Overview
In this lesson students will explore how the sun’s energy warms water.

Objectives
On successful completion of this lesson, students will be able to:

- Describe what happens to water when heated by the sun; and
- Measure and record data using a thermometer in a local area.

Alaska Standards
Alaska Science Standards
[Sa1] Students develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.

SB3 Students develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.

Alaska Cultural Standards
[D] Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.

[E] Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.

Bering Strait School District Scope & Sequence
1st grade Sequence #2: Heat, Light, & Sound

Materials
Per small group:

- 1 thermometer
- 1 clear plastic cup (10 ounce or bigger)
- Water (enough that each cup can be filled with 8 ounces of water)
- Data sheet
TEMPERATURE

- *Temperature: Heating Up and Cooling Down* by Darlene R. Stille and Sheree Boyd
- Chart paper and marker

**Additional Resources**

HSP I: Ch. 11, Lesson 1
*Temperature (Blast Off Readers: First Science)* by Kay Manolis
*Is it Hot or Cold: Learning to Use a Thermometer* by Carrie Stuart

**Activity Preparation**

1. Students will need to have knowledge of how to use and read a thermometer before doing this activity. They may need an older student or adult/elder to help them with the investigation and to complete the data sheet.
2. Fill each cup with 8 ounces of water.

**Whole Picture**

Students will explore how the sun warms water using a thermometer to measure the temperature. They will discuss how the warming of water could affect animals and plants in their local area.

**Vocabulary**

- **hot**: feels warm to the touch
- **heat**: energy that makes things hot. Heat from the sun warms land, soil and water all around you. You can feel heat from other things like lamps, stoves, and fire. Moving things can give off heat too.
- **temperature**: the measure of how hot or cold something is.
- **thermometer**: a tool to measure the temperature.
Activity Procedure

1. Ask students what they know about things that are hot. Ask what they know about the word heat. List responses on chart paper that is divided into two sections with one labeled hot and the other heat.

2. Read the book *Temperature: Heating Up and Cooling Down* with the class. Discuss the book. Ask what they learned about heat and where it comes from. Have them give examples and list on the chart paper used earlier.

3. Tell students that they will be exploring and investigating how the sun warms water. Show them a cup with water, a thermometer, and the data sheet. Tell them they will choose a sunny place in the classroom to set their cup. Explain that they will put the thermometer in the water to see what the temperature is. Tell them that they will check the thermometer every 15 minutes for 60 minutes to see what happens. They will record the temperatures they see every 15 minutes.

4. Divide students into small groups of 2 or 3.

5. Give each group a cup with water, a thermometer, and data sheet.

6. Have each group choose their location. Place the thermometer in their cup and record the beginning temperature.

7. Check the thermometer every 15 minutes and record the temperature.

8. Discuss the data sheets as a group. Compare the temperatures that were taken.

9. Ask the following questions:
   - What happened to the temperature of the water in the cup?
   - Why did that happen?
   - What would happen if we left the thermometer in the cup longer?
   - What would happen if it were always sunny outside?
   - What would happen to the water in the rivers, lakes, or ponds if the water got hot?
   - What would happen to the animals and plants that live in the water if it got hotter than it is now?
**Language Links**

Invite an Elder in to teach the vocabulary words in the students’ Native language.

**Answers**

Answers will vary to the questions asked during the activity procedure. The data sheets may have various temperatures shown because of where the cups are placed in the classroom.
### Student Worksheet

**Group members**  
__________________________________________  

__________________________________________  

__________________________________________  

**Date**  
__________________________________________  

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 minutes</td>
<td><img src="image1.png" alt="Thermometer" /></td>
</tr>
<tr>
<td>30 Minutes</td>
<td><img src="image2.png" alt="Thermometer" /></td>
</tr>
<tr>
<td>45 Minutes</td>
<td><img src="image3.png" alt="Thermometer" /></td>
</tr>
<tr>
<td>60 Minutes</td>
<td><img src="image4.png" alt="Thermometer" /></td>
</tr>
</tbody>
</table>