
My NASA Data - Mini Lesson/Activity

Seasonal Arctic Albedo

Grade Band

- 9-12

Time

- 15 minutes

Overview

Students connect day/night and seasonal cycles with albedo in the Arctic region.

Student Directions

What is Albedo?

Ice reflects more sunlight than many other types of surfaces. This is related to the color of the surface. Have you ever noticed that you get hotter outside in the summer when you wear black and you feel cooler when you wear white? This is due to differences in how much sunlight is absorbed and reflected by a black shirt and white shirt. **Albedo** indicates what percentage of the incoming solar radiation (sunlight) is **reflected** by a surface. The less albedo a surface has, the more energy contained in solar radiation (sunlight) is getting **absorbed**.

Ice has a high albedo, so it reflects incoming solar radiation. The ocean has a low albedo, so it absorbs much more incoming solar radiation. More information on albedo is available on the [Changing Albedo Values](#) phenomenon page.

Steps

1. Watch [The High Variability of Global Albedo video by NOAA](#), and think about how the changes in Arctic albedo might be impacted by the seasons.

[Video: The High Variability of Global Albedo](#)

The High Variability of Global Albedo | <https://www.youtube.com/watch?v=O0B8Yi7AZvQ> | Source: NOAA Visualizations

2. Answer the following questions. Check with your instructor on how to submit your answers.

1. In what season/s do you expect a change in albedo in the Arctic to have the greatest impact in the amount of sunlight absorbed and reflected at the surface?

Think-Pair-Share:

1. How does the amount of solar energy received by the Arctic change with the seasons?
2. Why does albedo change seasonally in the Arctic?
3. What is albedo?
4. How does the albedo of ice compare to the albedo of the ocean?

Teacher Note

Teachers, these mini lessons/student activities are perfect "warm up" tasks that can be used as a hook, bell ringer, exit slip, etc. They take less than a class period to complete. Learn more on the "[My NASA Data What are Mini Lessons?](#)" page.

Teachers who are interested in receiving the answer key, please complete the [Teacher Key Request and Verification Form](#). We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

NGSS Three Dimensional Learning

NGSS Disciplinary Core Ideas

- ESS2A: Earth Materials and Systems

Crosscutting Concepts

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- Cause and Effect

Science and Engineering Practices

- Analyzing and Interpreting Data