Afterschool Adventure!

OPERATION: SHAPE Hunt

STOP

Geometry and Exploring Shapes

Powered by a Ready To Learn Grant

This out-of-school resource was developed by Maryland Public Television.
Introduction

Calling all Shape Detectives! In this weeklong adventure, the children will explore and search for basic shapes as they go on a shape hunt. They will describe, match, sort and compose a variety of two-dimensional shapes, and create a shape book to document their progress. Each section of this adventure is introduced by a video clip or online game that encourages children to explore math concepts and skills related to shapes and their attributes.

Math Overview

This unit focuses on important geometry skills for 4-5 year olds: identifying, naming, sorting and matching a variety of two-dimensional (flat) shapes and composing complex shapes from simple shapes. Refer to More About Math to learn additional information about these math topics as they relate to the Operation: Shape Hunt learning activities.

Before You Begin

Print and staple a copy of My Shape Book for each child.

Watch the following video and see how to make students aware of basic shapes in their everyday environment and how these shapes make up objects in their surroundings.

Virtual Pre-K Ready for Math: Shape Hunt
Get Ready! Your afterschool adventure includes videos, online games and mobile apps, hands-on activities and books. Use this resource chart to prepare ahead.

**WATCH**

**PBS KIDS Videos**
- Part 1: Sesame Street: Kandinski: Blue Painting (:47)
- Part 3: Daniel Tiger’s Neighborhood: Cups and Plates (1:07)
- Part 5: Virtual Pre-K Ready for Math: Shape Hunt (3:19)
- Part 5: Sid the Science Kid: Rug Time: Charts (2:05)

**PLAY**

**Online Games & Mobile Downloads**
- Part 2: Dinosaur Train: Buddy’s Gem Hunt
- Part 3: Peg + Cat: Magical Shape Hunt
- Part 4: Cat in the Hat: The Great Shape Race

**EXPLORE**

**Hands-on Activities**
- Blank paper
- **My Shape Book**
- Markers, crayons or pencils
- Several examples of everyday three-dimensional shapes, like a book (rectangular prism), globe (sphere) and a paper towel tube (cylinder).
- Tangram handout
- Construction paper shape cutouts
- Construction paper
- Glue
- Clipboards (optional)
- **Operation: Shape Hunt Parent Letter** (one for each child)

**READ**

**Related Books**
- Part 1: **A Circle Here, A Square There: My Shapes Book** by David Diehl
- Part 2: **When a Line Bends... A Shape Begins** by Rhonda Gowler Greene
- Part 4: **Mouse Shapes** by Ellen Stoll Walsh
- Part 5: **Shapes, Shapes, Shapes** by Tana Hoban
- Part 5: **Cubes, Cones, Cylinders, and Spheres** by Tara Hoban
Part 1: Describing Shapes (30 minutes)

WATCH

Sesame Street: Kandinski: Blue Painting (:47)

Children talk about the different shapes they see in an abstract painting.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

Leader: It’s time for PBS KIDS Afterschool Adventure! This week, we’re going to explore Operation: Shape Hunt and learn about different kinds of shapes. We’ll describe and draw shapes, and sort and combine shapes to make new ones. Each of you will also create a shape book that you can take home to show your families.

Next, introduce the video.

Leader: We’re going to start our shape exploration by watching a short video. As we watch, I want you to call out some words to describe the shapes you’re seeing.

Play the video with the sound muted, and write down words that your children use to describe the shapes they see. Then play the video again, with the sound on. Write down the descriptive words used in the video (i.e., saucers, triangles, squiggly, straight, curvy, green, yellow). Ask for children’s help in calling out these words.

Leader: We’ve come up with some great words for describing shapes. Some of these words describe a shape’s color, some describe a shape’s edges, and some describe what a whole shape looks like.

Give each child a copy of My Shape Book. Assist the children as they write their name on the cover page and the descriptive words for the shapes on the page titled Describing Shapes.

Leader: Let’s see if we can use some of these words to describe shapes that we see around us as we play Shape Hide and Seek!

Introduce the game to the children.

Leader: Here’s how to play Shape Hide and Seek. I’m going to choose a shape that I can see right now in our space. I’m going to describe my shape, and I want to see if you can guess which shape I’m talking about!
Part 1: (continued)

Choose a shape and describe it using the following characteristics:

- Name and description of shape (circle with curved lines, triangle with three equal sides, square with four equal sides)
- Location (above the window, below the clock, next to the door)
- Two-dimensional (flat) or three dimensional (solid)

Allow children to guess and let them know when they’ve identified your shape.

**Leader:** That’s it! You guessed my shape. I described my shape, and you used my description to figure out which shape was mine! Now it’s your turn.

Challenge the children to find a shape that’s visible in your space and describe it using a variety of attributes (name, color, position, number of sides, etc.) Give each child a turn to describe their shape while other children try to find it. (If you have a large group, ask children to work in pairs and describe their shapes to their partners.)

**Keep Going!** If you have more time, explore the following resource:

**READ**

A Circle Here, A Square There: My Shapes Book by David Diehl

This book gives a very simple overview of basic shapes. As you read, have children name and describe the shapes they see on each page.
Part 2: Matching and Sorting Shapes (30 minutes)

PLAY

Dinosaur Train: Buddy’s Gem Hunt

In this game, children will dive deep into a cave to collect crystals of different sizes, shapes and color. Once all the crystals are collected, players must sort them before giving them to the Conductor.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

Leader: In our next game, we’re going to be collecting gems. Does anyone know what a gem is?

Define the term “gem” or “gemstone” as a cut rock or mineral. Let children know that gems are solid objects, but that one side of the gem is often cut into a shape – like a square, circle, or oval.

Leader: We’re going to help Buddy the dinosaur find gems of different shapes. Then we’re going to sort them for him. Let’s practice.

Divide a sheet of paper into four sections. Label the sections, “0 sides,” “3 sides,” “4 sides” and “5 sides.”

Leader: The last time we were together, we described shapes in lots of different ways. One of the most important ways to describe shapes is to tell how many sides they have.

Ask children if they can think of any shapes with no sides. Confirm or correct their ideas, and draw a circle and oval in the section labeled “0 sides.” Explain that circles and ovals have no sides; instead they have a curved line that forms a closed shape.

Ask children if they can think of a shape with three sides. Confirm or correct their ideas, and draw a few different triangles in the section labeled “3 sides.” With the children, count the sides and vertices (corners) on the triangles. Let the children know that triangles always have three sides and three vertices.

Ask children if they can think of shapes with four sides. Confirm or correct their ideas, and draw a few squares and rectangles in the section with four sides. Again, count the sides and vertices on each shape, and let the children know that squares and rectangles always have four of each. Show children that the sides of a square must be the same length, while only the opposite sides on a rectangle must be the same length.

Finally, ask children if they can think of shapes with five sides. Confirm or correct their ideas, and draw a pentagon or two. Count the sides and the vertices, and let children know that pentagons always have five sides and five vertices.

Leader: Now it’s time to look for some gems! We’re going to find gems that are in the shape of circles, triangles, squares and pentagons.
Access the game and play *Dinosaur Train: Buddy’s Gem Hunt* with the children. Encourage them to take turns finding the correct shape and clicking on it with the cursor. As they play ask:

*What shape is that? How do you know?*

Listen for children to describe the number of sides and vertices. If they don’t describe these attributes on their own, prompt them with simple questions:

- Would it still be a triangle if it was a different color? (yes)
- Would it still be a triangle if it was bigger or smaller? (yes)
- Would it still be a triangle if it had a different number of sides or vertices? (no)

When all the children have had a turn, or when Buddy has presented all the jewels to the Conductor, give each child their *Shape Book*. Ask children to find the page titled *Part 2: How Many Sides*? Encourage them to count the number of sides on each shape and then write the number next to the shape.

*Keep Going!* If you have more time, explore the following resources:

### PLAY

**NOVA: Gemstone Primer**

Did your children enjoy learning about gems? They can learn more about gemstones with this online primer. Be sure to define new vocabulary words, such as *precious*, *rare* and *flaw*.

### READ

**When a Line Bends . . . A Shape Begins** by Rhonda Gowler Greene

The children helped Buddy sort circles, triangles, squares and rectangles. But what about all the other exciting shapes out there? This book introduces children to a wide variety of flat shapes.
Part 3: Flat and Solid Shapes (30 minutes)

WATCH

Daniel Tiger’s Neighborhood: Cups and Plates (1:07)

In this video, Daniel and Katerina work together to match cups and plates by shape.

Collect a few three-dimensional shapes from your environment, like a book (rectangular prism), globe (sphere) and a paper towel tube (cylinder). Then gather the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

Leader: We’ve learned a lot about shapes together. But all the shapes we’ve seen so far are flat. Let’s learn about a different kind of shape. These are called solid shapes.

Hold up the shapes so that children can see the examples.

Leader: Solid shapes aren’t flat. You can pick them up and turn them around in your hands. They look and feel different from flat shapes. But they are similar to flat shapes in some ways. Let’s watch this video to learn more about solid and flat shapes.

Play the video, and pause at :57. Point out that the top of the cup is shaped like the circle. Have children point to the plate shaped like a circle.

Pause at :34. Have children point to the plate that is shaped like a diamond. Remind children that diamonds can be turned so that they look like squares.

Pause at :19. Have children point to the plate that is shaped like a heart.

After the video is over, talk to the children about similarities and differences among solid shapes (represented by the cups) and flat shapes (represented by the plates). Children should notice that some solid shapes have parts that match up with flat shapes. For example, the tops of the teacups looked like a triangle, circle, square and heart. (You may want to explain that on solid shapes, these are called faces and that solid shapes also have vertices and edges.)

Move to an area suitable for drawing and tracing, and provide each child crayons or markers along with their Shape Book. Help the children find the page titled Part 3: Tracing Solid Shapes.

Show them a solid shape, like a cup, and encourage them to predict what shape they will get when they trace it. Now have children trace the shape in their Shape Book. Does the shape match with what they predicted?

Ask the children to rotate the shape and trace it again. They may be surprised to find that some objects make different shapes depending on how they are traced – for example, a rectangular prism (like a cracker box) could be traced to create a square or a rectangle.

Keep Going! If you have more time, explore the following resources on the next page.
Part 3: (continued)

WATCH

Daniel Tiger’s Neighborhood: Cups and Plates (1:07)
Watch the last five seconds of the video clip again. Then ask children to practice singing Daniel and Katerina’s song, “Friends help each other, yes they do, it’s true!”

PLAY

Peg + Cat: Magical Shape Hunt
This game introduces children to a variety of solid shapes as they hunt for and collect a mermaid’s lost jewels.
**Part 4: Putting Shapes Together** (30 minutes)

**EXPLORE**

To begin this activity, print the Tangram handout and cut out the shapes.

Leader: We’ve talked about a lot of different kinds of shapes. Can anyone remember some of the shapes we’ve talked about so far?

Pause to allow children to answer.

Leader: What about a shape like this?

Join a rectangle and a triangle to form an arrow.

Leader: Shapes can be joined together to create new shapes and pictures. Sometimes, it’s easy to tell which smaller shapes make the new, larger shape and other times it’s a little harder.

Call on a few children and ask them to use the tangrams to make their own shapes. What new shape can the children make using two triangles? Two squares?

Provide children with the following:

- My Shape Book
- Construction paper shapes
- Glue
- Crayons

Now challenge them to create their own pictures. They may want to create a house, an animal or a person. Encourage them to glue the shapes together in their Shape Book on page 5 titled Putting Shapes Together.

**PLAY**

**Cat in the Hat: The Great Shape Race**

Children will help Sally and Nick scoop up a variety of shapes in this “Shape-a-thon” race. Then they will choose the right combination of shapes to repair and cross a bridge.

Ask the children to gather around your computer or interactive whiteboard. Make sure all the children can see the screen.
Part 4: (continued)

Now access the Great Shape Race game, listen to the directions, and play the first round with the children. Ask for volunteers to scoop up shapes and add them to The Cat in the Hat’s trailer. As you play, remind children to look in the trailer to see what shapes they need.

When you’ve collected all the shapes, show the children how to patch the bridge by making a compound shape. As you play, ask the children:

- What shapes do we need to patch the bridge? How do you know?
- What does the hole on the bridge look like to you? A dog? A fish? A tree?

Encourage the children to share their ideas with each other.

Leader: Now it’s your turn to play!

Allow children to play individually or in small groups. As children play, encourage them to say the name of each shape as they scoop it up or place it on the bridge.

Keep Going! If you have more time, explore the following resources:

READ

Mouse Shapes by Ellen Stoll Walsh

In this book, some clever mice use shapes to scare away a cat. As you read the story with your children, stop at each object the mice create then ask:

- What shapes did the mice use to make their picture?
- What would you create from shapes to fool the cat?
- Can you see a place where one shape is on top of another shape? How about a place where two shapes are lined up side by side?

EXPLORE

Shape Stories

Have the children create a story about their own shape pictures. Some children may be able to write down their own stories; for others, you will need to transcribe their ideas. Give each child his or her Shape Book in order to use some of the descriptive words written on page 1.
Part 5: Shape Hunt! (30 minutes)

READ

Shapes, Shapes, Shapes by Tana Hoban

Shapes are everywhere! This book contains photos of all kinds of shapes in everyday environments.

Ask the children to gather around a table or on your rug and introduce the book.

Leader: We’re going to look at this book together. But I’m not going to read it to you – because there are no words! In this book, there are only pictures. I want you to tell me what shapes you see as we look at each picture.

As you look through the book, ask children to name any shapes they recognize (both flat and solid), and count how many of each shape they see in each picture. Emphasize no matter which way it is turned, a shape will always remain the same shape.

EXPLORE

Shape Hunt

In this group activity, children will go on a hunt to find different shapes in their environment. They will practice collecting data by tallying up the shapes they find. To help prepare for this activity, watch the following video.

WATCH

Virtual Pre-K Ready for Math: Shape Hunt (3:19)

Ask the children to gather around a table or on your rug to listen to the directions for their final activity.

Leader: We’re going on our own shape hunt now, just like the author of the book. And we’re not just going to find shapes – we’re going to record how many of each kind of shape we find.

Review the basic properties of each shape and provide each child with their Shape Book. Ask children to go to the last page of their book titled Going on a Shape Hunt.

Explain that they will add a checkmark next to the shapes they find. Model how to use the tally chart by finding some shapes in the room and marking tallies on your chart next to the corresponding shape.

Explore the hallway, the lobby of your building, the gym, or even an outdoor space for shapes. As children search for and find shapes, listen to their conversations. Distinguishing between rectangles and squares in the environment may be the most challenging. Consider having a yardstick to demonstrate when a rectangle appears to be a square.
Part 5: (continued)

After about ten minutes, lead children back to your space. Have children count up their total tallies for each type of shape and comment on which shape has the most tallies. Are they surprised at what their data tells them?

Leader: We’re done – we completed Operation: Shape Hunt! We’ve learned a lot about shapes and had a lot of fun doing it! These books are now yours to take home so you can remember everything we did. Make sure to show them to your parents - so you can share Operation: Shape Hunt with them!

Before the children leave for the day, print out the Operation: Shape Hunt Parent Letter and give one to each child to bring home.

Keep Going! If you have more time, explore the following resources:

WATCH

Sid the Science Kid: Rug Time: Charts (2:05)
Listen as Teacher Susie explains the importance of using charts, and how they are very helpful scientific tools. She demonstrates how she uses a chart to keep track of class attendance by putting check marks, or tally marks, next to each student that is in class.

READ

Cubes, Cones, Cylinders, and Spheres by Tana Hoban
Help children notice shapes in the world around them! Lead the children on a treasure hunt to recognize and identify a variety of solid shapes in this book.

EXPLORE

Shape Hunt
Consider taking your children on a second shape hunt. This time they should search for the solid shapes they found in Cubes, Cones, Cylinders, and Spheres by Tara Hoban.