

Problem Solvers Activity 14: Mystery Shapes

CHILDREN ARE LEARNING TO...¹

- Recognize and name typical shapes: circle, square, and sometimes a triangle.
- With adult support, match some shapes that are different sizes and orientations.
- Begin to identify sides and corners as distinct parts of shapes.

MATERIALS NEEDED:

4 Small bowls

Sturdy cardboard, 2 manila folders or 1 sheet of posterboard

Scissors

Glue

Masking tape or colored duct tape (optional)

2 cloth bags

Handout 1: Shapes

Handout 2: Shape Examples

Handout 3: Sorting Shapes

PREPARATION:

- Create a set of attribute blocks by making 2 copies of **Handout 1**. Cut each shape out and glue to sturdy cardboard/manila folder. If desired, line the edges with masking/duct tape so they are smooth.

Alternatively, you can use Handout 1 as a guide to trace and cut the shapes from posterboard.

Note: Children are going to run their fingers along the sides of the shapes so they must be smooth, safe, and sturdy. You should have 24 shapes when you are done (8 each of circles, squares, and triangles).

- Create the “mystery bags” by placing attribute blocks (4 circles, 4 squares, and 4 triangles) in each of the two bags.
- Make 2 copies of **Handout 2** in color, if possible. Cut out each of the shapes. Put 3 triangles, 3 squares, and 3 circles in each of the 4 small bowls. Put these aside until the **EXPAND** activity.
- Make an extra copy of **Handout 2: Shape Examples (Squares)** to use in the opening **ENGAGE** activity.
- Make 4 copies of **Handout 3**.
- Prepare copies of the parent handout for distribution.

¹ Head Start Early Learning Outcomes Framework: Ages Birth to Five. <https://eclkc.ohs.acf.hhs.gov/interactive-head-start-early-learning-outcomes-framework-ages-birth-five>

- If you plan on implementing the optional book activity, refer to the preparation instructions in that section.

Background Information on Teaching Shapes

The goal of exploring shapes is for children to discover and describe the **attributes** (features) of shapes. That means helping children notice:

- How many sides a shape has
- How many corners (or angles) a shape has

How do we define shapes? Use the guidelines below and in the activity to talk about the features of shapes.

- Triangle: 3 straight sides, 3 corners (or angles)
- Square: 4 straight sides, 4 corners, all sides are equal in length
- Circle: A closed shape made by a curved line

As you lead the shape activities, make sure to vary the placement of the shape cut-outs. For example, place the triangle with a point at the base as well as with a straight edge at the base. Position the square on a corner so it appears to be a diamond. Placing shapes in different positions helps children understand that it is the **features** of the shape that are important to focus on, *not* how they are positioned. This is a critical discovery for children. Learning to focus on a shape's attributes gives children a deeper understanding of what makes a triangle, a triangle.

Once children become aware of the attributes of shapes, they can then begin to classify or sort shapes based on these attributes.

A final note:

Often we use objects in our world to teach shapes—such as a cube block to teach what a square is. However, it is important to remember that a three-dimensional (3D) object (like a cube block) is not an accurate model of a two-dimensional (2D) shape—like a square. It's best to avoid using a 3D shape to teach a 2D shape. If children point out a cube block and label it a square, you can draw children's attention to one side or "face" of that object. The *face* of the object is a 2D shape.

**WHERE IS THE FACE
OF A CUBE?**

Right here



ACTIVITY INSTRUCTIONS

ENGAGE

Gather a group of 4 children.

SAY: Problem Solvers, today we are going to talk about shapes. Let's begin by talking about things that are the *same* and things that are *different*. Hmmm, I'm going to show you some pictures. Let's look at them together.

Show children **Handout 2: Shape Examples (Squares)**.

ASK: Does anyone know the names of things in this picture? What can you tell me about the things in this picture? Have you ever seen these? Do you have some of them at home?

ASK: How are these pictures different? (They are all pictures of different things.) Is there anything the same about these pictures? Let's look very closely. Do you see anything that is the same? (They are all the same shape. If children struggle with noticing they are the same shape, you might trace a few pictures with your finger and observe: This one has 4 sides and 4 corners. And so does this one: 1, 2, 3, 4. Hmmm, it looks like they might be the same.)

SAY: Problem Solvers, let's use our eyes (point to your eyes) and our fingers (wiggle your fingers) to explore shapes!

• EXPAND

SAY: Today we are going to discover all about shapes. We're going to start by playing a game called Shape Sort. I'm going to give you some shapes to sort. You can be Problem Solvers and decide how to sort your shapes into different piles. Look at each shape and think about how they are the same and different.

Give each child a bowl of the prepared shapes and let them begin sorting.

If children struggle, you might play with them and model a sorting approach of your own: "I'm going to make a pile of shapes that have no sides or corners."

When children are done, ask them to talk about their piles and how they grouped their shapes.

Facilitate a discussion about the attributes of the circle, square, and triangle based on children's sorting piles.

Key points to make for each shape are below.

Introducing Squares

ASK: Let's explore this shape with our fingers. What can you tell me about it? (Let children share their observations.) Let's run our fingers around the sides. How many sides does it have? (Trace each side of the square with your finger.) 1, 2, 3, 4: This shape has four sides.

ASK: Now let's touch each of the corners. They're pointy! How many corners does this shape have? Can you touch each corner with your finger while we count together? 1, 2, 3, 4. This shape has four corners.

Summarize children's observations and discoveries.

SAY: This shape is called a square. It has four sides. The sides are all the same length, so it has *equal* sides. The square has four corners.

Introducing Triangles

ASK: Let's explore this shape! What can you tell me about it? Let's use our eyes and our fingers!

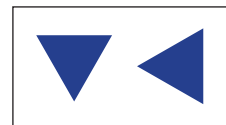
ASK: Pick one up and run your fingers around the sides. How many sides does it have? (Run your finger around each side as you count.) 1, 2, 3.

ASK: How many corners does this shape have? Can you touch each one with your finger while we count? How do you know this is a corner? (Two sides are coming together and it's pointy.)

Summarize children's observations and discoveries.

SAY: This shape is called a triangle. The triangle has three sides. It has three corners. Triangles can be different sizes, but they always have three sides and three corners.

SAY: Triangles can be tricky because what happens if we put a triangle corner-side down? [See box.] Is it still a triangle? Yes! How about if we put a triangle with a corner sticking out to the side—is it still a triangle? [See box.] Yes! It doesn't matter which way the corners point. If it has 3 sides and 3 corners, it's still a [pause, see if children fill in] TRIANGLE.



Introducing Circles

ASK: Let's explore this shape! What do you see when you look at this shape? What can you tell me about it?

ASK: (If children haven't named it:) This shape is called a circle. Let's explore the circle with our fingers. Pick one up and run your fingers around the edges. How many sides does it have? (None! It's made of one long, curved line.)

ASK: How many corners does this shape have? Let's run our finger around the edge again and see if we feel any corners. (Hmmm, it doesn't have any at all.)

Summarize children's observations and discoveries. Make sure to emphasize: The circle has one curved line. It doesn't have any corners.

EXPLORE

For children aged 2.5 to 3 years, play Mystery Shapes as a small group activity. See instructions below. Use one "mystery bag" of shapes for children to share.

For children aged 3 to 4 years, play Mystery Shapes as a partner activity. Give each pair of children a "mystery bag" filled with shapes.

SAY: You and your partner have a mystery bag. What do you think might be inside the mystery bag? Open the bag up and see... Yes, there are all kinds of shapes in our bag!

SAY: In this game, you'll put your hand in the bag without looking. Choose a mystery shape. Before you take it out, touch it with your fingers and try to figure out what shape it is. Then take it out and see! Let's play once together.

Lead the children through one demonstration round. Prompt children to touch the shape inside the bag—explore how many corners it has and how many sides it has.

When they take it out, say: I wonder what the name of that shape is? Wait to see if they name it. Review the attributes of the shape: Yes, a square has four equal sides and four corners.

SAY: We have a special tool here, Problem Solvers. (Give each child a copy of **Handout 3**). This will help us sort the shapes we found. Where do you think your shape belongs? (Wait to see if they match the shape they chose in the demonstration with the shape on the page.)

After the demonstration, let partners take turns playing the Mystery Shapes game. Observe to ensure children are describing and sorting the shapes accurately.

Conclude the activity when all the shapes have been sorted out of the bags.

ASK: Let's see how many shapes we sorted. Let's start with Circles. (Encourage children to count the circles they collected. Repeat with squares and triangles.)

REFLECT

To close the activity, bring the children back together. Use reflective questions - like those below - to prompt children's thinking about these activities. Listen for the spatial language they may use as they respond to these discussion questions.

- What was your favorite shape today? What makes it your favorite?
- What did you do to figure out the shape you were touching in the box?
- Which shape did you find the most of? (How many circles did you find? Triangles/squares?)
- Which shape was tricky to figure out when you were touching it in the box? What made it tricky?
- Which shape did you think was easiest to figure out when you were touching it in the box? What made it easy?

Individualizing the Activity

MAKE IT MORE CHALLENGING:

- Add additional shapes to the Mystery Bag: circles, triangles, and squares of different sizes, as well as triangles with sides of different lengths.
- In the partner activity, let children play the game as described in the first round. For the second round of play, have them put all the shapes back in the bag and challenge one partner to find a specific shape—like a square—in the bag.

MAKE IT LESS CHALLENGING:

- Limit the shape search to just circle and square. Once children have mastered those, introduce triangles.

MAKING CONNECTIONS ACROSS THE DAY:

- Notice shapes in the children's environment. Point them out and name them.
- At mealtimes, notice the shapes of children's food items—what is shaped like a circle, a square, a triangle?
- Compare shapes across the day. For example, you may have two books in your Book Corner that are both shaped like a square. Which square is bigger? Which is smaller?

Song: *Drawing Shapes*

The lyrics to the song are below. As you listen, draw the shapes in the air to model for children. Encourage children to stand and do what you do, drawing the shapes along with the lyrics.

A square, a square (draw the sides of a square in the air to the big beat of the music)
Draw it in the air
Four sides, all the same
Four points in this game. (draw the sides of a square in the air)
A square, a square,
Draw it in the air.

Triangle, Triangle, Triangle. (Draw sides of the triangle along with the big beat of the chant.)
Three lovely sides.
Trace it with your finger (Draw sides of a triangle in the air)
Tap out all three points.
Swoosh, swoosh, swoosh (Draw sides)
Tap tap tap. (Tap corners)
Triangle, Triangle, Triangle. (Draw sides)

Circle, circle (draw circle in air)
Trace round and round
One long side (draw circle in air)
That goes all around.

Making Literacy Connections

Share the following book with children as an opportunity to deepen their understanding of spatial relationships. The literacy extension activity below suggests another play-based experience to build spatial awareness.

Suggested Book: *Shapes, Shapes, Shapes* by Tana Hoban

AS YOU READ:

This book has no words, but there is still so much to talk about as you “read” aloud with children. Each of the photos in this story features shapes—sometimes more than one shape on the same page. As you read:

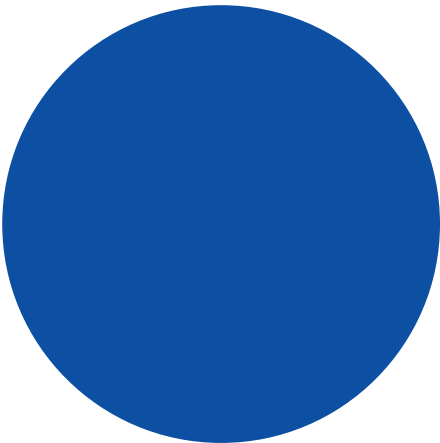
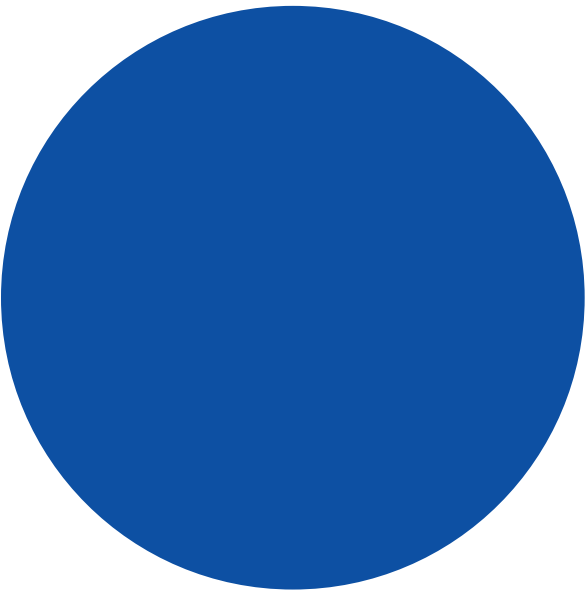
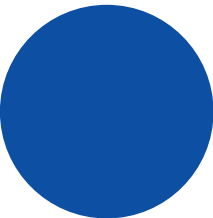
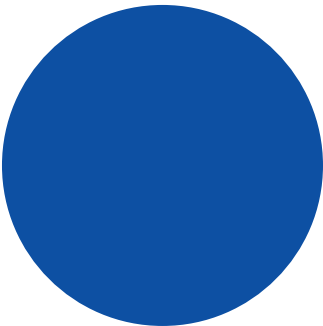
- Introduce the book as a “treasure hunt” to find shapes. Give children plenty of time to look at each image in order to take it in and locate the shape(s).
- Describe each photo in detail. Or, alternatively, turn the story into a discussion with children. Ask them: What is happening on this page? What do you see? Have you ever been anywhere/seen anything like this?
- Wonder together with children: What shape(s) do you see on this page? (It helps to go through the book first and mark the pages where more than one shape is featured.)
- Point out the “tricky shapes.” In some photos, when shapes are combined, they form another shape. Look for these instances and mark them in the book to remind yourself to talk about them. This is an important idea for children to understand: it is possible to combine shapes in order to make a new shape.
- This book introduces shapes that are not mentioned in this activity but that children are probably familiar with (like hearts, diamonds, and stars).

BUILD ON THE BOOK

Materials: Camera, printer, copier, stapler

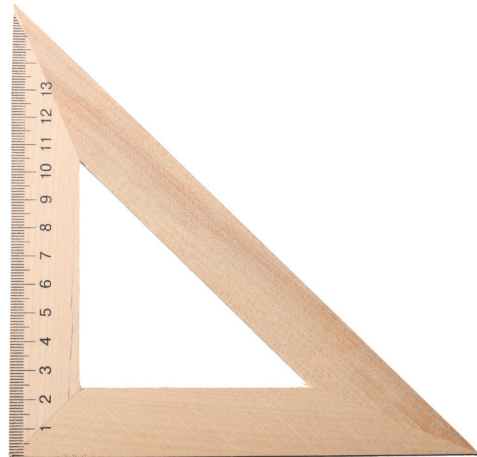
Take a Shape Walk around your school or neighborhood. Ask children to be Problem Solvers and find the shapes in their world to show you. When they find a shape, name it and snap a photo. Print the photos and ask children what words should go under each image. Photocopy and staple the pages into a classroom *Shapes, Shapes, Shapes* book to send home.

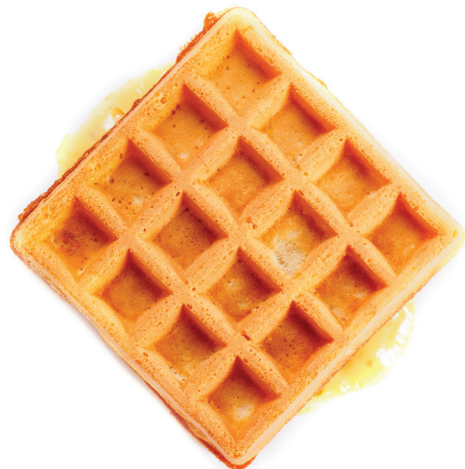
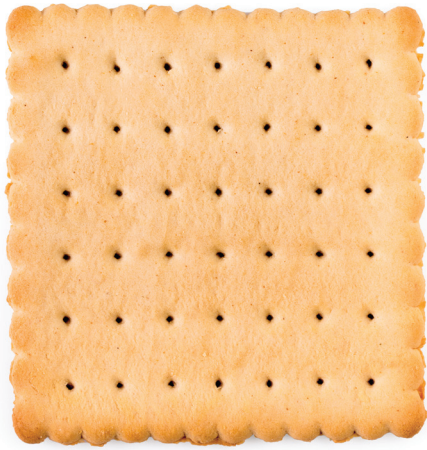
Handout 1: Shapes





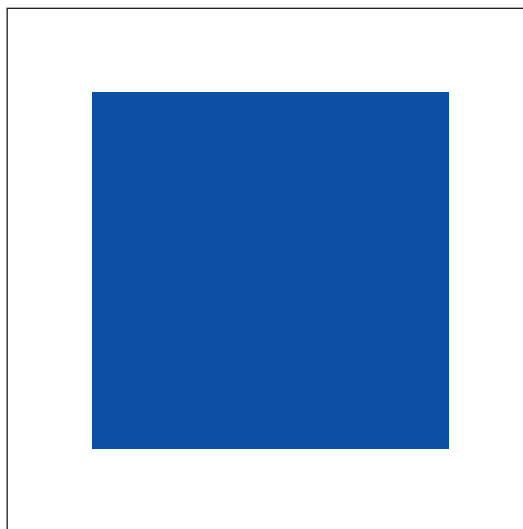
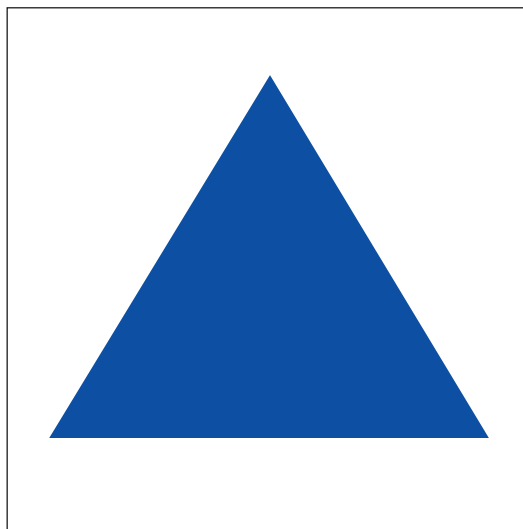
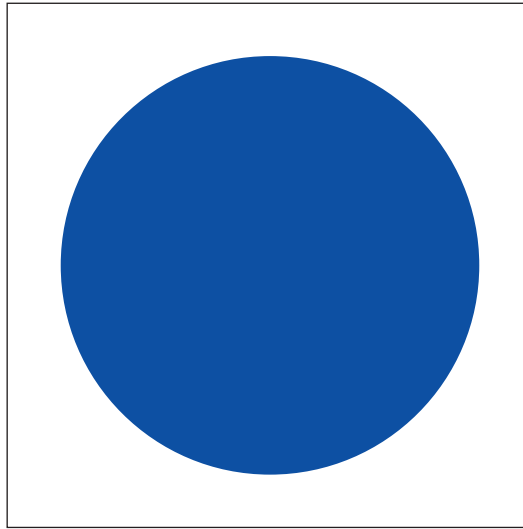
Handout 2: Shape Examples

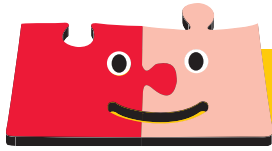






Handout 3: Sorting Shapes





Just for Families

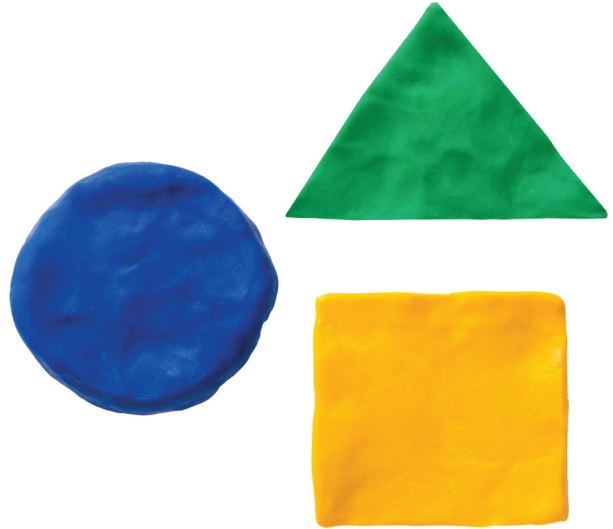
Finding Shapes at Home

This week, we're learning about shapes:

- **Circle** (no points, curved line)
- **Square** (4 corners, 4 equal sides)
- **Triangle** (3 corners, 3 sides)

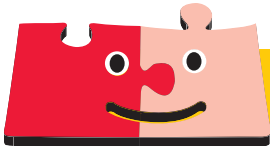
In your daily routines, point out shapes in your home and community:

- A square kitchen cabinet
- A window that is a square
- A piece of toast shaped like a triangle
- The drain on the tub in the shape of a circle



Describe the shape (it's number of sides and corners) and let your child trace it with their fingers.

While you are waiting for the bus or for an appointment, ask your child if they can find any shapes around them. Talk about the shapes they see. Count the sides. Count the corners. Talk about what shape it looks like (triangle, square, or circle).



Solo para familias

Encontrar figuras en casa

Esta semana, estamos aprendiendo sobre las figuras:

- Círculo (sin puntos, o línea curva)
- Cuadrado (4 puntos, 4 lados iguales)
- Triángulo (3 puntos, 3 lados)

En su rutina diaria, señale las figuras en su hogar y en su comunidad:

- El gabinete en la cocina es cuadrado
- Un pedazo de tostada con forma de triángulo
- El drenaje de la bañera en forma de círculo



Describa la forma (su número de lados y puntos) y deje que su hijo la trace con los dedos.

Mientras espera el autobús o una cita, pregúntele a su hijo si puede encontrar algunas figuras a su alrededor. Hablen sobre las figuras que ven. Cuente los lados. Cuente los puntos. Hable sobre la forma en que se ven las figuras (triángulo, cuadrado, o círculo).