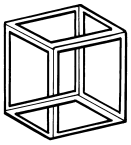


Puzzle Corner

Shape Makers

by Dave and Michelle Youngs

Shape Makers is one of a large family of dissection puzzles which challenge students to assemble a series of smaller shapes to form larger ones. *Tangrams*, which gained popularity in the early 1900s, are perhaps the most common kind of dissection puzzle. In *Shape Makers*, four squares and eight triangles must be reassembled to create a large square, a large triangle, a parallelogram, and a trapezoid. While the main task is fairly simple, it has many possibilities for more challenging extensions.

The second student sheet provides some of these extensions, showing three additional irregular shapes which can be created using the 12 puzzle pieces. Once students discover how to make these shapes, they are challenged to create some shapes of their own and record them. These student-created shapes can be traded with classmates so that students can try to solve puzzles that their friends have created. This gives the students more ownership of the puzzle and gives extra incentive to try and create a shape that will stump others in the class.

I hope you and your students have fun solving this puzzle and creating some shapes of your own. If any of your students discover especially creative shapes that can be made with the pieces, send us a copy of their work and we will try to print it in a future issue of the magazine. The solutions to this puzzle will be here next month, along with a new *Puzzle Corner* activity. If you have any questions or comments about this puzzle feel free to write us here at AIMS•P.O. Box 8120•Fresno, CA 93747 or by email: meyoungs@fresno.edu or dyoungs@fresno.edu.

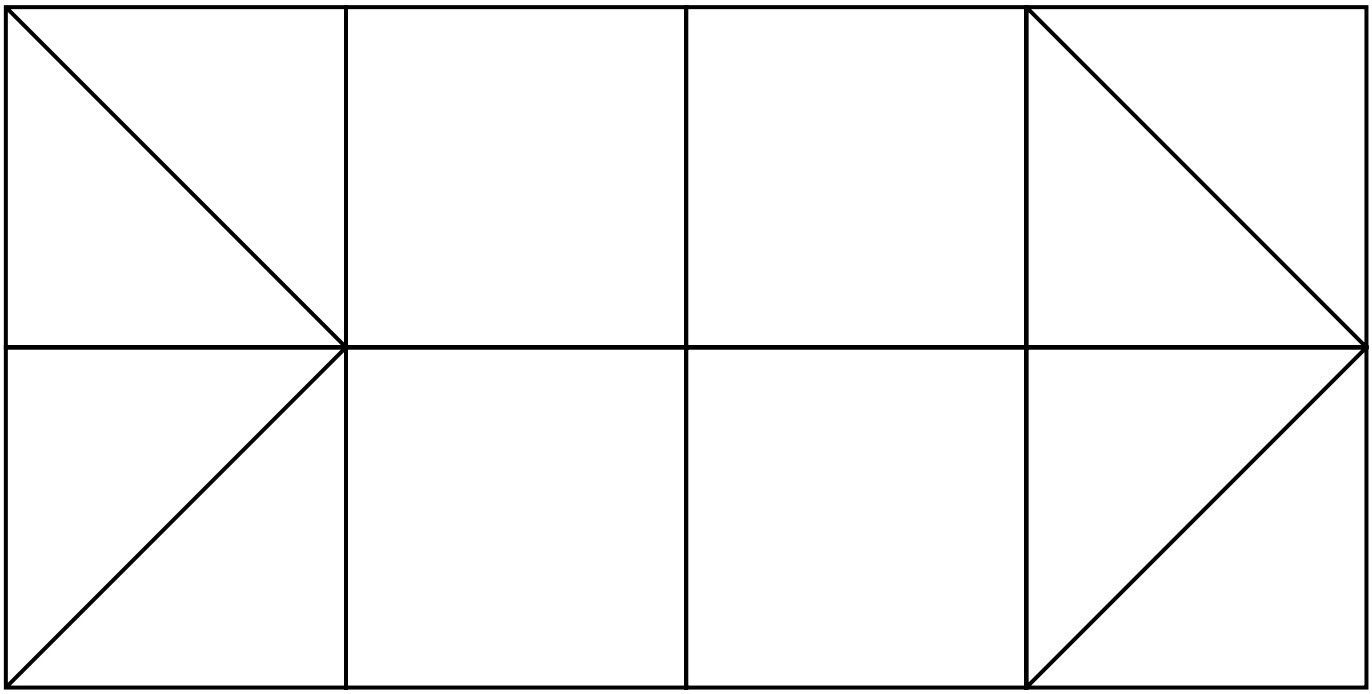
Solution

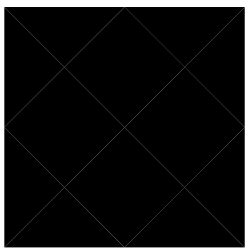
Last month's puzzle was called the *Fifteen Cent Flip*. The challenge in the puzzle was to switch the position of a nickel and a dime in a rectangular array using the fewest number of moves possible. It was stated that the minimum number of moves needed to switch the coins is fewer than 20, but more than 12. The puzzle can actually be solved in 17 moves by following the sequence given below. In each step the direction the coin moves is indicated. Due to the arrangement of the array, there is only one coin that can move in the direction indicated for a given step, so which coin is moving has not been specified.

1. Left
2. Down
3. Right
4. Right
5. Up
6. Left
7. Down
8. Left
9. Up
10. Right
11. Right
12. Down
13. Left
14. Up
15. Left
16. Down
17. Right

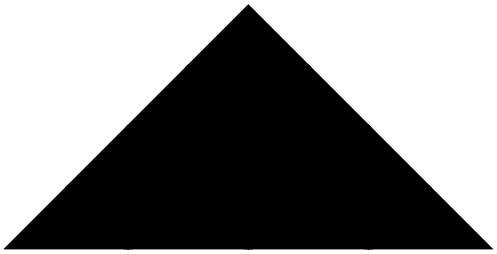
SHAPE Makers

The squares and triangles below can be cut out and rearranged to form the four geometric shapes shown at the bottom of the page. Cut out the 12 pieces and reassemble them to form these four shapes. Make a record of each solution.





Square



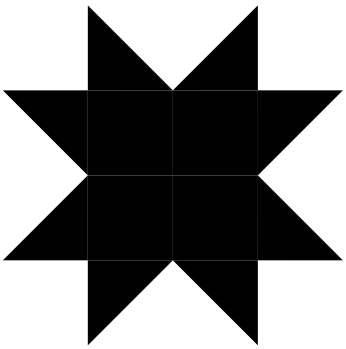
Right Triangle

Parallelogram

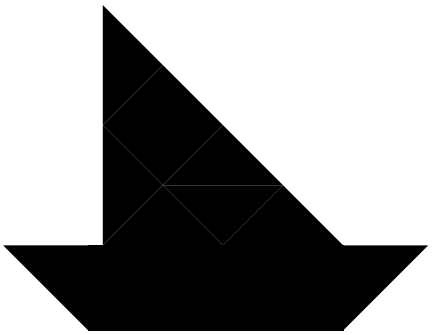
Trapezoid

SHAPE Makers

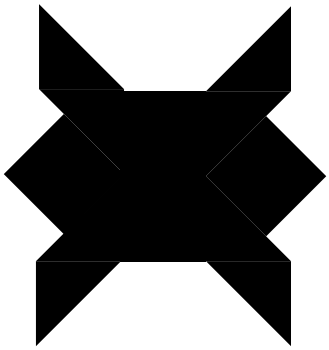
Once you have solved the puzzle and made the four regular geometric shapes, try to make the three irregualr shapes below using the same pieces.



Sunburst



Sailboat



Turtle

Draw your solutions in the space below.

What other shapes can you make with your puzzle pieces? Draw a picture of two more shapes you can create below.