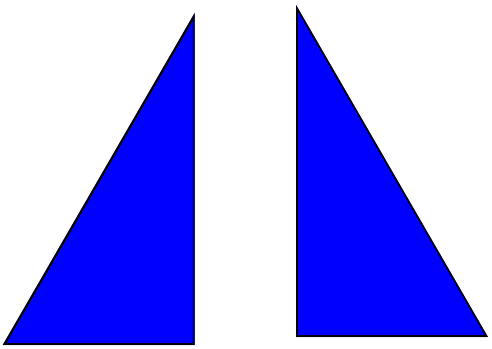
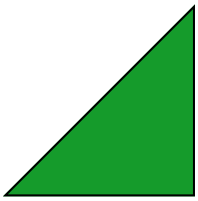
A Tale of Two Triangles



Left Handed

Right Handed



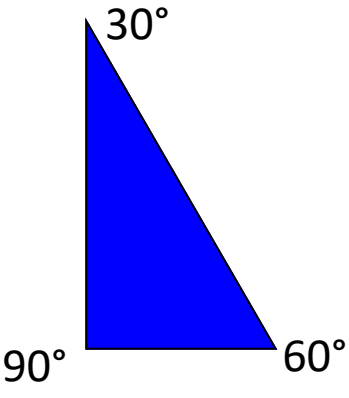
Ambidextrous

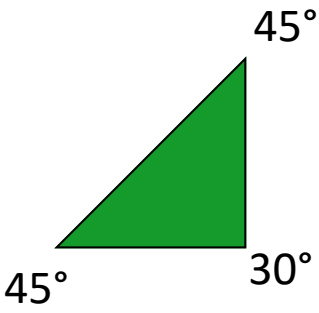
These two triangle are, without a doubt, the world's most famous Triangles. They are so famous that triangles similar to these two are sold all around the world in packets for students to use in their math classes. We're going to take a little closer look at these triangles today and try to see "So, What's the big Deal?"

If we define it by its angle our first Triangle is called the 30, 60, 90. One angle of 30°, one angle of 60° and one angle of 90°.

30 + 60 + 90 = 180

The three angles of all triangles add up to 180.





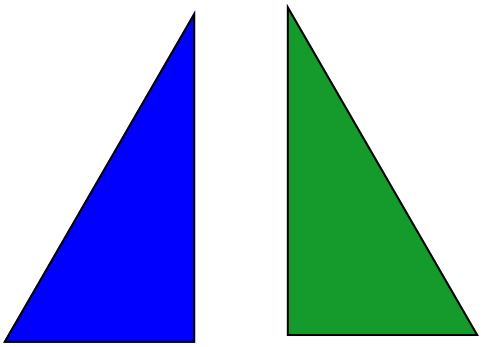
If we define triangle by its angles our itis called the 45, 45, 90. Two angles of 45°, and one angle of 90°.

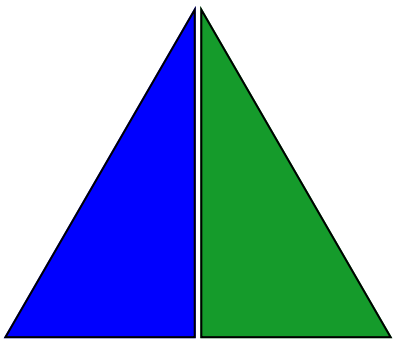
45 + 45 + 90 = 180

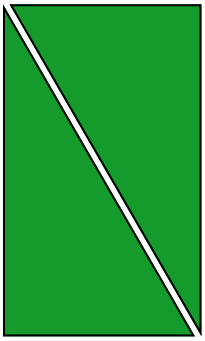
Our 30, 60, 90 triangle has a right handed version and a left handed version because its 3 corners are all different. The 45, 45, 90 is ambidextrous because it has two corners that are the same. This is called an Isosceles Triangle. You will see why this distinction is important in some of the activities.

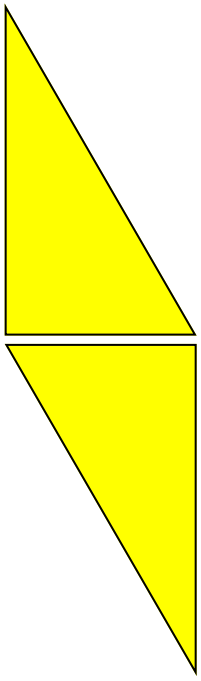
In your packet you will find sheets of paper with our triangles. You will need to cut these out to complete the activities. Best practice would be to cut out only as many triangles as you need for each activity as this makes less of a mess and helps to stay organized.

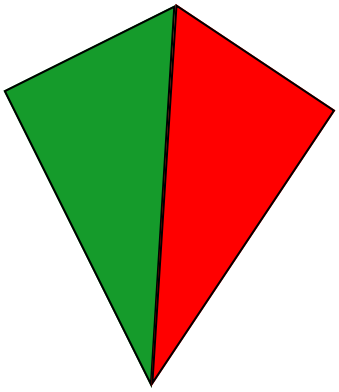
First le’s see how our triangles go together



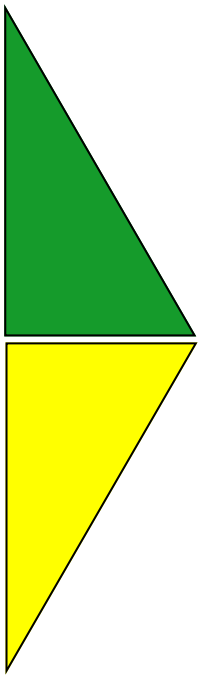


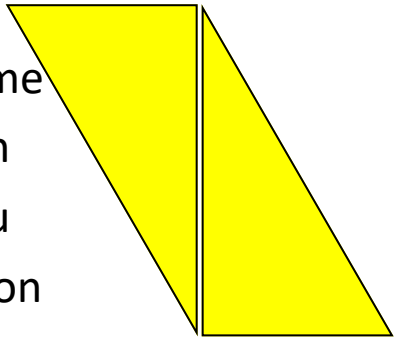




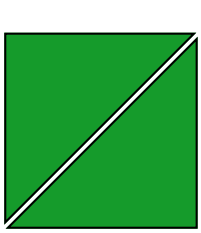


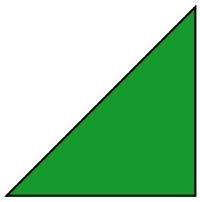
Those groups that have triangles of the same color need two rights or two lefts, those with different colors need one right and one left.

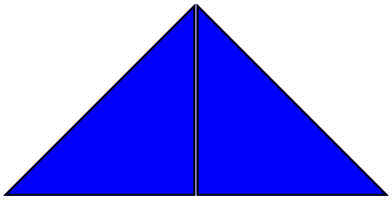




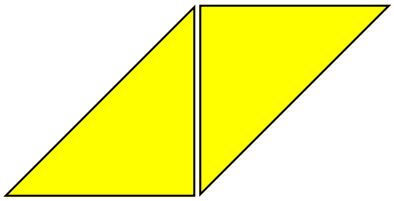
You may at any time glue the same shapes on top of the shapes with color or those without color. You may also construct the patterns on your own on another sheet.



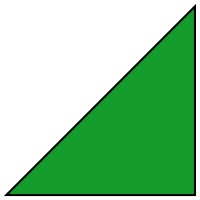


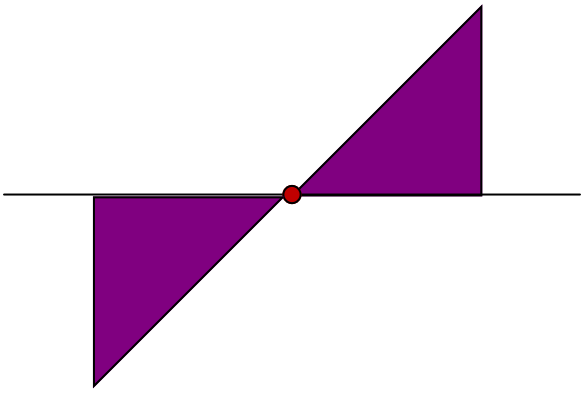


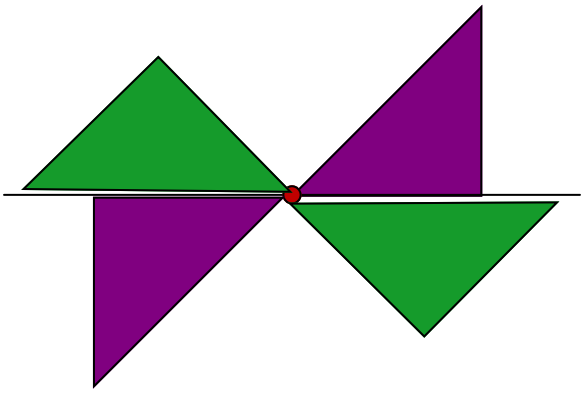
Our ambidextrous Triangle has very few unique ways of coming together.

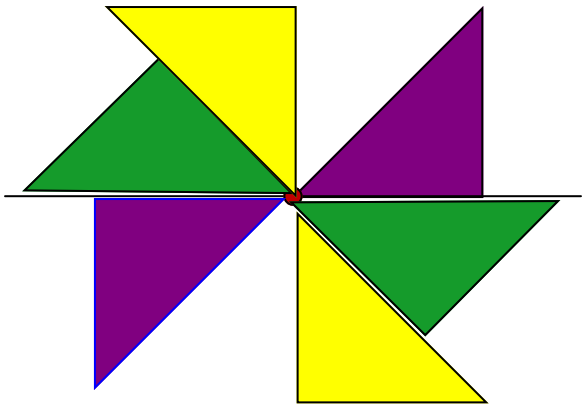


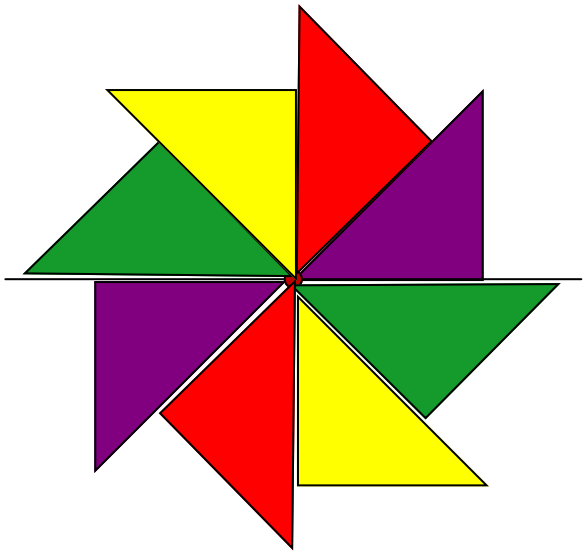
But we can bring the points of our triangles together around a point.

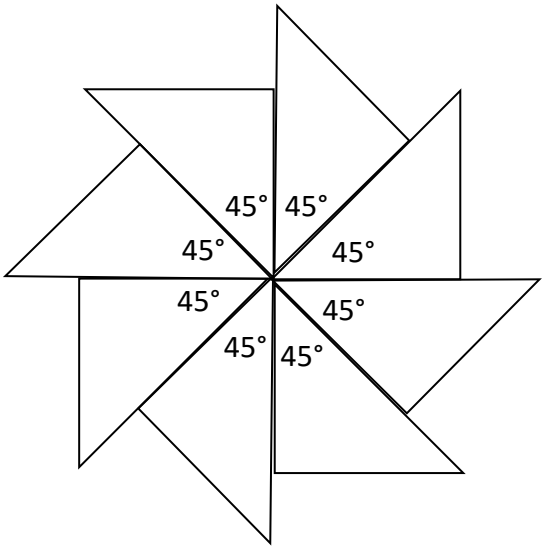










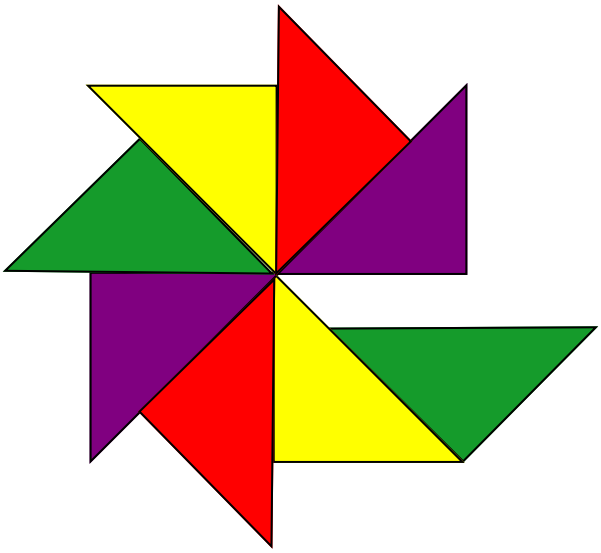


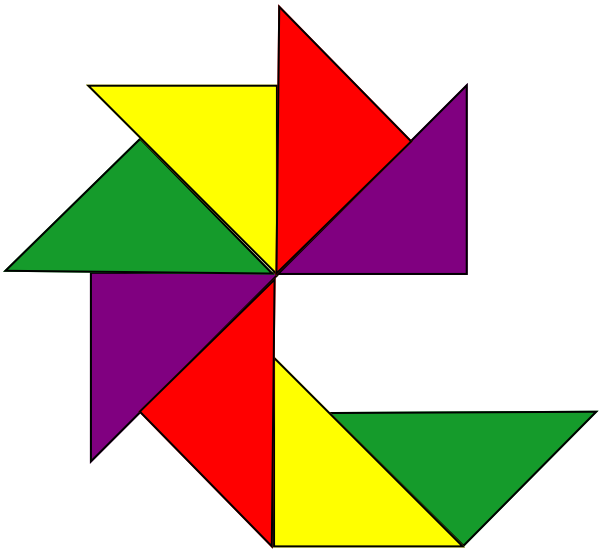
8 corners of 45° come together around a point and fill the space. No gaps and no overlaps.

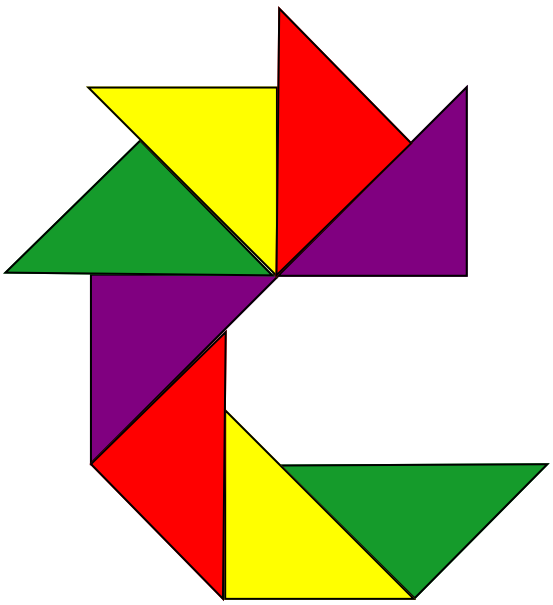
45° + 45° + 45° + 45° + 45° + 45° + 45° + 45° = 360°

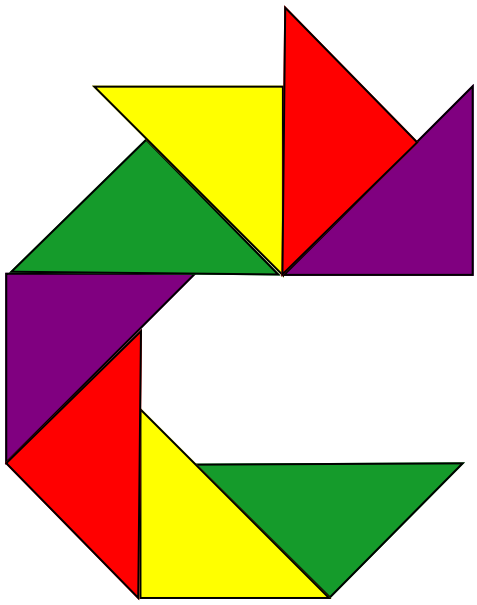
Or we can use multiplication 8 x 45 = 360

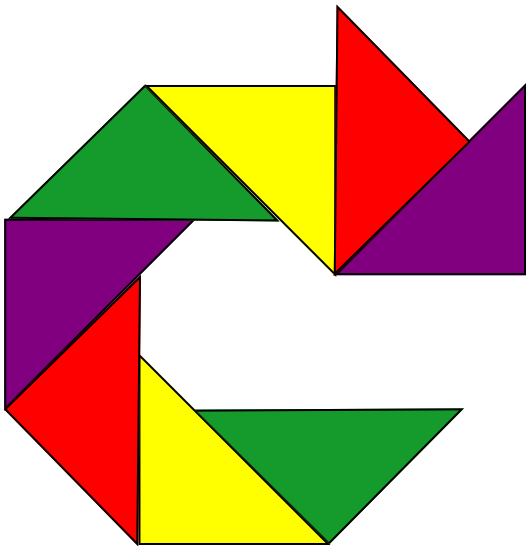
We now start to move the trangles, one by one, to a new configuration in which the other two corners come together to make a new shape.

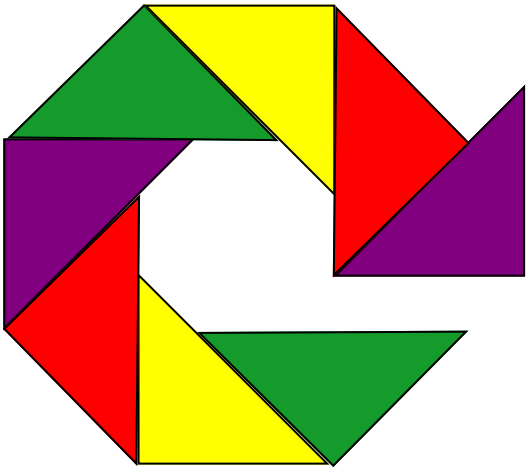


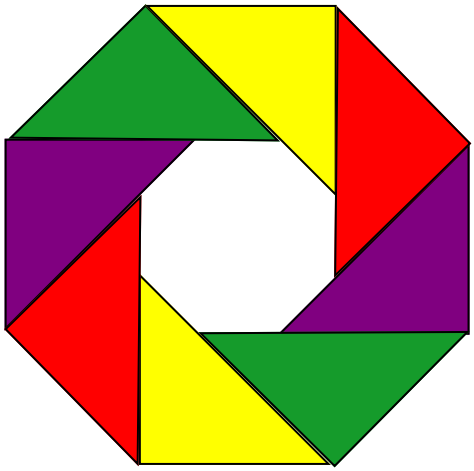




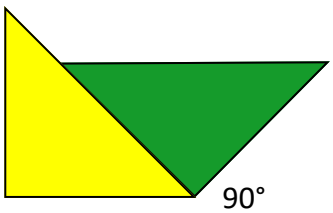






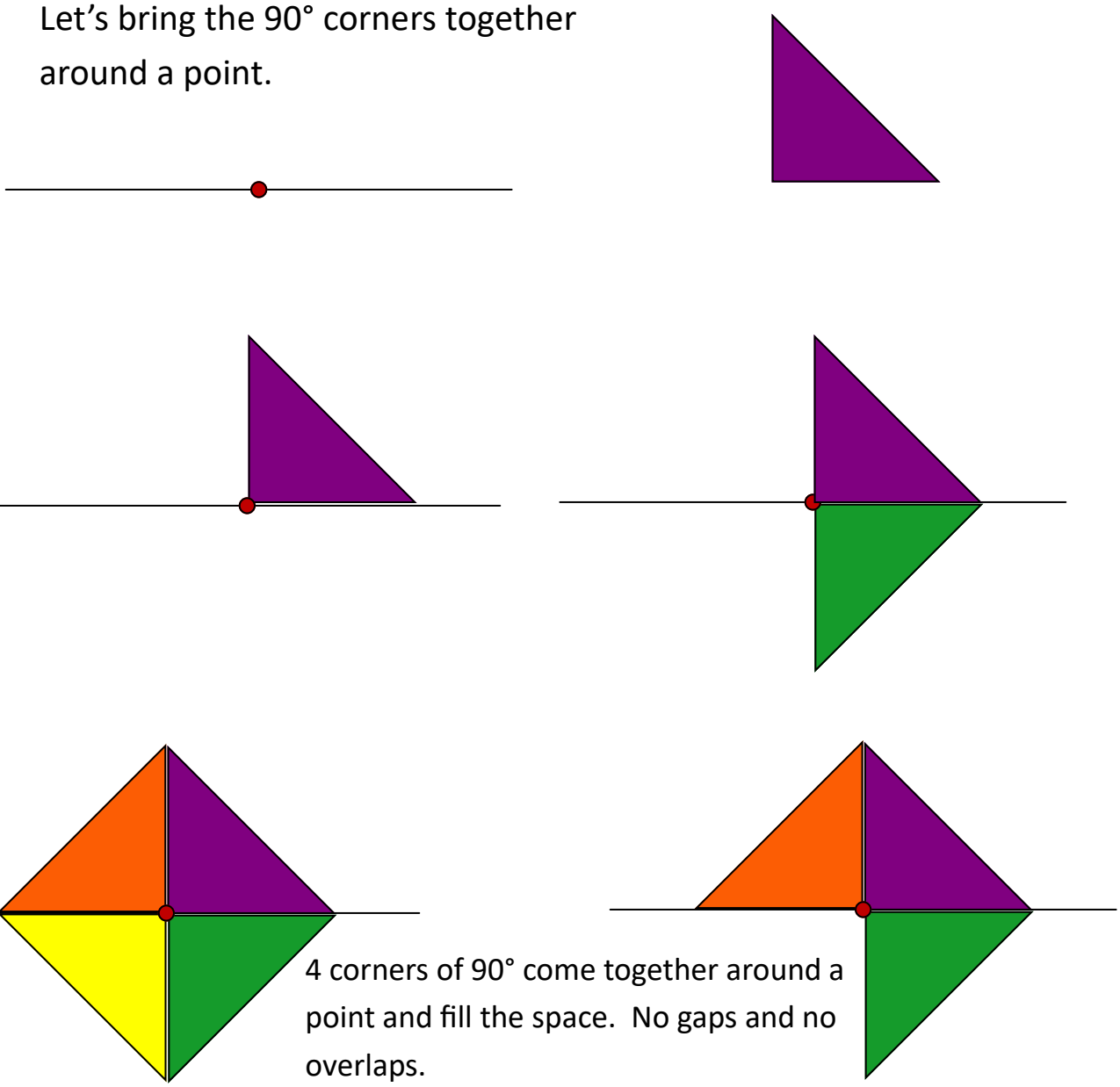


Our new shape has 8 sides. It is called an octagon. The corners are made of a 45° angle and a 90° angle. 45 + 90 = 135.



An Octagon is a shape with 8 sides and 8 corners. Each corner is 135°. What is the shape in the middle?

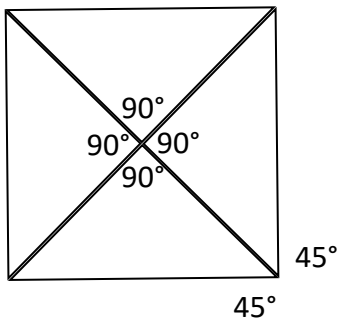
Let's bring the 90° corners together around a point.



4 corners of 90° come together around a point and fill the space. No gaps and no overlaps.

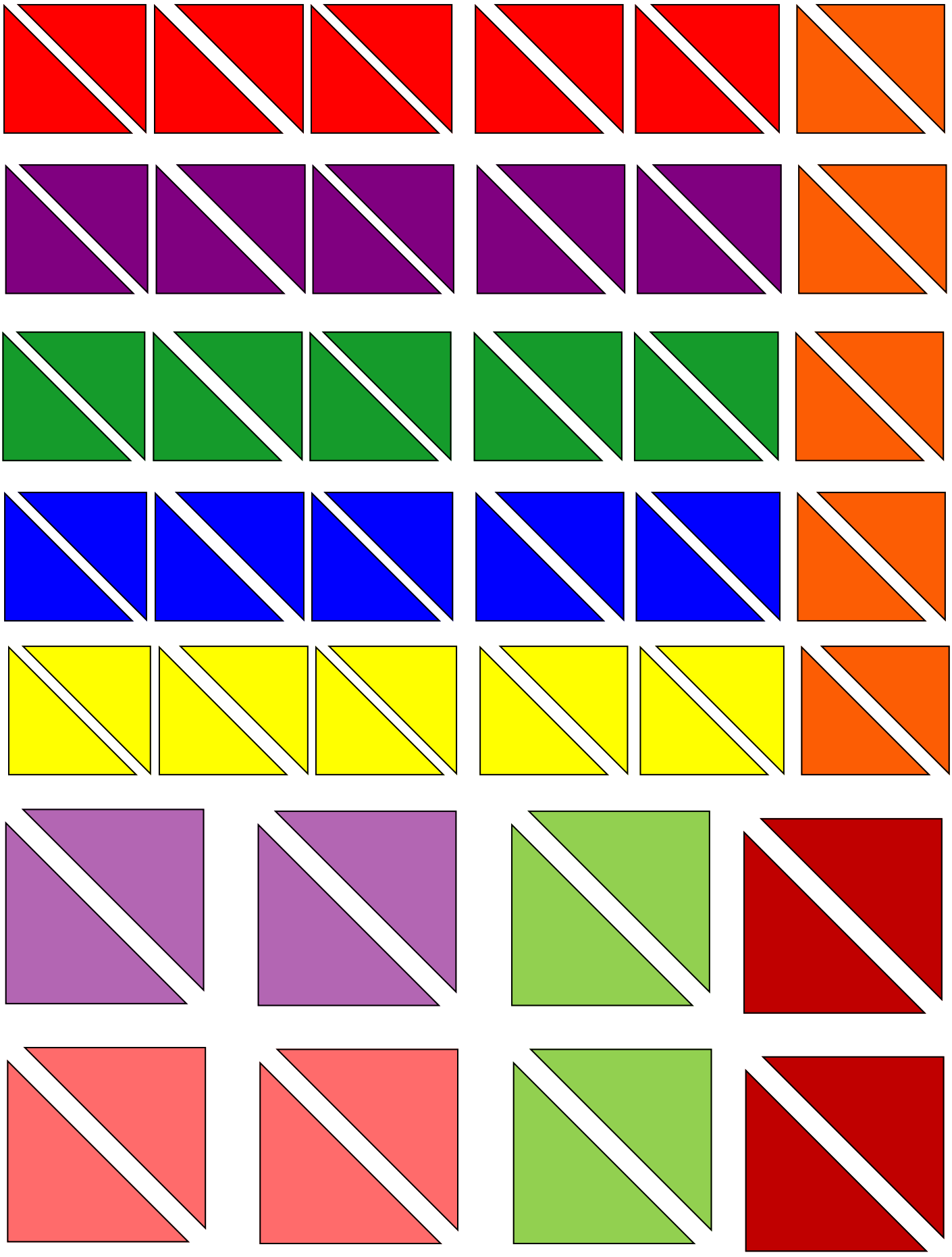
$$90° + 90° + 90° + 90° = 360°$$

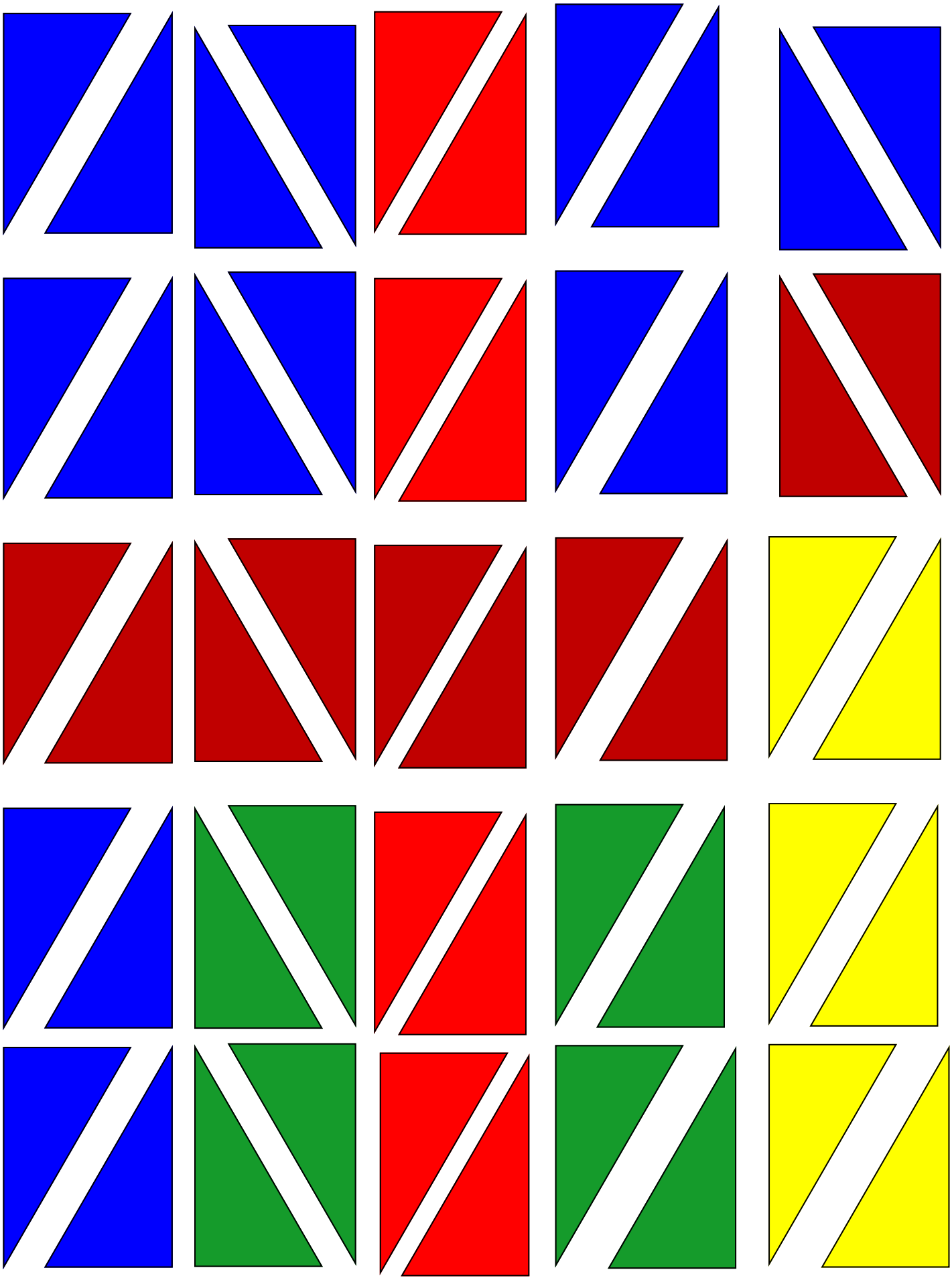
Or we can use multiplication $4 \times 90 = 360$

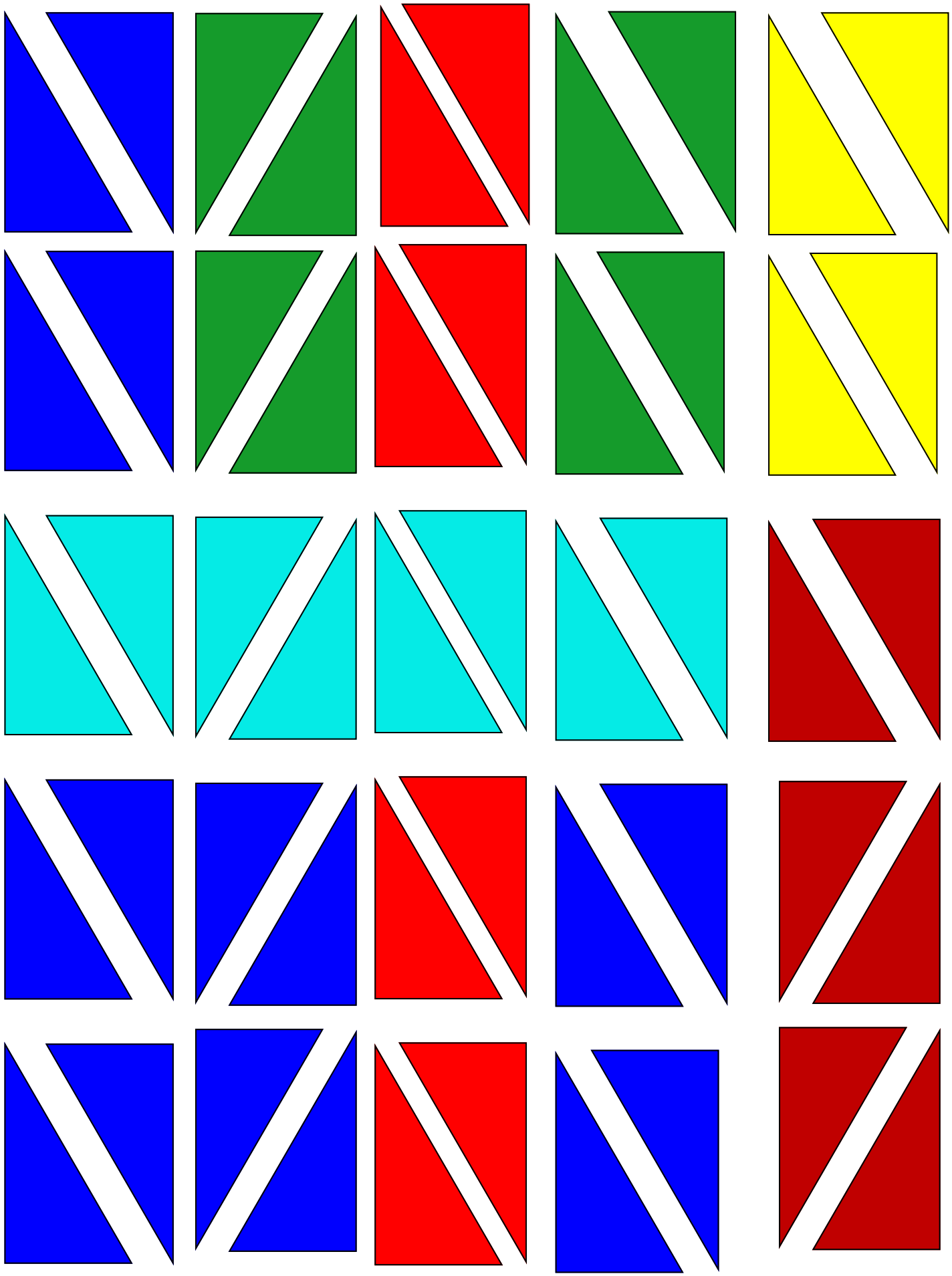


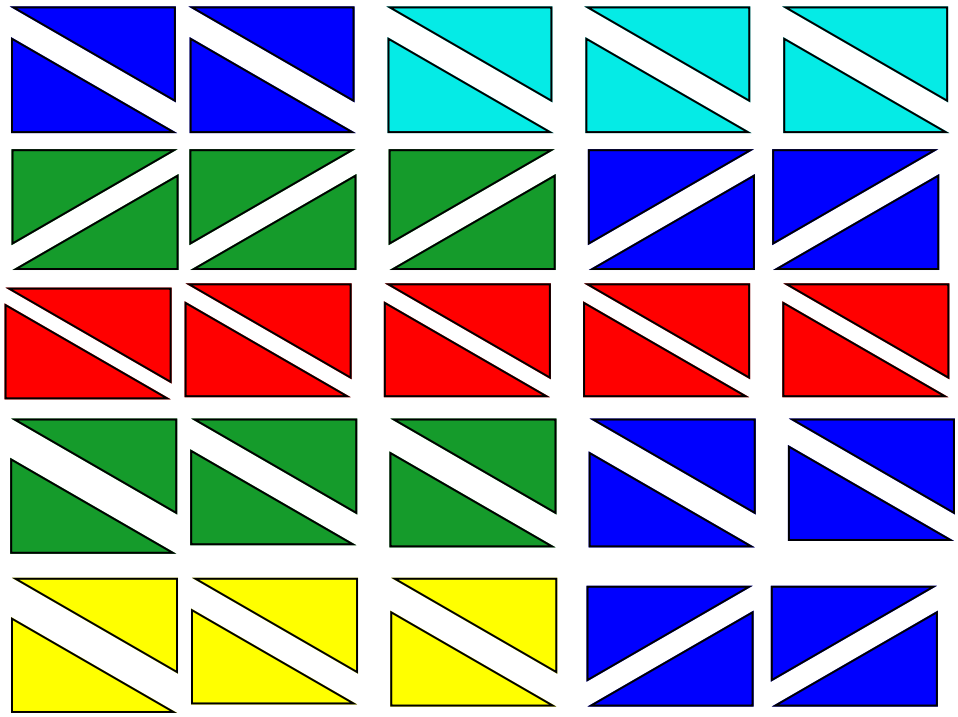
Our new shape has 4 sides. It is called a Square. The corners are made of a two 45° angles. 45 + 45 = 90.

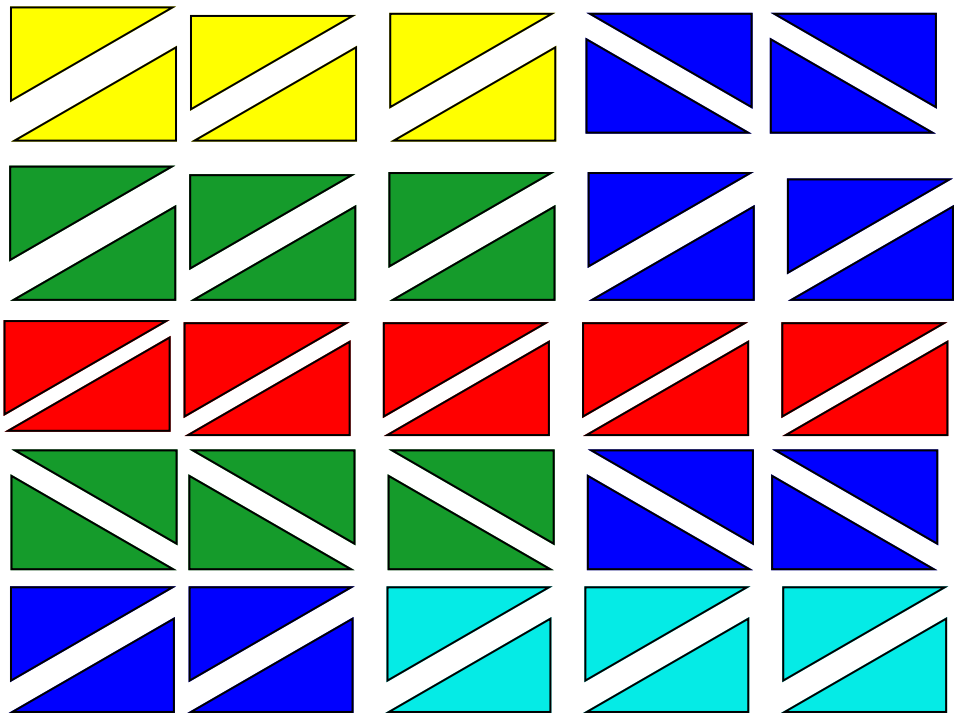
A Square is a shape with 4 sides and 4 corners. Each corner is 90°. Our ambidextrous Triangle leaves us no vacant space in the middle. We are done with this shape.

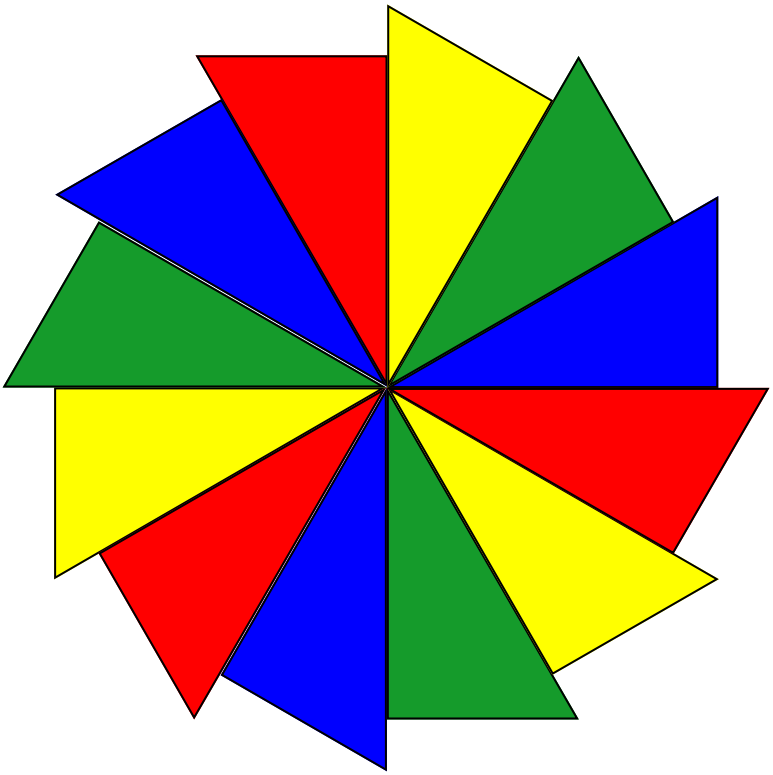








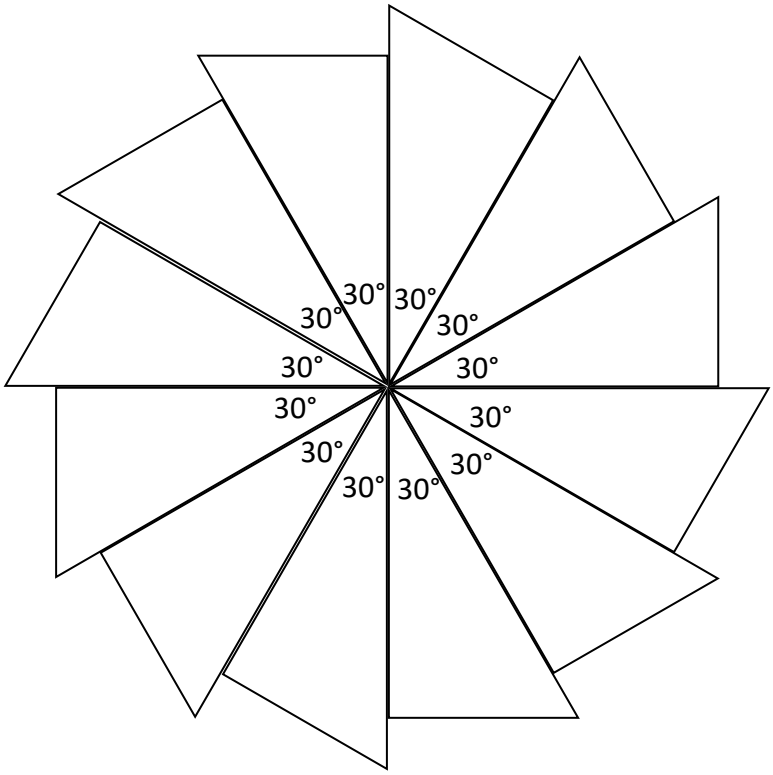




It takes 12 corners of 30° to fill the space around a point with no gaps and no overlaps.

30° + 30° + 30° + 30° + 30° + 30° + 30° + 30° + 30° + 30° + 30° + 30° = 360°

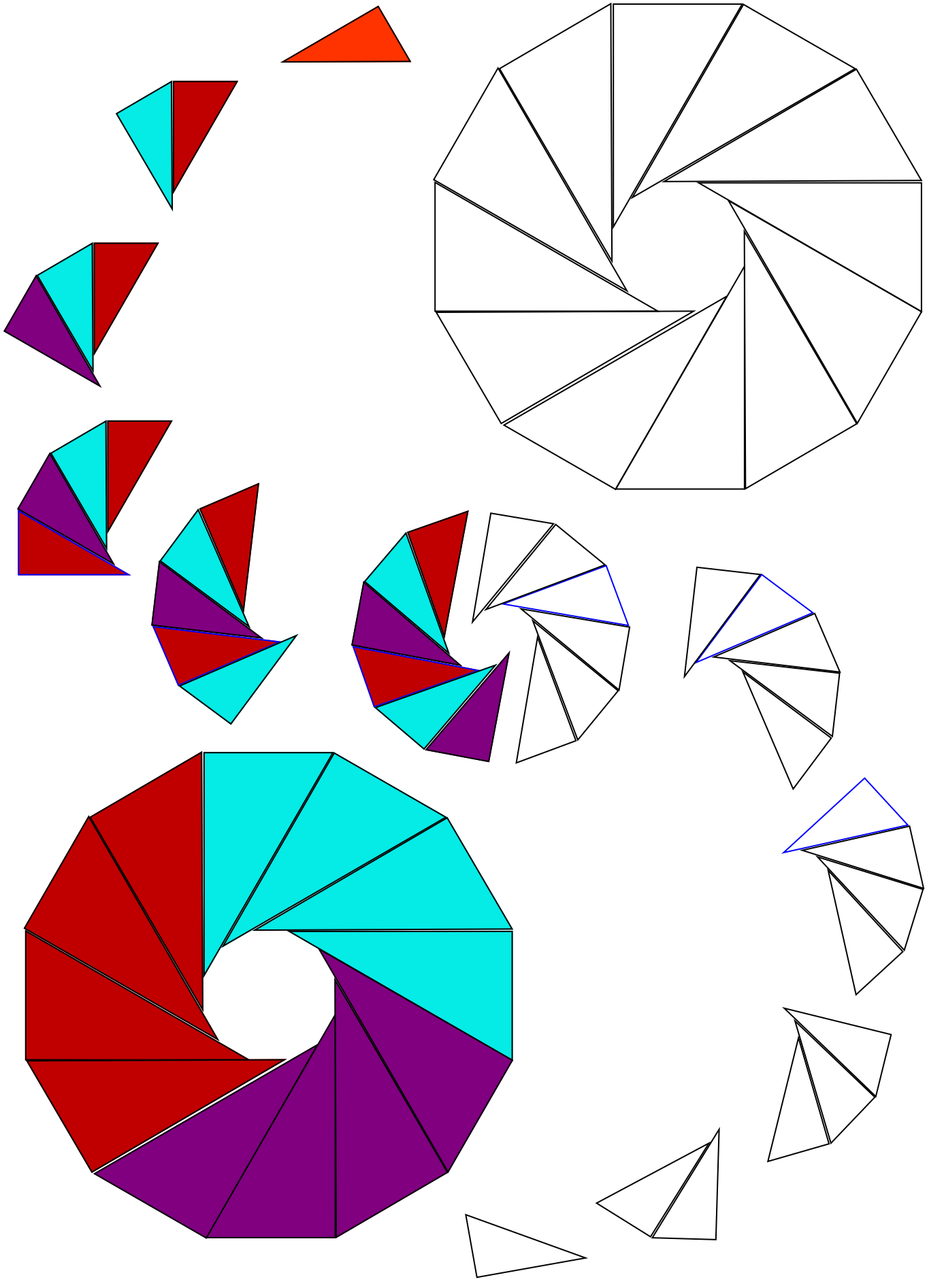
Or we can use multiplication 12 x 30 = 360

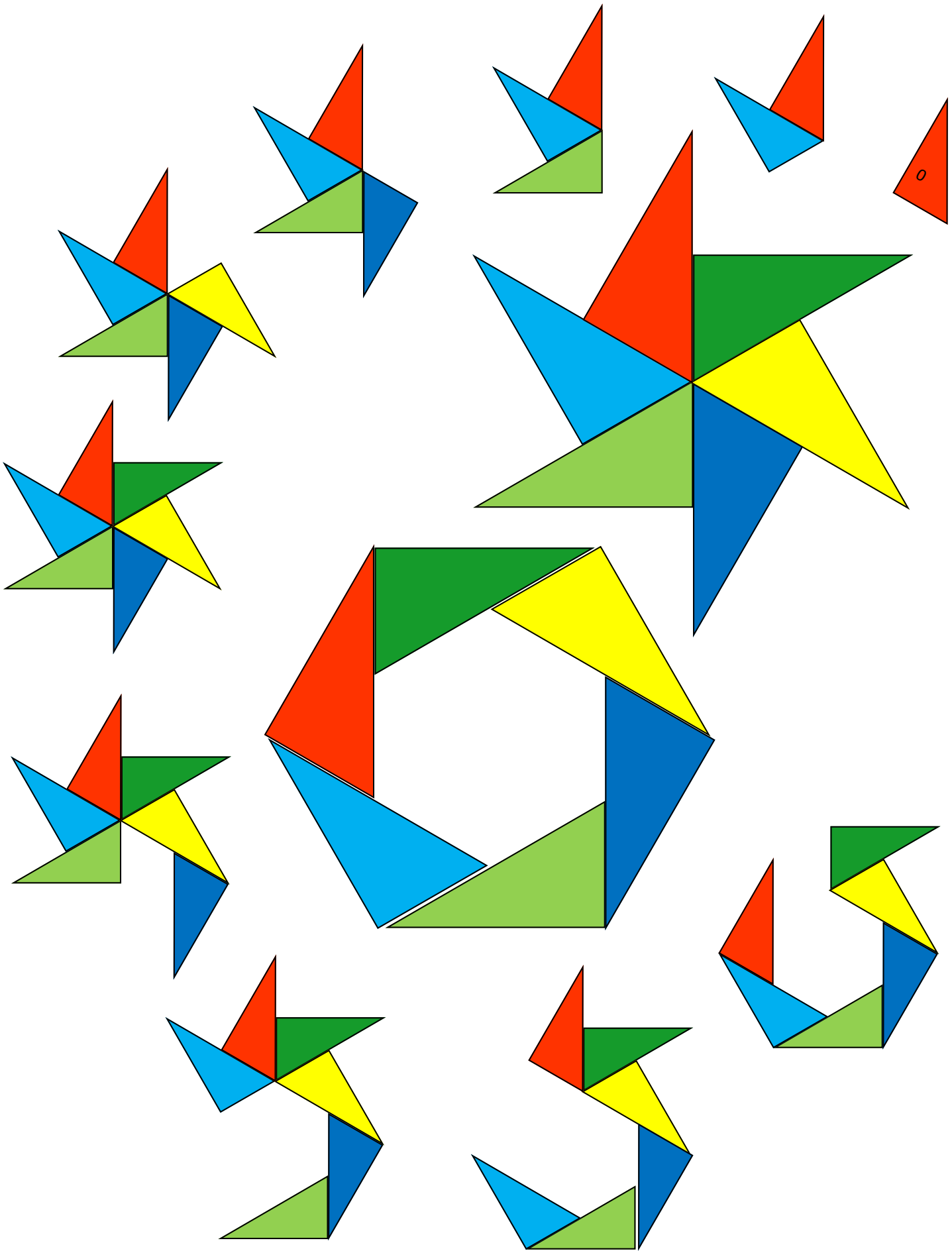


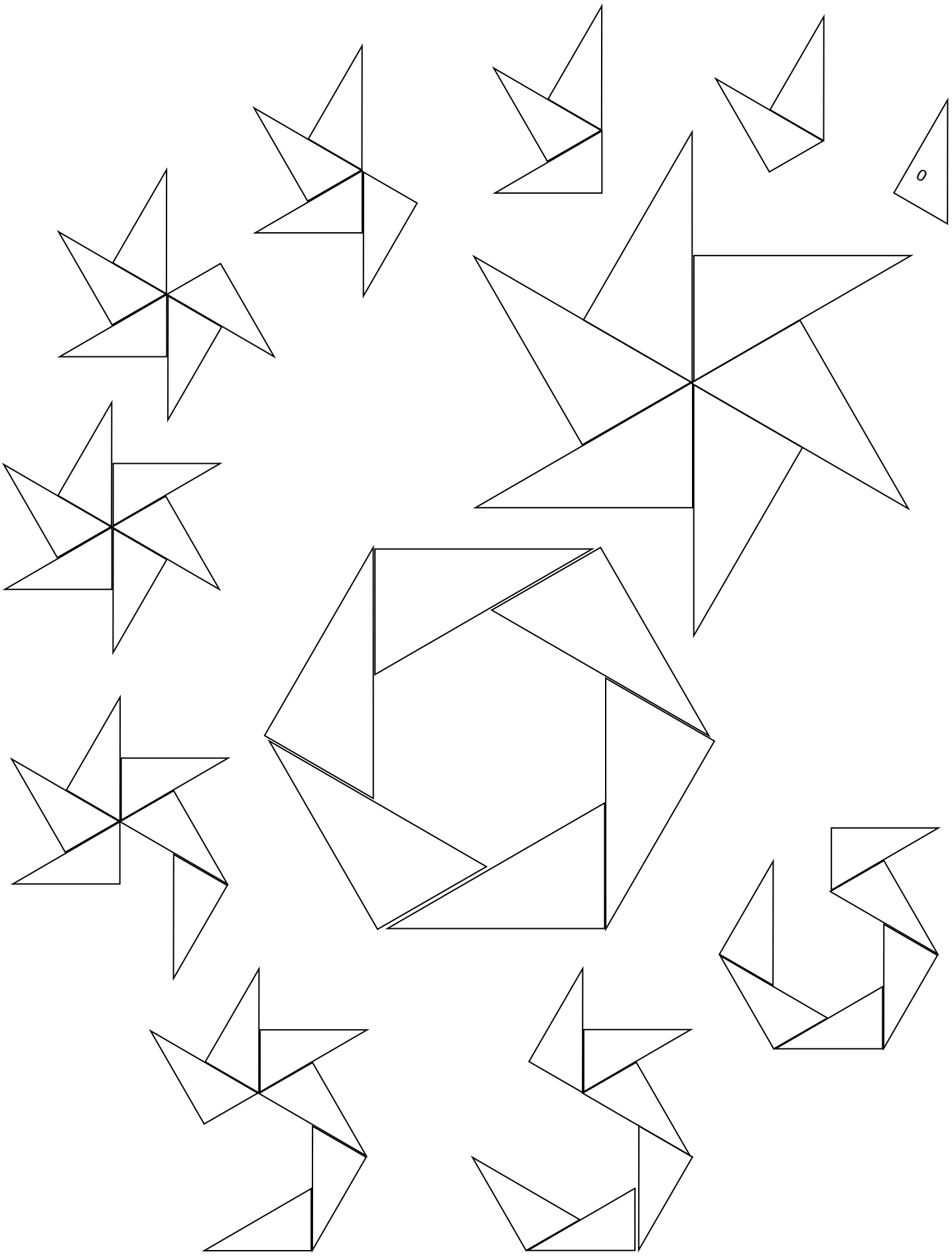
The most important place where our culture uses a circlle split into 12 pieces is the clock. We have 12 hours for the day and 12 hours for the night. This is one of our most important measurements.

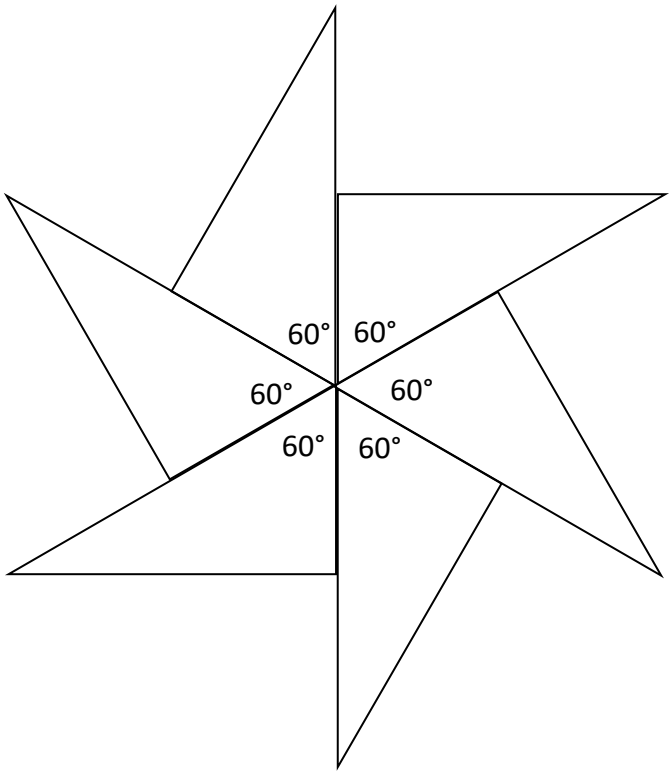
1 hour = 30 degrees.
Choose the triangles you wish and fill up the clock.

These are Right handed.





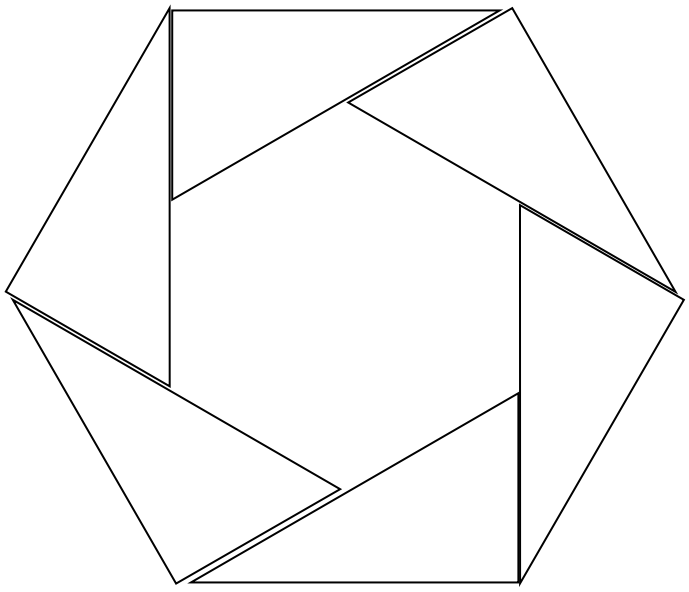


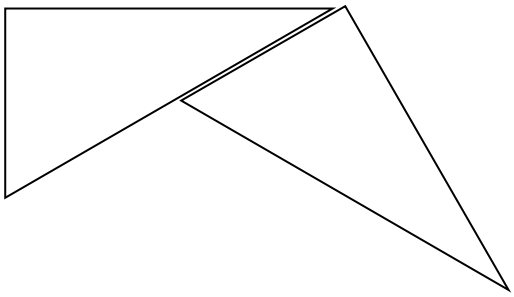


6 corners of 60° come together around a point and fill the space. No gaps and no overlaps.

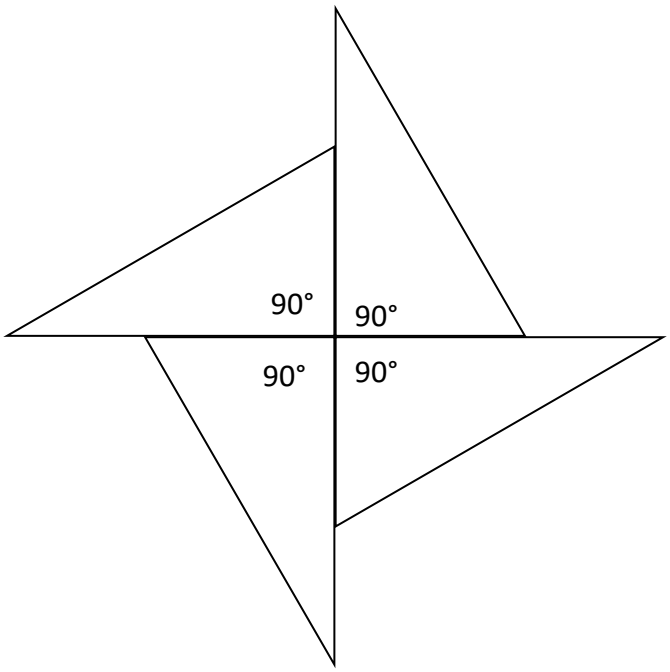
60° + 60° + 60° + 60° + 60° + 60° = 360°

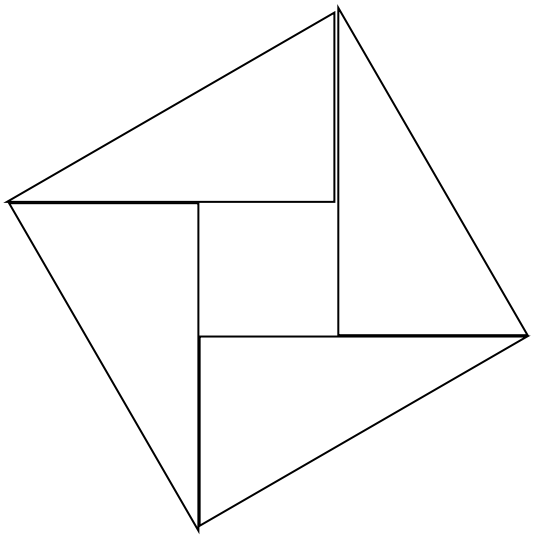
Or we can use multiplication 6 x 60 = 360





Our new shape has 6 sides. It is called an hexagon. The corners are made of a 30° angle and a 90° angle. 30 + 90 = 120.

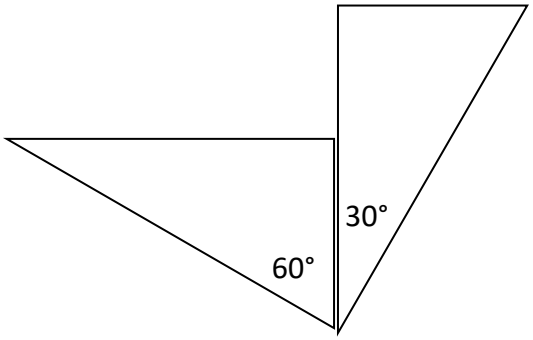




4 corners of 90° come together around a point and fill the space.
No gaps and no overlaps.

90° + 90° + 90° + 90° = 360°

Or we can use multiplication 4 x 90 = 360



We have our second square. The first one hand corners made two 45° angles. This one has corners made of one 30° angle and one 90° angles.