

Shine On Mr. Sun

Average Program Length: 30 minutes-1 hour, depending on age

Meeting Location: Ballast Point Outlook

Total material list:

--Solar Print Kit and Paper

--Pizza Box

--Newspaper

--Scissors

--Black construction paper

--Clear plastic wrap

--Aluminum foil

--S'more Ingredients (Graham cracker, marshmallows, chocolate)

Activities by Scout Level

Girl Scout

Daisies and Brownies- pick at least 1 of the steps below

Juniors and Cadettes- pick at least 2 of the steps below

Seniors and Ambassadors-pick at least 3 of the steps below

Boy Scout

Lions, Tigers, Wolves, and Bears- pick at least 1 of the steps below

Webelos, Scout Rank, and Tenderfoot- pick at least 2 of the steps below

Second Class, First Class, Star Scouts, Life Scouts, and Eagle Scouts-pick at least 3 of the steps below

Background

Every day, the sun radiates (sends out) an enormous amount of energy. It radiates more energy each day than the world uses in one year. Solar energy is a renewable energy source. The sun's energy comes from within the sun itself. Like most stars, the sun is made up mostly of hydrogen and helium atoms in a plasma state. The sun generates energy from a process called nuclear fusion. During nuclear fusion, the high pressure and temperature in the sun's core cause nuclei to separate from their electrons. Hydrogen nuclei fuse to form one helium atom. During the fusion process, radiant energy is released. It can take 150,000 years for energy in the sun's core to make its way to the solar surface, and then just a little over eight minutes to travel the 93 million miles to Earth. The radiant energy travels to the Earth at a speed of 186,000 miles per second, the speed of light. Only a small portion of the energy radiated by the sun into space strikes the Earth, one part in two billion. Yet this amount of energy is enormous. The sun provides more energy in an hour than the United States can use in a year! About 30 percent of the radiant energy that reaches the Earth is reflected back into space. About half of the radiant energy is absorbed by land and oceans. The rest is absorbed by the atmosphere and clouds in the greenhouse effect.

The sun is an extremely powerful energy in our universe. The heat and light from the sun are critical parts of an ecosystem. Solar energy drives wind formation, allowing us to use wind turbines to transform kinetic energy into electricity. Fossil fuels originally received their energy from the sun. The sun's heat helps water evaporate and return to the atmosphere where it is cycled back into water. The heat also keeps plants and animals warm, and it maintains a temperature where life can succeed. Without light from the sun there would be no photosynthesis and plants wouldn't have the energy they need to make food. The food that plants make feed all herbivores, which also feed the carnivores. Therefore, the sun powers the water cycle, the food cycle, and keeps the temperature stable for life!

Matching Badges



BSA-Energy

Correlates to Next Generation
Science Standards for PS3-3
ENERGY

Program Activities

1. See how the sun uses energy to do work. Using solar print paper, have scouts find an object in the park that they want to "print" with the sun. The object (ie: a leaf), must be on the ground already. Do not break anything off a plant. Place the object on the paper and leave it for 5 minutes in direct sunlight. Rinse the paper, and watch your design appear. Talk about the importance of leaving the objects in the park. It's okay to take art from a National Park, but not the resources. You don't know the significance of anything you take out of nature, and you could be taking food or shelter from an animal. What if everyone did it? What would happen?
2. Make a solar oven out of a pizza box, newspaper, scissors, tape, black construction paper, clear plastic wrap, and aluminum foil. Warm up the s'mores inside, and test the temperature with a thermometer after leaving it in the sun. Find more details here:
<http://www.saskriverbasin.ca/images/files/Solar%20oven.pdf>
3. Connect with an ancient people's discovery! If you were a Kumeyaay at Cabrillo, what resources would you use to create an oven? Explore the park and find the natural resources you would use. Write them down, and design/draw an oven using your list.

4. Many people in the world lack stable electricity. Can you design a solar oven that's hot enough to cook food? At home, research how the Kumeyaay at Cabrillo would be able to cook food (i.e.: Kumeyaay roasting pits and Agave hearts). Design/draw an oven using natural resources at the park. Compare your design with other Scouts, and see which is the most effective.

5. Work with organizations, such as Solar Cookers International, a Nonprofit based out of Sacramento, to see how you can help extend your ideas to different communities. Can you design an efficient oven using resources native to your specified area?