Identifying Aurora Shapes

Overview:

Students apply what they have learned about aurora shapes in the classroom to the real world. Because the activity depends on aurora activity in your area, check the *Geophysical Institute Aurora Forecast* website: (http://www.gedds.alaska.edu/AuroraForecast) before giving the assignment. Additionally, students are expected to spend time outside on two different nights observing the aurora; please keep this in mind when assigning the activity.

Objectives:

The student will:

- apply knowledge gained during in-class activities to the real-world;
- experience the aurora first-hand; and
- collect data about aurora shapes in their area over a period of time.

Materials:

- Watches or portable clocks
- STUDENT WORKSHEET: "Identifying Aurora Shapes"

Activity Procedure:

1. Distribute the STUDENT WORKSHEET: "Identifying Aurora Shapes."
2. Explain that aurora scientists often spend night after night watching the aurora.
3. Assign students field research, observing the aurora during two different nights. They are not expected to spend the entire night outside watching the sky, but should spend at least an hour each time. Remind students to dress appropriately for outdoor observations.
4. Ask students to check off the hypothesis they think will be most accurate at the top of their worksheet.

Alternate Activity: *If you are located in an area where aurora activity is rare, students may do an aurora shapes scavenger hunt on the Internet. Ask students to look for images or photographs of the different aurora shapes. Once they have identified an image that represents the shape they are looking for, students write down the Internet address for the image and turn it in to the teacher.*

Answers to Student Worksheet:

Data, Analysis of Data and Conclusion: *Answers will vary.*

Further Questions:

1. *Answers will vary. However, students should understand that by observing over a greater amount of time they are more likely to witness a greater variety of aurora forms.*
2. *Answers will vary. Students should demonstrate an understanding that the aurora is not consistent, and thus some nights there will be more aurora than others. Additionally, aurora activity is dynamic over the course of the evening. You may be able to demonstrate this fact by having students compare their findings. For example, one student observing from 9:00 p.m. to 10:00 p.m. may see little aurora activity,*

Name:_____ **Student Worksheet (1 of 3)**

Identifying Aurora Shapes

Testable Question:

Can the four aurora shapes studied in class be observed in my community?

Background Information:

The aurora is a constantly changing phenomenon which occurs in some parts of the world more regularly than others. Though each display is unique, the aurora occurs in certain shapes or patterns which can be observed wherever the aurora can be seen.

Your teacher has done research to determine that it is likely there will be aurora in your area over the next few nights. To complete this activity, you must spend time observing the night sky, looking for commonly seen aurora shapes.

Hypothesis:

Use the background information provided by your teacher or on this worksheet to make a hypothesis (Check one):

_____ The four aurora shapes we studied in class will be observed in my area on the assigned nights.

_____ The four aurora shapes we studied in class will not be observed in my area on the assigned nights.

Experiment:

Materials:

- Watch or portable clock
- STUDENT WORKSHEET: "Identifying Aurora Shapes"

Procedure:

1. On the nights assigned, dress appropriately and go outside to an area where you have a clear view of the sky.
2. Record the date, location and start time in the spaces above your data table. Begin observing the aurora.
3. Watch for aurora activity and identify any shapes you see (quiet arc, rayed bands, long aurora rays, patches). When you observe a shape, write it in the "Aurora Shape" column of your data table. Record the time that the shape appeared in the "Time Observed" column and make notes about color, intensity and duration in the "Notes" column.
4. Continue observing the aurora for at least one hour. When you decide to quit for the night, record your "Stop Time."

Name: _____ **Student Worksheet (2 of 3)**

Identifying Aurora Shapes

Data:

In the table below, record the data you collected while observing the aurora. You have been given space for at least two nights of observations. Use notebook paper if you need additional space for data.

Date: _____ **Location:** _____

Start Time: _____ **Stop Time:** _____

Aurora Shape	Time Observed	Notes (color, intensity, duration)

Date: _____ **Location:** _____

Start Time: _____ **Stop Time:** _____

Aurora Shape	Time Observed	Notes (color, intensity, duration)

Name:_____ **Student Worksheet (3 of 3)**

Identifying Aurora Shapes

Analysis of Data:

1. I observed the following aurora shapes:

   A. quiet arc
   B. rayed bands
   C. patches
   D. long aurora rays

2. When I was observing the aurora, I saw the following colors:

_____

_____

Conclusion:

Place a check next to your conclusion:

_____The four aurora shapes we studied in class were observed in my area on the assigned nights.

_____The four aurora shapes we studied in class were not observed in my area on the assigned nights.

Was your original hypothesis proved or disproved? Use a complete sentence.

_____

Explain what evidence supports your conclusion. Use complete sentences.

_____

_____

Further Questions:

1. Why is it important to spend more than one night observing the aurora?

_____

_____

2. How might making your observations on different nights, or at different times during the night, have an impact on your conclusion?

_____

_____

