

The Albedo Effect

Earth/Environmental Science

Name _____

Date _____

Period _____

1. Notice there are two beakers in front of you, one marked "control" and one marked "experimental." The experimental beaker has several white Styrofoam peanuts floating on the surface of the water. The objective of this experiment is to determine how the presence of these Styrofoam peanuts impacts the temperature of the water when exposed to light from above.
2. What objects do these Styrofoam peanuts represent?

3. Predict what will happen to the temperature of the water in both beakers when exposed to heat.

4. Measure the temperature in both beakers. Record the temperature (at time = 0 minutes) in both beakers on the chart below.

5. Place both beakers directly under the spotlight and turn on the spotlight. Make sure you take the thermometers out of the beakers during your wait time, as the heat from the lamp can cause the thermometer to get too hot for you to touch!

6. Measure and record the temperature in each beaker at 10, 20, and 30 minutes.

Time	Control Temperature (°F)	Experimental Temperature (°F)
0 minutes		
10 minutes		
20 minutes		
30 minutes		

7. While you are waiting to make your observations, you can answer the questions on the back of this sheet.

Data Analysis

8. Which beaker demonstrated the greatest increase in temperature?

9. Were the results of your experimental beaker as you predicted? Why or why not?

10. Based on your results, how might global warming influence Arctic temperatures? Explain your answer.

<http://www.ie.unc.edu/erp/index.cfm>

Go to <http://svs.gsfc.nasa.gov/vis/a000000/a003000/a003090/> and observe the **Average Total-Sky Albedo scale**.

1. Which color on the scale represents maximum reflection of sunlight – white or dark red?

Playing the animation will help you to better visualize the continents.

2. On the map, which region of the earth exhibits the highest reflectivity (greatest albedo)? What features of this region are responsible for this reflectivity?

3. On the map, which region of the earth exhibits the highest absorption (least albedo)? What features of this region are responsible for this absorption?

Observe the graphs at your station titled *Changes in Temperature, Sea Level, and Northern Hemisphere Snow Cover*

4. Describe the relationship between global average temperature and global sea level rise.

5. Describe the impact that a warmer global average temperature has had on Northern Hemisphere snow cover.

6. Go to http://www.nasa.gov/centers/goddard/news/topstory/2005/arcticice_decline.html or view the images provided at your station. Observe how the Arctic Sea Ice has changed over time and discuss the impacts of this change on the earth's albedo.