GEOMETILES®

Mini Set 2 Activities
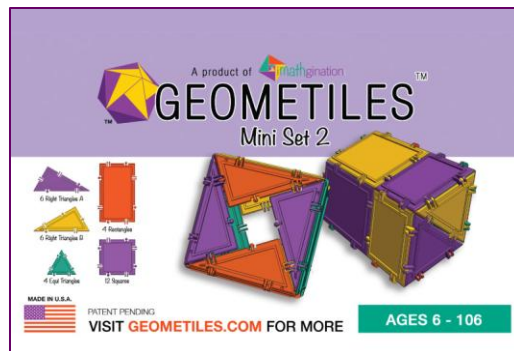
Welcome to Geometiles®!

Your Mini Set 2 contains 4 equilateral triangles, 4 rectangles, 12 squares, and 12 scalene right triangles. This booklet contains some problems and brainteasers for you to try. The puzzles are all at different levels, so there's something for everyone.

Puzzle 1

- Make a square that is 1/3 green, 1/3 yellow, and 1/3 orange.
- Now make an equilateral triangle that is 1/2 purple, 1/3 green, and 1/6 yellow.

Notes:

In the first problem, the student must first realize that she needs to make a square using a number of tiles that is divisible by 3. The only tiles available to her for making this larger square are the small square tiles. So she needs to use a number of them that is (a) a perfect square (b) divisible by 3. The only number that fits the bill is 9.
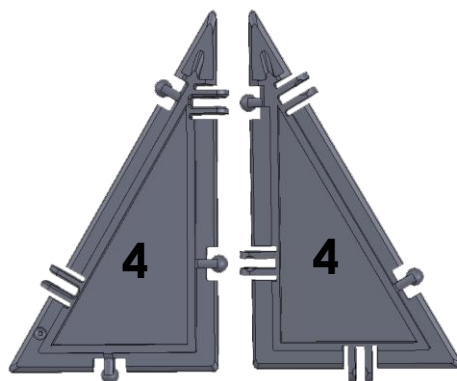
In the second problem, the student needs to understand that the equilateral triangle has to be made of 6 "equal" parts.

Puzzle 2

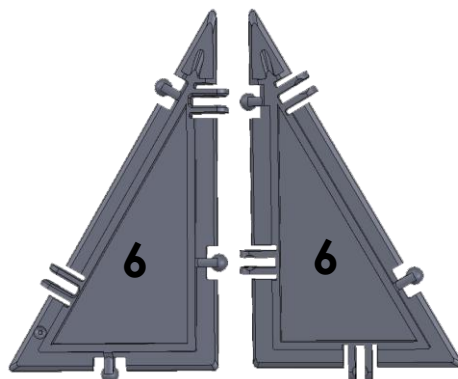How many different equilateral triangular prisms can you make using the tiles in your set?

Puzzle 3

How many closed solids can you create out of the following scalene triangle tiles?
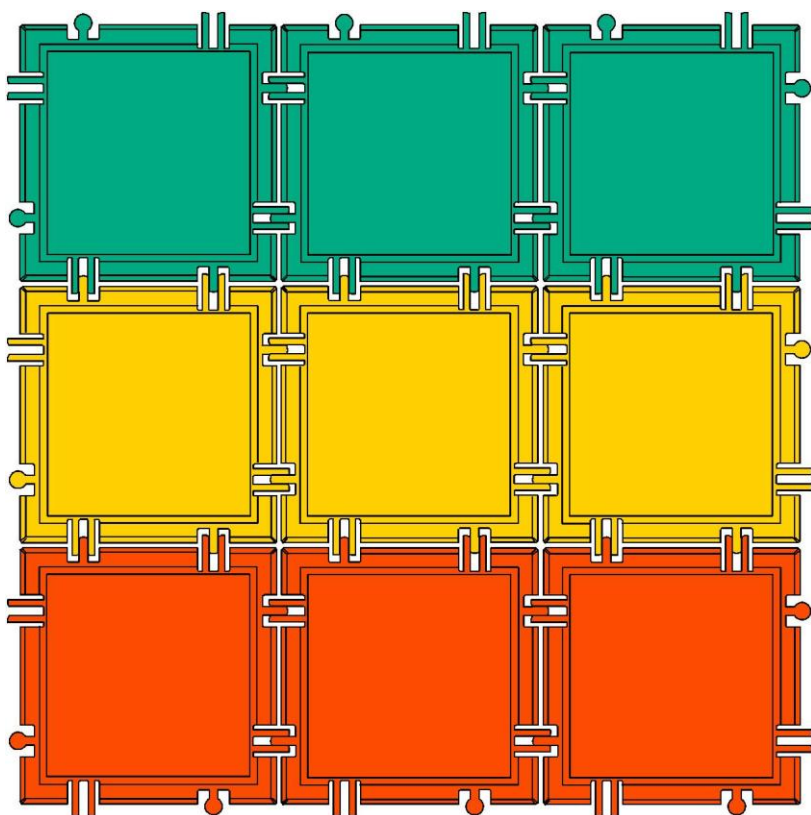
Puzzle 4

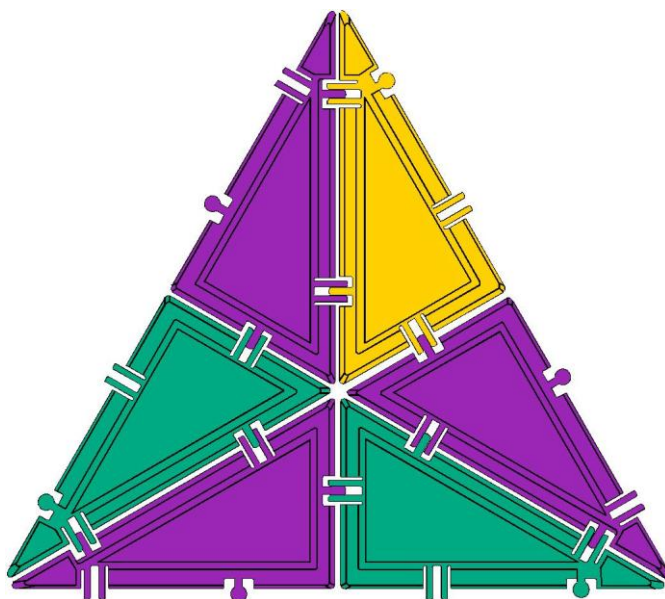How many closed solids can you create out of the following scalene triangle tiles?

Answers to all puzzles are given on the following pages. Don't turn over the page unless you are ready to look at the answers!

1/3 green, 1/3 yellow, 1/3 orange

1/6 yellow, 1/3 green, 1/2 purple

Puzzle 2

As the base of the prism, you can use either a larger equilateral triangle made of two scalene right triangles, or the smaller equilateral triangles.

If you use the larger triangle, only one prism is possible:

If you use the small triangular tile as the base of your prism, there are many possibilities possible depending on how many "stories" your prism has. In fact, it would be a good exercise to ask the students how many different heights are possible. The shortest prism would have only one "story" worth of square faces as its side walls. The tallest one will have 4 "stories" worth of side walls: 1 tall rectangular "story" plus 3 square "stories"

The best way to enumerate the possibilities is to stay organized. A prism can have 0, 1, 2, or 3 square stories. For each of these 4 possibilities, there are 2 possibilities for a rectangular story: to have one or not to have one. So the total number of possible heights is 4 ×2 -1= 7. Why do we subtract 1? Because it's impossible to have a prism with 0 stories!
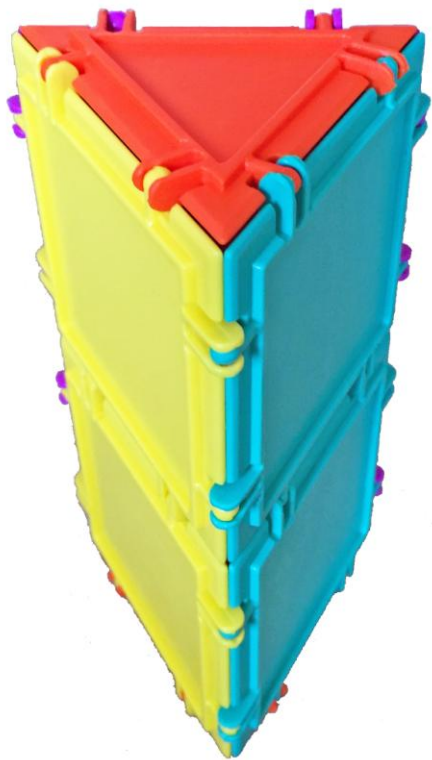
5 of the 7 solutions are shown below:

1 square story
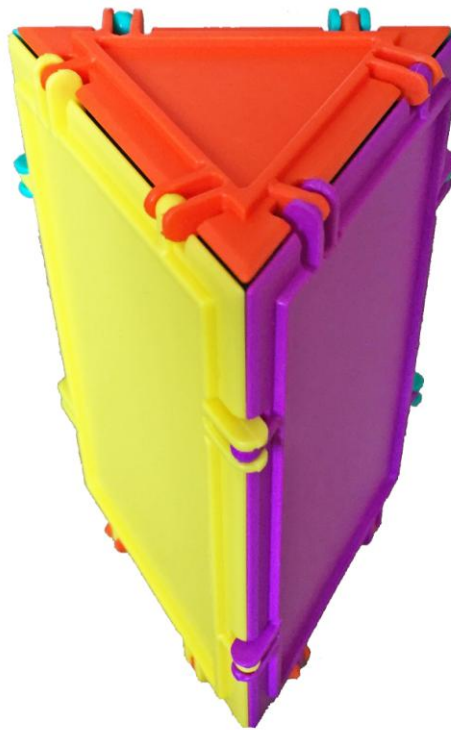
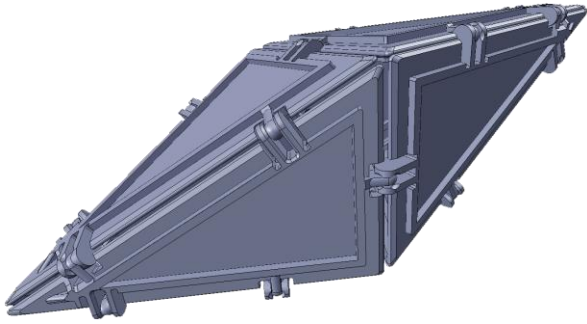1 rectangular story

2 square stories
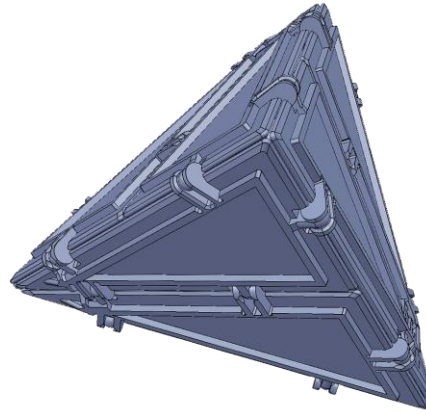
1 square story and 1 rectangular story

2 square stories and 1 rectangular story

Let the student figure out what variations are missing. Hint: how many prisms are possible with 3 square stories?
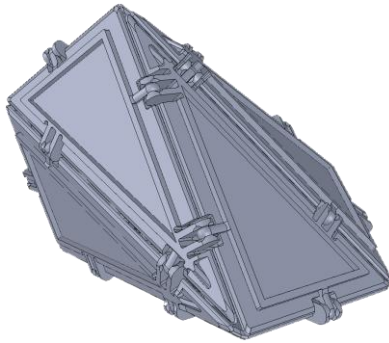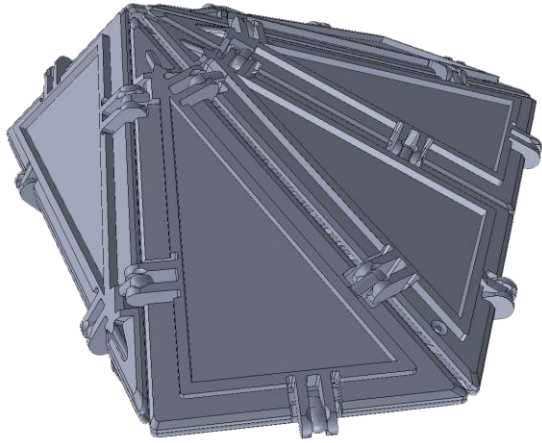
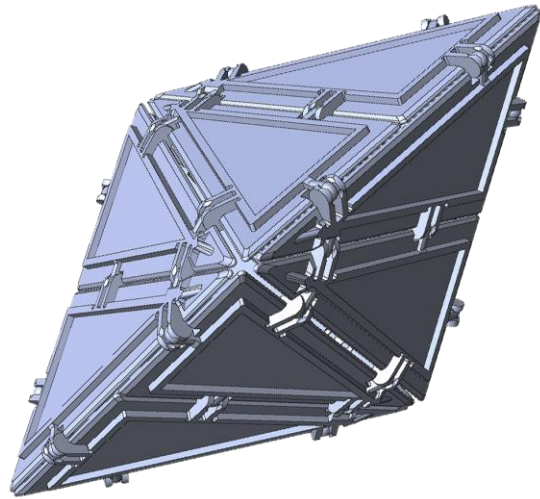## Puzzle 3

Octahedron
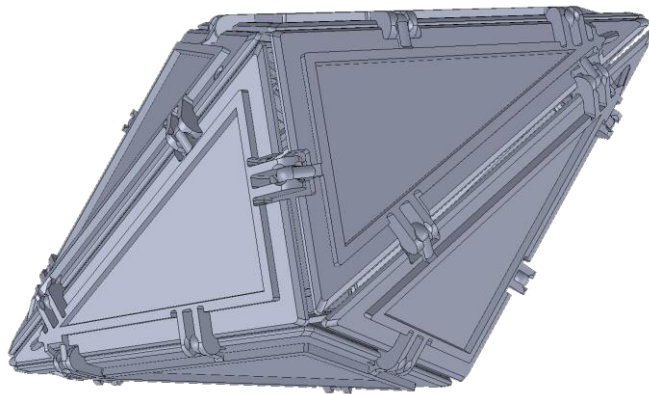

Regular tetrahedron

Ocatahedron

Puzzle 4

Pentagonal dipyramid

Double tetrahedron

Scalenohedron