

PARTICLE COLLISION

Lesson Summary:

This activity reinforces the idea that the aurora is created when particles from the sun collide with gas particles in Earth's atmosphere about 60 to 600 miles high. The lesson focuses on the auroral colors: green, purple, and red. The greenish-glow is produced by oxygen in Earth's atmosphere; the purplish glow is produced by nitrogen; and the rare red aurora is produced by high-altitude oxygen in Earth's atmosphere.

Objectives:

The student will:

- discover the aurora is created when particles from the sun collide with gas particles in Earth's atmosphere about 60 to 600 miles high;
- determine when the sun's particles collide with oxygen in Earth's atmosphere, a greenish glow is produced;
- observe when the sun's particles collide with nitrogen in Earth's atmosphere, a purplish glow is produced;
- determine when the sun's particles collide with high-altitude oxygen in Earth's atmosphere, a reddish glow is produced; and
- conclude particles in the atmosphere are more dense at lower elevations and less dense at higher elevations.

GLEs Addressed:

Science

- [5-8] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [7] SB1.1 The student demonstrates an understanding of the structure and properties of matter by using physical properties (e.g., density, boiling point, freezing point, conductivity) to differentiate among and/or separate materials (i.e., elements, compounds, and mixtures).
- [8] SB1.1 The student demonstrates an understanding of the structure and properties of matter by using physical and chemical properties (i.e., density, boiling point, freezing point, conductivity, flammability) to differentiate among materials (i.e., elements, compounds, and mixtures).
- [9] SD3.2 The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by explaining the phenomena of the aurora.

Search Terms:

- aurora
- Northern Lights
- solar particles
- gas particles
- Earth's atmosphere
- aurora colors
- oxygen
- nitrogen
- gases