



Dear Jax,  
How can it get cold when it's sunny out?  
Amanda Roach  
Gulf Breeze, Florida

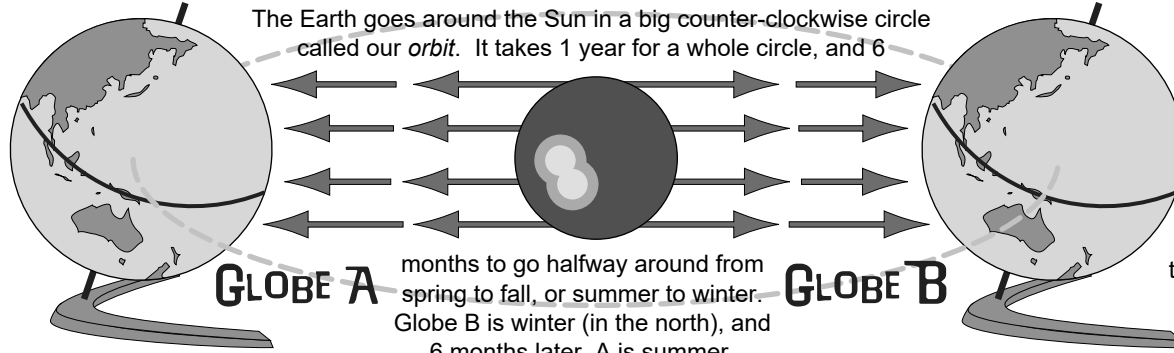
Beakman or Jax  
P.O. Box 30177  
Kansas City, MO 64112  
Question, name & address

Dear Amanda,  
Light from the sun is not the same thing as heat from the sun. The sun shines a lot of stuff at the Earth – light, ultraviolet radiation, even radio waves. And, of course, lots of heat.

This week begins winter in the Northern Hemisphere. It gets cold this time of year because the sun's radiant heat is spread out over a much larger area.

The radiant heat is the same; it just has to heat a bigger area. The different areas happen because the Earth is tilted on its axis.

*Jax Place*  
Jax Place



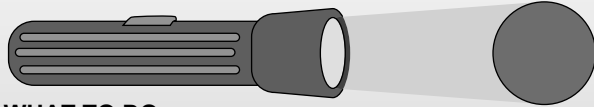
Look at globe A. Most of the sun's heat (arrows) is above the equator. Only 1 of the heat arrows is below the equator. That makes it summer above the equator and winter below it.

Globe B has most of the sun's heat aimed at the Southern Hemisphere, where it is summer, and winter's cold is in the Northern Hemisphere, where Amanda lives.

## experiment #1

### WHAT YOU NEED:

Flashlight - dark room or closet



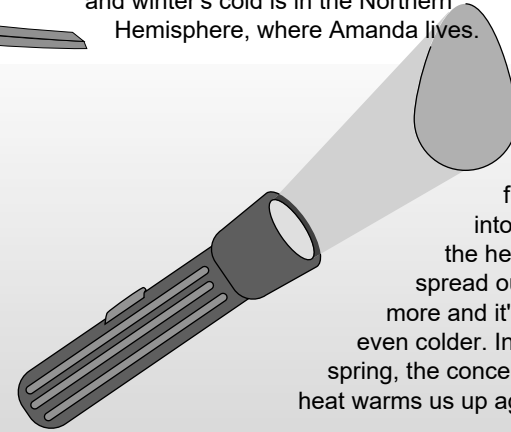
### WHAT TO DO:

Shine your flashlight directly at the wall like the drawing above. The light – and the heat – are concentrated into a small spot. Tilt the flashlight up and notice what happens to the shape of the

light. Notice its brightness compared to the other spot of light.

### WHAT IS GOING ON:

Pretend the light from the flashlight is heat from the sun. In the winter, the tilt of the Earth and the planet's curved surface spread the sun's heat out. That makes it colder. As we get



further into winter, the heat will spread out even more and it'll get even colder. In the spring, the concentrated heat warms us up again.