THE FOUR-SQUARE QUILT

Put triangles together to make patterns.

[45 minutes]

Materials:

- Four-Square Quilt Template (attached)
- Triangle Template (attached)
- Two different colors of paper
- Glue
- Set of Shape Finders for each group (attached)

Preparation:

Make one copy of the Four Square Quilt Template for each student. Copy the Triangle Template onto the colored paper. Each student will need four triangles in each of two colors, for a total of eight triangles. Younger students may need to have the triangles cut for them. Cut out the Shape Finder pieces.

Try This:

Step 1 How would you orient a triangle so that it fits inside one of the four squares on the Four-Square Quilt template? You may need to turn the triangle, or *rotate* it, to get it to fit.

Step 2 Arrange the eight triangles inside the four squares. Do not let any of the triangles cover part of another triangle. Make sure you do not cover any lines of the squares. To use all of the triangles, you will need to put two triangles in each square.

Step 3 Play around with different patterns until you find one you like.

Step 4 Glue the triangles onto the Four-Square Quilt Template to complete your final pattern.

Step 5 Look at other people's patterns. How are they different from yours? How many different arrangements do you see?

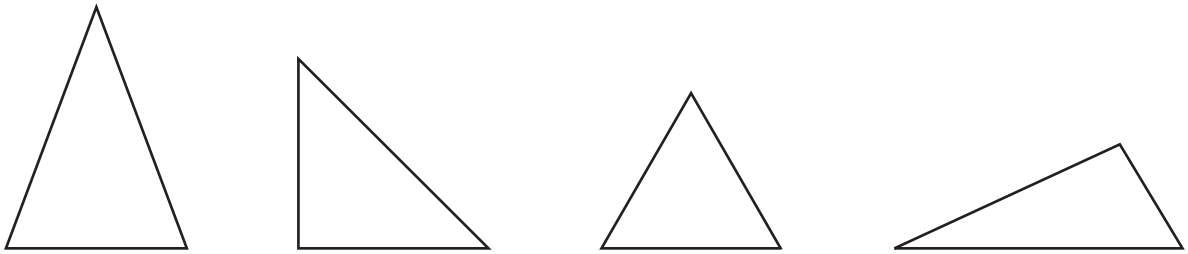
Step 6 Look at your pattern again. Do you see any larger shapes that are made of more than one triangle? Pick one of the Shape Finder pieces and place it on top of your quilt pattern. Does it match any part of your pattern? You may have to turn the Shape Finder piece sideways, or upside down, or flip it over, to match your pattern. Turning a shape sideways or upside down is called *rotation*. Flipping a shape over is called *reflection*. If the Shape Finder piece doesn't fit, try another.

Step 7 Can you find Shape Finder shapes on another quilt pattern? Try to identify similar shapes in different quilt patterns.

What's Going On?

Triangles can be combined to make other shapes. Two triangles put together can make a square, a larger triangle, or a four-sided shape called a parallelogram. With four triangles you can make an even larger triangle, a larger square, a rectangle, and other shapes as well.

When you flipped over the shape finder, you were creating a reflection of it. It's the same thing that happens to a shape when you see its reflection in a mirror. You can try this with a mirror if you have one. If you reflect a shape twice, you will be back to your original shape.



Isosceles Right Equilateral Scalene

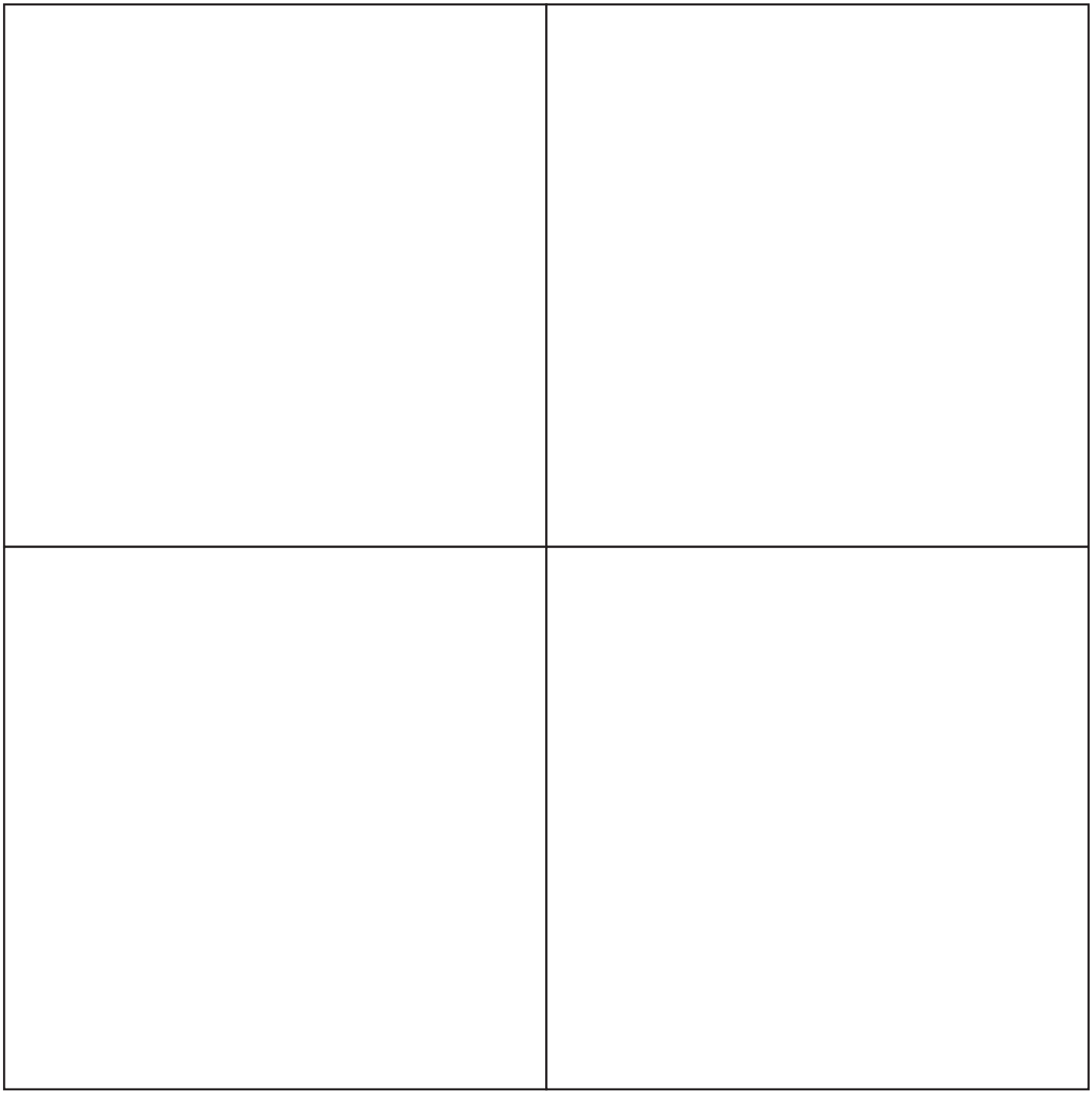
The triangles you used here are called *isosceles triangles*. That means that two of the triangle's sides are the same length.

They are also *right triangles*. Right triangles have one angle that measures 90 degrees, like the corner of a square.

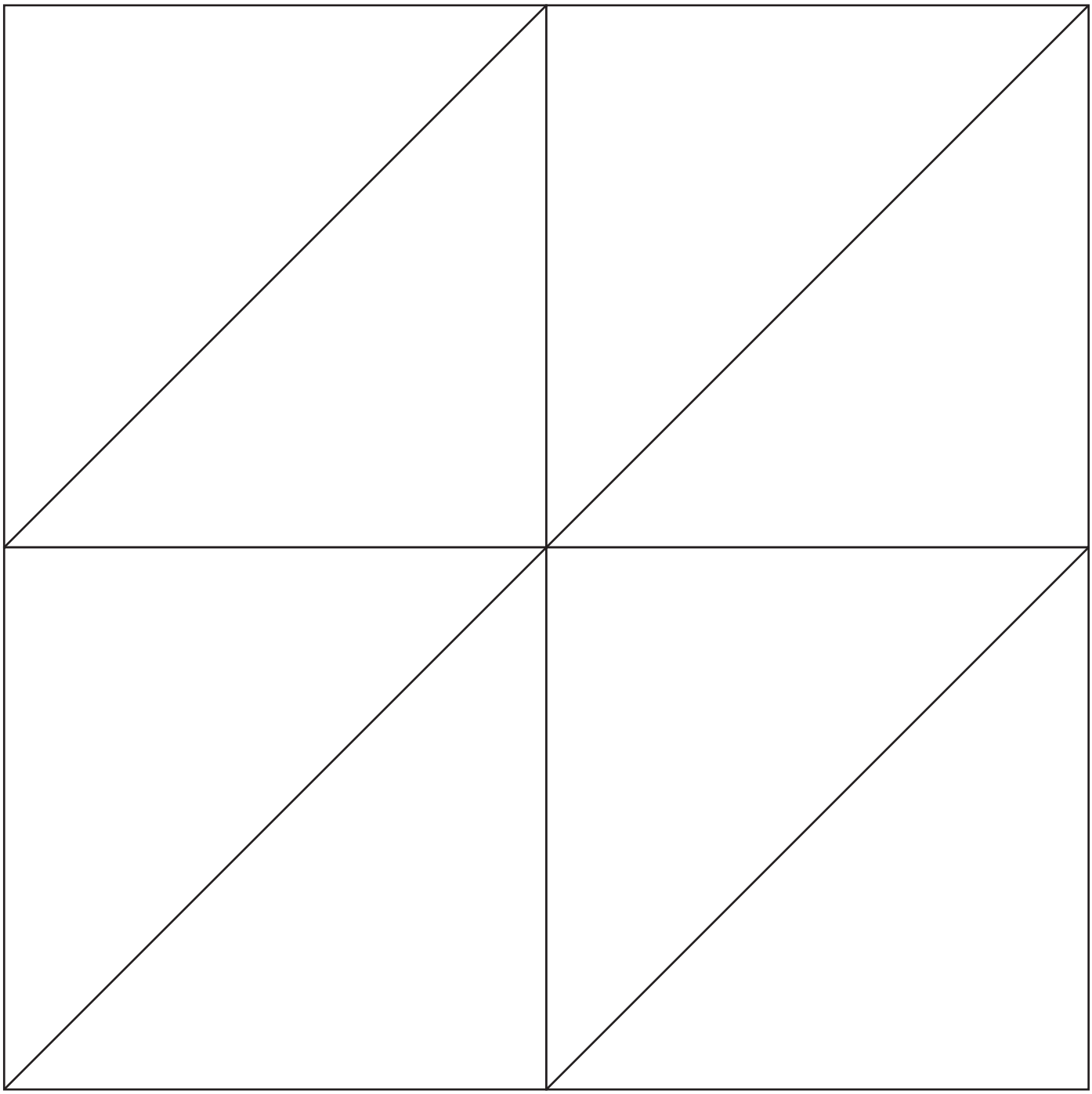
There are other kinds of triangles, too. When a triangle has three sides all the same length, it's called an *equilateral triangle*.

If all three sides of a triangle are different lengths, it's called a *scalene triangle*.

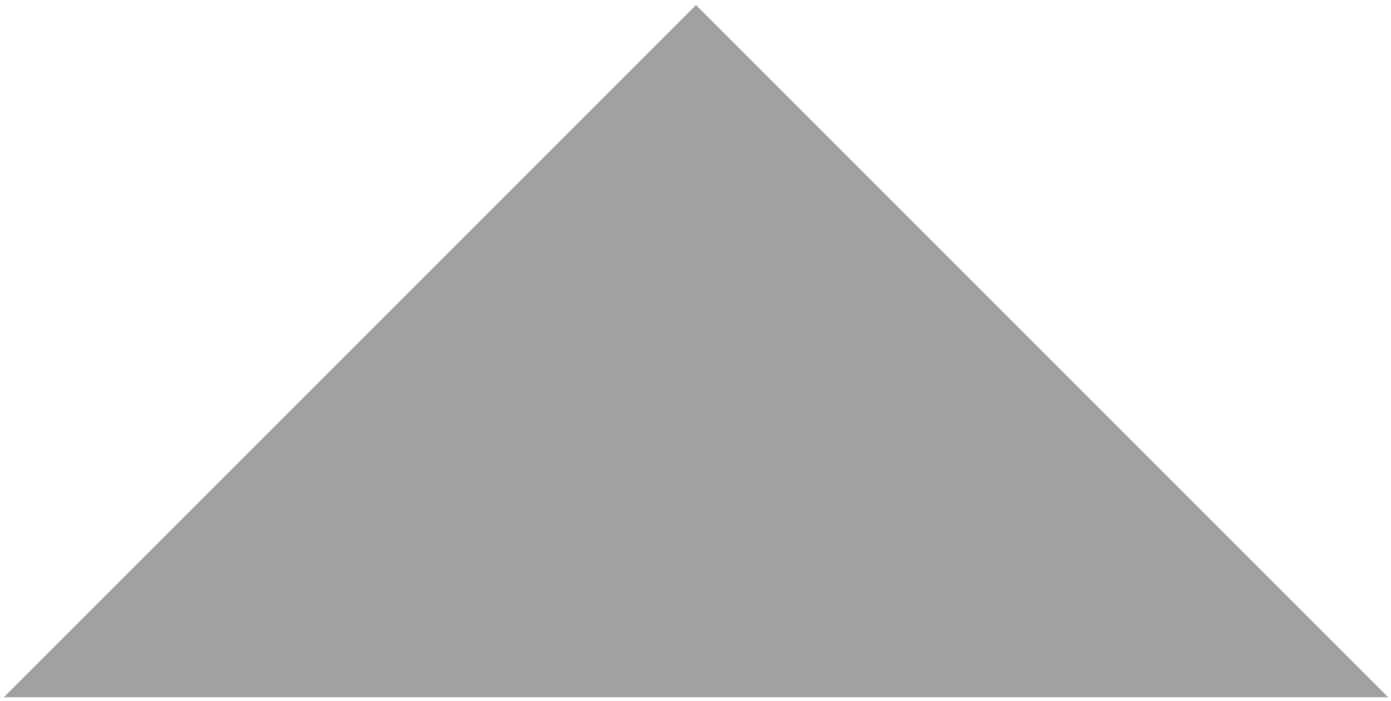
Four-Square Quilt Template

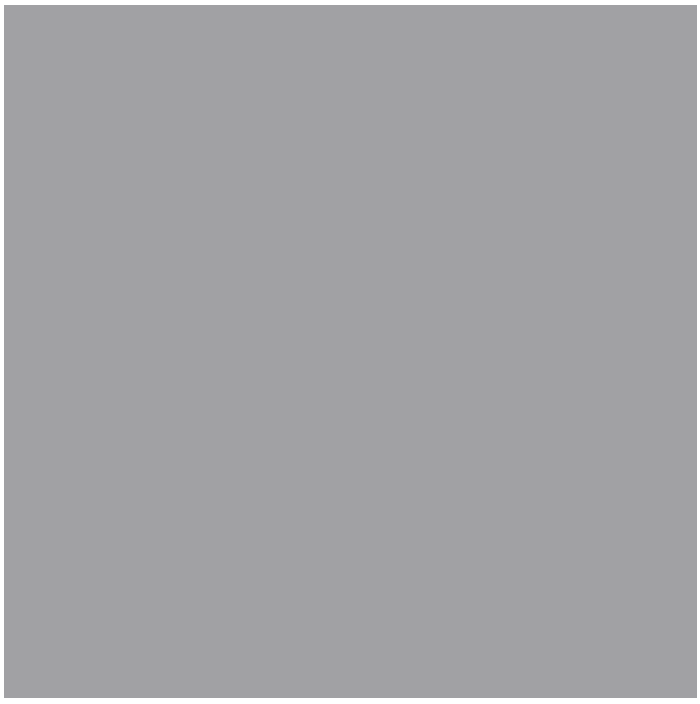


Triangle Template



Shape Finder





Shape Finder

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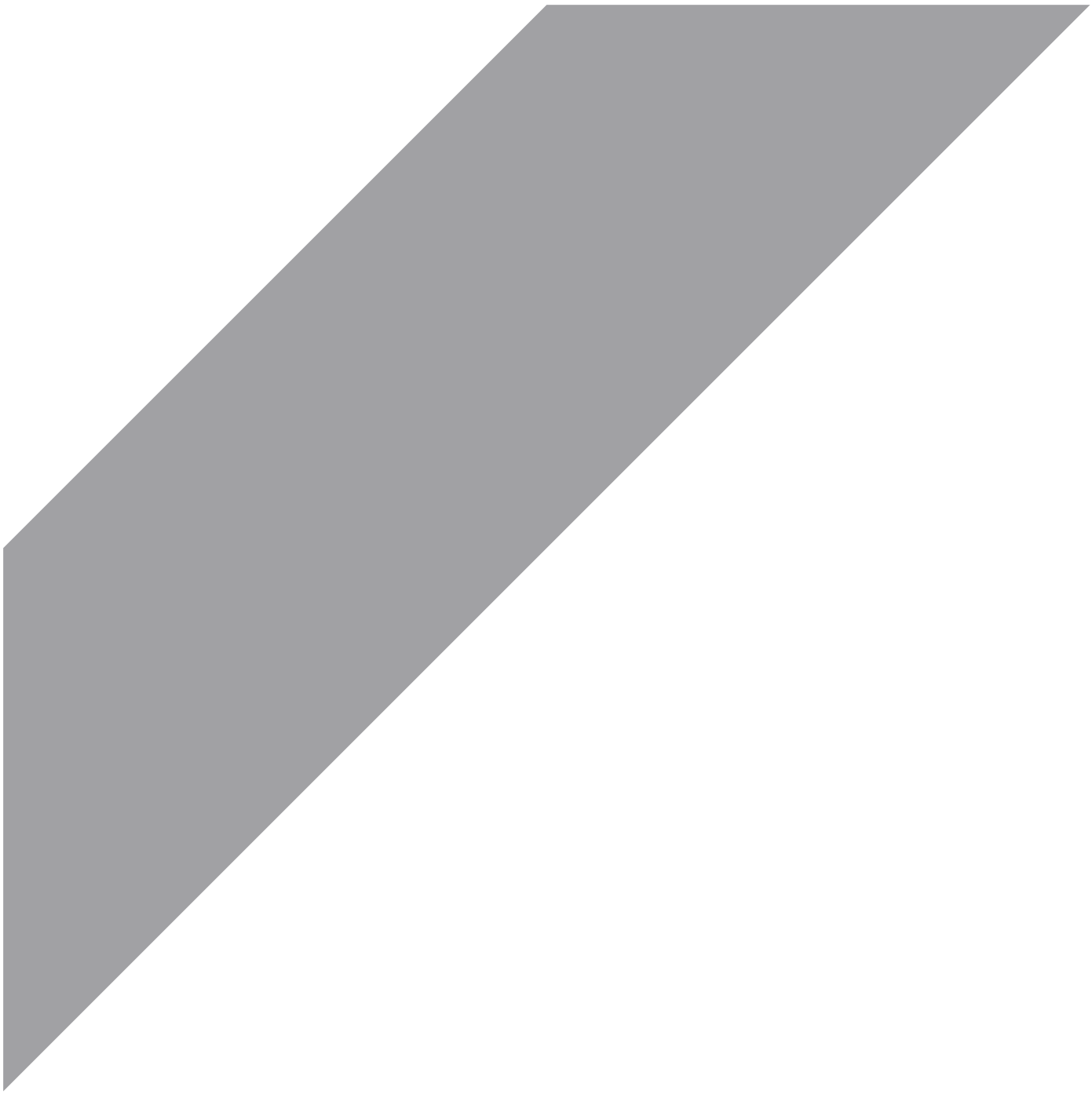

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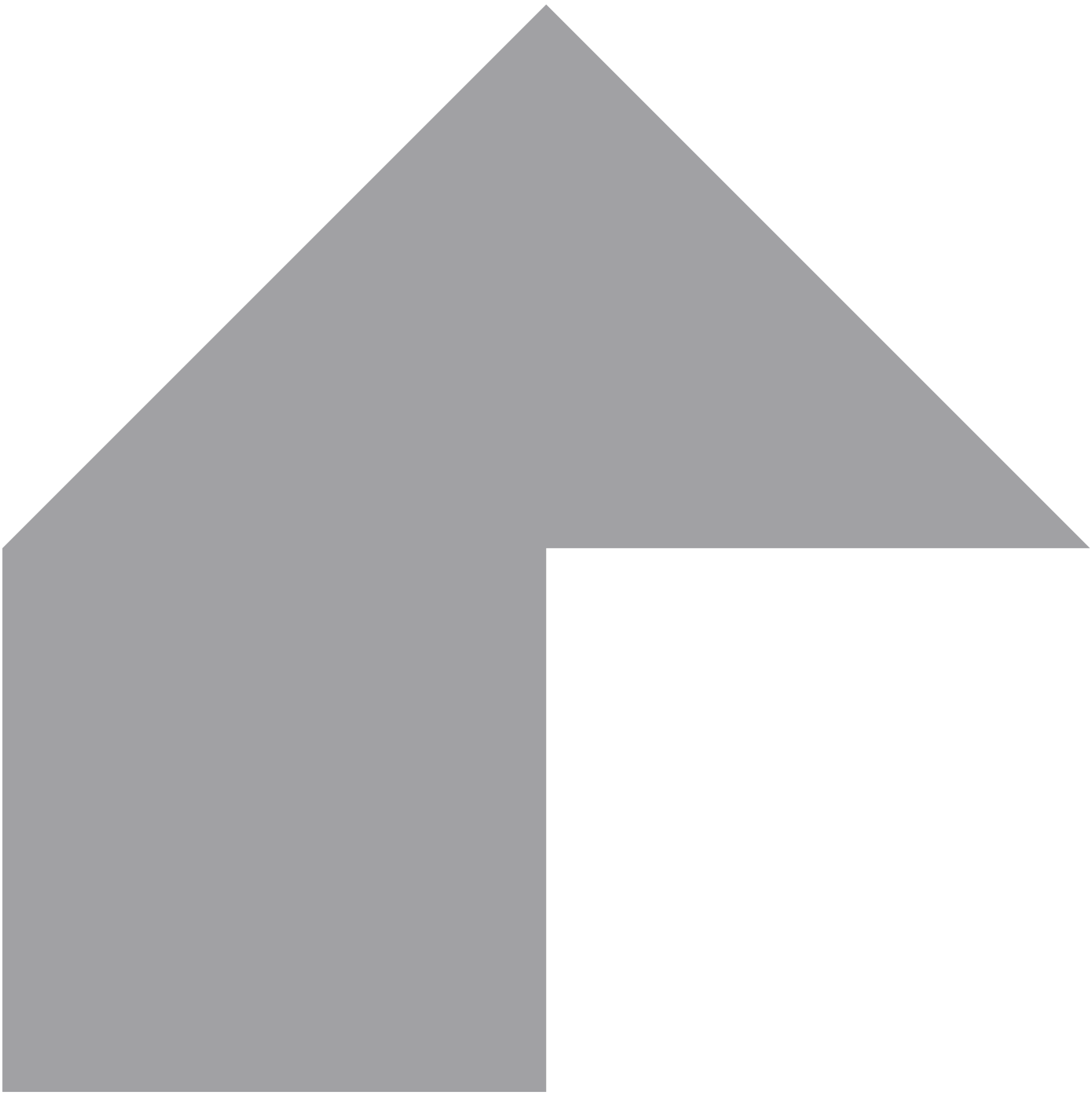

From the National Council of Teachers of Mathematics (NCTM)

THE FOUR-SQUARE QUILT

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships:

- Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes;
- Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes.

Apply transformations and use symmetry to analyze mathematical situations:

- Recognize and apply slides, flips, and turns.