

ACTIVITY 2: My Shadow Goes Where I Go



It's all about light!

Whenever there is light, there is a shadow!

TARGET AGE GROUP

PreK-3

TIME

60-90 minutes

PREPARATION

Review the RTL Activities introduction for tips and suggestions before implementation.

WATCH

“My Shadow Goes Where I Go”

The Cat in the Hat Knows A Lot About That!

Pause the video and reflect on Nick, Sally and Cat in the Hat as they play with shadows. Here are some places you might pause:

After Fish says, “Look, Sally’s shadow came back when she did!” (~00:37), ask kids:

- ▶ *Where do you think the shadows are coming from?*

At the conclusion of the song, ask the kids:

- ▶ *Does everything have a shadow?*

Let’s take a look around and explore the science behind shadows.

EXPLORE

Kids will explore shadows with a light source and how the position of the light can make shadows grow or shrink.

Materials:

- ☐ Objects to create shadows, such as:
 - Pre-made PBS KIDS *The Cat in the Hat Knows A Lot About That!* Shadow Puppet Character Cards
 - Toy cars
 - Interlocking plastic bricks (ie. LEGOS®)
 - Small plush animals
- ☐ A variety of light source, such as:
 - Flashlights
 - Desk lamps
 - Sunlight
- ☐ Markers/pencils
- ☐ Butcher paper and/or copy paper
- ☐ Non-standard measurement tools
- ☐ Shadow theater—a created space for viewing the shadows.
Ideas can include:
 - Rope, clothespins, bedsheet, wax paper, tent, chairs, table, butcher paper, etc.

INSTRUCTIONS

Set up makeshift shadow theater with a set of pre-made PBS KIDS *The Cat in the Hat Knows A Lot About That!* Shadow Puppet Character Cards, several light sources, paper, crayon/pencils/markers, small plush animals, toy cars, blocks/interlocking plastic bricks, and flashlights.

To get started, recap what kids learned about shadows from Cat in the Hat and his friends. Allow the kids freedom to create and draw shadows on paper, investigate in the shadow theater or create a puppet show.

As the kids investigate ask the following questions about shadows:

- ▶ *Can you make a shadow? Great! Tell me how you did it!*
- ▶ *Can you make a shadow bigger? Smaller?*
- ▶ *Is there another way to make the shadow change shape?*
- ▶ *What do you notice if you place the puppet between the light and the wall?*
- ▶ *What do you notice if you place the flashlight high up or down low?*
- ▶ *What do you notice if you rotate the shadow?*

MORE WAYS TO PLAY:

- ☐ Write and perform an original shadow puppet play.
- ☐ Become shadow detectives and track shadows on a sunny day. Have kids trace their shadows outside in the morning on a concrete surface with sidewalk chalk. Have kids revisit the same spot and track their shadows throughout the day as the sun moves through the sky. How has their shadow changed?
- ☐ Investigate rainbow shadows. Have kids predict what shadows will look like with colored lights. Tape pieces of colored cellophane over a flashlight so that light will shine through the cellophane. *What does this shadow look like?*



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READ

Bring the whole group together and read *The Black Rabbit* by Philippa Leathers, pausing often to ask questions and connect back to the topic shadows.

Before reading:

Show the cover of the book as you read the title, author and illustrator. While looking at the book cover ask,

- ▶ *Who do you think the Black Rabbit is?*

As you read ask:

- ▶ *Do you think Rabbit will get rid of the Black Rabbit?*
- ▶ *Why or why not?*

After the reading:

- ▶ *When Rabbit goes into the deep, dark woods, the Black Rabbit disappears. Why?*
- ▶ *What happened to make the wolf run away?*

Other book suggestions:

Guess Whose Shadow? by Stephanie Swinburne

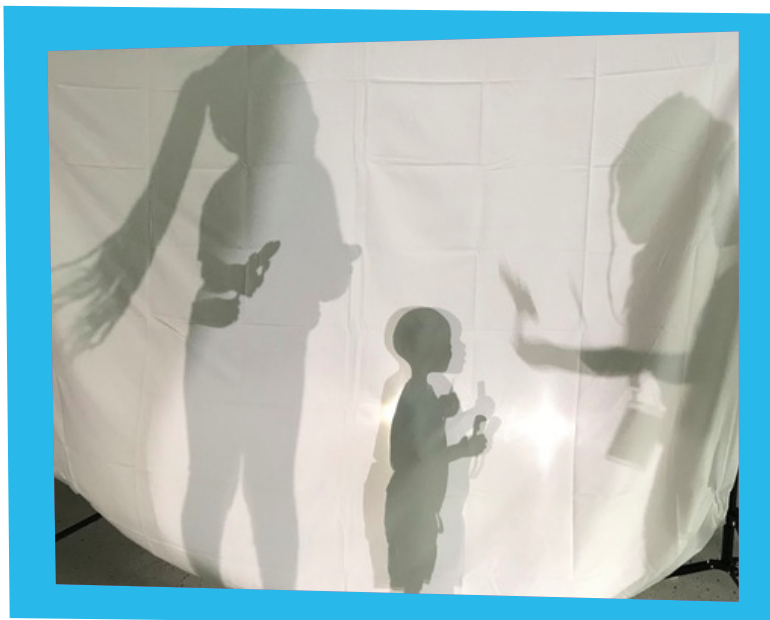
Light: Shadows, Mirrors, and Rainbows by Natalie Rosinsky

Moonbear's Shadow by Frank Asch

My Shadow by Robert Louis Stevenson

Nothing Sticks Like a Shadow by Ann Tompert

What Makes a Shadow? by Clyde Robert Bulla



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PLAY

Play & Learn Science!–Shadow games

These games are available within the *Play & Learn Science* app that is available for free on your tablet or smartphones app store.

In these games, kids will explore how shadows are created and how the position of the sun (the light source in this instance) influences the size and shape of shadows being created by different objects. They will also make predictions based on shadow observations.

Here are some tips for exploring learning through digital play:

Exploring Shadows and Shadow Scenes:

When children select an object, ask them,

- ▶ *How is a shadow created?*

Talk about the sun's position in the sky. Ask,

- ▶ *How does the position of the sun cause the shadow to be a certain size and shape?*

Encourage them to observe the objects and shadows closely. Ask:

- ▶ *Does everything make a shadow?*
- ▶ *How is the shadow similar to the object you used to make it?*

Guess the Shadow:

Talk about light sources and ask kids to make predictions. Ask:

- ▶ *What would happen to the shadow if you move an object closer to the light?*
- ▶ *What about the colors and pattern on the object? Does the shadow have the same colors and pattern?*

Talk about where the shadow falls. Ask,

- ▶ *If the light is shining on the wall, why is some of the wall dark?*

SHARE

Send the parent letter home with kids to encourage at-home conversations with families about this activity.



Stick Puppet Shadow Play



Shape, Size, and Silhouette Surprises

After Nick and Sally get spooked by some shadows, the Cat sheds light on how they are made. Join the fun! Explore shadow science with The Cat in the Hat stick puppets, a flashlight, and your own imagination.

Materials

- The Cat in the Hat Puppet printables
- Cardstock or paper
- Straws or wooden craft sticks (6)
- Scissors
- Tape
- Flashlight
- Wax paper (optional)

Make the Puppets

1. Print The Cat in the Hat Puppets onto cardstock or paper. If using paper, glue printed puppets onto a second sheet of paper to add more strength.
2. With an adult's help, cut out the figures. Tape a straw or wooden craft stick to the back of each puppet.



Tip

When playing with shadows, find a dark space with a blank wall. You might wait for the sun to go down or find a room without windows.

Explore

1. Hold a stick puppet or two in front of the wall.
2. Can you create a shadow with the flashlight?
What if you move the light closer to the puppet or farther away?
What if you shine the light from high above or down low? What happens?
3. Can you make the shadow almost disappear, even while shining the light on it? How did you do that?

More Ways to Play

1. Now it is your turn to be a puppet! Ask a friend to point a flashlight at you while you make your body, hands, and arms into a shadow figure. A bird? A dinosaur? The Cat in the Hat?
2. Chinese shadow puppetry is one of the oldest forms of puppet art. Create your own screen and stage by taping a long piece of wax paper across the bottom of an open door frame. With the help of a friend, hold a stick puppet behind the paper, and then shine a light on it so the paper catches the shadow (the puppet will be between the light and the paper).
3. Pretend that it is the Cat—and not the children—who is spooked by the shadows. Have Nick and Sally teach him about shadows using the stick puppets and your flashlight.

pbskids.org/catinthehat



Find related games in the **FREE**
The Cat in the Hat Builds That app.
Download it now!



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Stick Puppet Shadow Play



THE CAT IN THE HAT



Stick Puppet Shadow Play



FISH



Stick Puppet Shadow Play



SALLY



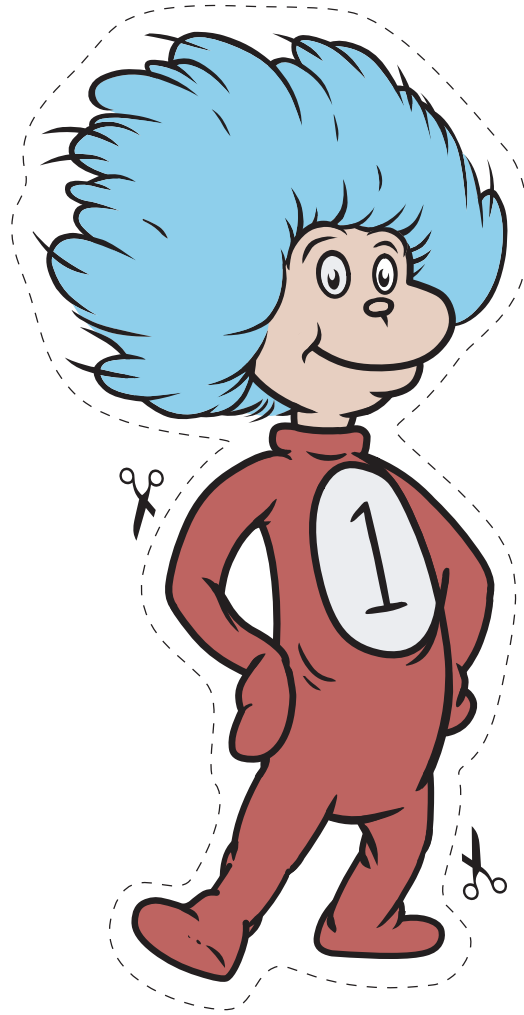
Stick Puppet Shadow Play



NICK



Stick Puppet Shadow Play



THING ONE



Stick Puppet Shadow Play



THING TWO

Hello Families:

Today, we used our investigative skills to learn about shadows with Cat in the Hat from the PBS KIDS program *The Cat in the Hat Knows a Lot About That!*

The theme was “My Shadow Goes Where I Go!” After learning that shadows are made by blocking light, kids investigated how the position of the light can make shadows grow or shrink, and how to change the shape of a shadow.

Think like a scientist! Ask your child, “What did you learn about shadows about shadows from *The Cat in the Hat Knows a Lot About That!?*”

Go for a “shadow walk” together and explore shadows indoors and outdoors. When your kid sees a shadow or makes one, take a picture. Look at the photos together and reflect on the differences your child observed in shadows inside and outside.

We also had the opportunity to read together *The Black Rabbit* by Philippa Leathers. Have your child retell the story to you.

Here are some related books to look for at the library:

- ▶ *Guess Whose Shadow?* by Stephanie Swinburne
- ▶ *Moonbear’s Shadow* by Frank Asch
- ▶ *My Shadow* by Robert Louis Stevenson
- ▶ *Nothing Sticks Like a Shadow* by Ann Tompert
- ▶ *What Makes a Shadow?* by Clyde Robert Bulla

Tune into your local PBS station and visit **pbskids.org** online for more opportunities to learn, watch and play together with your family. Watching videos and playing games with your kids encourages social interactions, bonding and learning.

You can also access PBS KIDS content free in PBS KIDS Video app and the PBS KIDS Games app.

Resources to Support Shadow Activities

Get kids thinking and exploring like scientists using this collection of shadow resources from Ready to Learn and PBS KIDS. Providing young kids the opportunity to participate in simple, PBS KIDS-inspired investigations is a great way to support developing science inquiry skills and practices. They can ask questions, make predictions, collect data, draw conclusions and experience science inquiry first-hand.

These resources can be used and adapted to meet the particular needs of your learning environment and your participating children. Whether you are a program director, classroom teacher, after-school and summer provider, PBS station staff, or any other adult working with young kids, these resources are for you!

Resources are grouped by activities, videos and games (online and mobile), and include a list of books related to the topic of shadows. Resources can be used as-is, adapted, grouped to make a complete lesson, integrated into preexisting lessons, or used as a jumping off point for your own lesson ideas.

For more resources, visit: pbslearningmedia.org/collection/rtl-educator



Videos

The Cat in the Hat Knows a Lot About That!

My Shadow Goes Where I Go

Grade Level: PreK-2

No matter where you go, your shadow will be there! In this short video, Nick and Sally create shadow puppets and sing a song about where your shadow can go!

Sid the Science Kid

Shadow Smile!

Grade Level: PreK-2

This episode of Sid the Science Kid teaches students all about shadows. Sid and his friends learn how to create shadows by blocking sources of light. This resource group includes seven video segments and an associated activity.

Full Time Kid

How to Make Shadow Puppets

Grade Level 2-5

Make your own shadow theater with just a few household items! Mya shows you how to make some neat shadow puppets and tells the story of the dinosaurs in her own shadow play.

Everyday Learning
Twinkle Twinkle Little Star
Grade Level: PreK-5

Students are introduced to traditional folk music with an animated rendition of a familiar song, “Twinkle Twinkle Little Star.” The video features shadow puppets and a crankie—a long illustrated scroll, which has been used as a method of storytelling since the 19th century.

Nature Cat
Nature Cat - Shadow Play
Grade Level: PreK-3

This is a short video of a father and his child playing with shadows using characters from Nature Cat. Not only do they have a blast, but they learn more about light and shadows too!

Curious George
Curious George: Shadow Tricks
Grade Level: K-5

In this video from *Curious George*, kids explore the relationship between light and shadows and learn that observations can sometimes be deceiving. Playing shadow tricks on their friends helps the kids draw conclusions about how light behaves when it encounters different types of objects and materials.



Activities

The Cat in the Hat Knows a Lot About That!
Stick Puppet Shadow Play
Grade Level: PreK-2

Make your own stick puppets of Cat in the Hat and his friends. Then find a dark space and explore shadow science with the puppets, a flashlight and your imagination.

Nature Cat
Shadow Play
Grade Level: PreK-3

In the Shadow Play activity, kids will use a flashlight to explore how blocking a light source can create a shadow. With this new knowledge, they will then put on a shadow play.

Sid the Science Kid
Shadow Investigation
Grade Level: PreK-2

Kids join The Super Fab Lab to investigate how and why a shadow is created and to answer questions such as: Do shadows have a similar shape to the item that blocked the light? If the item is striped or polka-dotted, do patterns show up on the shadow?



GAMES

Play & Learn Science!—Shadow Play ***"Shadow Play"***

Grade Level: PreK-2

Shadow Play consists of three games: Exploring Shadows, Shadow Scenes and Guess the Shadow. Kids will observe and investigate the relationship between light sources, objects and shadows while exploring, planning and carrying out investigations.

Peep and The Big Wide World ***"Shadow Shapes" Game***

Grade Level: K-2

Kids move an object in front of a flashlight and observe how its shadow changes in this interactive game from PEEP and the Big Wide World. As kids slide the object closer to and farther away from the light, they discover that when an object is moved closer to the light source, it blocks more light and its shadow becomes larger. Kids also explore how changing the position of the light changes the direction in which the shadow of the object falls.



Books

***The Black Rabbit* by Philippa Leathers**

***Moonbear's Shadow* by Frank Asch**

***What Makes a Shadow?* by Clyde Robert Bulla**

***My Shadow* by Robert Louis Stevenson**

***Guess Whose Shadow?* by Stephanie Swinburne**

***Nothing Sticks Like a Shadow* by Ann Tompert**



SUPER FAB LAB INVESTIGATION: **Shadow Investigation**



Episode: Shadow Smile

Cycle: Light & Shadow

Purpose (What We're Going to Explore and Learn)

When something or someone blocks light, a shadow is created. Shadows have a similar shape to the item that blocked the light. If the item is striped or polka-dotted, though, those patterns do not show up on the shadow.

Materials (The Stuff We Need)

- Stiff paper or thin cardboard cut into different puppet shapes (animals, human faces, stars, etc.)
- Craft sticks and tape
- Markers to draw patterns on the puppets
- Other decorative items for the puppets (optional)
- Flashlight

Procedure (What to Do)

1. Allow children to choose the shape they would like to decorate. Encourage them to decorate their shapes, perhaps by drawing patterns on them.
2. Tape a craft stick to the back of each shape to make the puppet.
3. Explain that you are going to darken the room a little, then shine a light on their puppets to create shadows. Before each child takes a turn creating a shadow, ask the class to predict what the shadow will look like. For example: What shape will it have? Will it be striped like the puppet? Will it have eyes like the puppet? Will it be blue?
4. Turn on the flashlight and check your predictions. Be sure to describe each shadow. What shape is it? Is it patterned? Is it blue?

Other Stuff You Might Want to Know or Do

- Have children draw their predictions of what their puppet's shadow will look like. Then draw what it actually looked like.
- After children have explored with their basic puppets, you might create some that have simple cut-outs in them. What happens when you shine a light on a shape with a hole in it? What does the shadow look like? Why? Help the children think about the fact that shadows are created when light is blocked. If there's nothing to block the light, then there's no shadow.
- On a sunny day, go on a shadow hunt. Talk about where the sun is, what object is blocking the sun's light, and what the shadow looks like.
- You might add flashlights to your classroom or home toy box so children can continue to explore with shadows.

Shadow Play



Nature Cat and his friends love playing outside and learning about science and nature. In this activity, your child can explore how objects can cast a shadow when they block the sun or other sources of light.



How to Put on a Shadow Play

Shadows can be a fascinating discovery for a young child. Some children may try to catch their own shadow, some children may try to run from it, and some children want to know why and how shadows are created. In this activity, your child will use a flashlight to explore how blocking a light source can create a shadow, and then use this new knowledge of shadows to put on a shadow play.

While You Play

If you are outside on a sunny morning or late afternoon, you may notice that you have a shadow. A shadow is a dark area where light from a light source is blocked by an opaque (not see through) object. In this case, the light source is the sun and you are the opaque object blocking the sun's light from reaching the ground. You may notice that other objects like trees or playground slides also have shadows. They are blocking the sunlight, too. As you complete this activity, talk with your child about the following questions.

The Science Behind the Fun

Physical Science:

Your child is exploring why we see shadows and how the size of a shadow can depend on where it is in relation to a light source.

Science Inquiry:

Your child is using a tool to sort, compare, and contrast household items based on whether they are magnetic.

Vocabulary:

Opaque pronounced [o-pāk]

If something is opaque, it means that you cannot see through the object. It is the opposite of transparent.

1. What light sources can you stand in front of to make your shadow appear? (Examples: Sun, flashlight, lamp, lamppost)
2. Can you see more of your shadow when the light is coming from the side of you or above you?
3. At what time of day is your shadow the longest?

Shadow Play



What you'll need

- Flashlight
- Printouts of Nature Cat, Hal, Squeeks and Daisy and their support bases
- Cereal box or cardboard
- Scissors
- Glue

Directions

Step 1

Print out the sheet of Nature Cat, Hal, Squeeks and Daisy pictures and their support bases and glue the entire page to a cereal box or other cardboard. Let the glue dry.

Step 2

Cut out the pictures of Nature Cat, Hal, Squeeks and Daisy and their support bases again, with the cardboard. Be sure to cut the small lines in the base and the base support.

Step 3

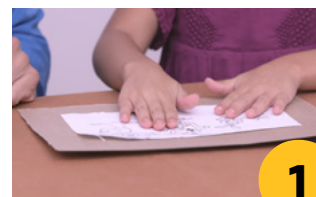
Slide the base support into the base for each character so that the character can stand up.

Step 4

Go into a room where the lights are turned off and sunlight is limited. Place a flashlight on the floor approximately two feet from a blank wall. Turn on the flashlight so that the beam shines on the wall.

Step 5

Place one of the characters into the beam of light. Can you see the character's shadow on the wall? Yes! You can see the shadow because the character is now blocking a portion of the light from reaching the wall. The area where the light is blocked creates a shadow and the rest of the light is still reaching the wall.



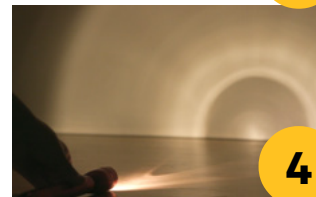
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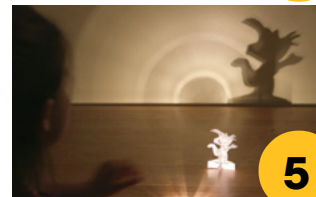
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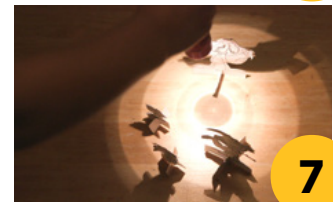
Step 6

Place a second character between the flashlight and the wall. Can you see both of their shadows? Now try moving one character closer to the flashlight and leaving another character closer to the wall. You will see that the character closer to the flashlight has a bigger shadow. The character further from the flashlight and closer to the wall will have a smaller shadow. This is because the character closer to the flashlight is blocking more of the light from the flashlight and letting less light pass by to reach the wall.



Step 7

Experiment with other light sources. What happens if you have a larger or smaller flashlight? What shadows can you see from an overhead light? What shadows can you see if you take the characters out in the sun during the morning or afternoon? Can you make the shadows bigger or smaller based on where they are in comparison to the light source?



Step 8

Use the characters to put on a shadow play. You can move the characters closer to or further from the light to show them coming towards something or walking away from something.



More ways to play Nature Cat

- Nature Cat the Groundhog

Visit: pbskids.org/video/nature-cat/2365661731



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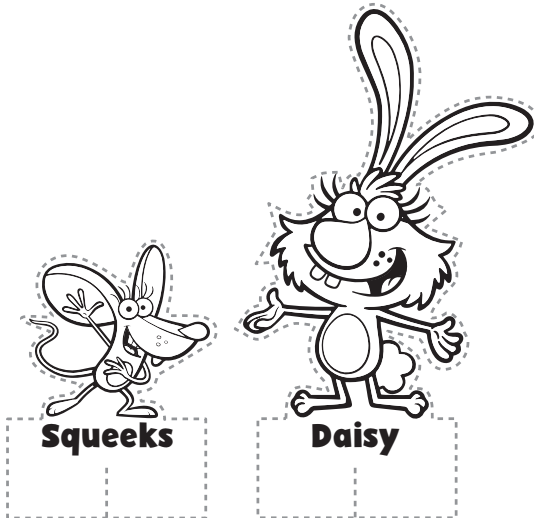
Shadow Play

pbskids.org



TALLY HO!

Cut out the pictures of Nature Cat, Hal, Squeeks and Daisy and their support bases. Be sure to cut the small lines in the character base and the base support. Slide the base support into the base for each character so that the character can stand up.



For more printables, go to pbskidsforparents.org



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