

# Why is it Hotter at the Equator than at the Poles

Name \_\_\_\_\_

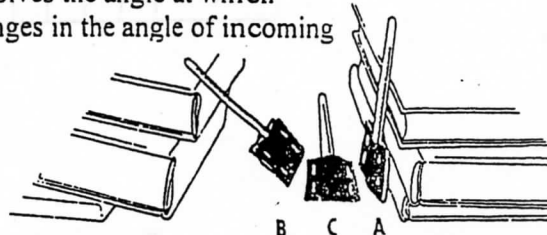
## Background

Two factors are crucial for determining the temperature of Earth's atmosphere and surface. One is day length. In summer, days are longer than nights and the total amount of energy received from the sun is high. If the day length was the only influence on Earth's surface temperature, the poles would be the hottest places on the planet during the summer times. This does not happen.

The other crucial factor affecting Earth's surface temperatures involves the angle at which sunlight strike earth. This activity is designed to explore how changes in the angle of incoming sunlight affects the way objects are heated.

## Procedure

1. Insert the thermometers into the black pockets.
2. Prop the thermometers as shown in Figure 3. One thermometer should be vertical(A), one slanted at about a 45 degree angle (B), and one horizontal(C). Make sure you can easily read the scales without touching them during the experiment.
3. Before turning on the lamp, record the temperature of all three thermometers in the Data Table under the "0 minutes" column.
4. Turn on the lamp and record temperatures for each thermometer every minute for 15 minutes. Record all temperatures in the Data Table.
5. Using the graph paper found at the end of the activity, make a graph of temperature versus *time for each thermometer*. To make comparison easier, plot the results for all three on the graph paper, with different lines to show the results from each thermometer.



## Questions/Conclusions

1. Which temperature showed the greatest temperature increase? Why?  
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2. Which thermometer(s) best represents the way sunlight strikes the equator?  
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3. The poles? \_\_\_\_\_
4. What parts of the globe would the third thermometer represent?  
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5. How can you explain the fact that the equator is always hotter than the poles?  
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6. If you were given a data table that listed the average yearly temperatures for cities as you go away from the equator, do you think you would see a trend in the temperatures?  
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7. If so what would this trend be and why would it exist?  
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DATA TABLE																	
Time (min.)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total change in temperature
Thermometer A																	
Thermometer E																	
Thermometer C																	

