

Energy

- Pass a set of materials to each group.
- Instruct student groups to work together to match the sounds of the eggs to the materials in the ice cube trays. Remind students not to open the eggs until they have been matched to items in the ice cube tray.
- After each group has finished matching, show students how to carefully open one egg at a time to check their work.

Facilitation Questions

- Which sense(s) did you use to match the materials in the eggs to the materials in the ice cube tray? *I used my sense of hearing to listen to each egg, my sense of touch to hold each egg, and my sense of sight to check that I properly matched the egg to the object I thought was in it.*
- How did you decide what was in each egg? *I shook each egg and listened to the sound. I felt how heavy each egg was and predicted how it might match the heaviness of an object in the ice cube tray.*
- What did you hear? *I heard soft sounds, hard sounds, sounds like a bouncing ball, and sounds like a rock would make.*
- What form of energy did you observe? *We observed sound energy.*
- How were the sounds different? *Some of the sounds were soft, some were sharp, some were loud, and some were quiet.*
- How many of the sounds did you guess correctly? *Answers may vary.*
- Which eggs did you match incorrectly? Why do you think that happened? *Answers will vary.*

Activity 2

Teacher Note

Because students will be using flashlights, you may want to review the appropriate ways to use a flashlight. Students should be advised to refrain from shining the light in each other's eyes.

It is recommended that students work in groups of 2–3 as you complete this activity as a whole class.

Materials

For teacher

- Materials for file folder tents:
 - 3 dark-colored, letter-size file folders
 - packaging tape
 - 1 sheet of white paper

For student groups

- 2–3 flashlights
- 1 file folder tent
- 1 set of color paddles
- 2–3 plastic animals or figures

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Place a piece of white paper in the work area to make viewing the shadows from all directions easier.

Advance Preparation

- Gather three dark-colored file folders and packaging tape to create one file folder tent.
- Open two file folders and lay them side by side so that two sides overlap. The distance between the fold of each file folder should be slightly wider than the width of a file folder. Tape the folders together, as shown in Figure 1.

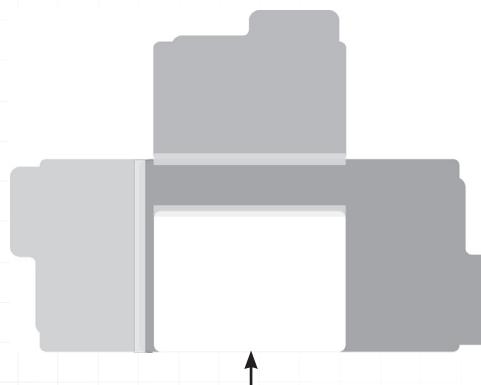
Figure 1.



Width of a file folder

- Open the third folder and lay it vertically across the two taped-together folders. Center the taped folders over the bottom half of the third folder, as shown in Figure 2.
- Tape the folders in place (front and back), making sure that when they stand the top flap allows no light to filter into the work space, as shown in Figure 3. Tape a sheet of white paper on the area where the two folders overlap, as shown in Figure 2.

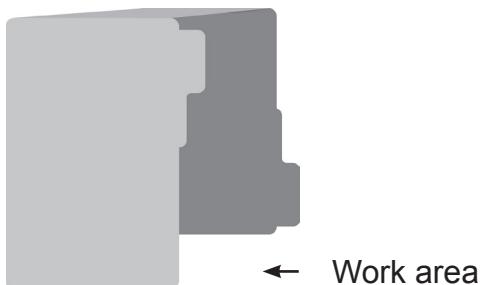
Figure 2.



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- To use the tent, stand the folder up so that it makes a U-shape, with the third folder providing a cover over the work space, as shown in Figure 3.

Figure 3.



Teacher Instruction

- Pass a set of materials, except the color paddles, to each group.
- Model how to set up the file folder tent and create a shadow using a flashlight and one of the plastic figures.
- Instruct students to place a figure within the darkened work space of the file folder tent.
- Instruct students to shine a flashlight toward the figure and observe its shadow.
- Ask the following: Is the flashlight located behind or in front of the figure?
- Instruct students to explore how the light energy affects the figure when held below, behind, in front of, or beside it. Remind students that they can move and pick up the figure to explore shadows.
- Allow students to continue to move the flashlight around the figure to alter the size and direction of the shadow and to ask questions that will allow students to practice vocabulary.
- Instruct students to remove the figure from the work space.
- Pass a set of color paddles to each group of students. Instruct students to shine the flashlight through each color paddle in the workspace and make observations.
- Allow time for students to mix and match the color paddles while shining the light through them to create more colors. Some students may find that using the ceiling lights also works when observing colors through the light paddles.

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- Instruct students to replace the figure and repeat the last two steps with the color paddles.
- Allow adequate time for students to complete the activity.

Facilitation Questions

- What do you observe when the flashlight is held above the figure? Below? Behind? In front of? Beside? *Students should describe how the position of the shadow changes as the light is moved to different locations. Encourage students to use the following sentence stem to answer: "When I held the flashlight (position word) the figure, the shadow _____."*
- What do you observe when you shine the flashlight through a color paddle? *The light appears to be the same color as the paddle.*
- What colors did you create by overlapping the paddles? *Yellow and blue make green. Red and blue make purple. Yellow and red make orange.*
- What do you observe when a color paddle is placed between the flashlight and the figure? *Students should describe how the color changes and how the amount of light changes when something is blocking the light.*
- What sense did you use to make observations? *I used my sense of sight to make observations of light.*
- What form of energy did you observe? *We observed light energy.*

Materials

For teacher

- 9" x 13" aluminum baking dish
- hair dryer, 1600–1857 W
- hot glue gun and glue sticks
- old, broken crayons, unwrapped
- tape
- timing device
- 4 sheets of white cardstock

For each student

- safety goggles

Activity 3

Advance Preparation

Prepare two pages by hot-gluing 4–6 crayons or crayon pieces of different colors in a circle at the center of two sheets of cardstock. Prepare two additional pages by hot-gluing crayons or crayon pieces of different colors in a line near the top of two sheets of cardstock.

Teacher Note

Because students will be using a hair dryer to melt crayons, you may want to review the appropriate way to use a hair dryer. Students should refrain

