

SHADOW SHENANIGANS

BENCHMARK and TASK

SC.B.1.1.2: The student knows that light can pass through some objects and not others.

- The student creates shadows by blocking light.

KEY QUESTION

How are shadows made?



BACKGROUND INFORMATION

Light travels in straight lines. The speed of light is 186,000 miles per second. When light strikes an object, it may go through the object, be blocked by the object, or it may be reflected by the object. Shadows are made when light is blocked. Shadows can be influenced by the source of light, the object that blocks the light, and the surface that receives the shadow.

MATERIALS

Teacher

flashlight

opaque, transparent, and translucent material

white cardboard (to be used as a screen)

class chart

3 pieces of tag board (8 ½ x 11 each)
(see **Teaching Tips**)

Per group

flashlight

white cardboard (to be used a screen)

items to be tested

plastic cup

pencil

book

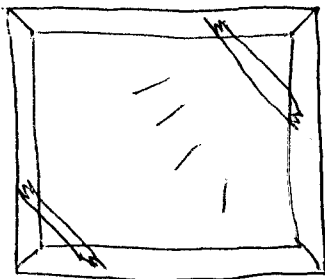
tissue paper

glass of water

wax paper

TEACHING TIPS

1. To use clear plastic wrap as the **transparent** material, make a frame from an 8 ½ x 11 piece of tag board. Attach a piece of plastic wrap to the frame with tape as shown in the illustration. Be sure that material fills the entire frame opening. The same thing can be done with wax paper for testing **translucent** material. Use an 8 ½ x 11 piece of cardboard as **opaque** testing material.



2. When conducting the test, darken the room as much as possible.

ENGAGE

Have students seated in small groups. Turn off all the lights, making the room as dark as possible. Focus a flashlight beam on the cardboard screen. Place the transparent frame between the light source and the screen. Have students make observations about the light reaching the screen. Continue the investigation by placing the translucent frame and then the opaque cardboard between the light source and the screen. Each time, have the students make observations about the amount of light reaching the cardboard screen.

EXPLORE

1. Distribute flashlights and other materials to small groups.
2. Darken the room and allow students to determine whether or not light passes through an object by shining a flashlight on objects and observing whether or not the light reaches the cardboard screen.
3. Students should group items into two categories:
lets light through
does not let light through
4. Students should name the objects that let light pass through and those that did not.
5. Bring class together to discuss their findings.
6. Record responses on a class chart.

<u>Lets light through</u>	<u>Does not let light through</u>

EXPLAIN

Develop the concept of shadows with the following questions.

Did the light pass through all the objects?

Did some objects let the light pass through partially?

What happens when light can't go through an object?

Using a flashlight, put your hand between the light and a screen.

Ask:

Can light go through a person?

What do you see on the screen when my hand is in front of the light?

If you are outside and the sun shines on you, what will you see on the ground?

How are shadows made?

What three things are needed to make a shadow? (light, something to block the light, and something on which the shadow can fall)

Allow groups the opportunity to make shadows with their “objects that do not let light through.”

EXTEND/APPLY

Ask:

What objects at home let light shine through?

What objects at home do not let light shine through?

How do objects that block light help us?

Encourage students to discuss how items such as window shades, lampshades, awnings, sunglasses, umbrellas, and car shades help them.

ASSESSMENT

In a center, have a flashlight, three frames: transparent, translucent, and cardboard, and some objects for students to determine whether or not light passes through an object. Students can classify on their paper the objects that allow light to pass through and those that do not.