Tracking Sunrise and Sunset

Summary

Students will collect, record, and graph the sunrise and sunset times.

Group Size

Individual

Materials

- Times of sunrise and sunset
- Graph paper
- Paper
- Pencil
- Colored pencils
- Rulers

Background for Teachers

Earth's axis is tilted with respect to the sun at an angle of 23.5°. Earth's tilt affects both the intensity of the sunlight we receive and the number of daylight hours. The *summer solstice*, which is the longest day and shortest night of the year, occurs on or near June 21st for the northern hemisphere. After June 21st, the days get shorter until on or near December 21 when the northern hemisphere has the *winter solstice*, the shortest day and longest night. There are also two *equinoxes* throughout the year: one occurs on or near March 20, the other on or near September 23. You can observe the changing number of daylight hours by recording and graphing the time of sunrise and sunset.

Intended Learning Outcomes

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning

Instructional Procedures

Invitation to Learn

Ask students to write how the time of the sunrise and time of the sunset changes throughout the year.

Instructional Procedures

Have students create a table similar to the one below on a sheet of paper to record their data.

Date	Sunrise	Sunset
1/21		
2/21		
3/21		
4/21		
5/21		
...		
12/21		

The time of sunrise and sunset can be obtained from various sources. One way is using the "Starry Night Backyard" program. Another is going to the Web site http://aa.usno.navy.mil/data/docs/RS_OneYear.html, this will give you the actual sunrise and sunset times for a whole year.

Have students record the times in their charts.

Note: This works best if you use military standard time.
Finally, have students create a graph of their data. There are several ways to do this. You may have them do it on there own or in groups. In classes with special needs students you may choose to create a class graph on a large piece of paper.
Have students make a grid and label the vertical axis *time of day* and the horizontal axis *date of observation*.
Have students plot the data and connect the dots with a line.
Students may color in the area above and below the graph (optional).

Extensions

Sunrise and sunset data for a period of time (e.g., September to December) may be collected from your local newspaper. Each time you collect the data, record it on a large graph and then have students add the new data to their science journals.

Assessment Plan

How does the length of day change with the seasons?
How many hours of daylight did we receive on June 21st, September 21st, December 21st, and March 21st? What is special about these dates?

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