

# Let's Explore Light and Shadows

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### Learning Goals

- Explain how light creates shadows
- Demonstrate how light changes shadows
- Discuss common causes of nighttime shadows

### Video Summary

#### Exploration Segment

Shadows come in all shapes and sizes. Children have fun playing with their shadows. A mime and his shadow act out the poem, *My Shadow*. Children then explore how shadows feel against different surfaces.

#### Concept Development Segment

Shadows are made when something blocks a bright light. Some students and their teacher explore making shadows by blocking light. They discover how to make shadows change size and move.

#### Application Segment

Nighttime shadows sometimes look scary. A child discovers that when he knows the source of shadows, they become less frightening. A shadow play connects light and shadow to the performing arts. "You Try It" challenges viewers to explain why objects sometimes cast two shadows.

## Key Words

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| <b>shadow</b>  | the dark area cast onto the surface of an object by something that blocks light from shining on the surface |
| <b>block</b>   | to stop by putting something in the way   |
| <b>blocker</b> | an object that prevents something from passing  |

## Let's Do It

- Ask students, *What is a shadow? Do you see a shadow now?* Make a list of places where students see shadows in the classroom.
- Tell students: *Watch this video to see what you can learn about shadows.*
- Begin the tape. Stop/pause it after the hostess reviews how shadows are made. Now help your students explore shadows: Focus a slide or movie projector or other bright light on a wall or screen and turn out the room lights. Have students explore blocking the light with a variety of objects (try objects with similar and different shapes and textures). Ask students, *Which shadows look the same? Which are different? How do they feel?* (Have students feel the shadow on the screen or wall.)
- Next, have students try changing the size of shadows by moving the light blocker closer to and farther away from the light. Ask, *What happens to the size of the shadow? Why?* (The blocker moved toward or away from the light.) Now ask students to move the blocker from side to side. Do the same with the light. *What makes shadows move?* (A moving blocker or light.) If students need help understanding these concepts, replay this segment of the video. When finished with the activity, watch the rest of the program.

## You Try It

How can an object have two shadows? Review how shadows are made, then discuss how several lights may shine on an object at once (find examples in the classroom). Help students explore shadows to find the answer. (An object casts two shadows when two lights shine on it from different angles.)

## More Exploring

**What caused the shadow?** Have students investigate the sources of the shadows that they found in the classroom before watching the video.

**Play Shadow Tag.** The child who is "It" tags other children by stepping on their shadows. Brainstorm with students how they could get rid of their shadows to avoid being tagged.

**Play Name that Shadow.** Seat students in front of a hanging sheet. Have one child stand behind the sheet, holding various objects in front of a bright light. While the student moves the objects to change their sizes and shapes, students on the other side of the screen try to guess what the objects are. Let children take turns at creating the shadows.

**Does everything make a shadow?**

Provide a variety of transparent, translucent, and opaque objects and have children explore how well each casts a shadow. Discuss the results.

**Make shadow drawings.** Tape drawing paper to a wall and arrange an object in front of a bright light. Set up several lights and objects so more than one student can work at once. Have students trace the shadow outlines of the objects, then

move them to a new position within the light beam. Have children trace the shadows again. Ask them to look at their tracings and describe what happened to the objects' shadows. Remove the papers from the wall and have children decorate the shadow shapes they have drawn.

**Explore sundials.** Show students how to tell time by reading the shadows on a sundial. Help them make their own dials by standing a stick upright in a lump of clay. Set the stick in the center of a piece of paper and place these in bright sunlight. Every hour during the day, have students trace the stick's shadow on the paper. Discuss what is making the shadow and why it moves during the day.



Read the following poem (presented in the video) and have students answer the questions below.

*My Shadow*, by Robert Louis Stevenson

I have a little shadow  
That goes in and out with me.  
What can be the use of him  
Is more than I can see.  
He's very, very lively,  
From the heels to the head.  
And I see him jump before me  
When I jump into my bed.  
The funniest thing about him  
Is the way he likes to grow.  
Not at all like proper children,  
But just always very slow.  
For he sometimes shoots up tall,  
Like an India rubber ball.  
And he sometimes gets so little  
That there's none of him at all.

- *What does your shadow do?*
- *What makes your shadow move?*
- *What makes your shadow grow big or small?*

**Help children make their own shadow plays** using *My Shadow* or a favorite story as the script. Have children take turns making the shadows with their bodies or with puppets. Help them explore how to use bright lights or direct sunlight to make shadows on a wall.