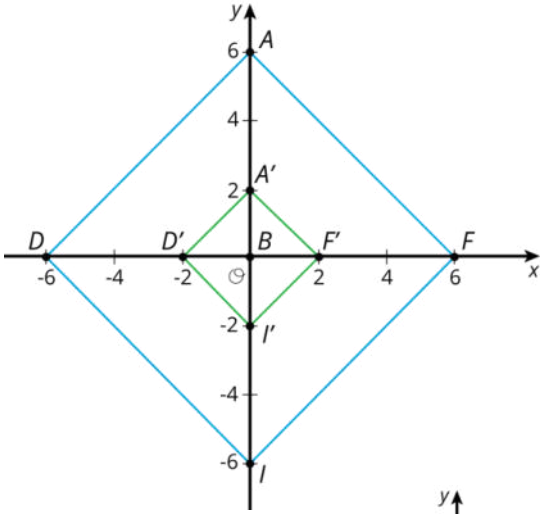
- Other than the answer, what information would have been nice to have?

- How did using coordinates help in talking about the problems?

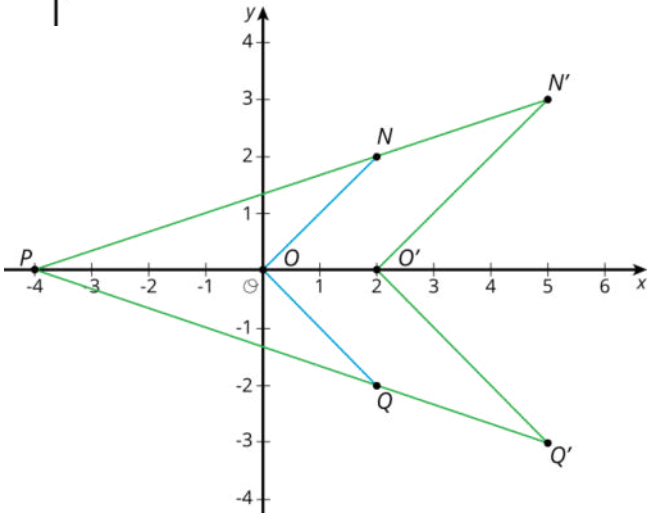




- If the problems had a figure on a grid without coordinates, how would you talk about the points?

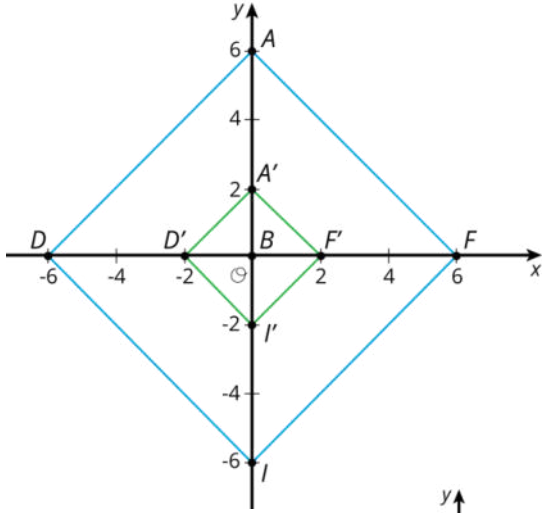


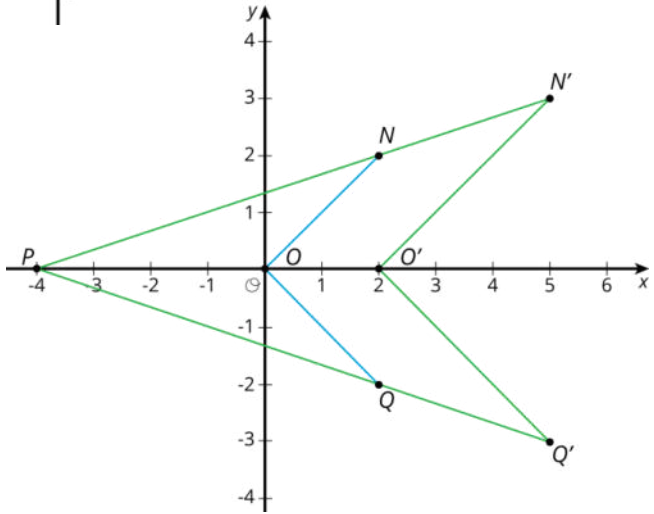
- What if there had been no grid at all? Would you still have been able to communicate the necessary information to perform the transformation?



Coordinates allow us to precisely provide the location of a polygon's vertices.

To perform a dilation, we need to know the scale factor and the center of dilation! The grid helps us efficiently communicate the center of dilation.

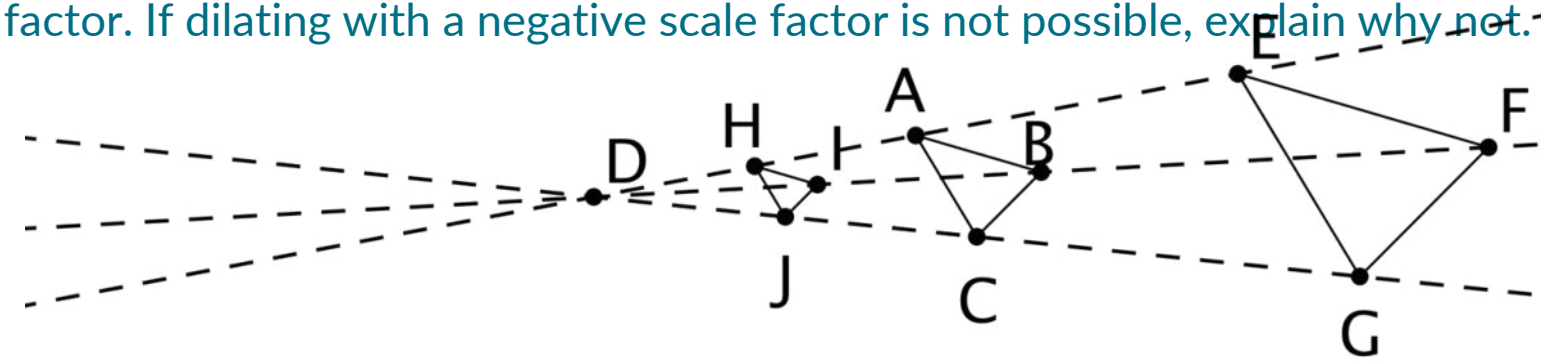




“Are you ready for more?”

Triangle *EFG* was created by dilating triangle *ABC* using a scale factor of 2 and center *D*.
Triangle *HIJ* was created by dilating triangle *ABC* using a scale factor of ½ and center *D*.

1. What would the image of triangle *ABC* look like under a dilation with scale factor 0?
2. What would the image of the triangle look like under dilation with a scale factor of -1? If possible, draw it and label the vertices *A′*, *B′*, and *C′*. If not, explain.
3. If possible, describe what happens to a shape if it’s dilated with a negative scale factor. If dilating with a negative scale factor is not possible, explain why not.



Why does anyone bother putting coordinate axes on a grid?

Why are coordinates useful? What are they good for?

BIG IDEAS:

Coordinates are an exceptionally powerful tool for communicating the location of the points in the plane.

There is only one point 3 units to the left of the origin and 2 units up from the origin, the point (-3,2).

BIG IDEAS:

The location of a polygon is determined by the location and order of vertices.

On a coordinate plane, these can be communicated by giving their coordinates.

BIG IDEAS:

Coordinates in the plane are much like an address in the city: they tell you where to go unambiguously! All you need are 2 signed numbers!

Today's Goal

- ❑ I can apply dilations to polygons on a rectangular grid if I know the coordinates of the vertices and of the center of dilation.

Identifying a Dilation

Cool Down