Fictitious Planets

Overview:

A planet can have an aurora oval that is always glowing if it meets three conditions: (1) it collides with particles from the solar wind; (2) it has a thick atmosphere of gases, and (3) it has a strong magnetic field. These characteristics can be used to predict the existence of the aurora on planets other than Earth. In this activity, students examine features of fictitious planets to determine if each planet could have an aurora.

Objectives:

The student will:

- identify characteristics necessary for an aurora to occur;
- predict the occurrence of auroras based on information presented about fictitious planets; and
- provide reasons for the predictions they make.

Materials:

- STUDENT INFORMATION SHEET: "Fictitious Planets"
- STUDENT WORKSHEET: "Aurora or Not?"

Procedure:

1. Review the characteristics necessary for a planet to have an aurora.
2. Hand out the STUDENT INFORMATION SHEET: "Fictitious Planets" and STUDENT WORKSHEET: "Aurora or Not?" Review the STUDENT INFORMATION SHEET with the class. Ask students to use information on this sheet to complete the STUDENT WORKSHEET: "Aurora or Not?"

Student Answers:

Name	***Aurora Y/N***	***Reason***
Elvey	*N*	*No atmosphere, weak magnetosphere.*
Bunnell	*Y*	*Has atmosphere with clouds and magnetic poles.*
Irving	*Y*	*Has atmosphere and magnetic poles.*
Brooks	*N*	*No magnetosphere.*
Eielson	*N*	*No atmosphere.*
Gruening	*Y*	*Has atmosphere and magnetosphere.*

Fictitious Planets

Far in the future, you and a team of fellow scientists discover another system of six planets orbiting a star much like our sun. You name the planets Elvey, Bunnell, Irving, Brooks, Eielson, and Gruening after buildings at the University of Alaska Fairbanks where you went to college. After investigation, you make the following observations about each of the planets.

Planet Characteristics Chart

Name	Characteristics
Elvey	Elvey is very hot because it is so close to the sun in its solar system. It is doubtful life could exist in such a hostile place. This small planet doesn't have enough mass to hold on to an atmosphere, but there may be a weak magnetosphere.
Bunnell	Bunnell is the 2nd planet from the sun. Its axis is tilted nearly 70 degrees toward its sun, but its magnetic poles are pointed nearly at its equator. Clouds often hang in the atmosphere near the surface of the planet.
Irving	Of all the planets in this new solar system, Irving seems to be most like Earth. Several gases have been observed in the atmosphere and the magnetic poles seem to be close to the geographic poles.
Brooks	Brooks has very thick clouds covering its dense atmosphere. These clouds have kept scientists from being able to study the planet's surface. So far, there is no indication of a magnetosphere.
Eielson	Eielson is the only planet surrounded by rings. Originally, it was thought that Eielson had an atmosphere because thin clouds seemed to float near its surface. Now scientists believe the clouds are probably just dust from the rings. Even though it does not have an atmosphere, it does have a magnetosphere.
Gruening	Because it is so far from the sun, this planet would be too cold to support life as we know it. It takes 120 years for the planet to orbit its sun. This planet does not have any nitrogen in its atmosphere, but it does have a thick atmosphere of other gases. There are indications that it has a magnetosphere.

Name:_____ **Student Worksheet**

Aurora or Not?

Directions: Using the information on the STUDENT INFORMATION SHEET: "Fictitious Planets," predict if you would expect to find an aurora on each of the planets listed below. Be sure to write down the reason for your prediction.

Aurora or Not?

Name	Aurora Y/N	Reason

