

Investigation Three – It’s Hot

Standard V Students will understand that the sun is the main source of heat and light for things living on Earth. They will also understand that the motion of rubbing objects together may produce heat.
Objective 1 Provide evidence showing that the sun is the source of heat and light for Earth.
Intended Learning Outcomes 1. Use science process and thinking skills

Standard
V
Objective
1

Background Information

Without the warmth of the sun’s rays, Earth would be frozen. Even at 93 million miles away, the sun warms Earth just enough to provide for the existence of people and animals. Depending on the sun’s position, living things are affected differently.

Pre-Assessment/Invitation to Learn

One at a time, have each child pick an article of clothing out of the bag. Depending on the article they choose, have them stand by a sign saying “Hot Day,” or a sign reading “Cold Day”. Discuss why there is a difference in the clothes we wear. Talk about how to stay warm in winter and cool in summer. Explain some misconceptions (misunderstandings) about heat sources here and In Heat Misconceptions Activity. One example would be that wool clothing does not produce heat and make you feel warmer.

Teach the children about sun safety. Too much sun can hurt our skin. Have the children add things on the “Ralphie is Hot” worksheet to protect him. These things include sun screen, drinking water, hat, shade, or sunglasses.

Instructional Procedure:

Preparation

Make a solar cooker during this lesson, or have students check out The Heat Science Kit, which includes instructions for making a solar cooker. Cook with the sun’s rays by “toasting” graham cracker sandwiches the solar way!

Materials

- Bag of clothes with the following items: coat, jacket, gloves, hat, scarf, earmuffs, sun glasses, shorts, lightweight shirt, sandals, swimming suit
- Aluminum foil
- Chocolate chips
- 2 Squares graham crackers for each child
- Mini marshmallows
- 1 large cake pan for each group of 8 students

Activity

1. Divide into groups of three or four and give each group a large cake pan.
2. Have each group line its container with aluminum foil (shiny side out).
3. Each group member will place some chocolate chips and marshmallows on a graham cracker square and set it in his or her group's container.
4. Have them cover the containers with paper toweling and observe how long it takes for the chocolate and marshmallows to melt.
5. After this treat has been "toasted", let each child place another graham cracker square on top of the melted goo to make a sandwich.
6. While each group shares its results with the class, let the children enjoy their solar snack.
7. Discuss if this experiment would work in another season.

Curriculum Extensions

Math –

- Employ estimation strategies by predicting the amount of time needed to cook the Graham cracker sandwiches. (*Standard V, Objective 1*)

Art –

- The students draw a picture about animal survival. Draw several pictures of how animals survive in winter and several drawings of heat adaptations for animals. (*Standard III, Objective 2*)

Science –

- Have the students decide other things that could be cooked in a solar cooker. Decide where the most effective places for solar cooking might be. (*ILOs 1, 2, 3*)

Assessment Suggestions

Give each child a small Carson-Dellosa Sunshine, or cutout sunshine, stapled with four blank yellow 3" x 3" yellow sticky notes. Have the children write at least four things that they learned about the sun. If they want to write more, they can write on the backs of the paper.

Resources

Books:

- *Light and Dark* by Jack Challoner (Raintree Steck-Vaughn Publishers)
- *The Night Book* by Pamela Hickman (Kids Can Press)
- *The Sun Space Observer Series* (Heinemann Interactive Library)
- *The Mountain that Loved a Bird* by Alice McLerran (Scholastic)

Web sites:

- http://www.nasaexplores.com/lessons/01-009/K-4_2-t.html Lesson Plans for "Solar S'mores"

Homework & Family Connections

Caroling is an activity associated with cold, winter weather, hot chocolate, favorite songs, and warm feelings. Choose some favorite summer songs. When the class has had several practice sessions, set a date for caroling. Ask other teachers in the school if your class may carol for their classes. Then lead your group through the hallways, stopping at doorways to sing for each class. Be sure to tell the children to wear sun hats, sunglasses, sandals, and other appropriate summer attire. Serve a cool treat such as refreshing lemonade when you return to your classroom

Tell the children to go home and sing some of these songs for their families and plan a neighborhood summer activity. Have them report on their plan and ask if their family actually carried it out.

Name: _____

Ralphie is Hot!

Draw five ways to protect Ralphie from the heat of the sun.



Name: _____

Did You Use the Sun Today?

At different times during the day, write down what you are doing.

Are you using the sunlight in any way? (Are you eating food that used sunlight to grow?)

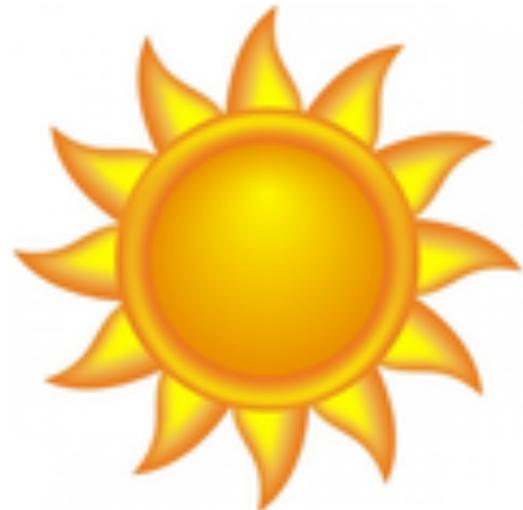
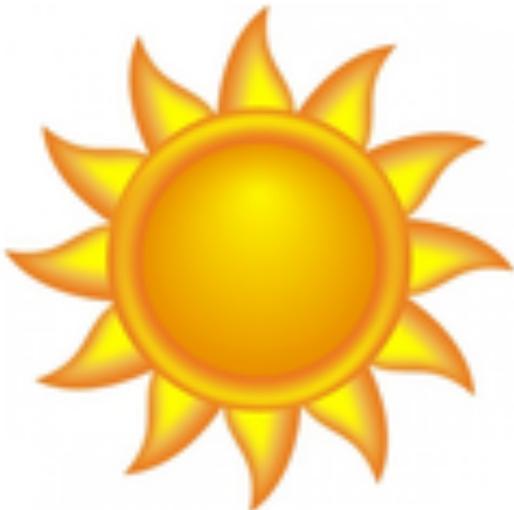
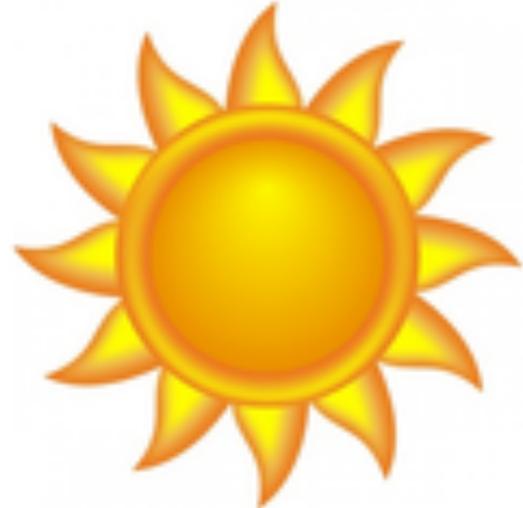
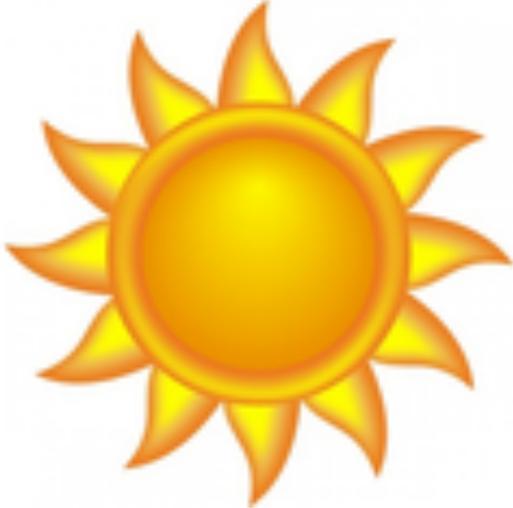
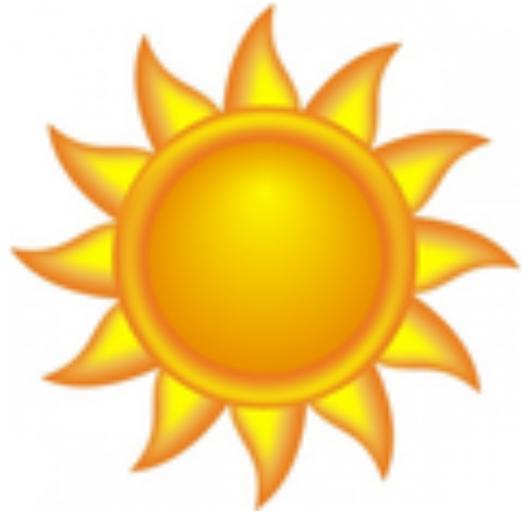
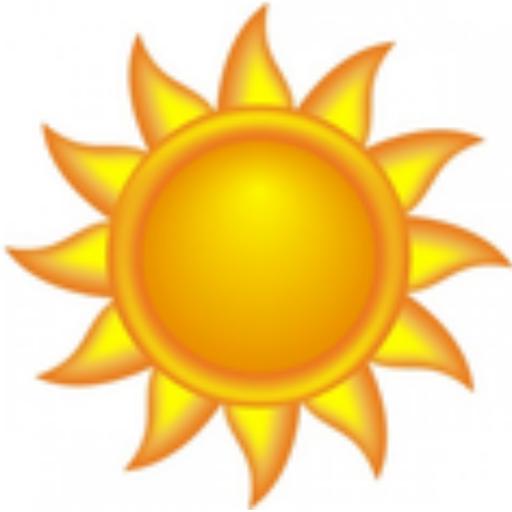
If you use sunlight in any way, write down how it is being used.

Time	Activity	Sunlight Used?		How
		Yes	No	

In what ways do we use sunlight every day? _____

Did you do more things that used sunlight, or didn't use sunlight? _____

Sunshine Cutouts



Sunlight

By Annette Van Wagenen

(Tune: Battle Hymn of the Republic)

Mine eyes have seen the beauty of the plants that grow on earth,
They need sunlight, heat, and water to refresh a rich, green turf.
Living mammals use the heat and glow of sunlight since their birth.
It all comes from the sun!
Sunlight, sunlight, hallelujah,
Sunlight, sunlight, hallelujah,
Sunlight, sunlight, hallelujah,
It makes our planet green.

We have sunlight in the daytime; but it's dark and cold at night.
It makes all of us feel better to have artificial light,
Flashlights, candles, lanterns, light bulbs will illuminate so bright.
Light brightens us our lives.
Sunlight, sunlight warms and heats you
Sunlight, sunlight makes the sky blue
Sunlight, sunlight is the ruler,
It keeps the world alive.

When two objects rub together, friction causes man-made heat.
It might be something electric like an oven roasting meat.
It could be a mechanism to unseal a can of beets.
Heat livens up our world.
Heat and light can go together.
Heat and light is a good mixture.
Heat and light can be for pleasure.
It makes the world go round.

