

Geoboards

The rows and columns of pegs (or nails) on the Geoboard are arranged as points in a rectangular coordinate system. The pegs are evenly spaced in each row and in each column. You create shapes by stretching the rubber bands across the pegs. You can make many different shapes. Explore with the following activity. After you have created a shape be ready to argue why you think it is the shape that you claim or to support conjectures.

1. Triangles on the Geoboard
 - a. Make a 3-sided polygon with a pair of perpendicular sides and no two sides the same length.
 - b. Create a triangle with all angles different and one angle bigger than the sum of the other two.
 - c. Create a triangle with 2 sides equal and an obtuse angle.
 - d. Is it possible to create a triangle with all sides equal on the Geoboard?
 - e. Is it possible to create a triangle with one long side that is longer than the sum of the lengths of the other two sides?
2. Quadrilaterals on the Geoboard
 - a. Create a quadrilateral with all sides equal and a right angle.
 - b. Create a quadrilateral with exactly one pair of opposite sides parallel.
 - c. Create two different quadrilaterals with 4 equal sides.
 - d. Create a quadrilateral that is not a parallelogram or trapezoid.
 - e. Is it possible to create a quadrilateral such that the length of one side is larger than the sum of the lengths of the other three sides?
3. Polygons on the Geoboard
 - a. Create a polygon that is neither a quadrilateral nor triangle.
 - b. Create a polygon that has all sides equal but not all angles equal.
4. Lines on the Geoboard
 - a. How many different length segments can be made on a 5 x 5 pin Geoboard?

Focusing on specific shapes with the Geoboard.

1. Is it possible to have two non-congruent right triangles on the Geoboard that have the same area? Create an argument to support your answer.
2. How many non-congruent right triangles can be made on the 5 x 5 pin Geoboard? Explain how you know.
3. How many 1 x 1 squares are there on a Geoboard? How many 2 x 2 squares are there on a Geoboard? 3 x 3? 4 x 4? What is the total number of squares (whole number lengths for sides) on a 5 x 5 pin Geoboard? Explain how you know your answer is correct.
4. What is the total number of non-congruent squares that can be created on a 5 x 5 pin Geoboard? Be sure to name them (1 x 1, 2 x 2...) and be able to argue in support of your claim.
5. Are there more, the same, or less rectangles than parallelograms that can be made on a 5 x 5 pin Geoboard? Explain your thinking.