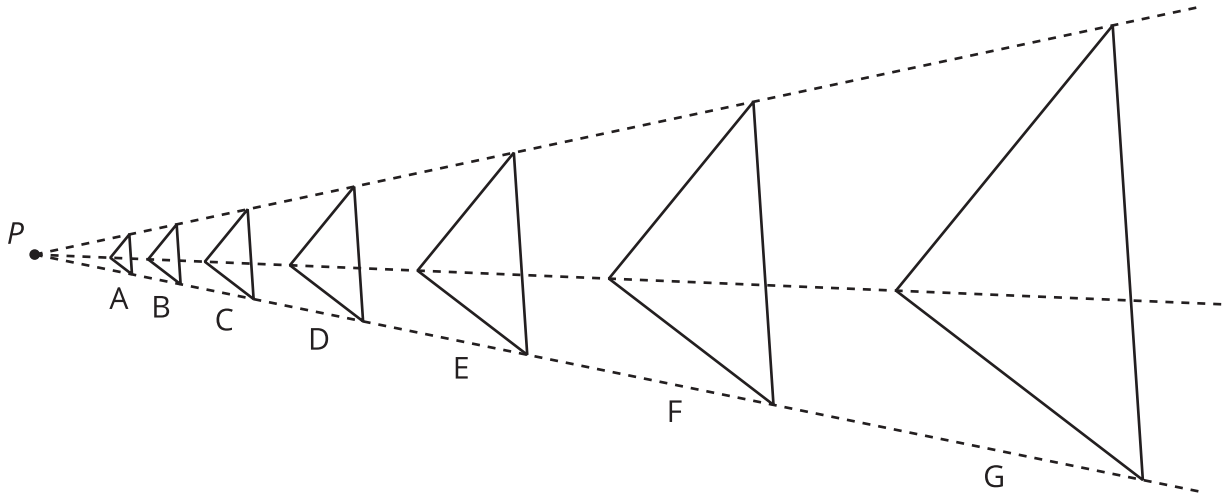
Unit 2, Lesson 5

More Dilations

Let's dilate figures in the coordinate plane.

5.1 Notice and Wonder: Many Dilations of a Triangle

All of the triangles are dilations of Triangle D. What do you notice? What do you wonder?



5.2 Info Gap: Dilations

Your teacher will give you either a problem card or a data card. Do not show or read your card to your partner.

If your teacher gives you the problem card:

1. Silently read your card, and think about what information you need to answer the question.
2. Ask your partner for the specific information that you need. "Can you tell me _____?"
3. Explain to your partner how you are using the information to solve the problem. "I need to know _____ because . . . ."

   Continue to ask questions until you have enough information to solve the problem.
4. Once you have enough information, share the problem card with your partner, and solve the problem independently.
5. Read the data card, and discuss your reasoning.

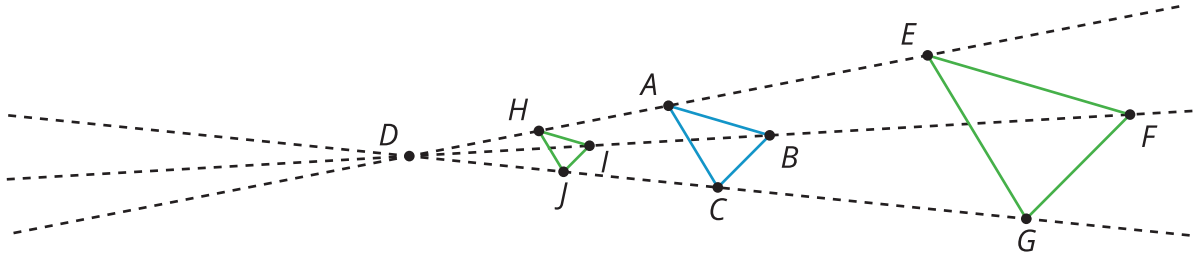
If your teacher gives you the data card:

1. Silently read your card. Wait for your partner to ask for information.
2. Before telling your partner any information, ask, "Why do you need to know _____?"
3. Listen to your partner's reasoning and ask clarifying questions. Only give information that is on your card. Do not figure out anything for your partner!

   These steps may be repeated.
4. Once your partner says they have enough information to solve the problem, read the problem card, and solve the problem independently.
5. Share the data card, and discuss your reasoning.

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 $\frac{1}{2}$ 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 triangle ABC look like under dilation with a scale factor of -1? If possible, draw it and label the vertices A', B', and C'. If it's not possible, explain why not.

3. If possible, describe what happens to a point if it is dilated with a negative scale factor. If dilating with a negative scale factor is not possible, explain why not.

Lesson 5 Summary

One important use of coordinates is to communicate geometric information precisely. Like an address in a city, they tell you exactly where to go. Because the plane is laid out in a grid, these "addresses" are simple, consisting of 2 signed numbers.

Consider a quadrilateral $ABCD$ in the coordinate plane. Performing a dilation of $ABCD$ requires 3 vital pieces of information:

1. The coordinates of A, B, C, and D
2. The coordinates of the center of dilation
3. The scale factor

With this information, we can dilate each of the vertices A, B, C, and D and then draw the corresponding segments to find the dilation of $ABCD$. Without coordinates, describing the location of the new points would likely require sharing a picture of the polygon and the center of dilation.