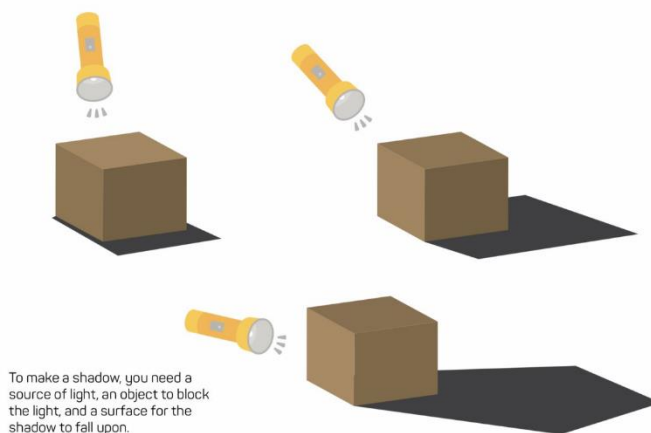


Shadowy Shapes

Background: Light from any source, such as the sun, a lamp, or flashlight, travels in a straight path and can be blocked by an object to create a shadow. The size and shape of the shadow can be changed by the position of the object in relation to the source of light.



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Objectives: Experiment making shadows using a flashlight. Observe that a beam of light can be blocked to create a shadow. Observe how the shadow changes as the object is moved in different positions. With a partner, make shadows with different objects and play a guessing game.

Vocabulary: light, position, shadow

Materials: flashlight, a collection of household objects (toys, kitchen items, tools, etc.) Be creative! (Optional: light-colored flat sheet, 2 chairs)

Procedure:

Step 1: Drape the sheet over two chairs to make a homemade movie screen (Optional: Find a large, empty section of wall, or other flat surface, to project shadows onto).

Step 2: Practice making a shadow by shining the flashlight on your hand to cast a shadow on the screen. Slowly move your hand around. Notice how sometimes your shadow looks like your actual hand, but other times it does not. It all depends on the position of your hand. Next, move the flashlight closer to your hand, then farther away. Does the size of your shadow on the screen change? What else do you notice?

Step 3: Now repeat Step 2 with a toy or object of your choice.

Now that you've experimented with making shadows, and learned that an object's shadow may not easily reveal its true identity, you're ready to play a guessing game.

Step 4: You and a partner collect different household items and sit on opposite sides of the screen. Take turns using the flashlight. Select one object at a time and shine a beam of light on it to cast a shadow. Have your partner guess the identity of the object based on the shadow they see. If they guess wrong, change the position of the object to cast a different shaped shadow. Continue this until they guess correctly or until they give up and you reveal your object. Take turns guessing and making shadows. (Optional: Both partners face the wall. One person secretly selects an object and sits closer to the wall. With their back to their partner, use the flashlight to cast a shadow onto the wall. Follow the same directions noted above).

The Shadow Guessing Game: Have your partner guess the identity of the object based on the shadow they see.

Household Item	Points	
	You	Partner
#1		
#2		
#3		
#4		
#5		

Score card.

Correct answer = 1 point

Incorrect answer = 0 point

Laboratory Connection: Scientists at Brookhaven Lab use very bright light (X-rays) as a tool to study the shapes of tiny molecules!