

Objective

Use Tangrams to solve visual/spatial puzzles.

Common Core State Standards

- **1.G.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

Geometry

Tangram Puzzles

While young children are often able to recognize and label a variety of simple geometric shapes, they have not yet developed a solid understanding of geometric concepts. Having the opportunity to solve puzzles using shapes will build a solid understanding of the shapes and foster the spatial and problem-solving skills needed to comprehend more involved geometric skills.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- **Ask:** Which shapes were already filled in for you on the first Tangram puzzle?
- **Ask:** Which shapes did you use to complete the first puzzle? Invite volunteers to list the combinations of shapes that they used.
- **Ask:** Did anyone use different shapes to finish the first puzzle? Allow children to compare the shapes they used. Repeat questions for the second puzzle and have children compare their results.

Solve It

With children, reread the problem. Then have children use the Tangram pieces to make their design. They can use any combination of Tangram pieces, as long as the end result is a square. Children will write to describe their designs and draw pictures of their designs on paper.

More Ideas

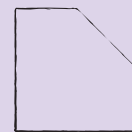
For other ways to teach about solving visual/spatial puzzles—

- Have children create their own puzzles by putting all 7 Tangram pieces together to make pictures of their choice. Then children will outline their pictures and trade with a partner. Each partner will attempt to fill in the other's puzzle.
- Distribute Tangrams to children and have groups of four combine their sets. Have children use all of the small triangles to create a shape or design. Tell them to do the same for the other shapes. Then have children trace outlines of their shapes, exchange papers with another group, and then work to figure out which Tangram piece was used to make each larger shape.

Formative Assessment

Have children try the following problem.

Which Tangram piece could be used to complete the square?



Try It! 20 minutes | Independent

Here is a problem about solving visual/spatial puzzles.

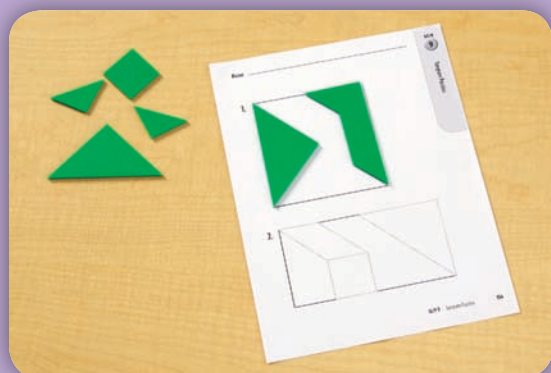
In Lora's classroom, there are tables that are different shapes. Some are triangles, some are squares, and some are parallelograms. Lora's teacher asks her to push some of the tables together to make a square. How can Lora figure out how to arrange the tables into a square?

Introduce the problem. Then have children do the activity to solve the problem.

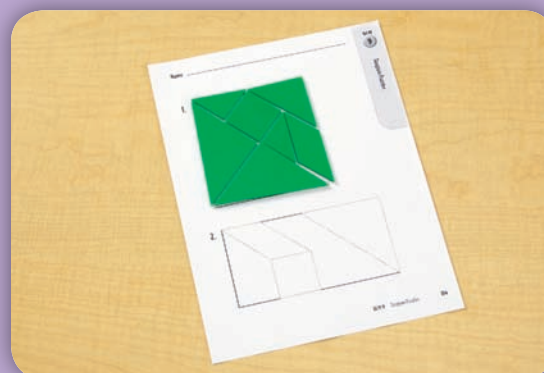
Distribute Tangrams and Tangram Puzzles (BLM 9) to children.

Materials

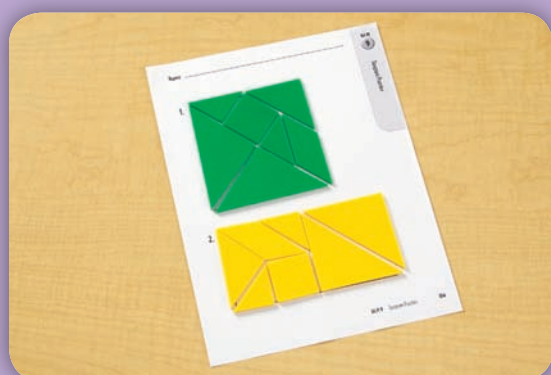
- Tangrams (1 set per child)
- Tangram Puzzles (BLM 9; 1 per child)



1. Tell children that they will be using Tangram pieces to fill in the Tangram Puzzles. Have children look at the first puzzle. **Say:** *Some of the shapes you will use are already drawn on the worksheet to help you. Put the matching Tangram pieces on top of those shapes to start the puzzle.* Have children place Tangram pieces over the shapes drawn on the first puzzle.



2. Say: *Now fill in the rest of the pieces on the first puzzle.* Allow children time to fill in the puzzle by experimenting with shapes to find out which will fit.



3. Once children have completed the first puzzle, allow them to complete the second puzzle on their own.

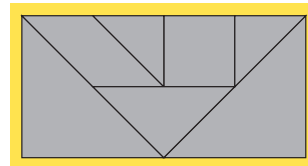
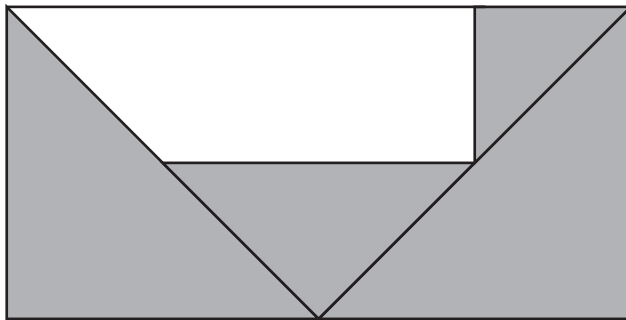
Look Out!

Watch out for children whose Tangram pieces protrude outside the lines of the puzzle shape. Explain that the Tangram pieces must exactly fill in the puzzle shape, with no leftover space inside the lines and no Tangram parts outside the lines. Have children trace around their Tangram pieces with a crayon and then remove them from the puzzle template. Help children find any spots where the crayon tracing diverges from the puzzle outline.

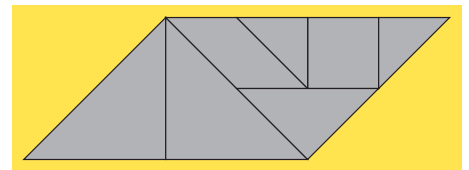
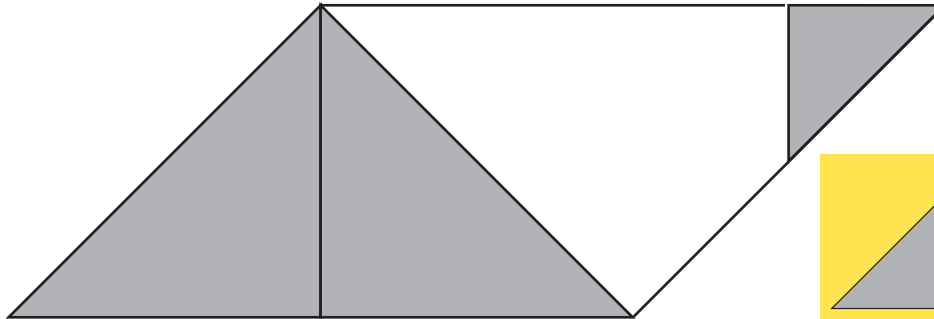
Use Tangram pieces. Complete the model to make each shape. Draw the shapes in place.

(Check students' work.)

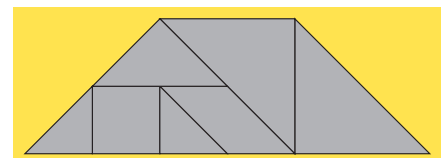
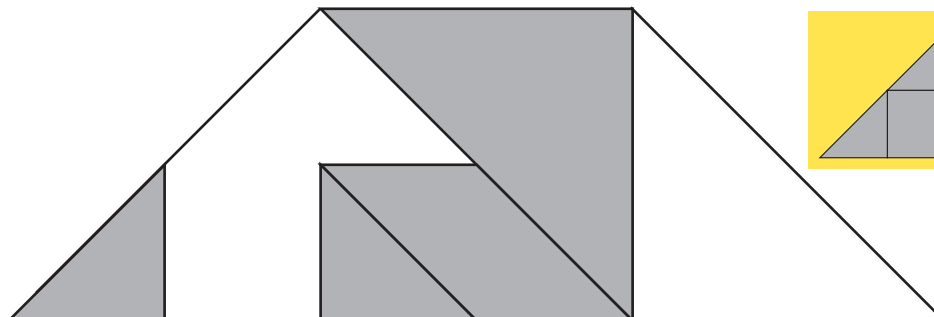
1.



2.



3.



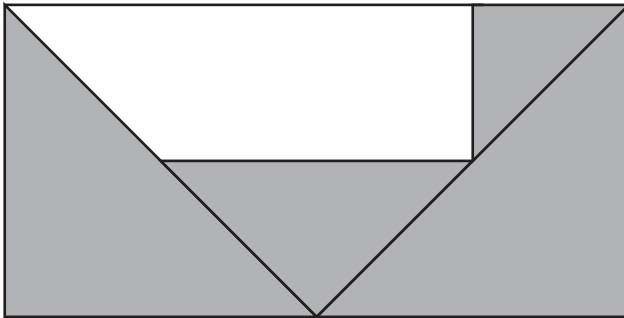
Answer Key

Challenge! How did you decide which Tangram pieces to place in the open spaces to complete the figures on the previous page?

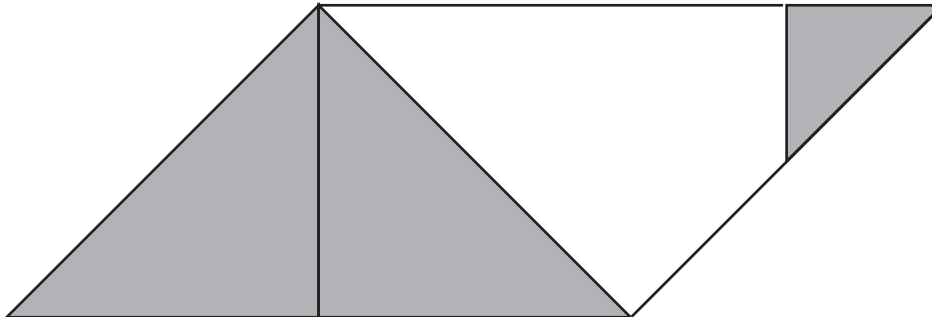
Challenge: (Sample) I tried putting the pieces in the places I thought. If they did not work, I tried a different way.

Use Tangram pieces. Complete the model to make each shape. Draw the shapes in place.

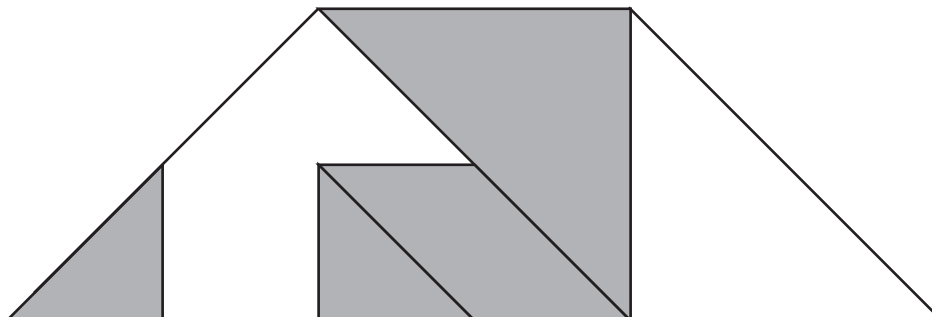
1.



2.



3.



Name _____

Challenge! How did you decide which Tangram pieces to place in the open spaces to complete the figures on the previous page?

Name _____

