

Albedo Lab - Investigation Sheet

Driving Question: What effect does albedo have on surface temperature?



Albedo Laboratory Hypothesis

Predict which paper envelope, white or black, will heat up faster. Which envelope will reach the highest temperature the fastest, thus having lower albedo? Include a reason for your prediction. Think about different surface temperatures in the summer.

RANK ALEBEDO TURN OFF LIGHT



Albedo Data Collection Table (*record in Celsius*)

| Envelope Type | BEFORE (Record before light is turned on) | 2 min. | 4 min. | 6 min. | 8 min. (Turn off light after recording this measurement) | 10 min. | Heat Increase (8 min. - Before) | Heat Reduction (8 min. - 10 minute) |
|----------------|--|--------|--------|--------------------|---|---------|------------------------------------|--|
| White Paper | | | | | | | | |
| Black Paper | | | | | | | | |
| Albedo Ranking | | | | Black - White - | | | | |



Albedo Lab Analysis

1. Which color envelope reached a higher maximum temperature? Why do you think this occurred? Think about reflection and absorption.

2. What did you notice about the rate of heat loss after the light was turned off? How did the heat gained over the first 8 minutes compare to the amount of heat reduction during the last 2 minutes? Did color appear to affect the rate of heat reduction?

3. Which color envelope would have a higher albedo? Why?

4. Which color envelope would have a lower albedo? Why?

5. Look at a globe or map of the world. Think about different types of surfaces on the Earth such as ice, oceans, forests, and large cities.
 - a. What surfaces are best represented by the white paper?

 - b. What surfaces are best represented by the black paper?

 - c. Which surfaces absorb more solar radiation?

 - d. Which surfaces reflect more solar radiation?

- e. How does the color of the Earth's surface affect air, land, and sea temperatures?
6. **Drawing conclusions.** Compose a well-written paragraph that addresses the investigative question: **What effect does albedo have on surface temperature?** Support your conclusion with evidence (data) from the albedo experiment.