Geometiles®

10 Sample Activities with the 96 piece Set

www.geometiles.com

U.S. Patent No. 9498735

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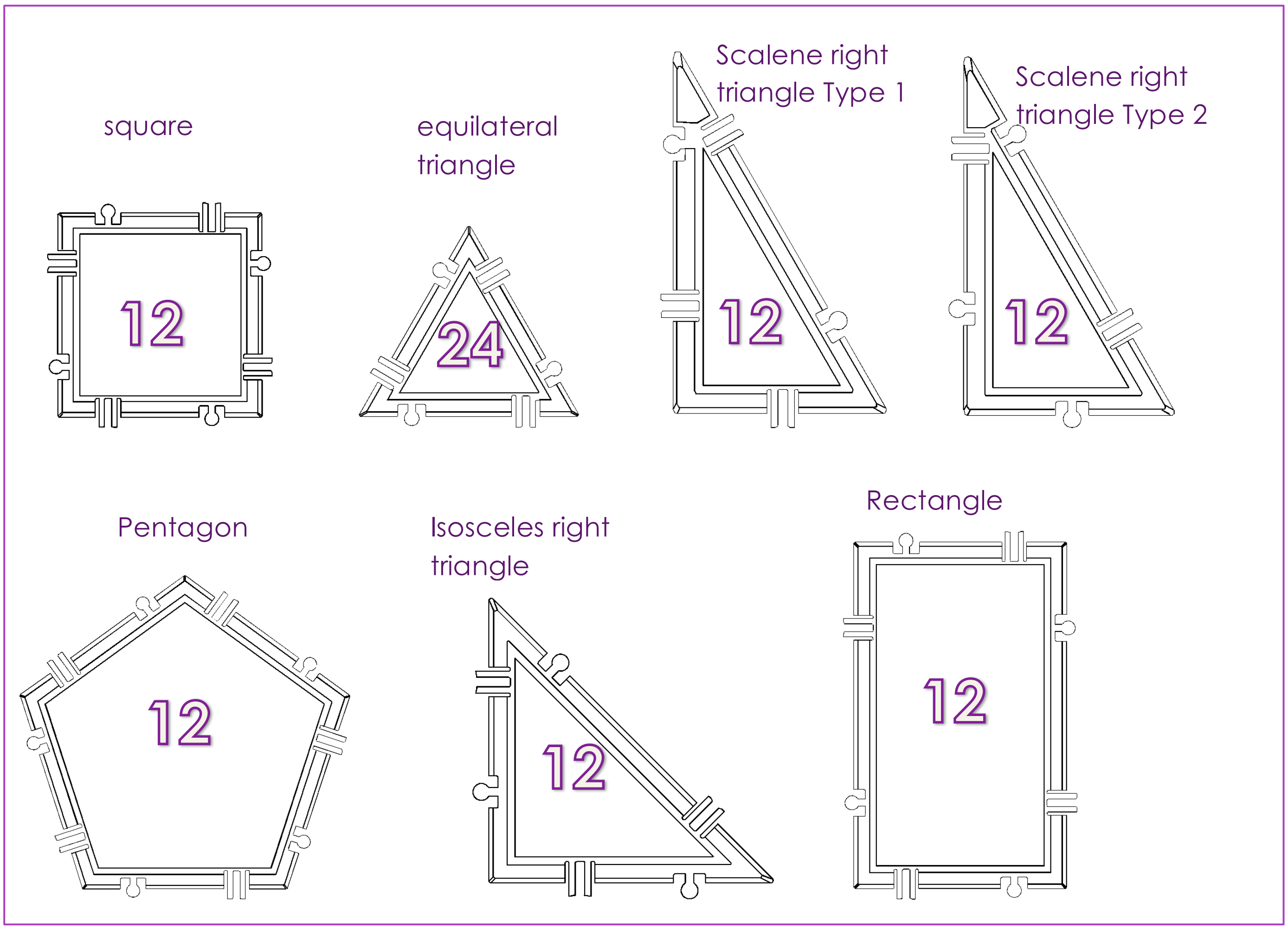
Welcome to Geometiles®!

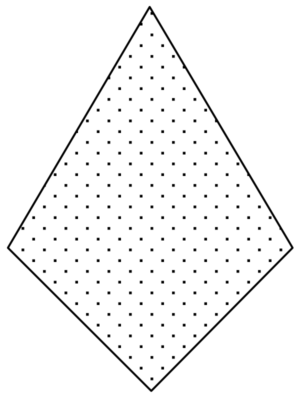
Here are some ideas of what you can build with your 96-piece set set. These are just a few of the many classroom activities you can do with Geometiles®. The full – and growing—list of activities can be found at **www.geometiles.com/resources.**

Materials: This booklet is based on one 96-piece set of Geometiles® interlocking tiles. Your colors may vary from the ones shown in this booklet.

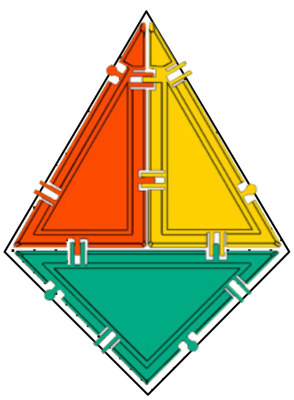


1. Tangram

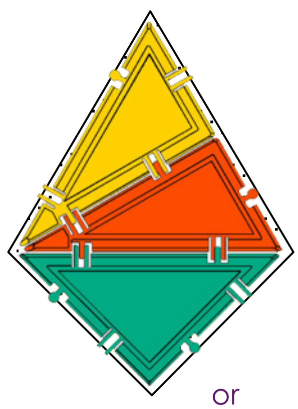
Find all the possible ways of solving this tangram.



Answers:



or



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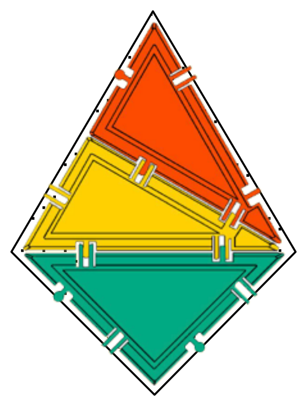


Note that all Geometiles tangram puzzles need to be solved by fitting snapped Geometiles shapes exactly onto the provided puzzle shape.

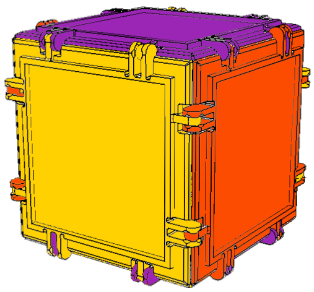
2. Cubes and boxes

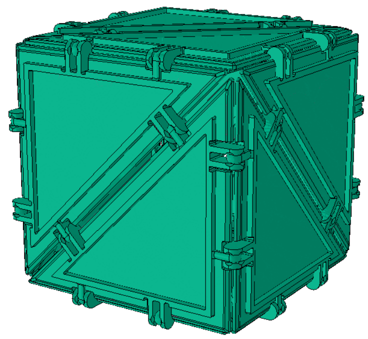
Make the following boxes:

a) a cube
b) a box with a square top and bottom that is not a cube.

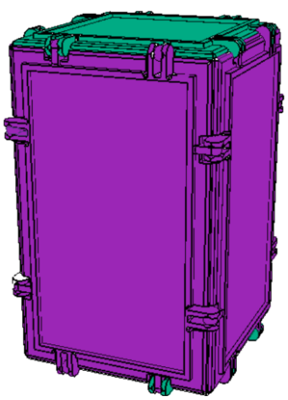
Answer: These are just some of the possible solutions:

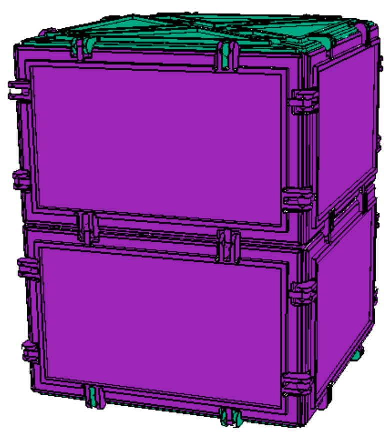
a)





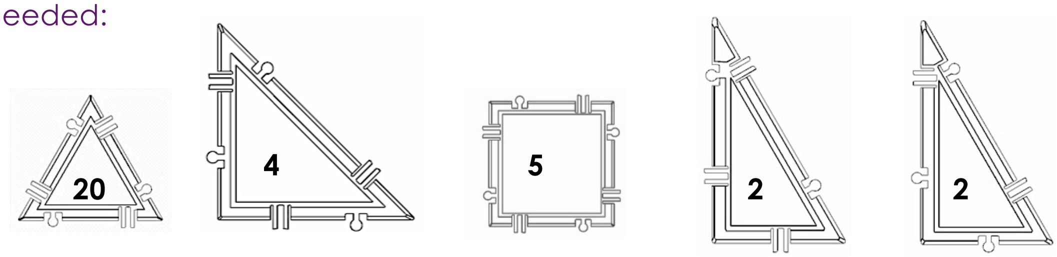
b)





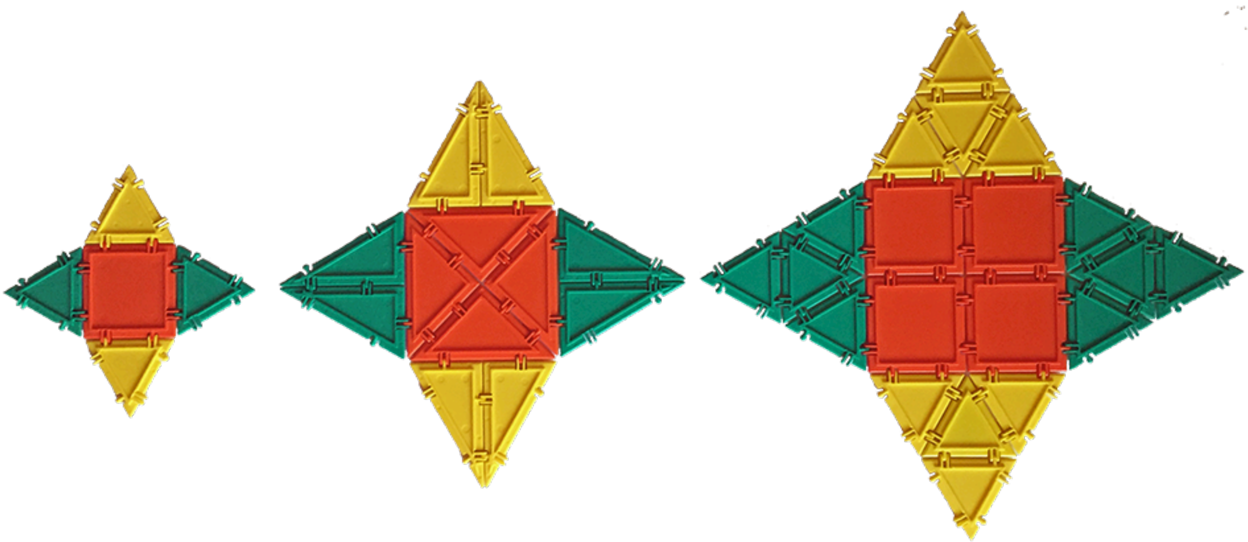
3. Family of Pyramids

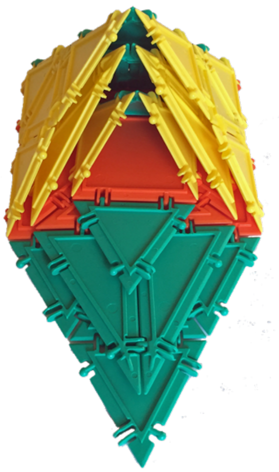
Materials needed:

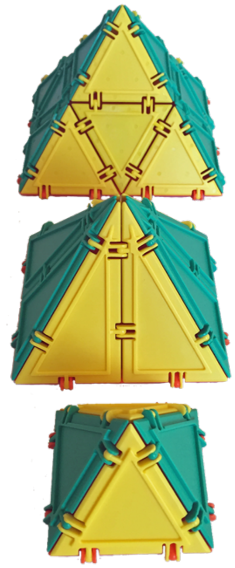


Level A

Have students build this family of square pyramids:







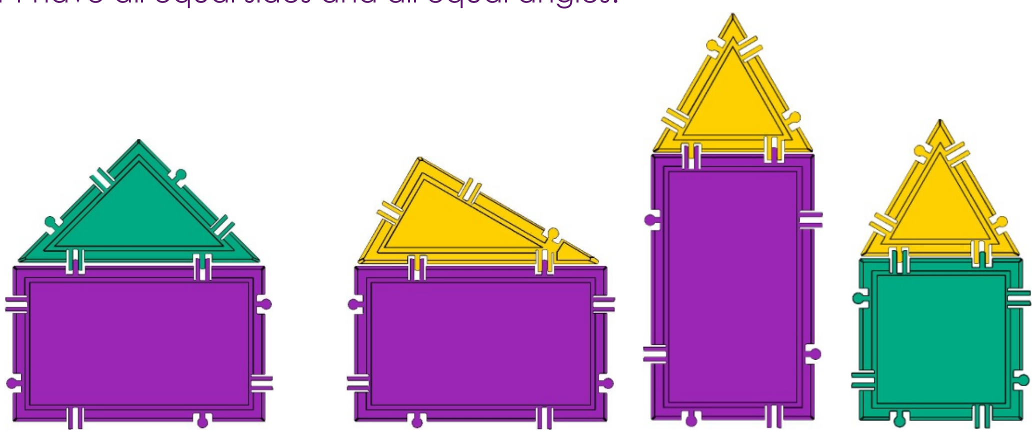
Level B

Look at the smallest and largest pyramid. Notice that the largest pyramid has side lengths that are twice those of the smallest one. Now look at the surface areas of the largest and smallest pyramid. The surface area of the smallest pyramid is the area of 1 square and 4 triangles, while the surface area of the largest pyramid is the area of 4 squares and 16 triangles. We see that when we scale lengths by a factor of 2, the surface area goes up by a factor of 4.

3. Playing with polygons

Construct as many different pentagons as you can with exactly 2 tiles.

Answer: This is a simple way to get students out of thinking that there are pentagons that don't have all equal sides and all equal angles.



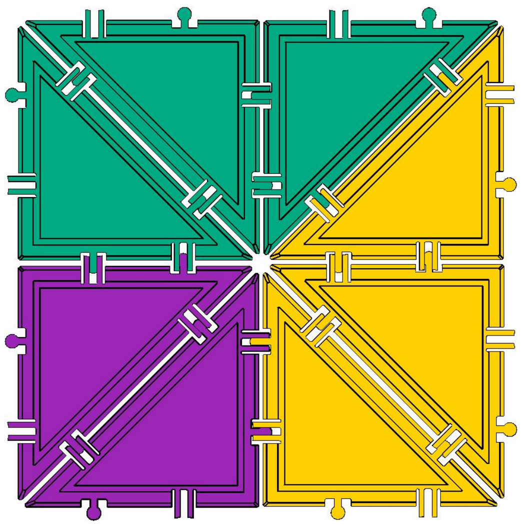
4. Fraction puzzles

a. Make a square that is 1/4 purple, 3/8 yellow, and 3/8 green.

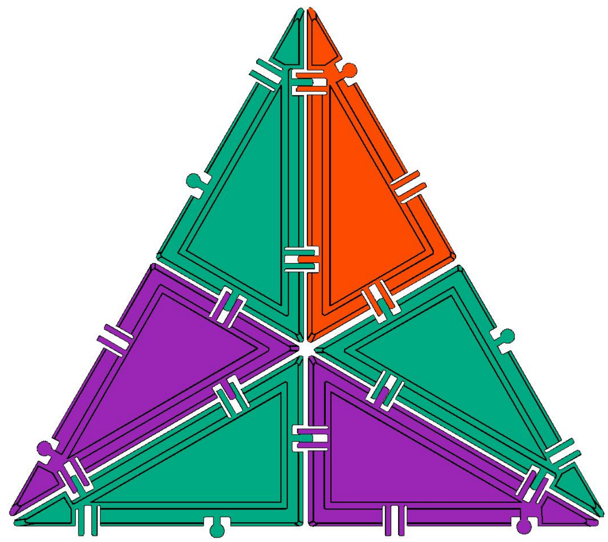
b. Now make an equilateral triangle that is 1/3 purple, 1/2 green, and 1/6 orange.

Answers:

Note that part of the puzzle is for the student to figure out what tiles (s)he needs to make a square or a triangle.



1/4 purple, 3/8 yellow, 3/8 green

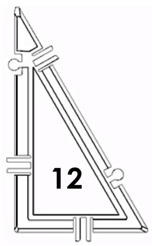


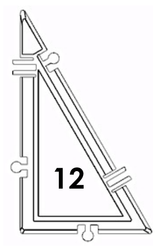
1/6 orange, 1/3 purple, 1/2 green

5. Spinner

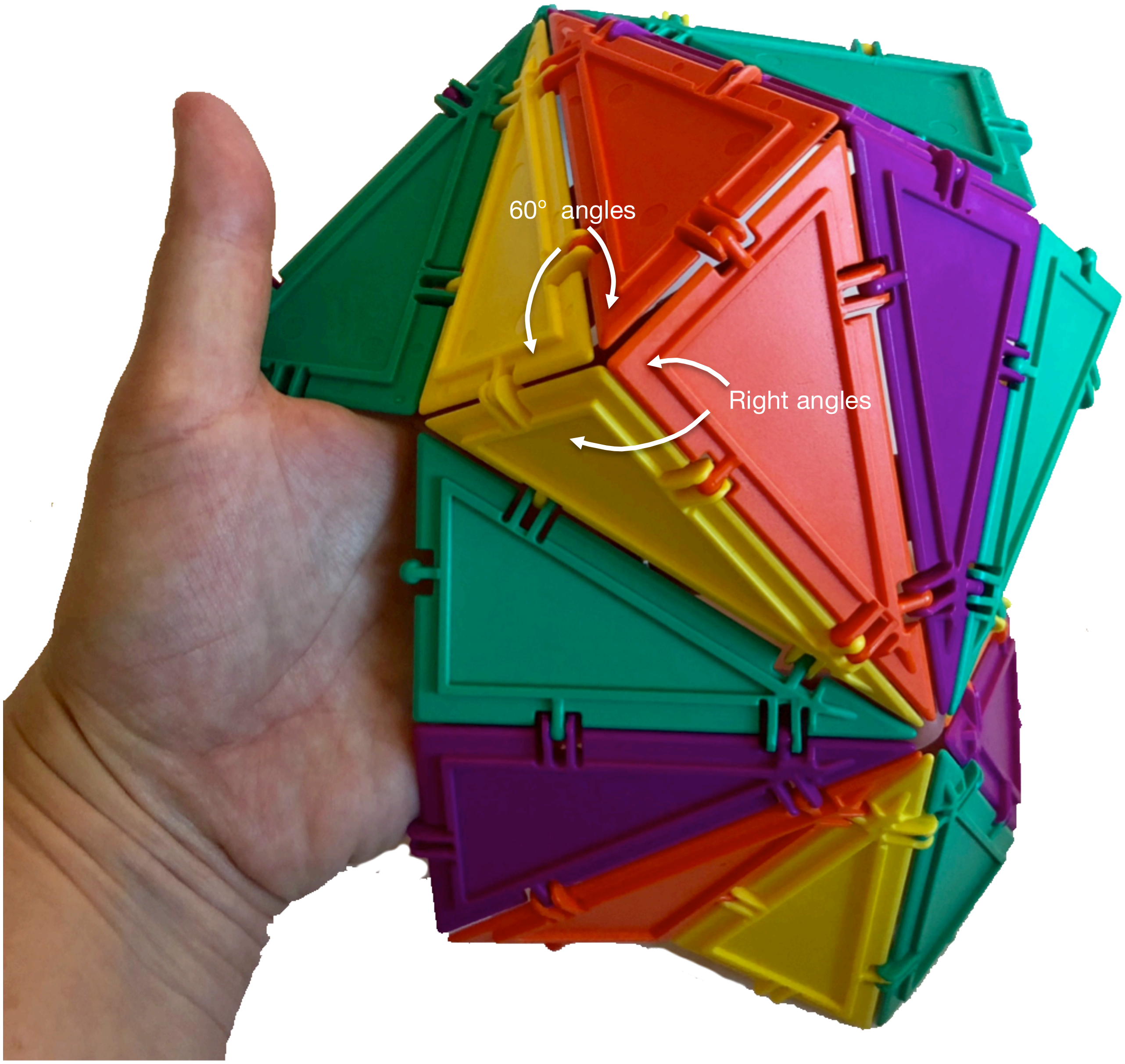
Children absolutely love playing with this spinner. Constructing it really challenges them to follow instructions, but the result is well worth it.

Materials needed:





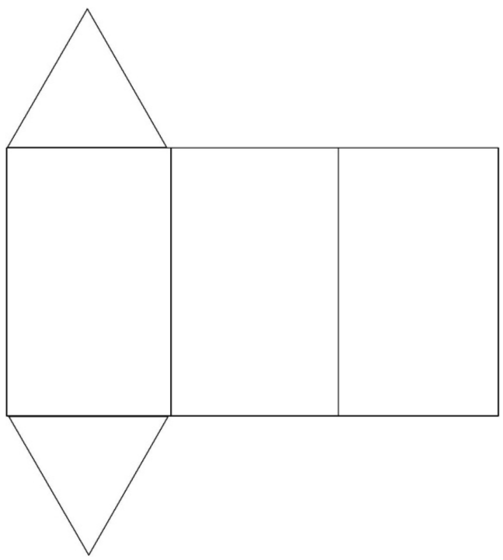
Note how the parts
are aligned



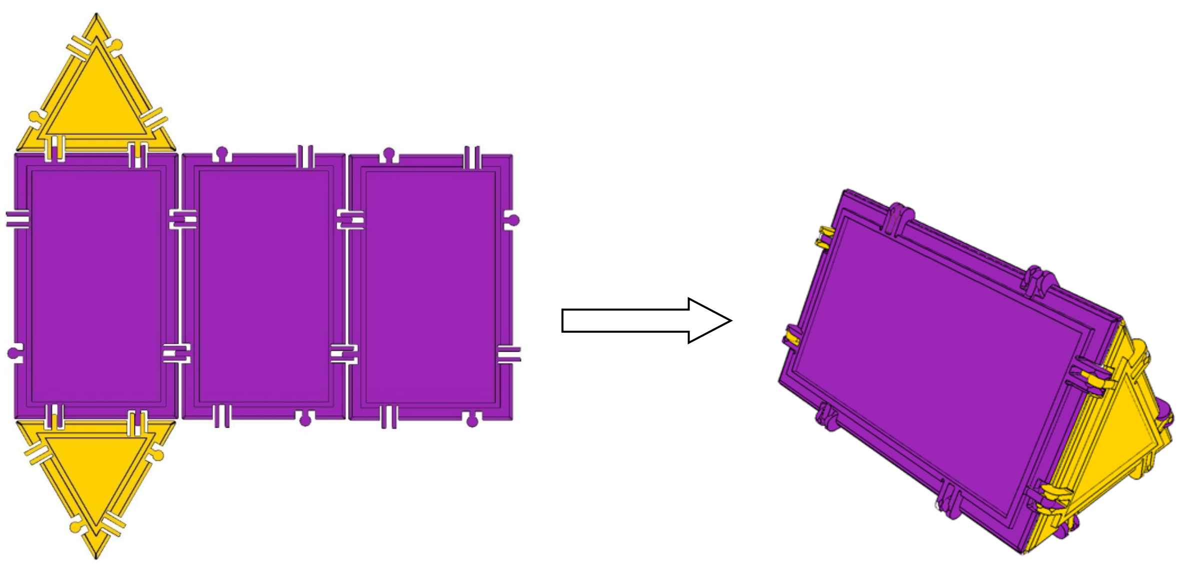
Start snapping them together along the perimeter

6. Net

Which 3-D figure is represented by this net, and what is the surface area of the figure?



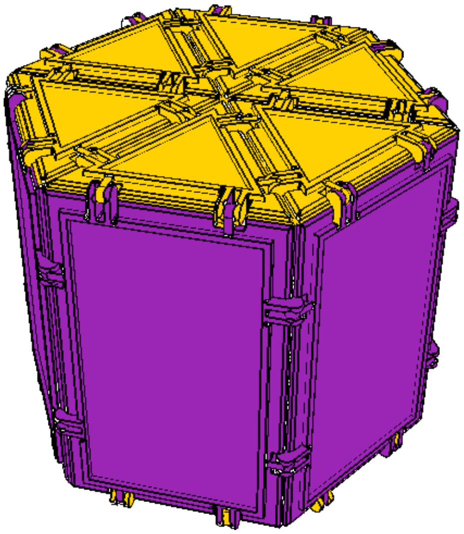
Answer: Triangular Prism.

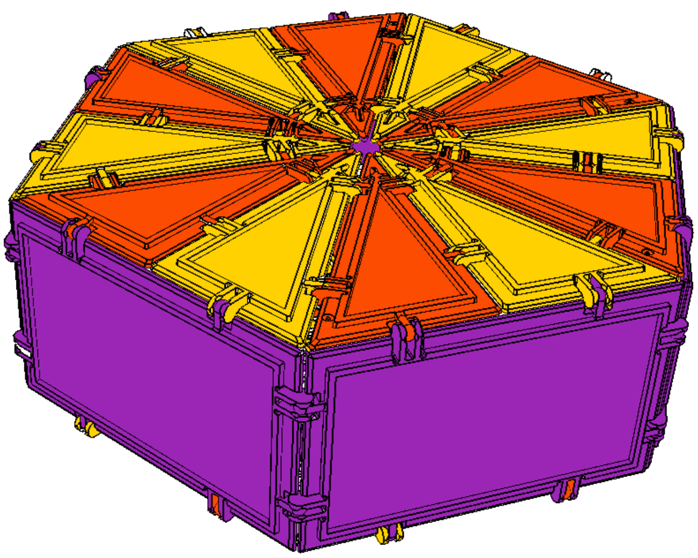


The rectangle is about 10 cm by 6 cm, and the triangle is about 6 cm on each side and 5.2 cm tall. Then the surface area is $(10\times6)\times3+\frac{1}{2}(6\times5.2)\times2 = 180+31.2 = 211.2\text{cm}^2$.

6. Hexagonal Prisms

Have students construct two different hexagonal prisms. This is a popular group activity for students. They have to work together to create the hexagonal top and bottom of the prism. Then their work comes together in the final hexagonal prism.

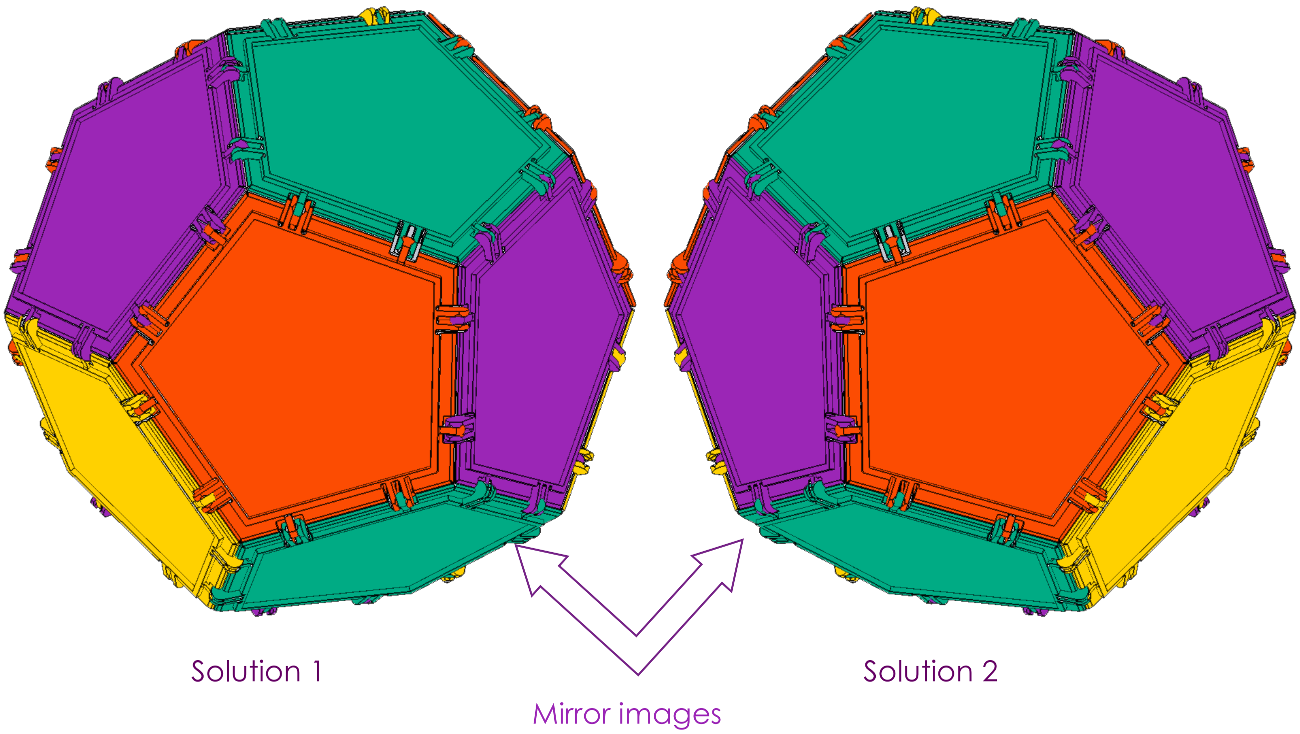


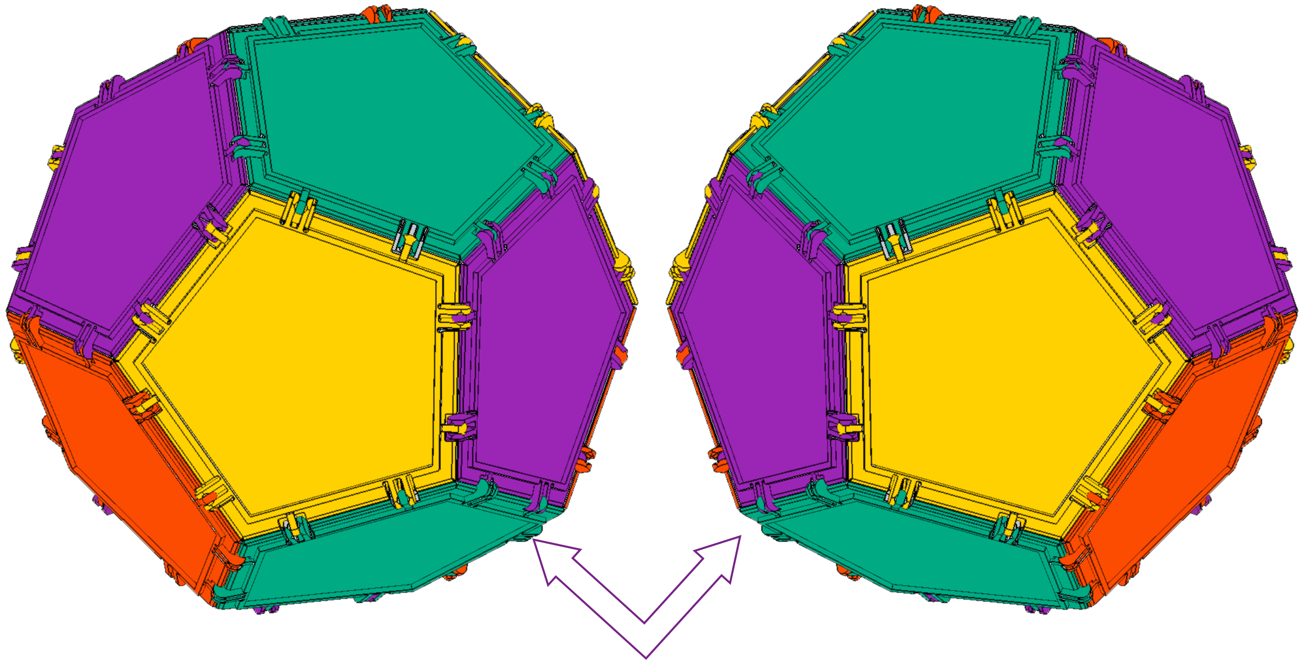


8. Dodecahedron

Make a closed object out of all the 12 pentagons in your box such that any two adjacent tiles have different colors.

Answer:The object in question is called a *dodecahedron*. There 4 solutions to this problem, and the two in each row are mirror images of one another.

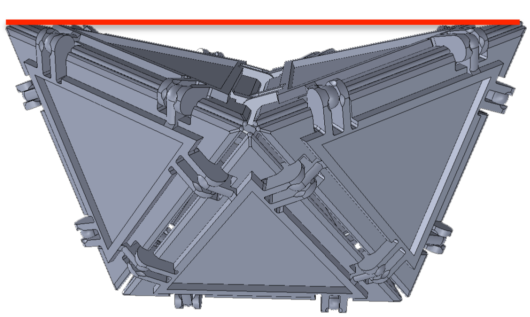




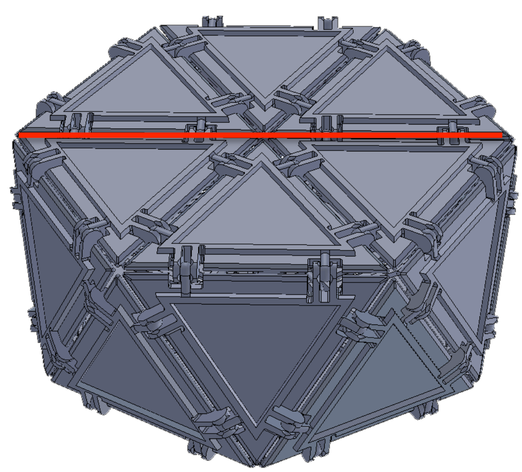
Mirror images

10. Solids made only out of equilateral triangles.

A solid is **strictly convex** if a line segment joining any two of its points is entirely contained inside the solid (not on its surface or outside it). Note that a strictly convex solid may not have any coplanar faces. Here are some examples of solids that are NOT strictly convex.



Not strictly convex (or even convex) because red line is not contained inside it.



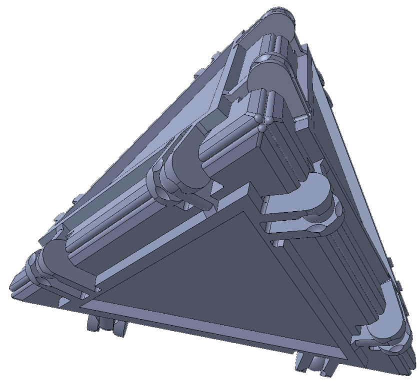
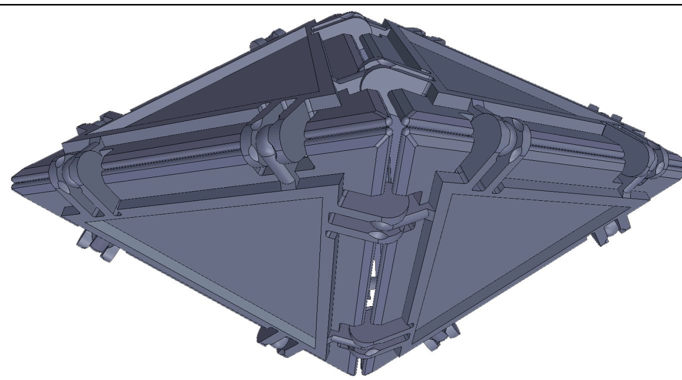
Convex, but not strictly convex because red line is on the surface. The faces on the top are coplanar.

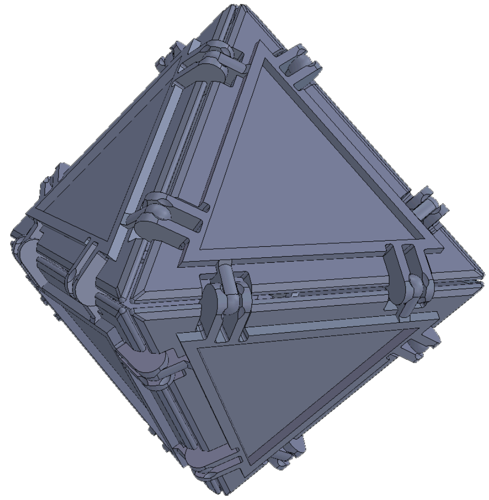
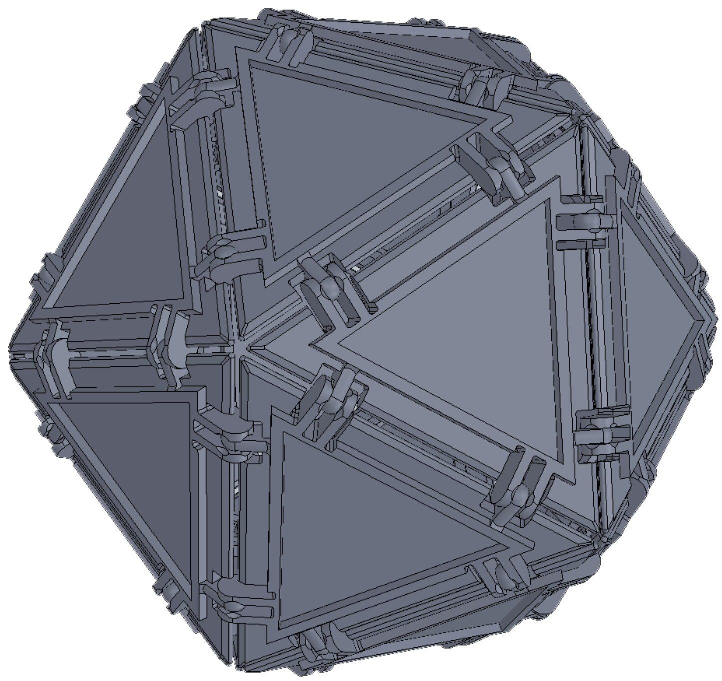
Here is a question to ponder: build a **strictly convex** solid using the following numbers of equilateral triangles:

4, 6, 8, 20.

Answer

These solids are called the **convex deltahedra**.

Number of equilateral triangles	Solid
4	 tetrahedron
6	 triangular dipyramid

8	 octahedron
20	 icosahedron

