

INTRODUCTION

Learning About* Attribute Blocks is a resource providing hands-on activities and ideas that allow you, the teacher, to lead students in an active exploration of the world of mathematics. The activities presented involve students in the process of exploring abstract concepts through the use of manipulatives. Students are encouraged to think critically, plan strategy, and share conclusions.

This Learning About* Attribute Blocks Activity Guide emphasizes:

- communication
- exploration
- problem solving
- analysis

Each set of Attribute Blocks consists of 60 blocks in three colors (red, yellow, blue), five shapes (circle, square, rectangle, triangle, hexagon), two sizes (large, small), and two thicknesses (thick, thin). The Attribute Blocks are contained in a compartmentalized plastic storage box. The storage box lid can be used as a template or shape sorter.

Attribute Blocks can be used to:

- identify shapes, colors, and sizes
- sort and classify by size, color, shape, and thickness
- create and identify sets
- create and identify patterns
- develop logical thinking

Exploring with Attribute Blocks

Students at all grade levels should be allowed time to freely explore and experiment with the Attribute Blocks before guided activities begin.

INTRODUCING AND EXAMINING SHAPES, COLORS, AND SIZES

Group Size: Pairs or Small Groups

Procedure: Provide a set of Attribute Blocks for each group of students. Instruct students to examine their blocks. Ask students to describe the blocks. Discuss how the blocks are alike and how they are different.

Hold up a square Attribute Block.

- How many sides does this block have? [four]
- Are all the sides the same length? [yes]
- What do we call the shape of this block? [square]

Hold up a triangle Attribute Block.

- How many sides does this block have? [three]
- What do we call the shape of this block? [triangle]

Hold up a rectangle Attribute Block.

- How many sides does this block have? [four]
- Are all the sides the same length? [No. Two sides are long, and two sides short.]
- What do we call the shape of this block? [rectangle]

Hold up a hexagon Attribute Block.

- How many sides does this block have? [six]
- Are all the sides the same length? [yes]
- What do we call the shape of this block? [hexagon]

Hold up a circle Attribute Block.

- How many sides does this block have? [None. It is round.]
- What do we call the shape of this block? [circle]

If the following chart is developmentally appropriate for your students, you may wish to create it on the chalkboard.

Block Shape	Number of Sides
Triangle	3
Square	4
Rectangle	4
Hexagon	6
Circle	0

Hold up a blue Attribute Block.

Instruct students to find another block that is the same color. The block matched in color need not be the same shape or size.

- What color is the block I am holding? [blue]
- What color is the block you have matched? [blue]

Continue this matching for the red and yellow blocks. As the students provide matching color blocks, you may wish to review the names of the block shapes.

Hold up a large square Attribute Block.

Instruct students to find a block that is the same shape, only small in size. The small square need not be the same color as the large square block.

Continue this activity for the other blocks—circle, rectangle, triangle, and hexagon. As your students become more proficient at matching sizes, large to small and vice versa, you may wish to become more specific in providing directions.

For example:

I am holding a large red triangle. Show me the same block, only smaller in size. [small red triangle]

Encourage students to be specific about shape, color, and size in describing the Attribute Blocks. Students should make use of correct, appropriate vocabulary.

SORTING AND CLASSIFYING (SIZE, COLOR, SHAPE, AND THICKNESS)

Group Size: Pairs or Small Groups

Procedure: Provide a set of Attribute Blocks for each group of students. Allow students a few minutes to freely explore and creatively manipulate the blocks.

Write the following words on the chalkboard:

large, small
red, yellow, blue
square, circle, triangle,
rectangle, hexagon
thick, thin

As you read and identify each word, direct students to hold up a block displaying the particular attribute.

Instruct one student in each group to sort four blocks by one attribute (e.g., color). The rest of the students in the group must try to identify the attribute by which the example blocks are sorted and classified.

Have students alternate roles and continue sorting and classifying by one attribute. As you circulate among the student groups, encourage students to verbalize the sorting strategies they use.

Challenge Activity: Encourage students to sort and classify the blocks using more than one attribute.

Example:

All blocks are blue and large. (color and size)

All blocks are blue, large, and thin. (color, size, and thickness)

All blocks are square and thick. (shape and thickness)

SETS

Group Size: Pairs or Small Groups

Procedure: Provide a set of Attribute Blocks for each group of students. Ask students to describe the blocks. Discuss how the blocks are alike and how they are different.

Write the word “set” on the chalkboard. Challenge students to provide a definition of the word “set.” [possible answer—things that go together] Encourage students to give examples of sets. [baseball cards, watercolor paints, crayons, luggage, etc.]

Hold up or display the following blocks:

blue large hexagon

blue large circle

red small square

blue large square

Do all of these blocks belong to the same set? [No. The red small square does not belong.]

Describe the set. [blocks that are blue and large]

Hold up or display the following blocks:

red large hexagon

blue large hexagon

yellow small hexagon

red small circle

yellow large hexagon

Do all of these blocks belong to the same set? [No. The red small circle does not belong.]

Describe the set. [blocks that are hexagons]

Hold up the following blocks:

thin blue large rectangle
thin red large rectangle
thick yellow large square
thin yellow large rectangle

Do all of these blocks belong to the same set? [No. The thick yellow large square does not belong.]

Describe the set. [blocks that are thin, large rectangles]

Direct students to work in groups to create and identify sets of blocks. One student in each group will create a set of blocks using one attribute (thickness, color, size, or shape). The other members of the group are to identify the attribute that distinguishes the set.

After each set is created and correctly identified, students will exchange roles. Circulate among the groups. As students become proficient at creating and identifying sets distinguished by one attribute, challenge students to create more complex sets, distinguished by two or more attributes.

PATTERNS

Group Size: Pairs or Small Groups

Procedure: Provide a set of Attribute Blocks for each group of students. Review the attributes of color, shape, size, and thickness.

Write the word “pattern” on the chalkboard. Elicit student definitions of the word pattern. [possible answer—something that repeats]

Direct students to provide examples of patterns. [rhythm patterns, designs on wallpaper or clothing, etc.]

Display the following blocks:

large thick blue square
small thick blue square
large thick red square
small thick red square

What blocks would come next in the pattern? [large thick yellow square-small thick yellow square]

Identify the pattern. [size—large/small; thickness—thick; color—blue/red/yellow; shape—square]

Display the following blocks:

large thick red triangle
large thick red square
large thick red circle
large thick red rectangle

What block would come next in the pattern? [large thick red hexagon]

Identify the pattern. [size–large; thickness–thick; color–red shape–all shapes]

Direct students to work in groups to create and identify patterns. One student in each group will create a pattern, and the other members of the group will continue the pattern. After each pattern is created and continued, students will exchange roles.

LOGICAL THINKING

Group Size: Pairs or Small Groups

Procedure: Provide a set of Attribute Blocks for each group of students. Allow students a few minutes to explore the blocks before the directed activity begins.

Explain to the students that they will solve story problems. The students will be using the Attribute Blocks to solve each story problem.

I have 4 equal sides. I am large and thin. I am not red or yellow. I am the _____ Attribute Block. [square, large, thin, blue]

There are 3 blocks displayed. All the blocks are large triangles. The blocks are all thick. The red triangle is not last. The blue triangle is in the middle. What is the order of the blocks? [First–large thick red triangle. Second–large thick blue triangle. Third–large thick yellow triangle.]

We are the small thin circles. How many ways can we be arranged?
[6—red-yellow-blue; red-blue-yellow; yellow-red-blue; yellow-blue-red; blue-red-yellow; blue-yellow-red]

Challenge student volunteers to create story problems for the other members of their groups to solve.