

OUR SUNSATIONAL SUN

HEAD START DOMAINS/EARLY CHILDHOOD LEARNING OBJECTIVES

Language Development: listening and understanding

Literacy: book knowledge and appreciation

Physical Health: health status and practices

Science: scientific knowledge, scientific skills and methods

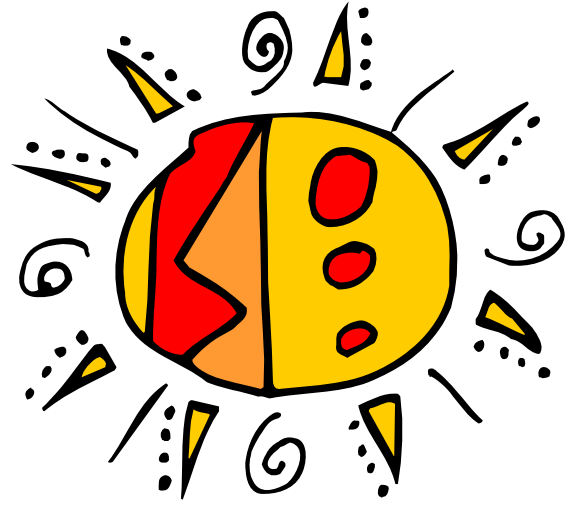
Creative Arts: music and art

LEARNING GOALS/OBJECTIVES

- Observe the heat of the Sun through a series of experiments
- Learn a song about Sun safety
- Recognize that the Sun is a far distance away

BACKGROUND INFORMATION

The Sun is 93 million miles away and would take approximately 220 days to get to in a spaceship traveling 17,500 miles per hour. In comparison, at this rate, it would take 23 years to reach Pluto from Earth. The surface temperature of the Sun is 10,000°F, although radiation past the surface of the sun can reach 2,000,000°F in the **corona**, the ring around the Sun above its surface that is best visible during a solar eclipse. As the Earth spins on its orbit, the Sun's rays shine on the Earth and move across it. As Earth moves, it causes day and night to happen on its surface. The seasons are caused by the position of the Earth relative to the angle at which the Sun's rays hit the surface of the Earth at a given point.



Basic Background

Have one student hold a globe or a ball to represent the Earth. Shine a lamplight, one that has a shade to better direct the light, on the Earth. If you rotate the globe, the light of the “Sun” shines only on one part of the Earth, leaving the other half in darkness during the nighttime.

Notice the light from the lamp shining on Earth when the Earth is close to the “Sun.” What happens if we walk farther away? The light shines, but does it shine as brightly as it does closer to the Earth? The farther we walk, the less the effect of the light on the Earth. What about the warmth from the light? Have someone hold their hand near the lamp and feel its warmth and then walk farther away and feel it.

The Sun is very far away, but we definitely feel the heat from it. Even though it is far away, it makes a lot of heat, so much that we can feel it millions of miles away.

WHOLE GROUP CLASSROOM ACTIVITY

Materials

- Lamp
- Sunprint sheets (see below for more info)
- Scissors
- Various objects, such as leaves, pennies, washers, and paperclips—anything to place on the sunprints that will leave a negative image behind on the sheet
- Energy Beads (see below for more info)
- Heavy cord for bracelets

Preparation

1. Sunprints: These are relatively cheap and can be ordered over the Internet at various locations such as the Exploratorium in San Francisco or Schoolmasters Science at 1.800.521.2832. The cost is around \$5 for 10 sheets. It is cost effective to cut the sheets into halves or quarters.
2. Remember that these are light-sensitive sheets of photographic paper that must be stored in a place away from direct light.
3. Energy Beads: You can order these through Steve Spangler Science at www.teacherdiscoveries.com or call 1.800.223.9080. They are fairly cheap, and kids really like them as they change color in the sunlight.



Procedure

Sunprints

1. Give background information about the Sun using a flashlight and globe (see Basic Background above).
2. Create sunprints by passing out different objects small enough to fit on the piece of photo-sensitive paper. (It's best to use objects with negative and positive shapes such as objects with holes in them, like washers or the handles of a pair of scissors.)
3. Show the students how to place their objects on a sample sheet of regular construction paper.
4. Tell them that they will be using a special type of paper for the real experiment that is sensitive to the light of the Sun. You can show them a completed sample ahead of time.
5. Place the sheets in the Sun or by a very sunny window ledge. Place the objects on it to create a sunprint.
6. You can sing the Sun song (see below) as you wait. Take care not to over-expose your paper. Read the instructions that come with the paper for proper exposure time.

Energy beads

1. Give each student a bead. Have them hold it in their hand in the Sun. These work best in direct sunlight. The beads will turn a bright color when they have been exposed enough.
2. Cut strips of leather or plastic cord for bracelets for each student.
3. Have the students string the bead through the cord and have an adult help tie the cord around the students' wrists.
4. When the bead is not in direct sunlight, it will turn white. When it is exposed to sunlight again, it will turn a bright color.
5. There are beads of various colors. Give the students as many as you wish. The beads stay sensitive for a long time, and can be re-exposed numerous times.
6. While waiting for the sunprints to etch, sing this song and make up movements that go along with each verse. The song reminds kids not to look directly at the Sun:

The Sun Song (sung to the tune of "She'll Be Coming 'Round the Mountain")

Oh we know that our Sun is very hot
Oh we know that our Sun is very hot
Oh we know our Sun is hot
'Cause it heats things on the spot
Oh we know that our Sun is very hot

We'll be wearing our sunglasses in the Sun
We'll be wearing our sunglasses in the Sun
We'll be wearing our sunglasses
'Cause it burns off hot bright gases
We'll be wearing our sunglasses in the Sun

Keep your eyes never looking at the Sun
Keep your eyes never looking at the Sun
Keep your eyes from the Sun
And you'll still have lots of fun
Keep your eyes never looking at the Sun



CURRICULUM INTEGRATION

Activity Center #1—Imaginary Play

Materials

- Tables
- Fabrics (black to absorb heat and silver to reflect heat)

Procedure

1. Have students imagine they are traveling to a planet closer to the Sun than Earth, such as Mercury or Venus.
2. Have them build a shelter with various materials to represent a structure that would protect them from the Sun. (Discuss what you would need in order to protect yourself from the heat of the Sun.)
3. In another area, have students build a shelter for a planet far away from the sun like Jupiter. (Discuss how you could keep warm.)
4. Draw a picture of what you think it would be like to live in one of these shelters.

Activity Center #2—Sun Fun Art

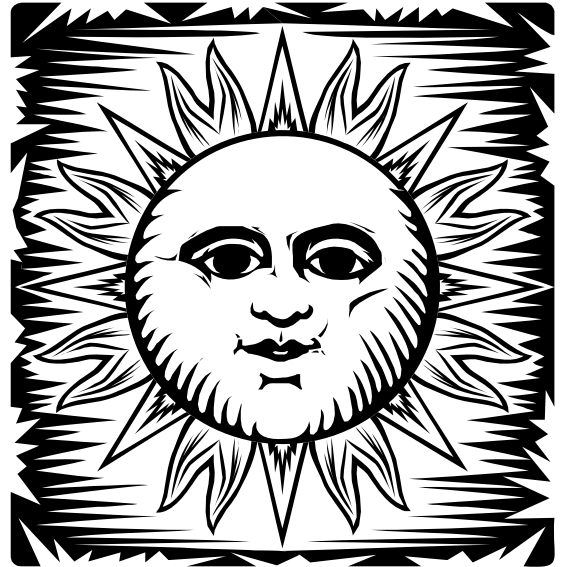
Materials

- Finger paint paper
- Scissors
- Karo syrup
- Yellow and red food coloring

Procedure

1. Pre-draw a medium-sized circle on the finger paint paper. Have children cut out the circles.
2. Pour about a teaspoon of Karo syrup in the middle of the circle.
3. Have the children add two to three drops of yellow food coloring and one drop of red food coloring to the Karo syrup.
4. Have the children finger paint until the circle is no longer white.
5. Let the circle dry for 24 hours.
6. Punch a hole at the top of the circle and thread with yarn.
7. Allow the children to take home their Suns or hang them up at school.

Optional: Have the children use a hole punch to cut black circles out of construction paper and add to their Suns as “Sun spots.”



EVALUATION

1. See Home Extension activity below.
2. When students bring their papers back, have them draw a picture of the objects and where their paper was located.
3. See if they can make the distinction between the sunny location and the shady location. Ask which prints came out better and how that relates to the amount of exposure to the Sun.

RELATED EXHIBITS TO VISIT AT THE MUSEUM

- Telescopes are sometimes set up on the Sky Terrace for observation
- Outreach: Starlab, our portable planetarium that we set up at your site, consists of general overviews of the night sky. Be sure to ask your instructor to place emphasis on information on the Sun.

HOME EXTENSION

1. Give each student two pieces of black construction paper.
2. At home over the weekend, have them place both pieces of paper outside, one piece of paper in bright direct sunlight and another in a shadier place with less direct light.
3. Place objects on the paper, just like the sunprint paper, for an hour and have them bring them to school.
4. Discuss the results.

VOCABULARY

Corona: the ring around the Sun above its surface that is best visible during a solar eclipse

RESOURCES

Children

The Sun, Our Nearest Star. Franklyn M. Branley. ISBN# 0060285346

Wakey, Wakey, Nighty Night. Sam Williams. ISBN# 0439249899

The Sun is my Favorite Star. Frank Asch. ISBN# 0152021272

Web Sites

<http://umbra.gsfc.nasa.gov/images/latest.html>

