

# Why is it always cold in antarctica?

How does the color of a surface impact how it responds to incoming solar radiation? How might this factor influence temperatures in antarctica?

## Part 1

1. Gather materials- two thermometers, scissors, black and white construction paper, sunlight ( or heat lamp)
2. Fold paper into small pocket around bulb, see image. Take data every two minutes for a total of 10 mins

The envelopes must be placed over the bulb end of the thermometers. And the thermometers must be equidistant from your heat source. Why?



## Part 2

3. Tape a thermometer to a ruler at the 1 inch mark
4. Test different surfaces - one must be asphalt, one must be grass, think of 3 other surfaces
5. Hold the ruler vertical against the surface so the thermometer is 1 inch above surface
6. Wait 4 minutes- record the temperature.
7. Cool the thermometer in a cup of room temp water for 30 seconds between trials

## Data

	Original temp	2 mins	4 mins	6 mins	8 mins	10 mins	
White							
Black							

Surface	Temperature initial	Temperature final (after 4 mins)	Change in temp	% change
Asphalt				
Grass				

## Discussion

8. Compare antarctica to north america, which continent would reflect more solar radiation? Why?
9. Which surface had the highest albedo?
10. Which surface had the lowest albedo?
11. You are in charge of building a new housing complex. What materials would you use
  - a. To keep the roof from getting too warm?
  - b. To prevent the grounds from getting to warm
  - c. To reduce the heat of the parking lot?
12. Explain and diagram the [Ice- albedo feedback loop](#) 1 min