

## TEACHER INFORMATION

# Seasons and Angle of Insolation

1. Editable Microsoft Word versions of the student pages and pre-configured TI-Nspire files can be found on the CD that accompanies this book. See *Appendix A* for more information.
2. If you use globes with adjustable tilt, make sure the tilt is 23.5 degrees.
3. You may wish to use a fan to cool the globe and probe between runs.
4. It is important that the tip of the Temperature Probe be in contact with the globe surface during data collection. Scotch<sup>®</sup> Magic<sup>™</sup> Tape seems to stick best to the globe. If tape will not hold the Temperature Probe in place, it is possible to hold the probe in place with your hand or clamp stand.
5. A Surface Temperature Sensor (order code STS-BTA) works very well for this experiment and is easier to tape to the globe than a Stainless Steel Temperature Probe.
6. A paper protractor cut in half makes it easier to read the angle of insolation than using a big protractor.
7. Longer data-collection durations can be used, if desired.
8. A 100 W clear bulb may be used, but temperature changes will be smaller. Compact florescent and LED bulbs should not be used for this lab.

## SAMPLE RESULTS

|                            |        |        |
|----------------------------|--------|--------|
| Beginning temperature (°C) | 23.4   |        |
|                            | Winter | Summer |
| Maximum temperature (°C)   | 23.6   | 24.7   |
| Minimum temperature (°C)   | 23.3   | 23.2   |
| Temperature change (°C)    | 0.3    | 1.5    |
| Angle of Insolation (°)    | 50     | 17     |

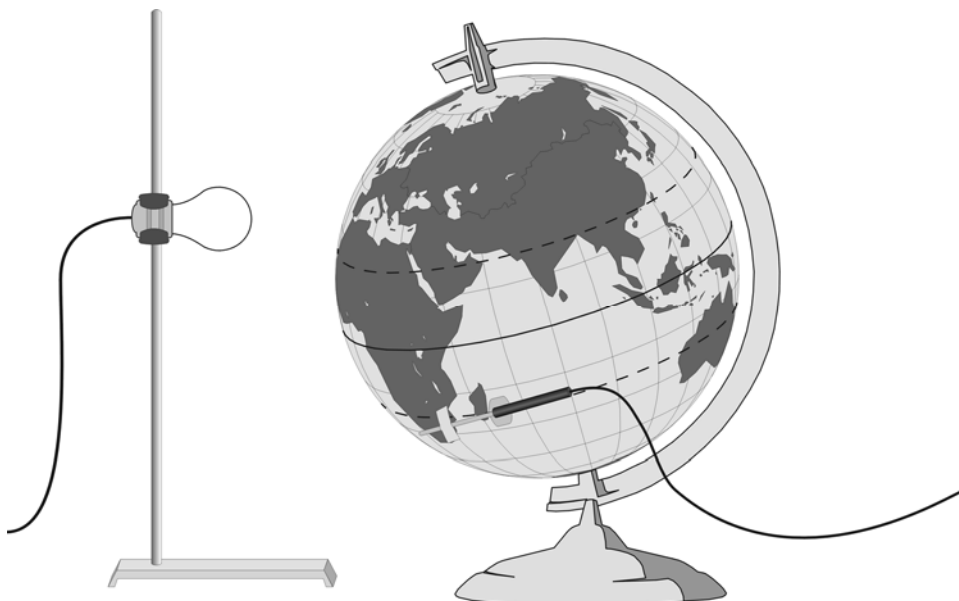
## ANSWERS TO QUESTIONS

1. The temperature change for summer is larger than that for winter.
2. In the Northern Hemisphere, the sunlight is more direct in the summer because the Earth is tipped toward the sun. A greater amount of solar radiation is directed at a smaller area.

## ***Experiment 8***

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3. If the Earth were tilted at a greater angle, summers would be warmer and winters would be cooler.
4. The smaller the angle of insolation, the greater the temperature change.
- 5.



6. Other factors that affect weather in an area include proximity to water, movement of air masses, and geographic features.

## **ACKNOWLEDGEMENT**

We wish to thank Don Volz and Sandy Sapatka for their help in developing and testing this experiment.