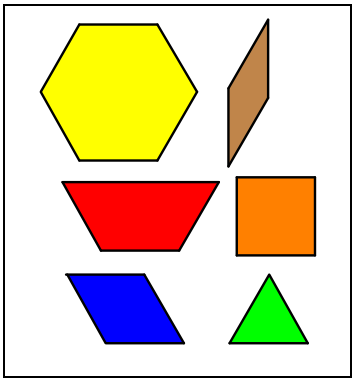
Pattern Blocks



What are Pattern Blocks?

One set of pattern blocks has six colour-coded geometric solids. The top and bottom surfaces of these solids are geometric shapes: hexagon, trapezoid, square, triangle, parallelogram (2). Except for the trapezoid, the lengths of all sides of the shapes are the same. This allows students to form a variety of patterns with these solids.

How do Pattern Blocks help students?

As their name suggests, pattern blocks are used to create, identify, and extend patterns. Students use the many relationships among the pieces to explore fractions, angles, transformations, patterning, symmetry, and measurement.

How many are recommended?

Students usually work in pairs or small groups, when using pattern blocks. A class set of about 700 to 1000 pieces allows students enough pieces to do a variety of activities. Sometimes a single set of six pieces per pair is sufficient but larger amounts are often required. Allow time for students to explore the blocks and to become familiar with their attributes. Discuss the variety of names that can be used for each piece, e.g., the two parallelogram faces are also rhombi. The triangle face can also be called an equilateral triangle, an acute triangle, as well as a regular three-sided polygon.

Note: Ensure that students understand that blocks are named for the large faces although each block is actually a 3-D geometric solid. For example, instead of properly naming the yellow block as a hexagonal prism, it is usually called a hexagon.

Sample Activities

1. How many different ways can you name the orange (square) block?
2. How many different ways can you cover the hexagon with other shapes?
3. Use three blocks to make a pentagon. How many different ways can you do this? What is the sum of the interior angles in each case?
4. Design a tessellating floor pattern.
5. How many lines of symmetry are there for each block?
6. Create a symmetrical design. Describe the design to a partner.
7. How many different angles can you create by placing two or more blocks together so they meet at one vertex?
8. Determine the size of each different face as a fraction of the size of the hexagon.
9. If the hexagon represents $\frac{5}{6}$, what fraction does the triangle represent?
10. Build a shape with a perimeter of 10 and an area of 5.
11. Design a sequence of patterns. Analyse the pattern and determine an attribute of the 100^{th} term in the sequence.
12. Put a variety of pieces into a paper bag. Determine the probability of choosing one type of block.
13. Let *a* represent the area of a hexagon. Determine a representation for the area of each other block.
14. Create a shape with three or more pattern blocks. Choose a variable to represent the area of each block in the shape. Create an expression for the total area. Make several copies of the shape. Create an algebraic expression for the total area of all of the shapes.

Recommended Websites

http://nlvm.usu.edu/en/nav/frames_asid_169_g_1_t_2.html Virtual Pattern Blocks

http://matti.usu.edu/nlvm/nav/category_g_4_t_3.html Interactive Manipulatives and activities

http://math.rice.edu/~lanius/Patterns/ Exploring Fractions

http://fcit.usf.edu/math/resource/manips/pattern.pdf Explorations with Pattern Blocks

http://mathforum.org/sum95/suzanne/active.html Investigating Tessellations using Pattern Blocks

http://www.mathcats.com/explore/polygons.html Polygon Playground (interactive)