GEOMETRY PLAYGROUND

Activities | Grades 3–5
www.exploratorium.edu/geometryplayground/activities

EXPLORING PATTERN BLOCKS

Part One: Free Exploration
[30 minutes]

Materials:

- Pattern blocks (multiple sets)
  You can purchase these online, or download and print out paper patterns
  here: http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm

Try This:

Step 1 Build with the blocks and explore what you can make with them.

Step 2 Look at other people's work and share your own. Discuss how you used the
blocks and whether you made patterns, pictures, or something else. Did you
try to cover all of the space with your blocks, or did you prefer to leave gaps?

Part Two: Sorting and Classifying Shapes
[20 minutes]

Materials:

- Pattern blocks (multiple sets), excluding the orange squares and white
  rhombuses

- Shapes Worksheet (included)

Try This:

Step 1 Look at the pattern block shapes.How are they similar and different? How
many sides does each block have? How long are the sides? Use one side of
the green triangle to measure the sides of each block. The total length of all
sides is the block's perimeter. If the side of the triangle is equal to one, what is
the perimeter of each shape?

Step 2   Definitions of the pattern block shapes:

Green *equilateral triangle*: three sides, equal lengths

Blue *rhombus*: four sides, equal lengths, opposite sides are parallel

Red *trapezoid*: four sides, two sides are parallel

Yellow regular *hexagon*: six sides, equal lengths

Step 3   Use the Shapes Worksheet with outlines of the shapes for this part of the activity. For each shape, there are empty outlines. Use your pattern blocks to fill in the shapes. How many different ways can you fill each shape? For example, you can use two triangles to make a rhombus.

How will you know when you've found them all? Try to come up with a logical system to test and prove whether or not you've tried every possibility. Share your system with a friend and find out if your systems were similar or different.
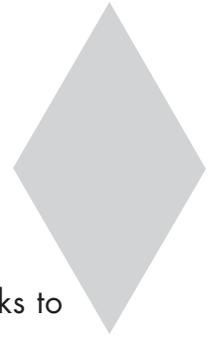
Shapes Worksheet

Triangle:
Use one block to fill this shape.
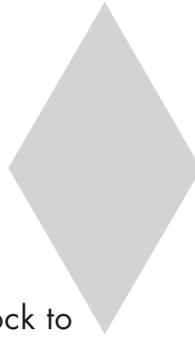
Rhombus:
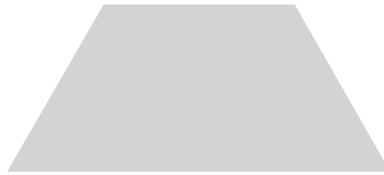Use one block to fill this shape.

Use two blocks to fill this shape.
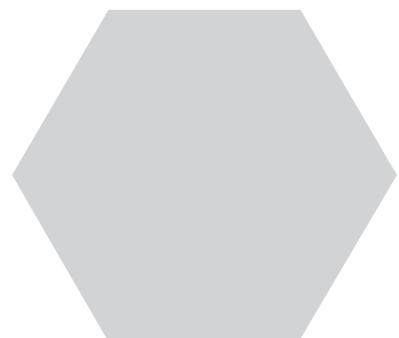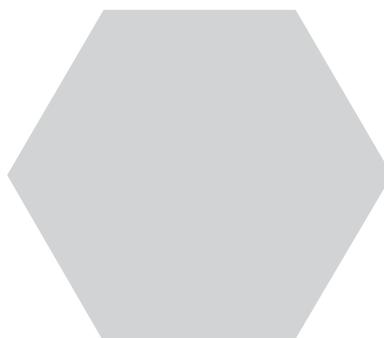
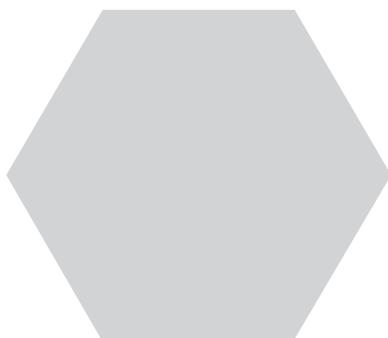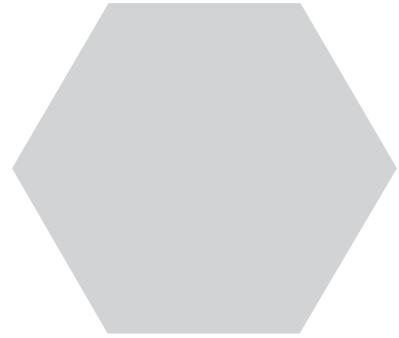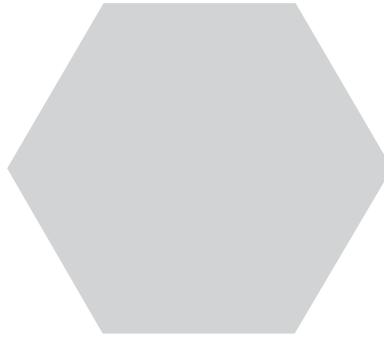**Trapezoid:**
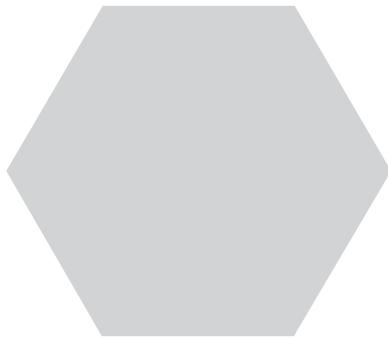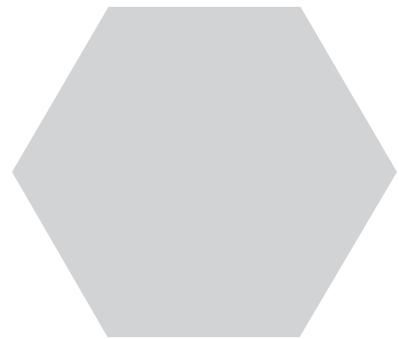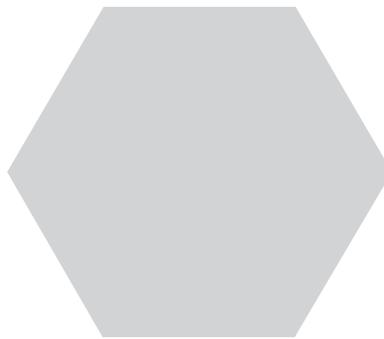Use one block to fill this shape.

Use two blocks.

Use three blocks.

Hexagon Challenge:
There are eight different ways to fill this shape. Can you find them all?

EXPLORING PATTERN BLOCKS

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships:

- Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes;

- Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;

- Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Apply appropriate techniques, tools, and formulas to determine measurements:

- Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.