

## **Environmental Project Activities**



The North Dakota Environmental Project encompasses a variety of topics from traditional environmental topics such as global warming to camping, hiking, and shooting sports.

### **Glacier Melt:**

**Age Level: 4th Grade and up**

**Lesson Goal:** Youth will understand the relationships that exist in our environment for the production of air, temperature control and the greenhouse effect.

#### **Lesson Objectives:**

Youth will be able to identify how humans may contribute to global warming.

Youth will be able to describe some factors that influence increased global warming.

#### **Lesson Materials:**

- Two pans that hold a quart of water
- Two teaspoons of soil
- A method to collect the melt
- Measuring cup



#### **Content Knowledge:**

The world's glaciers are part of the mechanism to moderate the world's temperature. This experiment is to discover how pollution, most commonly soot or dust, on glacier ice can affect its melting rate and influence the earth's temperature. With premature melting, the ability of the glacier to cool the earth over a longer period of time is changed and so is the overall climate.

1. Two pans are filled with one quart of water. One pan is filled with clean water and the other is filled with water with one teaspoon of soil mixed in it and one sprinkled over the top once frozen. The soil simulates dust from pollution that settles on the glacier. They are frozen to form our glacier.
2. Next, remove the ice glaciers from the pans and place them in the sun on a clear sheet of plastic or light-colored background in the sun. The glaciers can be positioned to collect the melt and measure the rate of melt with a measuring cup. A paint roller plastic pan works or a slanted surface with forming a plastic garbage sack to a collection point for measuring the melt rate.
3. Monitor every 15 minutes until the time of the melting of each glacier. The amount of melt and an estimation of the percent melted is recorded on the activity sheet.

#### **Questions to Answer:**

1. How did the dust contamination influence the melting rates of the glaciers?
2. Which glacier would contribute to cooling the earth the longest?
3. Which glacier would cause sea levels to rise more quickly?
4. Is there anything that can be done to help slow glacier contamination?

## Greenhouse Influence

In this activity, youth will be able to simulate and monitor an experiment for the influence of the greenhouse effect on the temperature of our environment. Rising levels of carbon dioxide in the atmosphere appear to be clearly linked with the rise in global temperature. The issue with carbon dioxide in particular is that there is currently more of it in the atmosphere than there should be, and it is starting to trap too much heat as a result. The extra heat trapped by the growing number of greenhouse gases is leading to a phenomenon called global warming. Global warming speeds glacier melt influencing their cooling of the earth. The melt causes sea levels to rise more rapidly changing shorelines around the world.

### **Lesson Materials: Greenhouse Activity**

- 2 -glass jars (quart sized)
- 2 - one-gallon clear plastic bags or bread sack
- 2 thermometers, two sticks or tent pegs, tape
- Observation Sheets



Take two glass jars and fill one third with cold water. (quart jar)

1. Let stand until both are same temperature (overnight)
2. Add 5 ice cubes to each jar.
3. A thermometer is fastened to a stick, landscape peg, or object to keep it above the water in the jar. The thermometer is placed in each jar.
4. Wrap one jar in the clear plastic sack and the other with no cover.
5. Put both jars in the sun near window for two hours.
6. Youth can monitor the temperature rise of each jar and record results on the activity sheet.

### **Questions to Answer:**

1. Was there a difference in the jar temperatures over time?
2. What may have influenced the temperature?
3. What situation would the melting of ice represent here on earth?
4. Which situation would more quickly melt the earth's glaciers?
5. What could be the result of glaciers melting in this situation?

### **Resources and References:**

<https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

<https://www.ncdc.noaa.gov/sotc/global/201913>

<https://www.cbsnews.com/news/report-1-million-animals-plant-species-face-extinction-due-climate-change-human-activity-population/>

<https://www.ndsu.edu/ndsco/#:~:text=Mission,and%20extension%20and%20information%20services.>



[www.ag.ndsu.edu/extension](http://www.ag.ndsu.edu/extension)

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## 4-H Environmental Activity Record

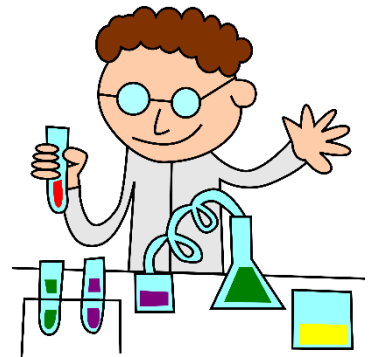


### Glacier Melt Activity

Melting Time	Glacier 1 with dust	Glacier 2 natural
15 minutes		
30 minutes		
45 minutes		
60 minutes		

### Greenhouse Activity

The water in both jars are same temperature (room temperature) to start before adding ice cubes. The ice cubes are put in the jar, and the thermometer inside. One jar will be sealed with a clear plastic sack and placed in sunshine and the other without the barrier.



Youth can complete the chart below:

Time	Temperature Jar with Barrier	Temperature Jar Natural
30 minutes		
45 minutes		
60 minutes		
75 minutes		

## **Camping: Portable Coal Stove**



There are many versions of portable stove designs. It is always fun for youth to experiment making food or providing heat in various ways. A survival stove can be purchased or can be designed from repurposed materials. In reality, few of us may ever face a camping survival situation. However, it is always good practice to demonstrate problem solving skills which may be useful at another time.

### **Age Level: 4th Grade and up**

**Lesson Goal:** Youth will understand providing for basic needs and recycling.

### **Lesson Objectives:**

Youth will construct a source of heat and cooking stove.

Youth will be able to describe how to construct the stove.

Youth will be able to describe how the repurpose of materials can conserve landfill space and increase the practical use of a material.

### **Lesson Materials:**

- Sardine tin
- Steel window screen 5 x 5 inches
- Tin can 2 inches high and 4 inches in diameter (minimum) and plastic lid, keep the tin can lid
- Charcoal (2-3 coals)
- Petroleum jelly and cotton balls
- Matches (prefer waterproof for camping)
- Drill with an 1/8-inch metal drill



### **Construction:**

Generally, the idea in camping is to keep ideas simple and easy to use. The weight and size to pack them is also a consideration. Preferably, items that can be salvaged to serve another purpose are used to reduce landfill needs and conserve resources.

- The frying tin for an egg can be a sardine tin.
- The base of the heater/stove can be any size depending on how large of a stove is desired. Generally, it is preferred that the can is a minimum 4-6 inches in diameter and 2 inches tall. A 4 inches tall can will allow one to pack more of the stove parts. Six to eight holes are drilled around the base of the can to allow air to enter the can. The can used is from Clover Valley chunky white chicken breast. The lid of the can is kept for additional use.
- The screen is the grill. The edges are bent down around the can so the grill fits the can and will be less likely to fall off.
- Tin foil can be molded on the top of the stove and around the item to be cooked for baking.

### **Directions:**

The stove can function as a heater or cooking stove. Charcoal, cotton balls, and petroleum jelly is used as a safe heat source for youth to use. This version of stove is designed to save space in your pack and

not be used more than one or two times a trip. One has to always consider the cooking conditions as wind and temperature affect small stove cooking times.

1. For cooking an egg, the stove is set up on a sheltered solid location so that it is not easy to tip over. There should not be flammable materials close by. Most campers prefer to quickly cook eggs so a hotter burning heat source is needed. Next, 3 cotton balls are rubbed with petroleum jelly and placed into can and lit on fire. Then, the grill is put into place. The sardine tin is sprayed with cooking oil or rubbed with butter. The egg is cracked into the tin. One will need to watch until the egg is done. Three cotton balls will cook on egg in 45-degree temperatures.



2. For baking small items, coals are used for a longer consistent temperature. The coals are started by using two cotton balls and petroleum jelly making a nest inside the can for the coals to sit. Coals are placed and started, the grill put into place and the tin lid placed on the grill.
3. Next, the item to be baked is placed inside a formed sack of tin foil. The tin foil is sprayed with cooking oil. The baking time will be approximately one hour in 40-degree temperatures for a bun or biscuit and it will have to be turned once or it will be black on the bottom.