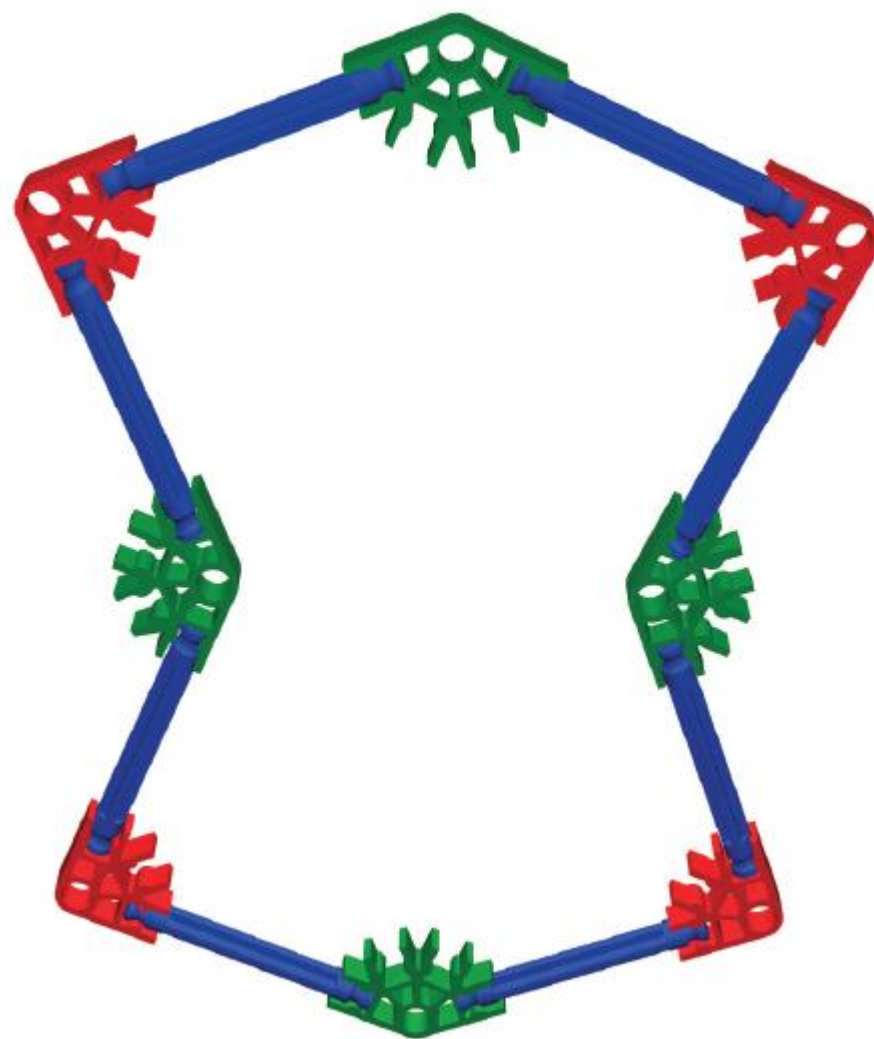
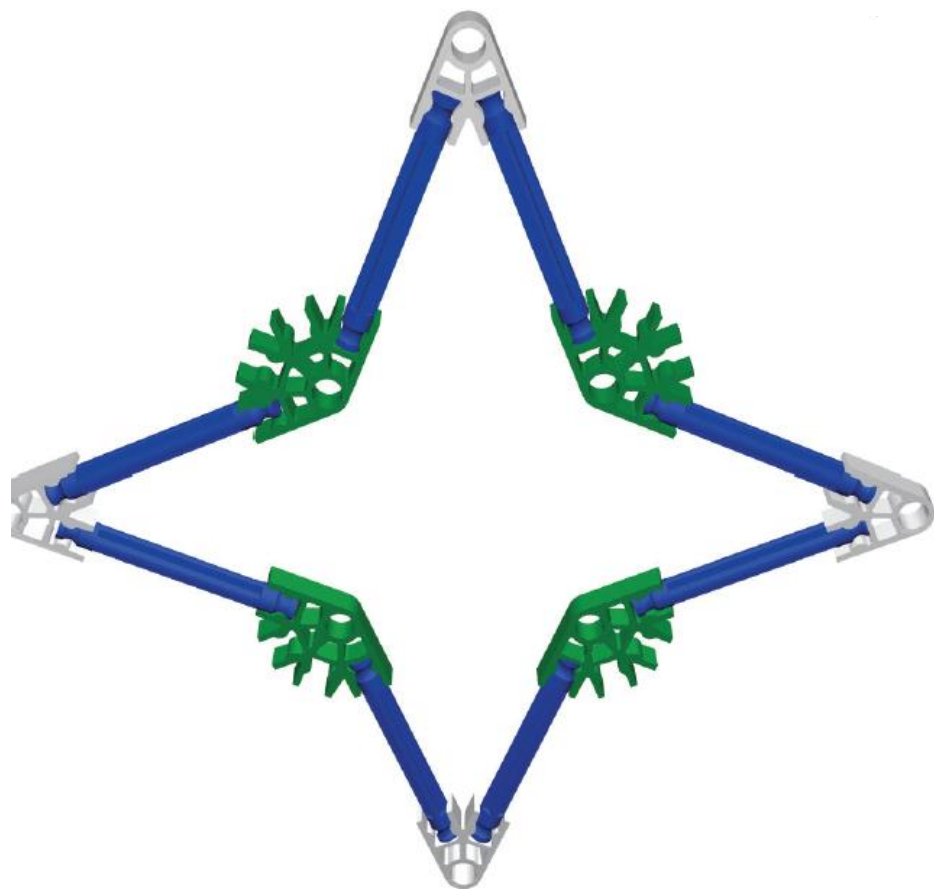
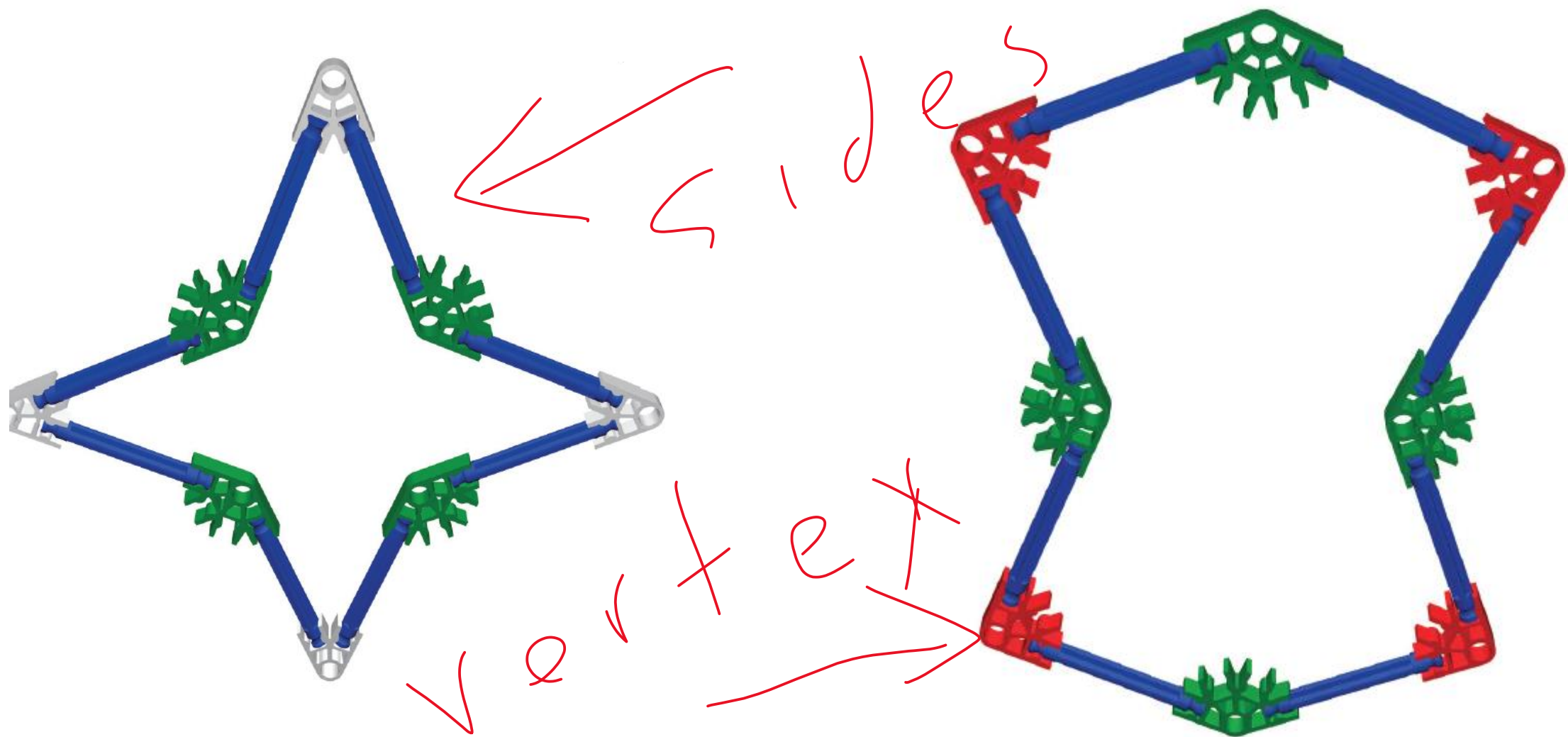


A **POLYGON** is a 2-dimensional closed shape made up of lines and angles!

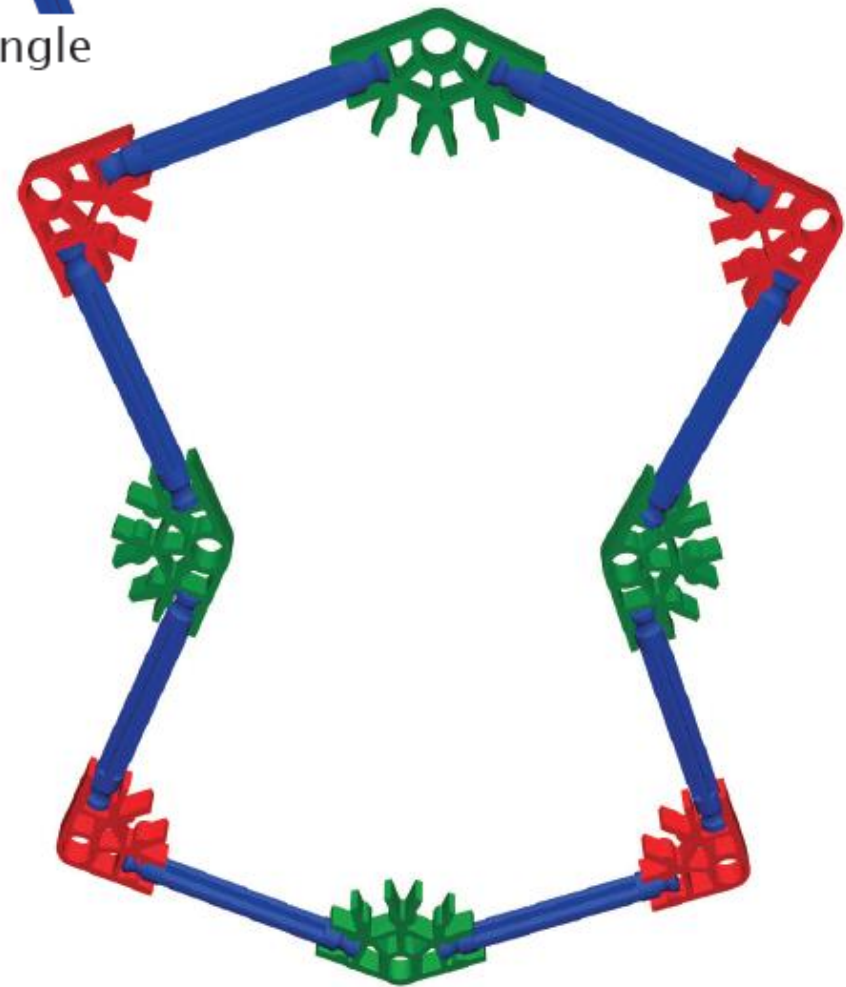
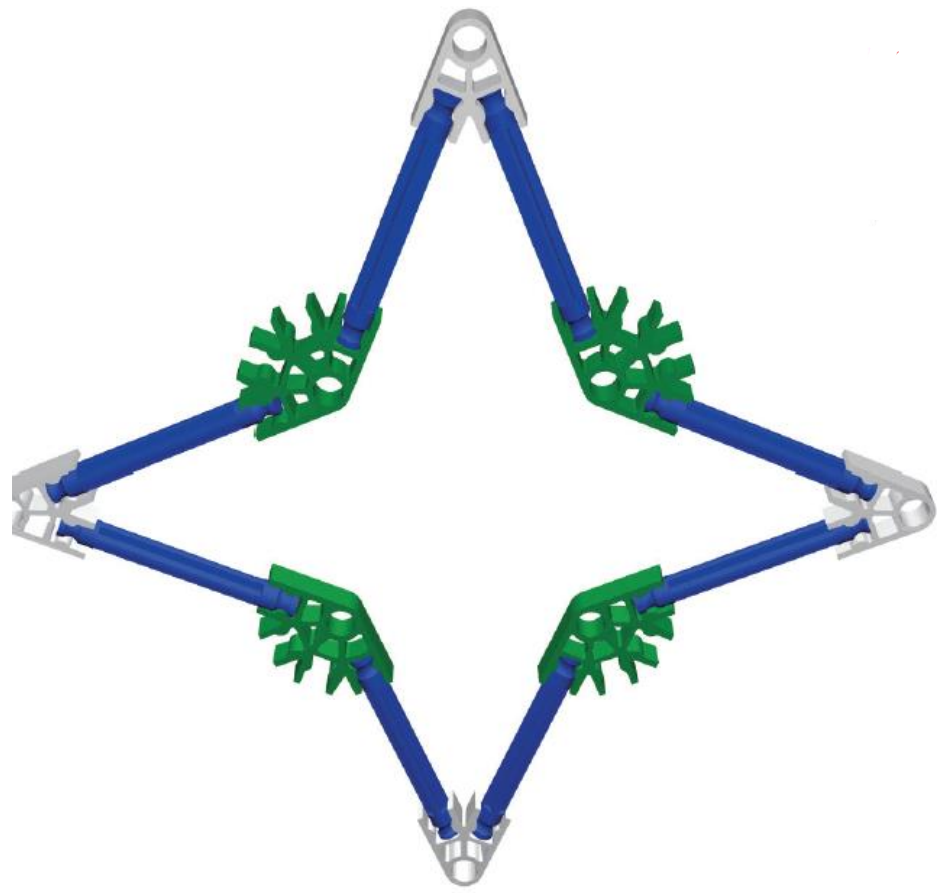


A **POLYGON** is a 2-dimensional closed shape made up of lines and angles!



If you add up the interior angle and exterior angle you get a straight line, 180°! You can discover the sum of a simple polygon's interior angles using the formula: (number of sides - 2) * 180 degrees!

Exterior Angle



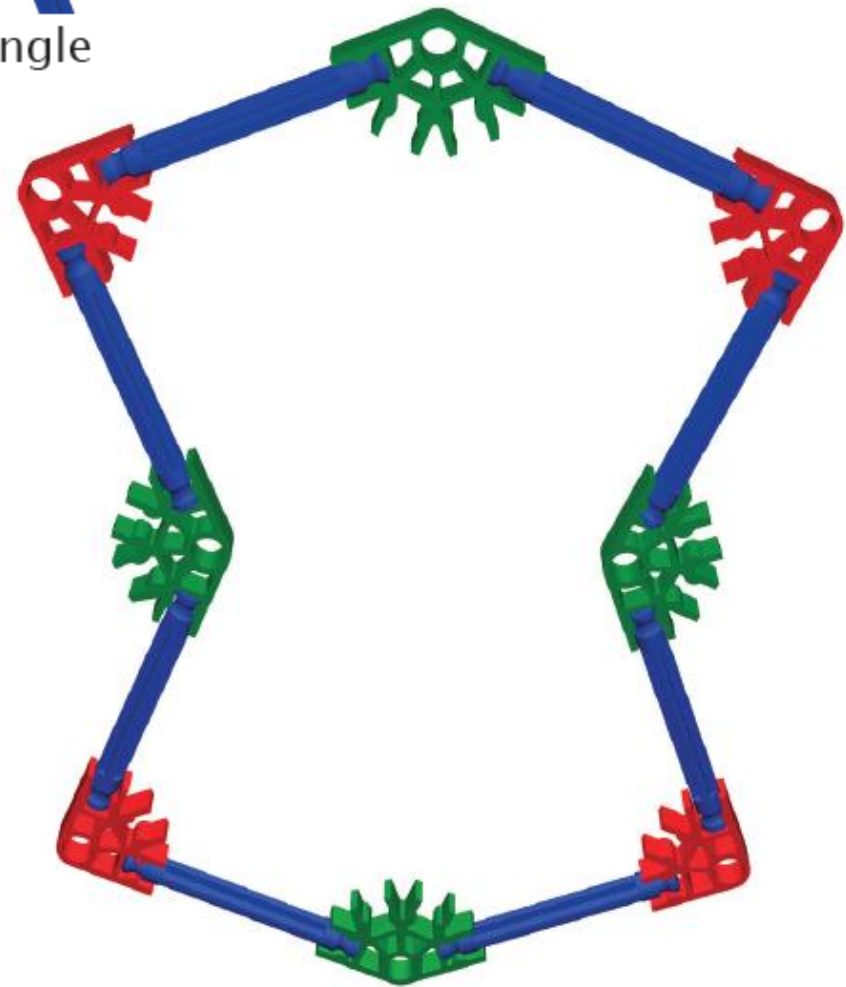
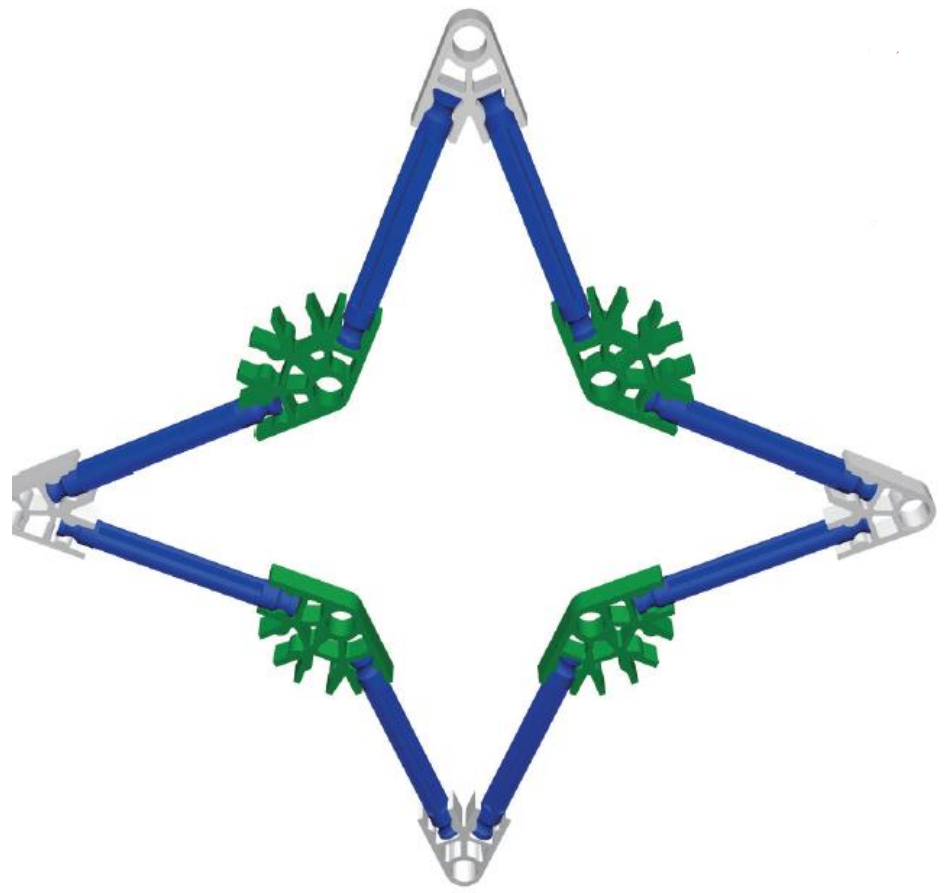
If you add up the interior angle and exterior angle you get a straight line, 180°! You can discover the sum of a simple polygon's interior angles using the formula: (number of sides - 2) * 180 degrees!

1. FIND THE SUM OF THE INTERIOR ANGLES FOR EACH OF THESE POLYGONS

Exterior Angle



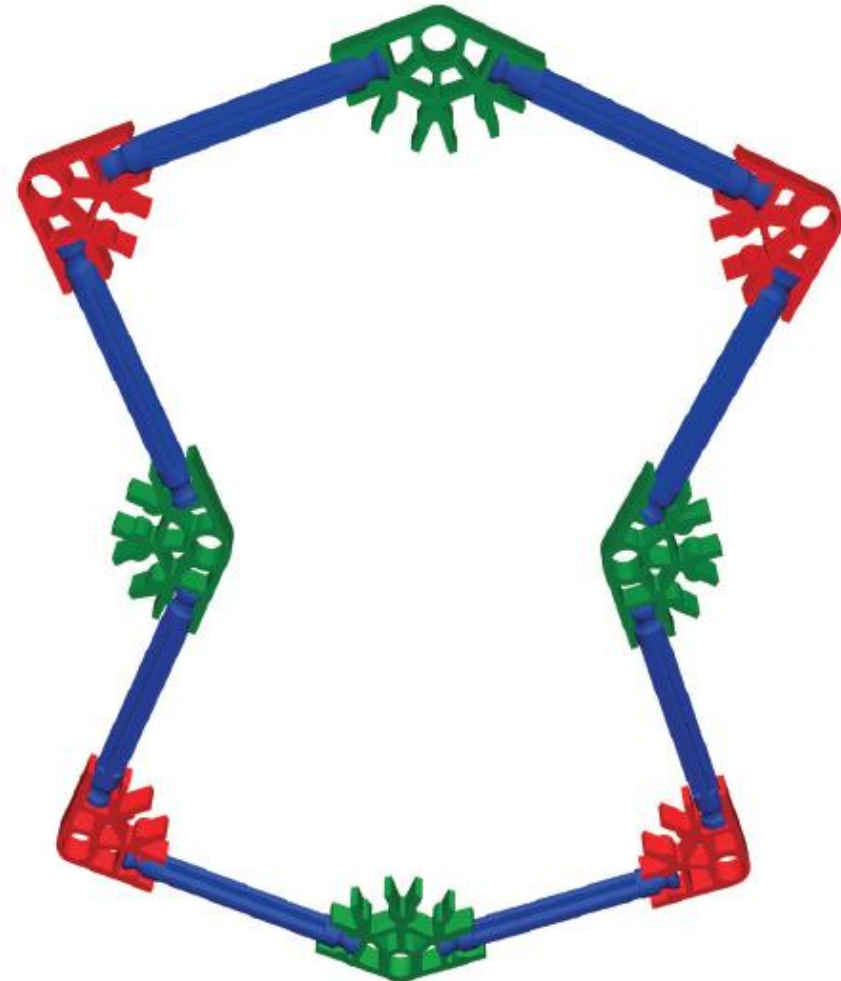
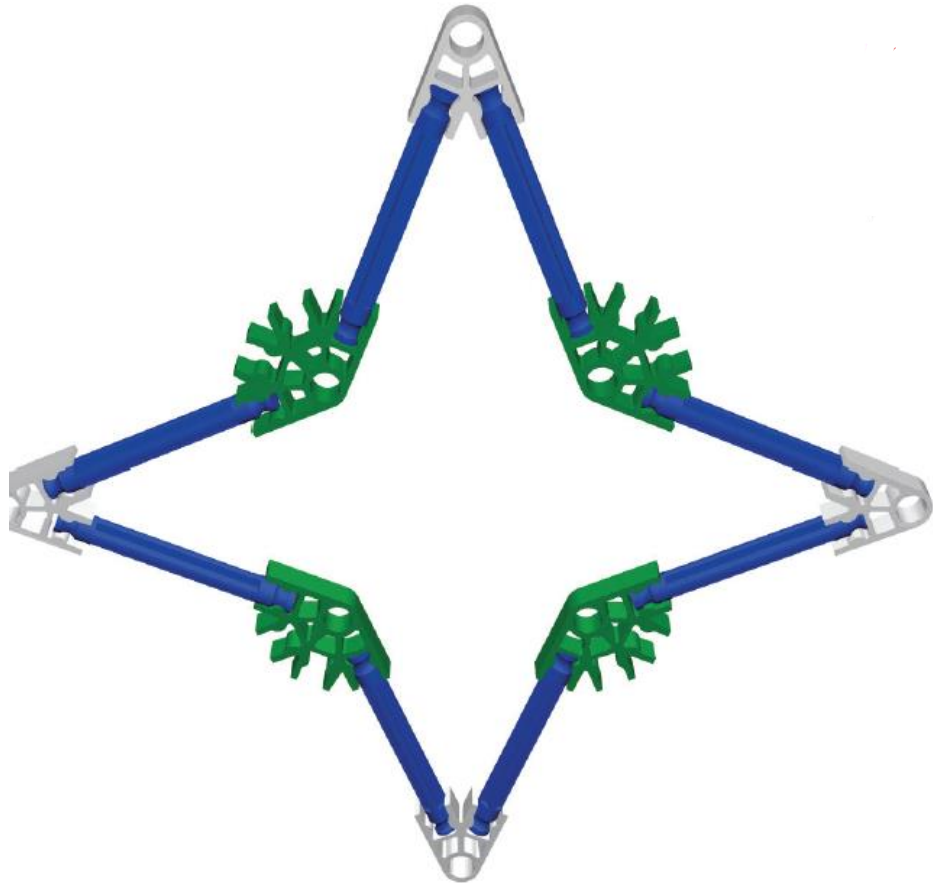
Interior Angle



To find the perimeter, measure the length of each side and add them together.

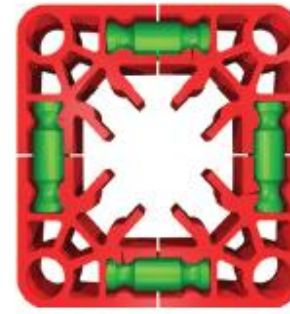
$$\text{Perimeter} = \text{Side} + \text{Side} + \text{Side} + \text{Side} + \text{Side}$$

2. FIND THE PERIMETER FOR EACH OF THESE POLYGONS

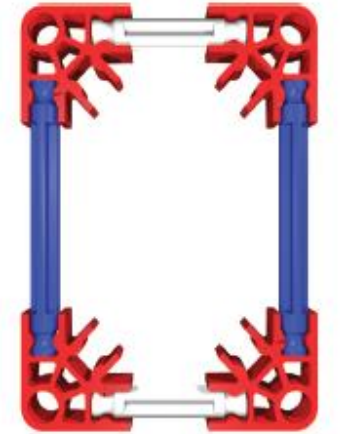


A **quadrilateral** is a four sided polygon.
There are many types of Quadrilaterals.

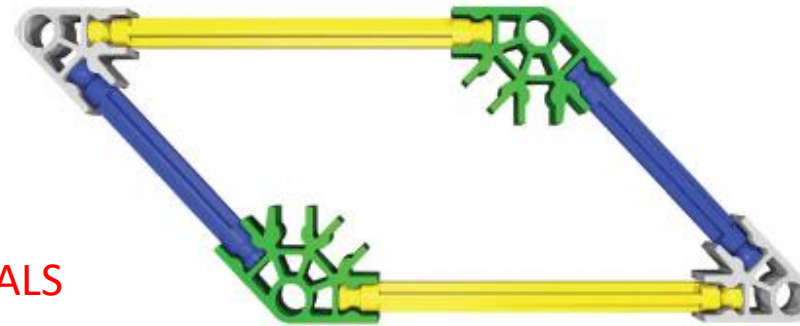
3. FIND THE PERIMETER FOR EACH OF THESE QUADRILATERALS



SQUARE



RECTANGLE



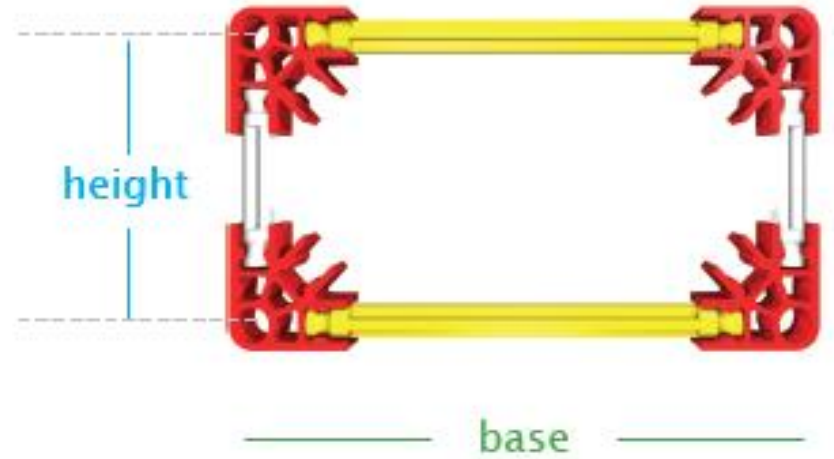
PARALLELOGRAM



TRAPEZOID

A **parallelogram** is a quadrilateral that is made up of 2 sets of parallel lines.

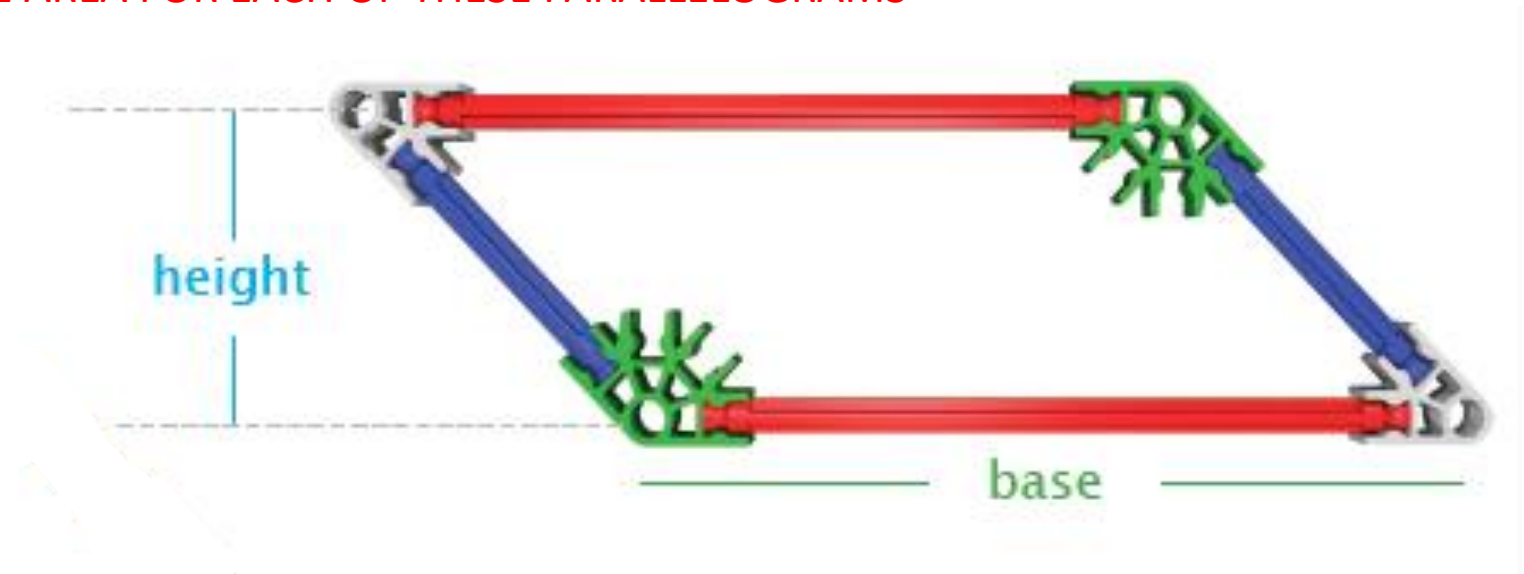
To find the **AREA** of a parallelogram, you multiply the base by the height.



$$\text{Area (A)} = \text{Base (B)} \times \text{Height (H)}$$

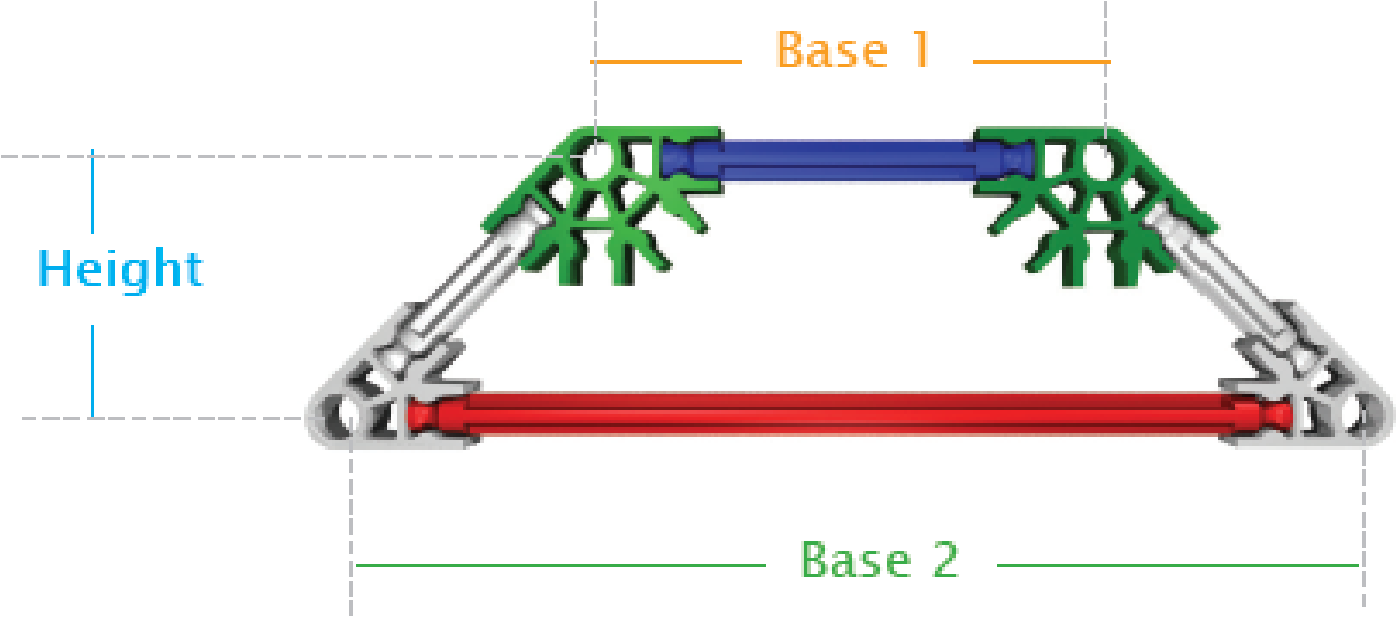
$$A = B \times H$$

4. FIND THE AREA FOR EACH OF THESE PARALLELOGRAMS

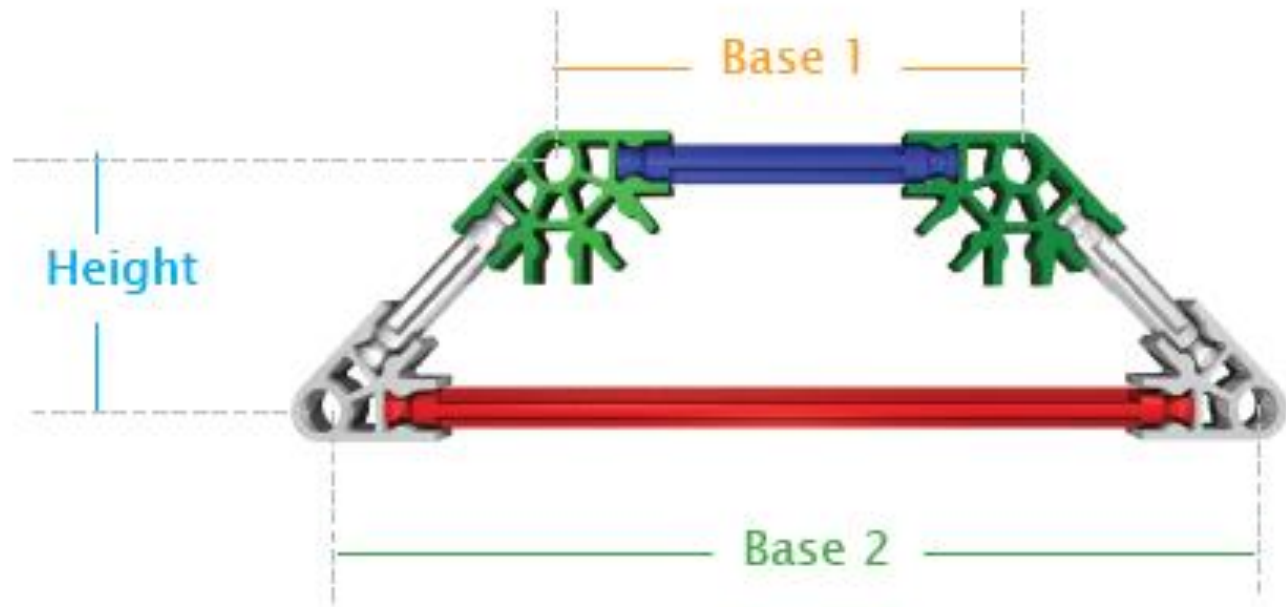


A trapezoid is a basic geometric shape. It is a quadrilateral, because it has four sides, but it is not a parallelogram because only ONE of the sets of sides is parallel (labeled B1 and B2 below).

Build each of the models shown below. Using a ruler, measure the bases and height for each model (measure from the center of the round hole in each connector). Record your answers on a separate sheet of paper. Use the formula below to calculate the area of each trapezoid. To find the area of a trapezoid, use the following formula: $A = 1/2 \times (B1 + B2) \times H$



$$\text{Area (A)} = 1/2 \times (\text{Base (B1)} + \text{Base (B2)}) \times \text{Height (H)}$$



$$\text{Area (A)} = 1/2 \times (\text{Base (B1)}) + (\text{Base (B2)}) \times \text{Height (H)}$$

$$A = 1/2 \times (B1 + B2) \times H$$

Always do the math inside the parentheses first before moving on! (Add the bases B1 and B2 together first.)

5. FIND THE AREA FOR EACH OF THIS TRAPEZOID.

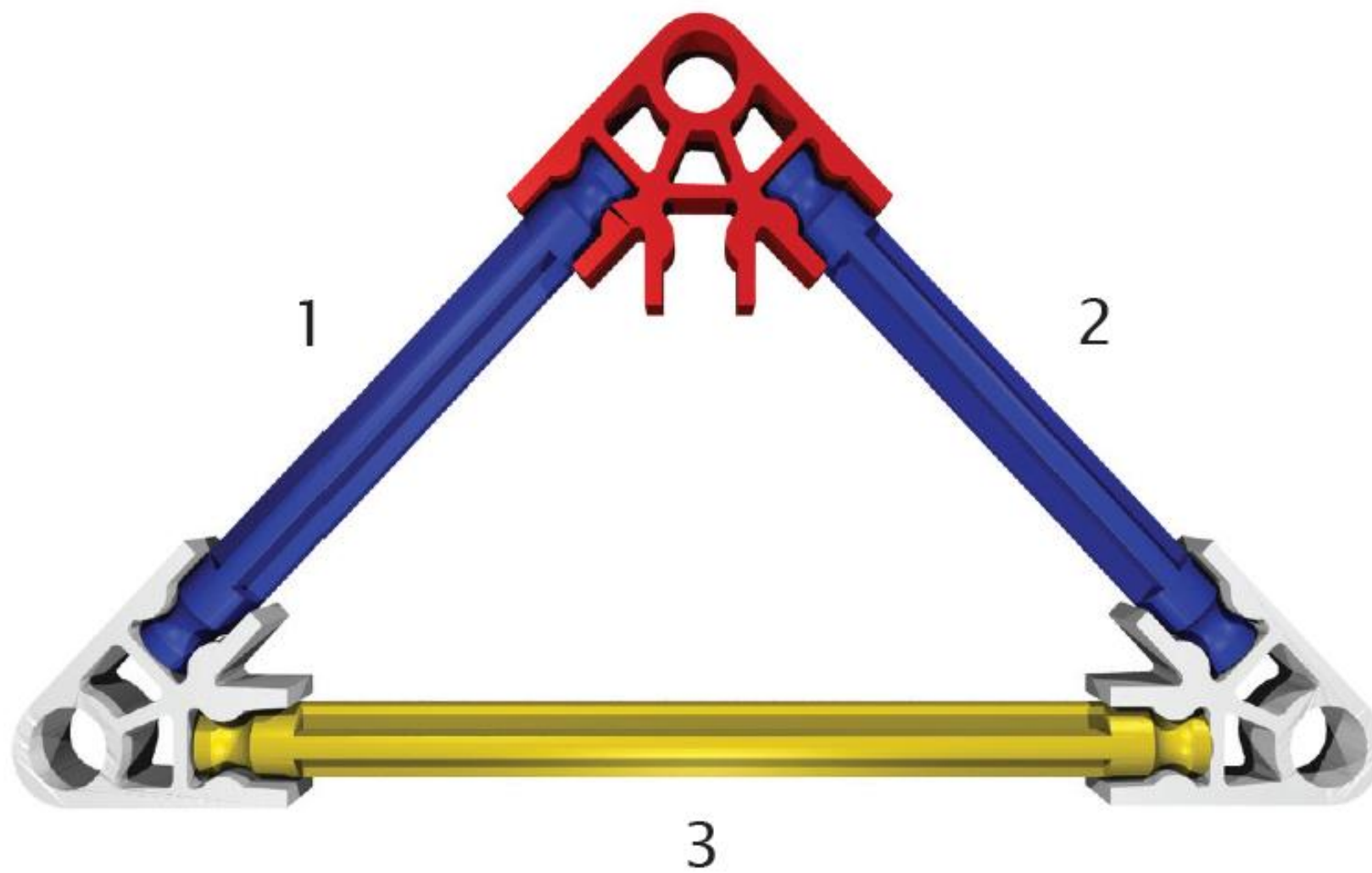
Think About It

Knowing how to find the area of parallelograms, trapezoids, squares, and rectangles is very important.

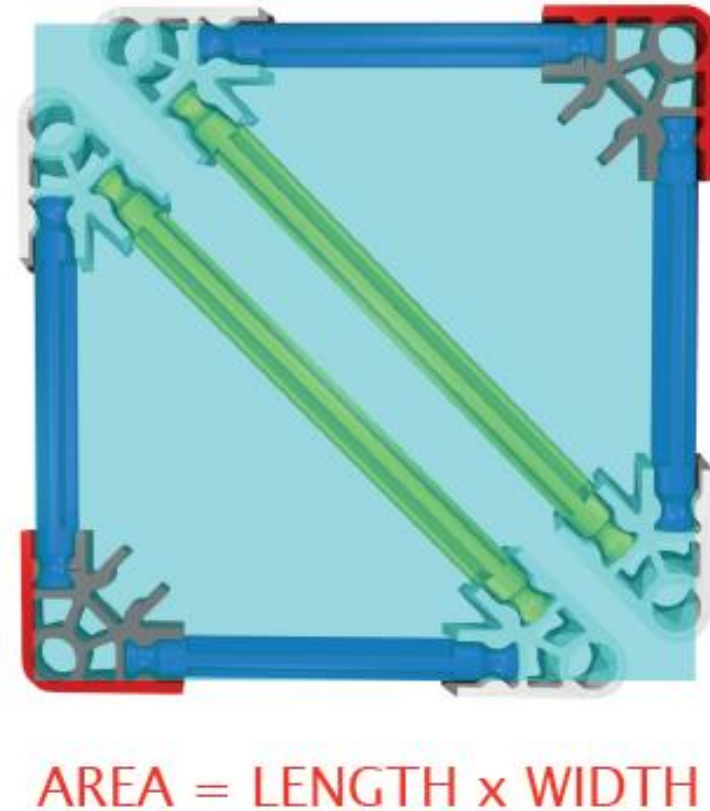
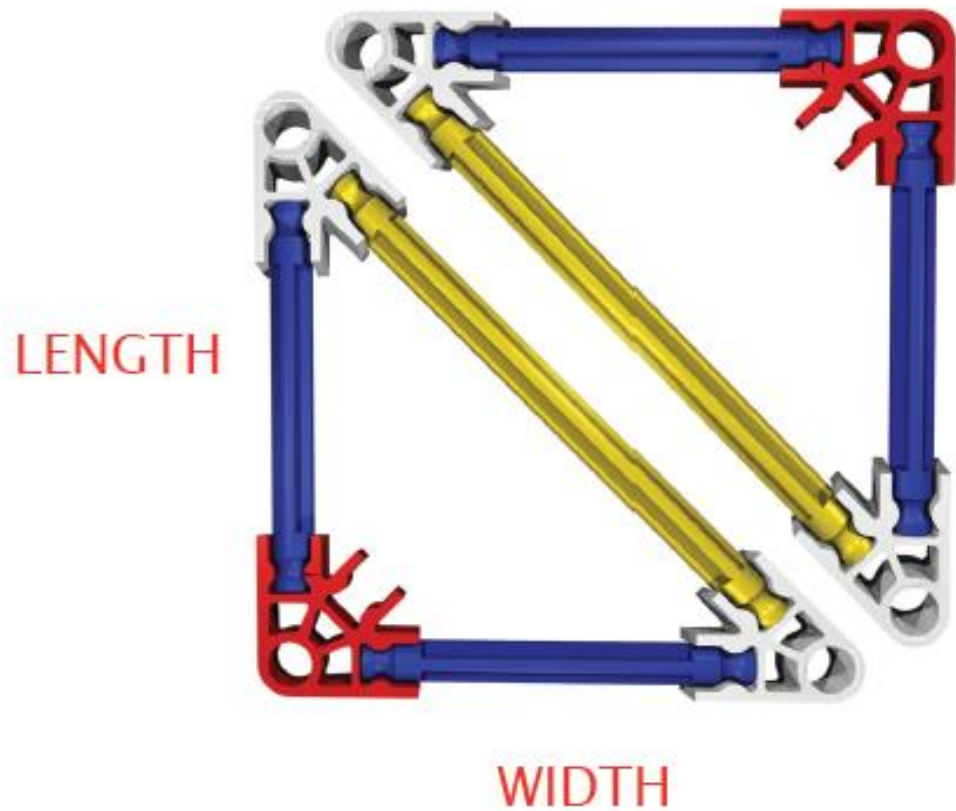
If you are trying to figure out how many square feet of lime-green shag carpet you will need for your bedroom or how much cherry-apple red paint you will need for your walls, you first need to take some measurements and do the math to find the area of the walls and floor.



A triangle is a basic geometric shape that has three sides. Build this triangle.

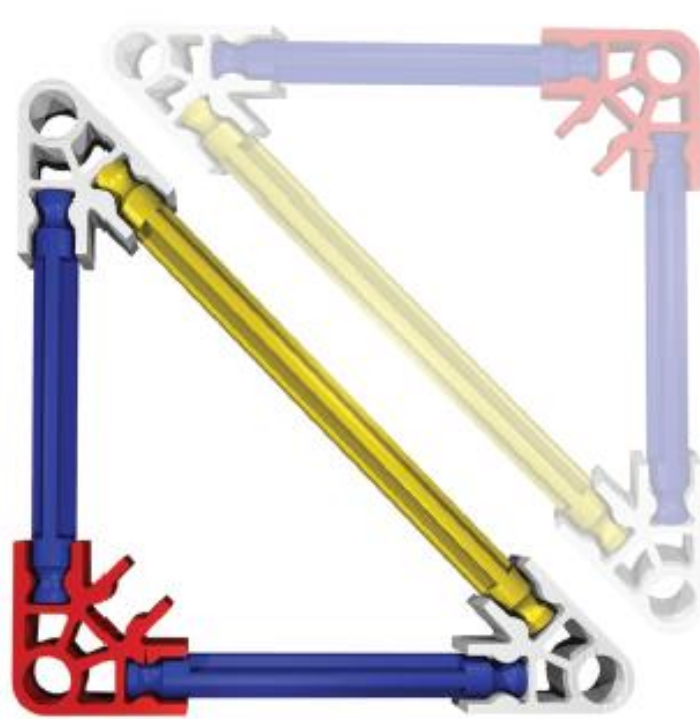


The area of a rectangle (or square) is calculated by multiplying the length and the width. Notice that the triangle we want to find the area of is exactly $1/2$ of the area of the square or rectangle. Also notice that the triangle base is the same as the width of the square and the triangle height is the same as the length of the square.

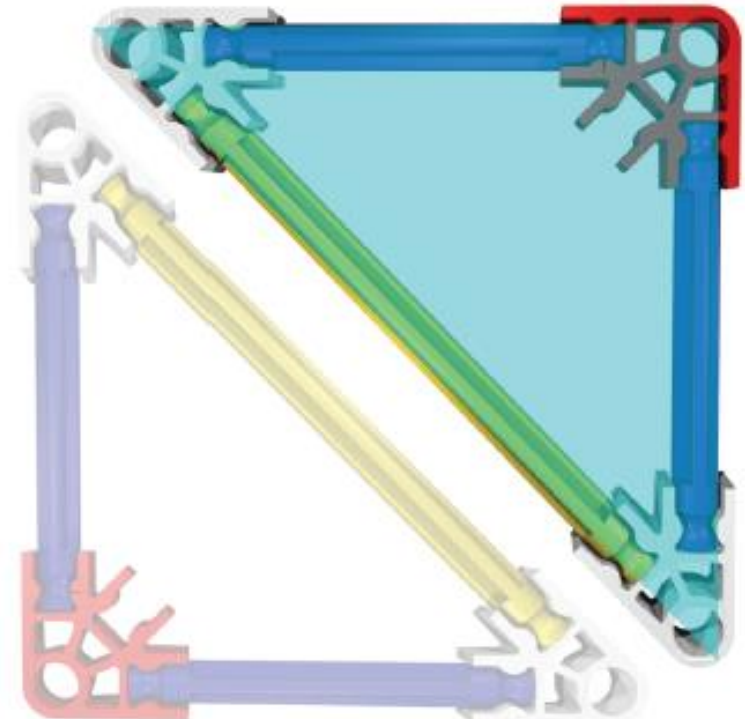


We use the following formula to find the area of any triangle:

LENGTH=HEIGHT



WIDTH=BASE

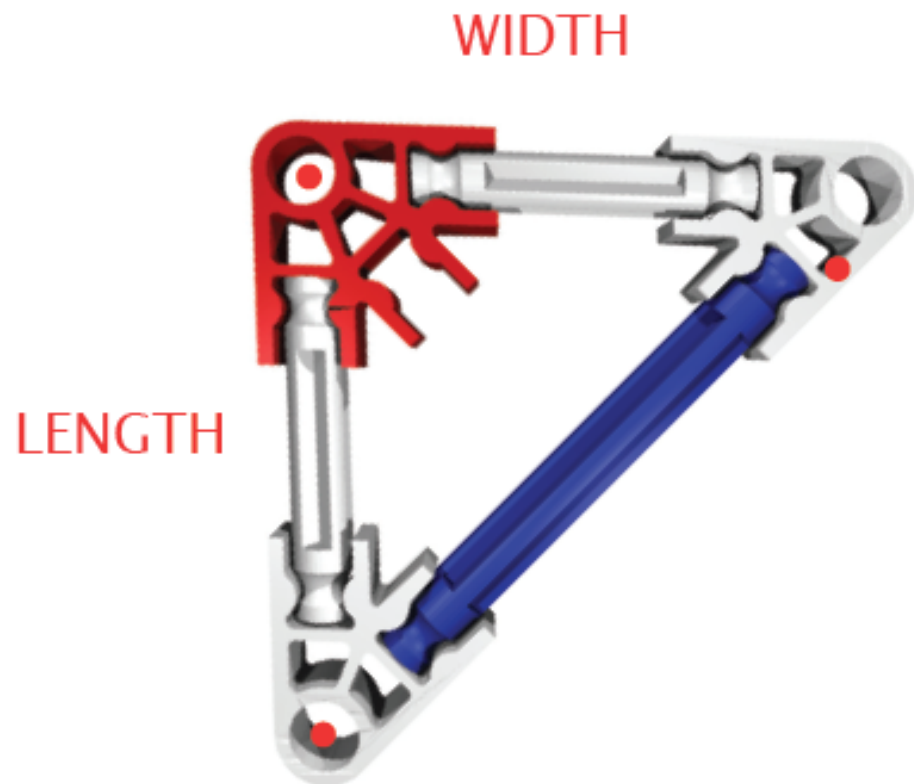


AREA OF A TRIANGLE = $1/2 \times \text{BASE} \times \text{HEIGHT}$

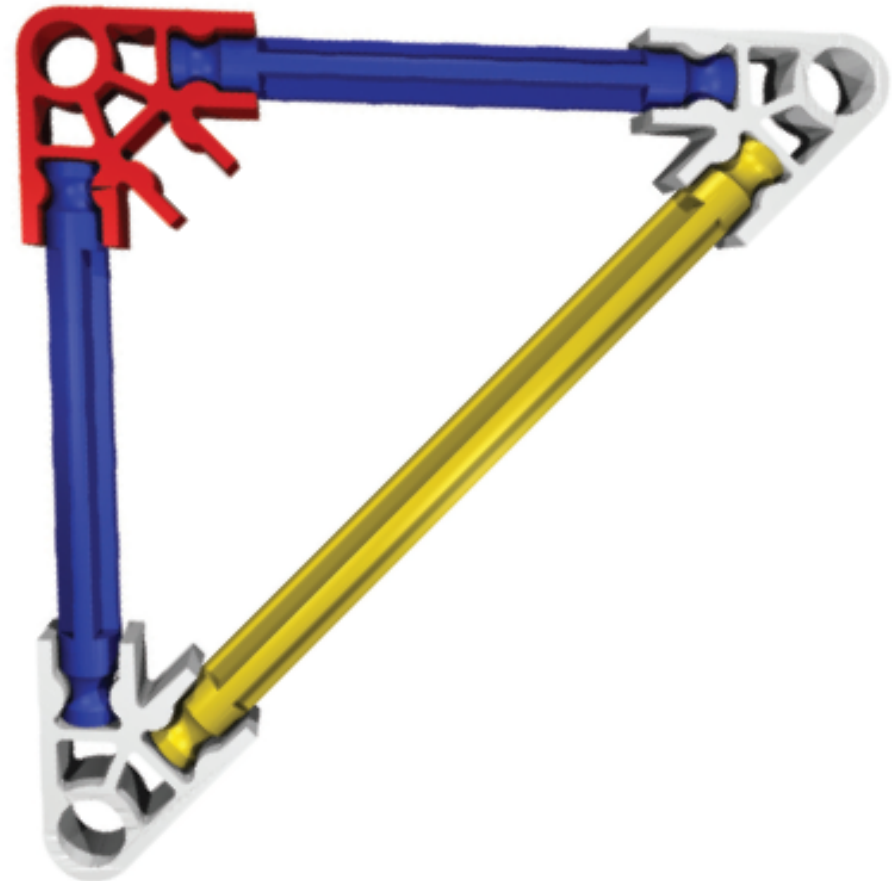
OR

$$A = 1/2 \times B \times H$$

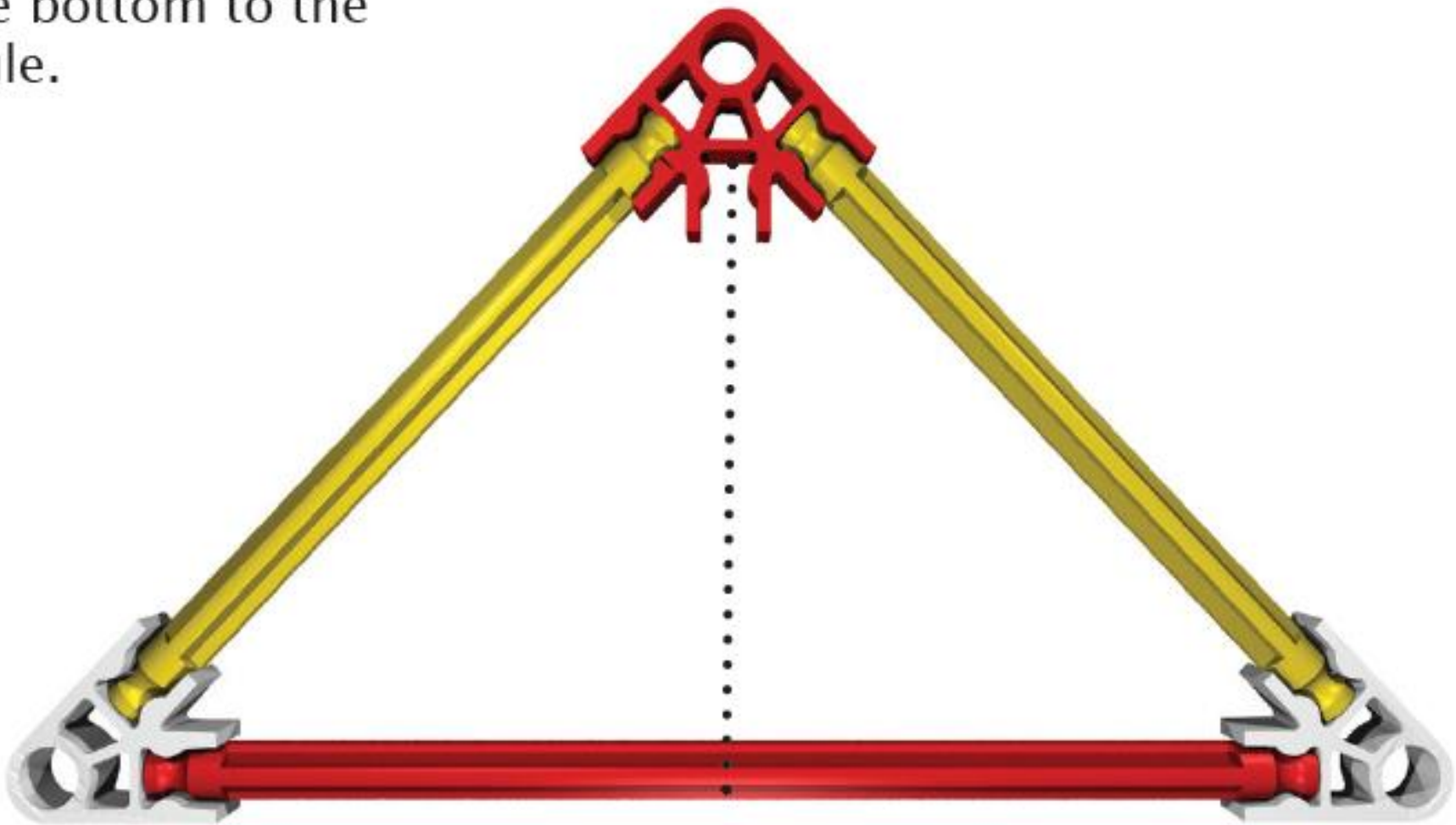
Build each right-triangle below. Use a ruler to measure the base and height of each triangle (measure from the center of each round connector hole.) Record your measurements on a separate piece of paper. Use the formula for the area of a triangle (Area = $1/2 \times B \times H$) to find the area of each triangle.



$$A = 1/2 \times B \times H$$



If the triangle is not a right-triangle, you must draw and measure an imaginary line to find the height from the bottom to the highest point of the triangle.



This formula works for all triangles, not just right triangles. Build each of the triangles pictured below. Using a ruler, measure the base and height of each of your models. Record your measurements on a separate piece of paper.

Now calculate the area of each triangle:

