

Activity: Me and My Shadow

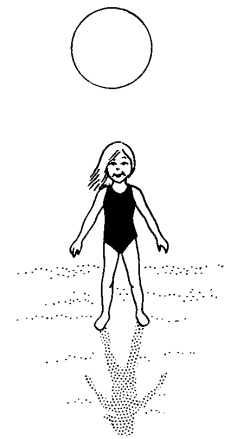
Grade Level: Grade 1

Major Emphasis: Shadow Movement

Major Curriculum Area: Science

Related Curriculum Areas:

Refer to Outdoor Education Curriculum Matrix K-2
Language Arts
Physical Education
Mathematics



Program Indicator:

The student will observe and describe how shadows are formed.

Student Outcomes: The student will:

1. observe the movement of his/her shadow.
2. communicate that the movement of the shadow is caused by the movement of the earth.
3. identify the sun as the necessary source of light and his/her body as the necessary "blocker" to form the shadow.
4. predict shadow movement.
5. measure shadow length.

Readiness:

1. Introduce vocabulary:

shadow	day	light
night	"blocker"	source

2. Complete the first grade Unified Science Units, "Shadows" and "Earth Movement," Part 1 - Day and Night.

Materials:

Fair Weather

popsicle stick pennants
meter stick attached to base
meter stick
shadow record chart
timer

Inclement Weather

flashlight
projector
large sheet of paper
can, paper cup, wooden block
plexiglass rectangle
screen rectangle
clear plastic cup

Procedures:

Activity A: Make a Shadow (DL2&3)

1. Divide the students into small groups. Select an appropriate location for each group.
2. Have each group put into the ground a meter stick attached to a shadow pole so that the entire meter stick is exposed. Measure the shadow with another meter stick and record it on the chart. Refer to Figure 1.
3. Observe the shadow and mark the end of the shadow with a group marker.
4. Discuss the movement of shadows. Have the students make predictions about where they think the shadow will be at the end of the activity period.
5. Have each student choose a popsicle stick pennant and place it in the ground where they predict the shadow will be.

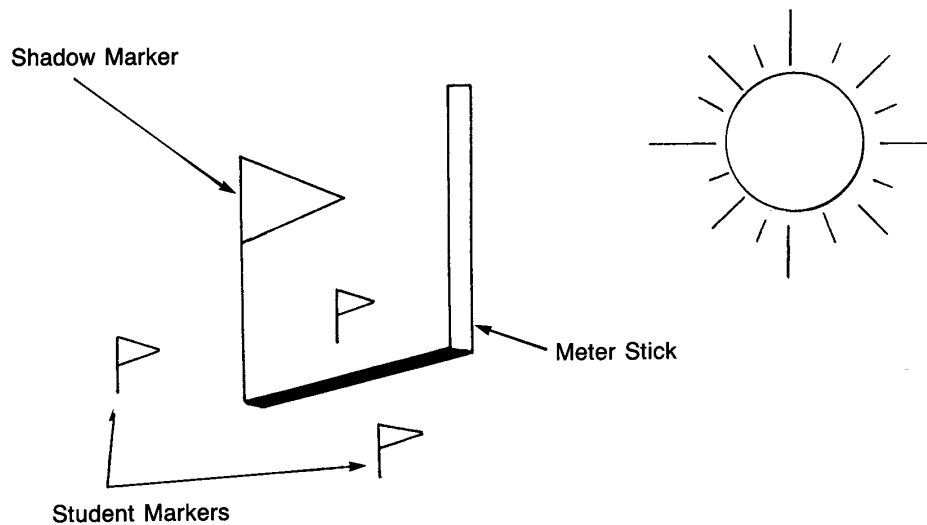


Figure 1: Shadow Marker Setup

Activity B: Shadow Games (DL3,4&5)

1. Involve the students in several shadow activities in an open area (giving the shadows time to move).
 - a. *Shadow Tag*: One student is "it" and has to step on another student's shadow to make him/her "it."
 - b. *Duplicate Your Partner*: One student creates and holds a position to form a shadow; his/her partner tries to duplicate the shadow.
 - c. *Find Your Shadow*: Have a student close his/her eyes, turn around several times, stop and point in the direction they think their shadow will be. Have them concentrate on where they feel the sun on their body.
 - d. *Make Your Shadow Bigger/Smaller*
 - e. *Make Your Shadow Disappear*

- f. *Make One Shadow*: Work in groups of three or four students to make one large shadow. Try to create familiar shapes.
2. Discuss the successes and problems with the shadow groups.

Alternate Activity: In case of inclement weather, substitute the following activities.

1. Shine a projector light at a wall in a darkened room. Have students stand in front of the light. Allow a brief period of improvised shadow play. Discuss the projector as the light source and the students' bodies as the "blockers." Ask students to discover a way to change the size of their shadow.
2. Provide students with a collection of objects: a wooden block, a rectangle of clear plexiglass, a rectangle of plastic screening and a clear plastic glass. Have students use a flashlight as a light source to determine which objects will and which objects will not cast shadows. Ask the students to state a rule about the nature of objects that will cast shadows.
3. Place a can, a paper cup and a wooden block on a large sheet of paper in a darkened room. Give the students a flashlight. Encourage them to change the position of the flashlight. Ask them to observe and describe how the shadows change as the flashlight is moved. Then have them experiment by changing the positions of the objects. Have them observe and describe the changes in the shadows. Encourage students to discover how many different shadows each object can cast.
4. Use a projector as a light source. Play games described in Activity B.

Summary: (DL2,3&4)

1. Return to the shadow marker setup to observe position and length of the meter stick shadow. Record data on the "Shadow Record Chart." Refer to Supplement A.
2. Discuss the following questions:
 - a. What happened to the length of the shadow (longer or shorter)?
 - b. If you came back here tomorrow at this exact moment, where would the shadow be?
 - c. If you came back here after your next station, where would the shadow be?
 - d. Why did the shadow move?
 - e. Which is longer, the object or the shadow?
 - f. If you came here at midnight, where would the shadow be?

Follow-Up: (DL3&4)

1. Have students create hand shadow animals.
2. Using paper plates, have students make sundials and learn how to use them.

Extension Activity: (DL3,4&5)

1. Have students select a favorite story and make shadow puppets on popsicle sticks. Hang a sheet from the ceiling and shine a bright light on the sheet (from the back). Have the students dramatize the story in shadows.
2. Take students outside and have them work in groups of two. One student will trace the outline of his partner. Reverse roles. Be sure to trace the shoes and write their names. One hour later go back outside and have the first child stand back on his shoes. Have the partner trace the new shadow. Reverse roles. Why has your shadow moved?

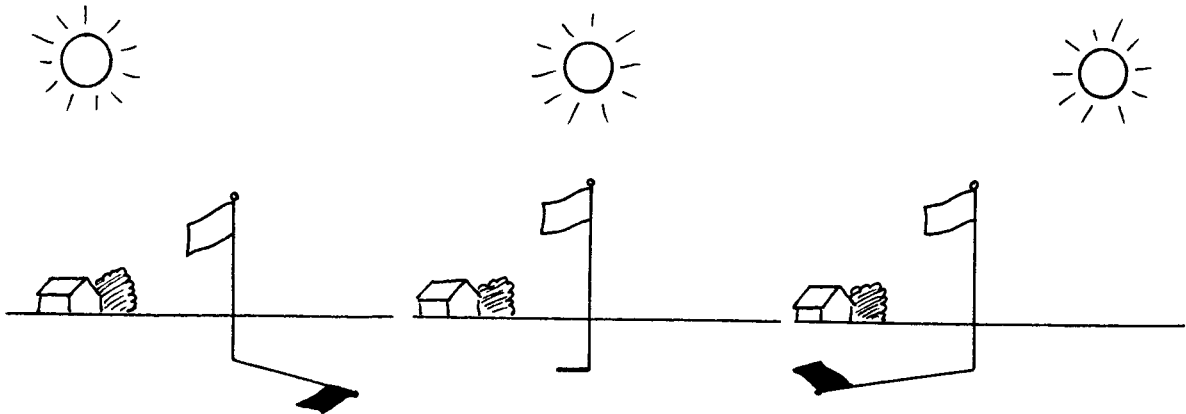


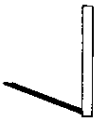
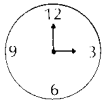
Figure 2: Shadows and the Position of the Sun

Teacher Resources:

Books:

- < *NatureScope: Astronomy Adventures, National Wildlife Federation, p. 39.
- < *Shadow Magic, Severn.
- < *You and Your Shadow, Severn.
- < *The Art of Hand Shadows, Almoznino.

Shadow Record Chart



Activity Group

Time

Shadow Length

Did it Move?

Compare and Circle Answer

	Beginning ----- Ending	Yes No	Shorter Same Longer
	Beginning ----- Ending	Yes No	Shorter Same Longer
	Beginning ----- Ending	Yes No	Shorter Same Longer
	Beginning ----- Ending	Yes No	Shorter Same Longer
	Beginning ----- Ending	Yes No	Shorter Same Longer
	Beginning ----- Ending	Yes No	Shorter Same Longer

