

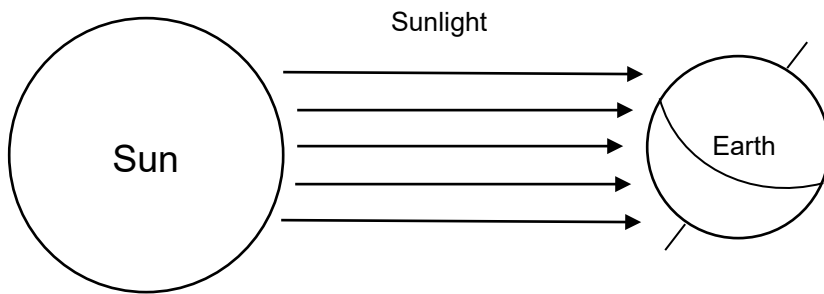
Name: _____

Date: _____

The Sun's Effect on Climate Student Pre- or Posttest (Answer Key)

1. The Sun and Earth

- a. Draw and label circles representing Earth and the Sun.

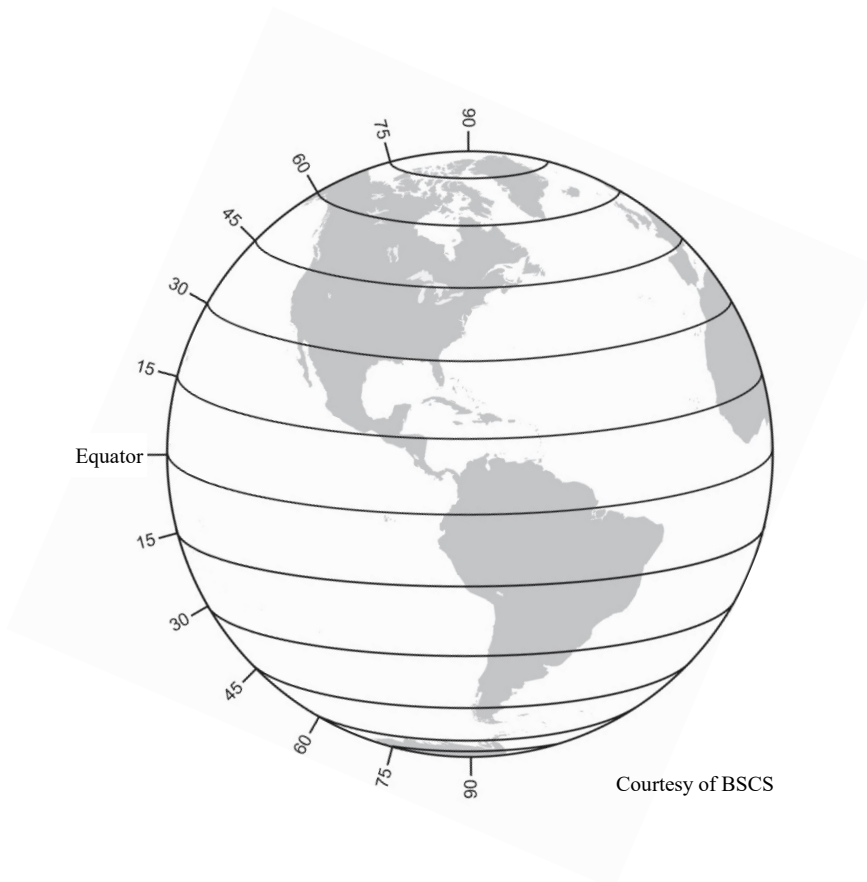


- b. Add to your drawing to show how sunlight gets from the Sun to Earth.
- c. Explain your drawing. Why did you draw the sunlight the way you did?

Ideal response:

The equator receives the most direct and concentrated amount of sunlight. So the amount

of direct sunlight decreases as you travel north or south from the equator.



2. Temperature and Latitudes

Look at the diagram of Earth above that shows different latitudes.

- a. Imagine you're sailing from the equator to latitude **60° N** (north). How do you predict the temperatures will change as you travel north?

Ideal response:

The temperatures will decrease as I travel north away from the equator and toward 60° N latitude. Temperatures are warmer at the equator because that area gets the most direct sunlight, and temperatures are cooler at 60° N because that area gets less direct sunlight.

Equator = Warmer Temperatures

b. Why do you make that prediction?

Ideal response:

The equator gets the most direct sunlight year-round, so the farther north or south I sail,
the sunlight will be less direct, and the temperatures will be cooler.

c. Imagine you're sailing from the equator to latitude **60° S** (south). How do you predict the temperatures will change as you travel south?

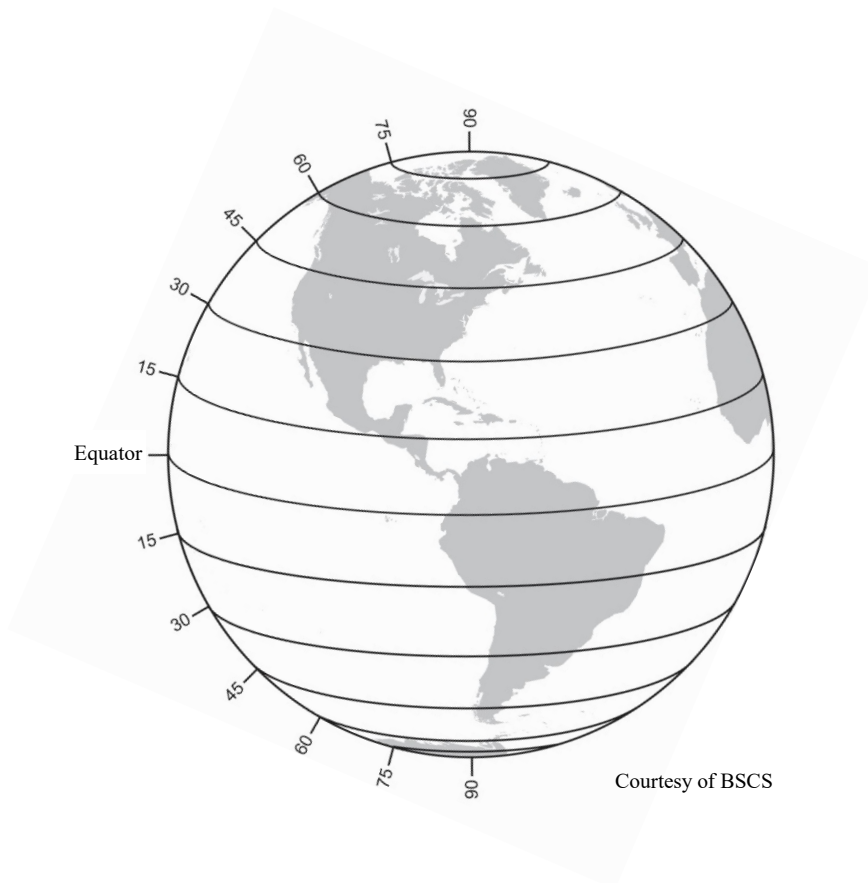
Ideal response:

The temperatures will decrease as I travel south from the equator, just like sailing to
60° N latitude.

d. Why do you make that prediction?

Ideal response:

The equator gets the most direct sunlight and energy, so the farther I travel north or
south from the equator, there will be less direct sunlight and energy, so the temperatures
will be cooler.



3. Latitudes and the Sun's Energy

Look at the diagram of Earth above that shows different latitudes.

- a. Which latitude receives the most energy from the Sun overall?

Ideal response:

The equator.

- b. Which latitudes receive the least energy from the Sun overall?

Ideal response:

The poles (latitudes 90° N and S).

- c. Why do you think the poles get less direct sunlight than the equator? (Explain your answer.)

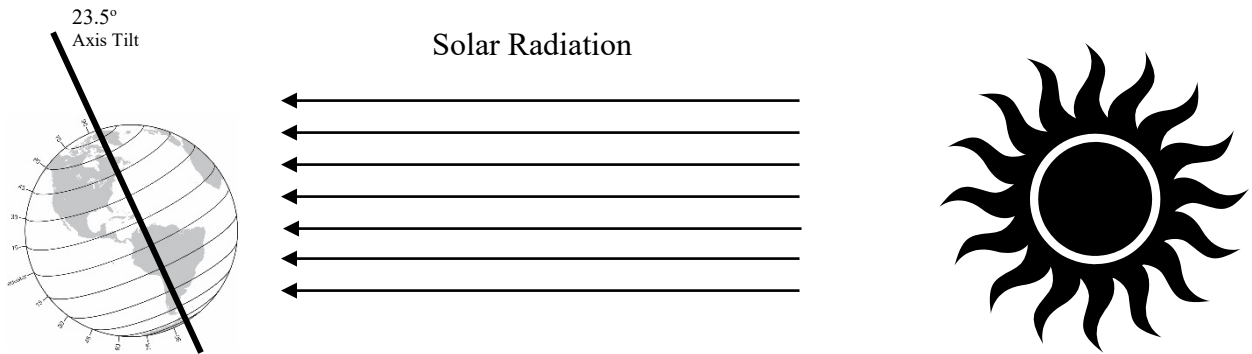
Ideal response:

The equator gets the most direct sunlight year-round. The angle of sunlight hitting the equator is more direct than it is at the poles, so the poles receive less direct sunlight.

4. Summer in South America

Notice the location of South America in the diagram of Earth in question 3.

- a. Draw a picture below that shows why it's hot (like summer) in January in South America.



Ideal response:

The drawing should show Earth and the Sun, with Earth tilted so that the Southern Hemisphere is pointing toward the Sun and the Northern Hemisphere is pointing away from the Sun.

- b. Explain your drawing.

Ideal response:

It's hot (like summer) in January in South America because Earth is tilted so that the Sun shines more directly on the Southern Hemisphere (the angle of sunlight is more direct or straight on), and the Sun's energy is more concentrated. This explains why South America is hotter in January than at other times of the year when the angle of sunlight is less direct.