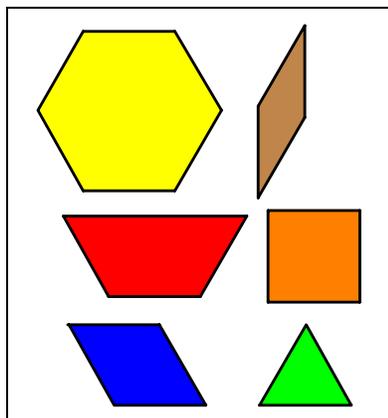


TIPS for Manipulatives PATTERN BLOCKS



What are they?

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 they help students?

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

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 will allow 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. For example, 2 of the 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. Ensure that students understand that pieces are named for the large faces that are the usual subject of study. Each piece is actually a 3-D geometric solid. For example, instead of properly naming the yellow piece as a hexagonal prism, it is usually called a hexagon.

What are some sample activities?

1. How many different ways can you name the orange (square) piece?
2. How many different ways can you cover the hexagon with other shapes?
3. Use exactly 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 piece?
6. Create a symmetrical design. Describe the design to a partner.
7. How many different angles can you create by placing two or more pieces 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. Analyze the pattern and determine an attribute of the 100th term in the sequence.
12. Put a variety of pieces into a paper bag. Determine the probability of choosing one type of piece.
13. Let “ a ” represent the area of a hexagon. Determine a representation for the area of each other piece.
14. Create a shape with three or more pattern blocks. Choose a variable to represent the area of each piece 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.

Are there any recommended websites?

- http://arcytech.org/java/patterns/patterns_j.shtml - virtual pattern blocks
- <http://math.rice.edu/~lanius/Patterns/> - exploring fractions – Cynthia Lanus
- <http://fcit.usf.edu/math/resource/manips/pattern.pdf> - working with pattern blocks – collection of explorations
- <http://mathforum.org/sum95/suzanne/active.html> - *Math Forum - Investigating Tessellations*
- <http://www.mathcats.com/explore/polygons.html> - *Polygon Playground*
- http://matti.usu.edu/nlvm/nav/category_g_4_t_3.html - interactive manipulatives and activities