

AURORAS Reading Comprehension

Auroras, often called Northern Lights (Aurora Borealis) and Southern Lights (Aurora Australis), are spectacular light displays most commonly viewed in the polar regions. Auroras occur because of interactions between Earth's magnetic field and solar winds. The solar wind is a stream of charged particles emitted from the sun's corona that travels far into space at speeds of up to 400 miles per second. Charged particles within the solar winds collide with atmospheric atoms and molecules when they reach Earth's magnetic field. The collisions cause quantum leaps, which means the kinetic energy within the electrons of the particles are converted to light. The collisions of different particles result in different-colored lights. Atomic oxygen produces red and green lights; nitrogen produces pink, blue, or violet light; helium produces purple lights; and neon produces rippled orange light. Auroras come in a vast array of shapes and forms such as arcs, swirls, "curtains," and glowing shapes. They often appear to be moving.

Auroras often occur as a result of a geomagnetic storm. A geomagnetic storm is the temporary disturbance of the Earth's magnetic field as a result of an event in space such as a solar flare or coronal mass ejection (the ejection of charged particles from the sun's corona). In noteworthy geomagnetic storms, auroras can be seen well south (or north) of where they usually occur. The famous Great Geomagnetic Storms of 1859 produced what witnesses called the most spectacular auroras ever seen. Such auroras were seen throughout the United States, Japan, and Australia. The event lasted for almost a week.

- 1.) **Quantum leaps are caused by...**
 - a.) the collision of solar winds with atoms and particles within Earth's magnetic fields.
 - b.) the collision of solar winds with the sun's corona.
 - c.) the collision of solar winds with Earth's winds.
 - d.) the collapse of Earth's magnetic field.

- 2.) **If the answer to a question is "the Geomagnetic Storms of 1859," what could be the question?**
 - a.) What was an example of a noteworthy geomagnetic storm?
 - b.) Can auroras be seen away from the North or South Poles?
 - c.) When do charged particles collide?
 - d.) What is one way an aurora can form?

- 3.) **Which of the following questions about auroras is NOT answered in the passage?**
 - a.) How many auroras normally occur in a year?
 - b.) How fast does solar wind travel?
 - c.) What are some reasons auroras occur?
 - d.) Have auroras ever been seen in Australia?

- 4.) **If you were to make a "recipe" for an aurora, which of the following "ingredients" would be unnecessary?**
 - a.) the conversion of kinetic energy to light
 - b.) particle collisions
 - c.) solar wind
 - d.) people

- 5.) **The collision of neon particles produces _____ light.**
 - a.) orange
 - b.) red
 - c.) purple
 - d.) blue

- 6.) **Where would I MOST likely view the Aurora Borealis?**
 - a.) equator
 - b.) the sun
 - c.) South Pole
 - d.) North Pole

- 7.) **Which is NOT true about auroras?**
 - a.) They often appear to be in motion.
 - b.) They are most often viewed in the polar regions.
 - c.) They can appear as curtains, shapes, or swirls.
 - d.) A geomagnetic storm is a permanent disturbance in Earth's magnetic field.

8.) What could be an antonym of the word "commonly" in the sentence below:

Auroras, often called Northern Lights (Aurora Borealis) and Southern Lights (Aurora Australis), are spectacular light displays most commonly viewed in the polar regions.

- a.) rarely
- b.) never
- c.) often
- d.) lately

9.) Which of the following could be an EFFECT of a geomagnetic storm?

- a.) Earth's magnetic field
- b.) an aurora
- c.) the sun
- d.) a mass coronal ejection

10.) What is the best definition of the word "emitted" as used in the sentence below:

The solar wind is a stream of charged particles emitted from the sun's corona that travels far into space at speeds of up to 400 miles per second.

- a.) grew
- b.) taken from
- c.) released
- d.) spun