Module 1: Transforming Geometric Objects

TOPIC 2: SIMILARITY

In this topic, students investigate dilations. They make connections between scale factors and dilation factors by examining Worked Examples of Euclidean dilations. They then define similar figures. Throughout the topic, students relate dilations to scale factors and scaling up and down. Finally, students use dilations to map from a figure to a similar figure, eventually identifying a sequence of transformations that map from a figure to a similar figure.

Where have we been?

This topic connects grade 7 scale drawings with similarity. Students first review content about scale factors from grade 7 and determine that, after an enlargement or reduction, the ratios of corresponding side lengths are equal, and the corresponding angles have the same measure.

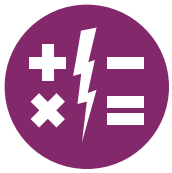
Where are we going?

The properties of similar figures are useful for solving real-world problems about scale factors. Similar triangles will also be used later in the course to explain properties of the slope of a line.

Using Technology to Create Similar Figures

Graphic design and other software programs have methods for scaling images and other objects. This scaling, shown here as a percent of the size of the original figure, produces a similar figure by dilating the image or object. A dilation of 100% is the same as doing nothing to the original figure.

Myth: "If I can get the right answer, then I should not have to explain why."



Sometimes you get the right answer for the wrong reasons. Suppose a student is asked, "What is 4 divided by 2?" and she confidently answers "2!" If she does not explain any further, then it might be assumed that she understands how to divide whole numbers. But, what if she used the following rule to solve that problem? "Subtract 2 from 4 one time." Even though she gave the right answer, she has an incomplete understanding of division.

However, if she is asked to explain her reasoning by drawing a picture, creating a model, or giving a different example, the teacher has a chance to remediate her flawed understanding. If teachers aren't exposed to their students' reasoning for both right and wrong answers, then they won't know about or be able to address misconceptions. This is important, because mathematics is cumulative in the sense that new lessons build upon previous understandings.

You should ask your student to explain their thinking, when possible, even if you don't know whether the explanation is correct. When children (and adults!) explain something to someone else, it helps them learn. Just the process of trying to explain is helpful.

#mathmythbusted

Talking Points

You can further support your student's learning by asking questions about the work they do in class or at home. Your student is learning to think about mathematical similarity and scaling.

Questions to Ask

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? How do you know?
- Is there anything you don't understand? How can you use today's lesson to help?

Key Terms

dilation

A dilation is a transformation that produces figures that are the same shape as the original figure, but not necessarily the same size.

similar

When two figures are similar, the ratios of their corresponding side lengths are all equal. This means that you can create a similar figure by multiplying or dividing all of the side lengths of a figure by the same scale factor (except 0).