

CURIOSITY AT HOME

FAIR AND SQUARE



Spatial reasoning is the skill you use to read a map, organize a toy drawer, or build a fort. This skill is also often used in art and math projects- it's the way we think about how objects relate to one another in a physical space. In this activity, challenge your spatial reasoning with a series of puzzles!

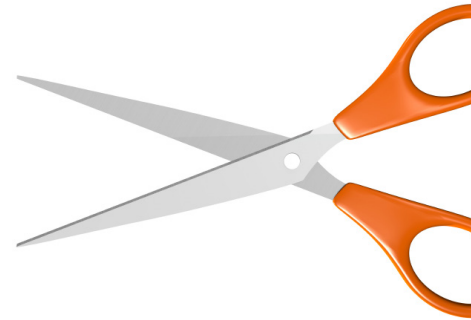
MATERIALS

- Scrap paper
- Scissors
- Science notebook or paper
- Something to write with



PROCEDURE

- Either trace or print the shapes below onto a piece of paper. Carefully cut out the first shape.
- Your goal is to make a single cut, dividing the shape into two pieces that can then be put back together to make a square. First, you'll want to carefully think through where you want to cut the shape, and make a line there with your writing tool.
- Cut the paper and try rearranging the shapes into a square.
- Did it work? Draw your resulting shape in your science notebook, showing how the two pieces fit together.
- No luck on your first try? Think about what you'll do differently, then copy the shape and try again.
- Try the same thing with the other two shapes.



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EXPLORE MORE

Make up your own shape puzzles. Start out with a square, then cut and tape it into a new shape. Trace it on to a sheet of paper, then test it to make sure it can turn into a square. Share your puzzles with someone and see if they can solve it.

DID YOU KNOW?

To solve the third square, you needed to look at not only the space being taken up by the object, but the surrounding *negative space*. Negative space is the term for the empty space surrounding an object, like the hole in a donut. Looking at negative space can be useful for solving problems like this one, and for drawing complex shapes in general.



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K-2 GRADE EXPLORATION

- Design a shape puzzle using a triangle instead of a square. Share it with someone. Were they able to solve the puzzle?
- Make a different kind of puzzle. Draw a picture, then cut it into puzzle piece shapes. See if you or a friend can re-arrange it to put it back together.



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3–5 GRADE EXPLORATION

- Explore the following questions and write your observations in your science notebook. Are there some shapes that cannot be cut and re-arranged into squares? Make a shape that cannot be re-arranged into a square with a single cut. How is it different than the shapes you made into squares?
- Make a different kind of puzzle. Draw a picture, then cut it into puzzle piece shapes. See if you or a friend can re-arrange it to put it back together.



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6–8 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- How do you know whether a shape will be able to be cut and rearranged into a square or not? Try a couple different variations and see if you can figure out a way to predict whether it will work or not.
- Experiment more with negative space. Draw a picture where the empty space between shapes makes an interesting outline or shape.



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