

## Shapes and Shape Parts

### Shape Parts and Wholes

Show children a picture of a whole shape and a shape part from that shape that you have cut out in advance (e.g., a right triangle and a cut-out right angle, or an oval and a cut-out curved line that matches the curve on the oval). Ask them to describe the shape part and trace it with their fingers. Then prompt them to place the shape part on top of the matching part of the whole shape. Ask open-ended questions to encourage talk and gesture about shape features, such as: *How is this part different from this part? Can you show me with your hands or your body?* and *How can you tell that this part will/won't fit here?* Repeat with other shapes and shape parts as time permits. Once children understand how the shape parts “fit” on the whole shapes, set out a set of whole shapes and shape parts and encourage them to find matches.

### Shape Concentration

Arrange several pairs of shape cards facedown and have children take turns turning over two at a time to try to find a match. (For a version of the game that does not rely on working memory, play with the cards faceup instead.) When they find a matching pair, children explain why the shapes match and keep the cards.

- For a beginner version of the game, provide children with cards with pairs of identical shapes.
- For a more advanced version, provide children with cards with different variations of the same type of shape (e.g., rectangles in different proportions and different types of triangles) and have them match cards with shapes in the same family (i.e., triangles or rectangles).
- To provide practice seeing shape parts within wholes, provide children with cards with pairs of shapes and shape parts (i.e., a curve and a circle; a right angle and a right triangle).

### I Spy

Lead children in a guessing game to find shapes (2-d and/or 3-d) and shape parts in the environment, including the classroom, hallway, or outdoors. Give clues that include shape and positional language, such as:

- *“I spy with my little eye something that is a circle above the door”*
- *“I spy with my little eye a straight line between the windows.”*
- *“I spy with my little eye a cylinder next to the desk.”*

For each shape, have children explain how they know it fits your clue. Invite children to give the clues as they are ready.

### Stamping with 3-D Shapes

Provide a variety of objects representing various 3-D shapes, such as balls, toilet paper tubes, tissue boxes, and blocks, as well as paint or ink for stamping. Show children how to stamp different faces of 3-D objects by dipping the face in the paint and pressing the painted face onto a blank piece of paper to make a print. Encourage children to predict which 2-D shape will result from stamping a particular face of a 3-D object and then test their predictions.

## Spatial Transformations

### Copy My Creation

Have children watch carefully as you use a small number of blocks (pattern blocks, attribute blocks, etc.) to build a design on the table. When you are finished, encourage children to describe the design using shape names and positional language (e.g., *it looks like a boat because it has a triangle on top like a sail*). Next, give each child an identical set of blocks and have them copy your creation.

### Rotating Figures

Show children pictures of objects or figures that they are very familiar with, such as stick figures, letters, or numerals. For each picture, ask children to imagine what the object or figure would look like if you turned it upside down. Have them close their eyes to imagine, and then describe what they think. Next, turn the picture upside down and have them compare what they see to what they imagined. As children become familiar with the game, modify the amount of rotation of the image. For example, if you show children a capital “F,” say: *Imagine what this would look like if we turned it this way (gesture counterclockwise) so the long side is on the bottom*. Ask children to describe, and perhaps draw, what they imagine. Then rotate the image and have them describe the results. Repeat for other images. Examples include:

- Turning the letter “P” so that its long edge is either on the top or on the bottom.
- Turning the number “8” on its side
- Turning an open hand so the fingers are pointing to one side, rather than pointing up.

### Mapping the Classroom

Provide children with pencils and a large sheet of paper in the same overall shape as your classroom. Choose one area of the classroom as the focal point (a rug, the library, etc.) and demonstrate where to draw it and how to represent it on your classroom map (e.g., *our rug is a rectangle near the front of the room, so I’m drawing a big rectangle here*). Encourage children to continue mapping other important areas of the classroom. Promote spatial language and thinking by talking with them about where they are positioning objects and why. (Do not expect perfection!) Some children may also begin to informally explore aspects of scale as they create their classroom maps.

### Block Transformations

In advance, create two identical sets of three different interlocking plastic blocks (Duplos, Mega Bloks, etc.). Then move through the following steps with children.

1. Display your blocks and have children describe each one.
2. Narrate your actions while connecting two of your blocks. For example: *I’m putting the long blue block under the short green block*.
3. Have children close their eyes while you use the same two blocks from the other set to build a structure that is similar to the first, but not exactly the same. For example, the bottom block might be attached at the same place, but rotated to face a different direction.
4. Encourage children to discuss what is similar and different about the two structures, as well as how to change them so they are exactly alike. Invite a child to change the blocks until the structures are identical.

Repeat the activity by building a new structure with the same three blocks or a different set. When children understand the activity, they can do it with a partner.