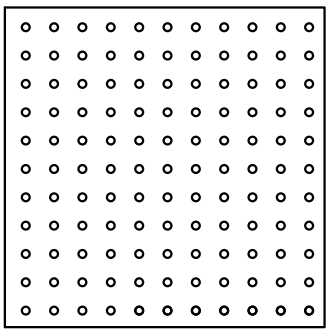
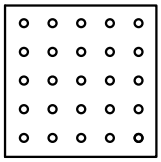
Geoboards





Rubber bands

What are Geoboards?

Geoboards are grids of pegs that hold rubber bands in position. Geoboards are available in a variety of sizes, styles, and colours. The transparent geoboard can be placed on an overhead projector to facilitate sharing of student observations and conclusions. Many geoboard activities are available for both the 5-pin × 5-pin and 11-pin × 11-pin geoboard sizes.

How do Geoboards help students?

Geoboards are useful in developing conceptual understanding of area and perimeter. However, they can be used to explore mathematics from any of the mathematics curriculum strands. Fractions, the Pythagorean theorem, tessellations, transformations, and patterning support the use of this manipulative.

How many are recommended?

Geoboard activities are often done by pairs of students, so one geoboard per pair of students is sufficient. When geoboards are introduced to the class, give students some time to experiment and explore. Blackline masters of geoboards can be used to record solutions.

Sample Activities

1. Construct a design for a quilt square or a stained glass window. Analyse the design. Enlarge or reduce the design. Compare your design with another student's design. (What's the same? What's different?)
2. Construct two three-sided (or four-sided) figures that are congruent (or similar).
3. Determine how many different sizes of squares (or equilateral triangles) can be constructed on a 5-pin × 5-pin geoboard. How many can be constructed on a 11-pin × 110-pin geoboard?
4. Construct two pentagons that have the same areas but different perimeters (or vice-versa).
5. Construct a symmetrical design.
6. Construct a diagonal segment. Construct a line segment that is parallel to the first segment. Determine the lengths and slopes of both segments.
7. Construct a line segment whose length has a measure between 3 and 4 units (or a given slope).
8. Choose any two pegs on the geoboard and determine different paths from the first peg to the second. Record solutions and determine which path is the longest and which is the shortest.
9. Create a 3-sided (or 4-sided) shape. Compare that shape with a partner's shape. What is the same? What is different?
10. Create a shape. Determine its area in more than one way.
11. Design a shape on one half of the geoboard. Construct its reflection.
12. Make a figure that has an area of 4 and a perimeter of 10.
13. Determine the maximum area that can be enclosed on an 11-pin × 11-pin geoboard if the perimeter is 25 units.
14. Determine different ways to divide the geoboard into 4 equal areas.
15. Divide the geoboard into different areas. Express each area as a fraction (decimal, percent) of the whole area.

Recommended Websites

http://standards.nctm.org/document/eexamples/chap4/4.2/ Interactive Geoboard Activities

http://nlvm.usu.edu/en/nav/search.html?qt=frames Virtual Manipulatives Geoboards

http://mathforum.org/trscavo/geoboards/contents.html Geoboards in the Classroom (includes dot paper)