



Fun in the Sun

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Target Grade: 1st Grade

Time Required: 60 minutes (On a hot sunny day)

Standards: (Tennessee state)

- 1.PS3: Energy
 - 1) Make observations to determine how sunlight warms Earth’s surfaces (sand, soil, rocks, and water).
- 1.ETS1: Engineering Design
 - 1) Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
- 1.ETS2: Links Among Engineering, Technology, Science, and Society
 - 1) Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions.

Lesson Objectives:

Students will:

- Know the definition of solar energy and how it affects Earth’s surfaces.
- Understand different surfaces affect the reaction of temperature from the sun.
- Be able to predict and infer solar energy and Earth’s surfaces by performing experiments.

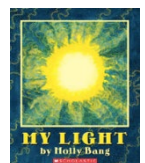
Central Focus:

This one-day lesson gives students the opportunity to manipulate different items in a muffin pan to see how the heat from the sun affects the given object. The items represent different surfaces on Earth. Students will then be asked to come up with a conclusion about solar energy and how it affects Earth’s surfaces.

Background Information:



Before beginning this lesson, read one of the two books “The Sun is my Favorite Star,” by Frank Ashe, or “My Light: How the Sun Becomes Electricity,” by Molly Bang. This will help students form connections about solar energy from the sun while teaching the lesson.





Materials

- Trade books on the sun: The Sun is my Favorite Star by Frank Ashe (less complex), My Light: How the Sun Becomes Electricity by Molly Bang (more complex)
- Muffin Tins (Disposable, aluminum)
- Items to use for melting test:
 - Soil
 - Sand
 - Water
 - Ice
 - Rocks
 - Chocolate
 - Marshmallows
 - Crayons
- Thermometers
- Chart paper and marker
- Recording sheet

Instruction

Introduction:

Hook: Read one of the stories to listed above to the class. Pick the story that is most appropriate for your class depending on reading level and interest. Be sure to point out evidence from the text that shows how the sun warms the Earth's surface, and what the outcome of warming that surface has.

Motivator: Bring students attention to an anchor chart that has the questions "Why is it so hot today?" And "What is solar power?": Turn and talk with your partner about what you think these answers are. When you come to a conclusion, write down your thoughts so you don't forget.

Activity:

Introduce the activity (point out solar energy definition and explain in detail): Class, you are going to create a melting machine that you will use solar power to change or melt matter. Think about the road on a hot day, would it be a good idea to walk without shoes on? What would it feel like? Why?

Teacher explains the activity: You are going to use the objects on the back table (show each object to the class), and place one item in each hole of the muffin pan. On your recording paper, write down why you chose a certain item, and predict what you think will happen. Draw a diagram of the muffin pan and the objects you chose and how it looks before you place it in the



sun. Please write a “M” next to the items you believe will melt. When we go outside, find a spot where the sun is bright. We will leave the pan there for minutes.

Give students time to discuss with their group the items they want and time to record their items.

Activity: Give students time to find a spot for their muffin pan. They are allowed to use thermometers at this point. After 15 minutes, let the students go observe the items in their melting machines. They should record, “How have the items changed? Are items hot to the touch? Which items melted? What caused some items to melt? Would all of the items melt if they were left in the sun for a greater amount of time?”. They should also draw another diagram of how the item looks now.

Closure: Bring the class back together and discuss their findings for each item. Record the student’s observations on your anchor chart. End the lesson by defining solar energy again and asking open ended questions such as, “What could we do tomorrow with the energy of the hot summer sun?”. As an exit ticket, have the students write down an object that they would like to put in the melting machine.

Differentiation

Students with more background in the science can “ramp up” their melting machines to include more aluminum foil or even magnifying glasses. The making of the melting machine can be an engineering project. Thermometers and timers can also be used to standardize the experiment. Students who are not yet fluent writers can have the option of drawing or writing on the observation sheet. The partner work also supports these learners.

Assessment

Formative: Students will be assessed on engagement in lesson and quality of conversation (Was the student predicting, inferring, and using schema while participating), the quality of response on the observation sheet (Was the student able to show understanding of the experiment with pictures and words), and the quick check at the end of the lesson (Was the student able to extend thinking to another experiment?).

Fun in the Sun Melting Machine

Write the letter "M" next the items that DID melt

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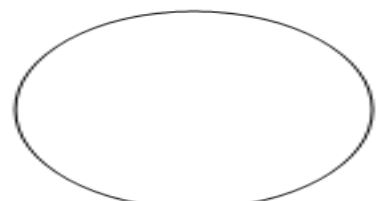
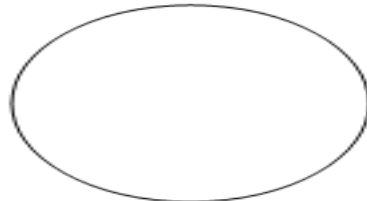
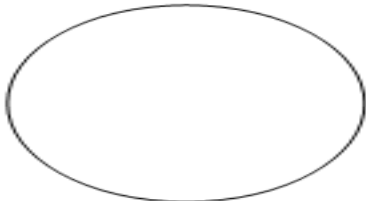
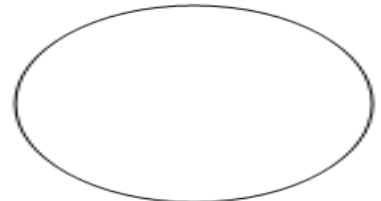
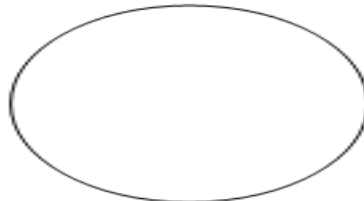
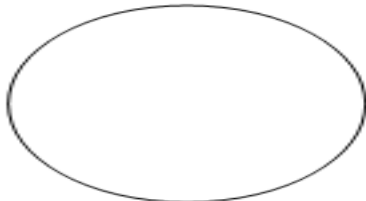
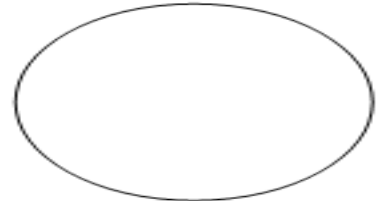
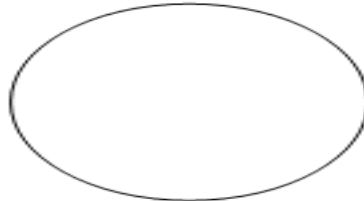
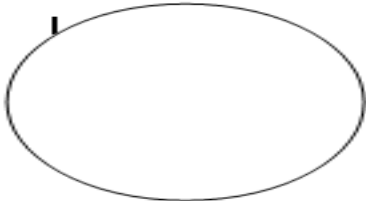
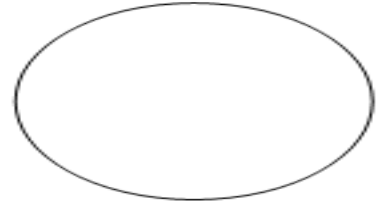
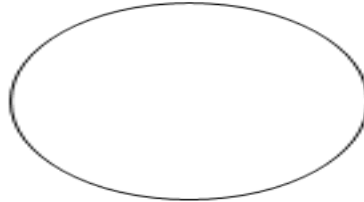
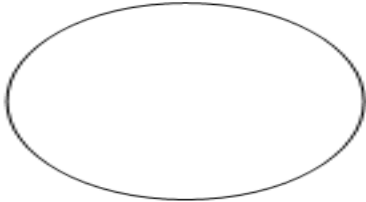
Item name:	Why did you choose this item?	Prediction
Soil		
Sand		
Water		
Ice		
Rocks		
Chocolate		
Marshmallow		
Crayon		

Fun in the Sun Melting Machine

We placed our melting machine _____

The temperature outside was _____

Write the letter "M" next the items that DID melt.



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Observations and Conclusions? What did you observe about solar power?