

Name _____



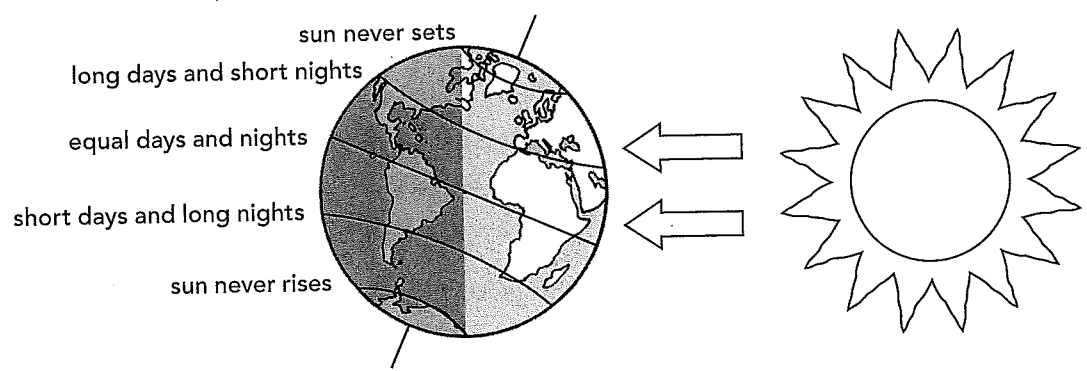
Day 1 **Weekly Question**
Why are the North and South Poles so cold?

Earth's **climate** varies greatly from region to region and season to season. One reason for this is patterns of daylight. Over the course of a year, every place on Earth receives the same amount of daylight. But how and when the light is received differs by location and time of year. At the poles, the sun rises and sets only once each year. Six months of continuous daylight are followed by six months of darkness. Because it is dark for such a long time, the poles get very cold. And because they are frozen, it is difficult to heat them up once the sun does shine.

The situation is much different at the equator. There, the daily amount of light does not change much. Within each 24-hour period, there are roughly 12 hours of daylight and 12 hours of darkness. As a result, the temperature at the equator is nearly constant—and warm—throughout the year. With the same amount of light and darkness every day, the areas near the equator do not have a chance to get cold like the poles do.

Vocabulary

climate
 KLY-mit
 the average weather conditions of a particular area



This chart shows the amount of daylight that four cities get in January and July. Use the information to list the cities in order of their distance from the North Pole.

North Pole

↓

Equator

City	Hours of Daylight	
	January	July
Shanghai, China	10	14
Barrow, Alaska, U.S.	0	24
Bogota, Colombia	12	12
St. Petersburg, Russia	6	18

Name _____

Daily Science

**Big
Idea 3**

WEEK 3

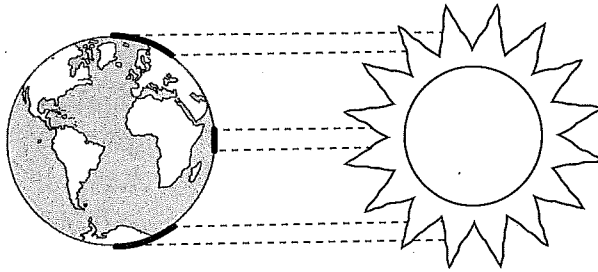
**Day
2**

Weekly Question

Why are the North and South Poles so cold?

Because of the **curvature** of Earth, the sun hits different places at different angles. While the sun shines almost directly overhead at the equator, it remains low on the **horizon** at the poles. Because it is at an angle, the sunlight at the poles travels farther through the atmosphere than the sunlight that hits the equator. And the atmosphere absorbs and reflects some of the sun's energy. So the sunlight that reaches the poles is weaker than the sunlight that reaches the equator.

A sunbeam that hits the ground at an angle also spreads over a greater area than a sunbeam that comes from overhead. This further reduces the amount of solar energy that the poles receive. With less solar energy, temperatures at the poles remain low.



Vocabulary

curvature

KER-vuh-chur
arching or bending

horizon

huh-RYE-zun
*the line where
the sky and Earth
appear to meet*

A. You can estimate the angle of the sun in the sky by the length of your shadow. The longer your shadow is, the greater the angle of the sun. Use this information to answer the questions.

1. If you're standing at the South Pole, will your shadow be longer or shorter than where you live? Why?

2. Where is your shadow shorter, Seattle, Washington, or Miami, Florida? Why?

B. A magnifying glass can use the sun's energy to burn paper. In order to ignite the paper, the magnifying glass must be held so that light from the sun forms a small, circular dot. Explain why you think this is necessary.

Name _____

**Day
3**

Weekly Question

Why are the North and South Poles so cold?

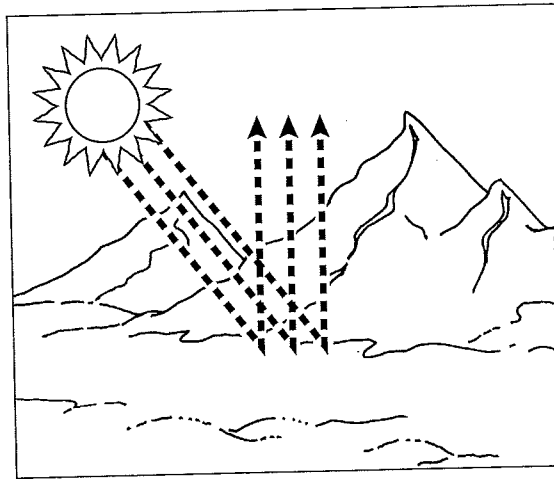
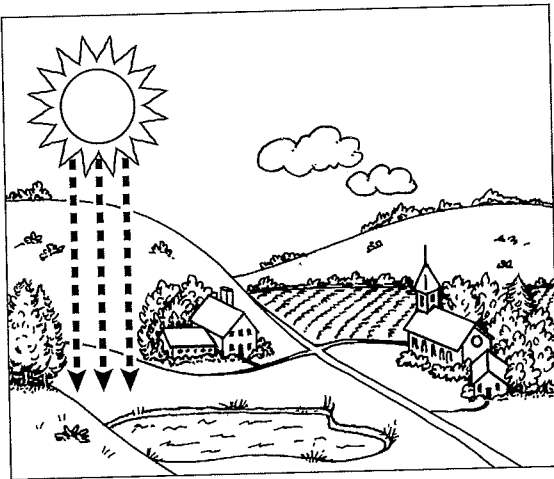
Certain features of Earth's **landscape**, such as soil, water, trees, and even towns and cities, absorb energy. This results in warmer temperatures. But snow does just the opposite. It reflects 90% of the sun's energy and sends it back into space. Snow is one more reason why the North and South Poles are so cold.

Yet another reason is the weather pattern. Clouds increase the temperature on the surface of Earth, functioning like a blanket to keep heat close to the ground. But because the climate is so dry at the poles, there are rarely any clouds in the sky. There are, however, strong winds at these latitudes, which blow most of the surface heat away.

Vocabulary

landscape

LAND-skayp
the visible
features of
a region



A. Use information from the passage to complete the analogies.

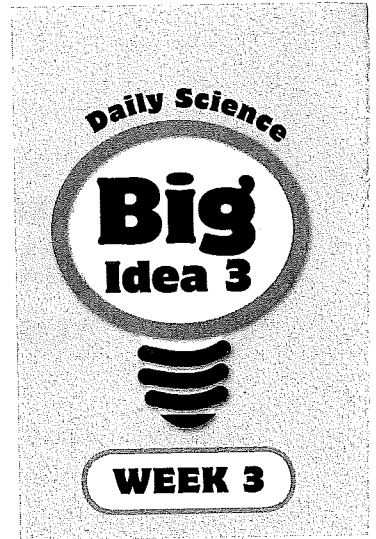
1. **Pavement** is to **absorb** as **snow** is to _____.
2. **Wind** is to **cold** as **cloud** is to _____.

B. Name one feature of the landscape and two features of the weather at Earth's poles. Explain how each of these features contributes to cold temperatures.

Landscape: _____

Weather: _____

Name _____



Day 4

Weekly Question

Why are the North and South Poles so cold?

At the North Pole, average temperatures range from -18°C (0°F) in summer to -37°C (-34°F) in winter. Temperatures at the South Pole are, on average, 17°C (30°F) colder. The coldest temperature ever recorded in the Arctic was -56°C (-68°F), while the coldest temperature in the Antarctic was -89°C (-128°F)! Why is the South Pole so much colder than the North Pole?

There are two reasons for this difference. One is that the North Pole is located in the middle of the Arctic Ocean. Regions near the ocean are warmer because the ocean absorbs heat. By comparison, the South Pole is on the continent of Antarctica, 800 miles from the nearest sea. The second reason is that areas of higher elevation have colder temperatures. While the North Pole is located at sea level, the South Pole sits at an elevation of nearly 10,000 feet.

A. Use the chart to answer the questions.

Average Monthly Temperatures at the South Pole (in Fahrenheit)													
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Avg. high	-13°	-35°	-58°	-62°	-63°	-63°	-67°	-67°	-67°	-53°	-33°	-15°	-49°
Avg. low	-18°	-44°	-69°	-76°	-78°	-78°	-81°	-80°	-80°	-63°	-38°	-18°	-60°

1. Which three months of the year have the lowest average temperatures?

2. During which month does the highest average temperature occur?

B. Some areas with year-round mild climates, such as California, have snow-topped mountains. Explain how this is possible.

Name _____

Daily Science

**Big
Idea 3**

WEEK 3

**Day
5**

Weekly Question

Why are the North and South Poles so cold?

A. Use the words in the box to complete the paragraph.

climate landscape horizon curvature

Many factors affect the _____ of a region.

Because of the _____ of Earth's surface, the sun sits low on the _____ at the North and South Poles.

In addition, features of the polar _____, such as snow and ice, reflect the sun's energy, which further decreases temperatures at the poles.

B. Next to each landscape feature or weather condition, write whether it contributes to a *colder* or a *warmer* climate.

1. direct sunlight _____

6. close to the ocean _____

2. high winds _____

7. sun low on horizon _____

3. clouds _____

8. snow _____

4. high elevation _____

9. 12 hours of daylight _____

5. trees and soil _____

10. low latitudes _____

C. In your own words, explain how six months of darkness and six months of light contribute to cold temperatures at the poles.
