

Cause and Effect

Overview:

The aurora acts like a huge generator that produces up to 10 million megawatts of electrical power. This power can disrupt our systems on Earth and in space. (As a result of this lesson, students may consider the aurora harmful. Pay careful attention to misconceptions and questions that arise as a result of the effects of the aurora.)

Objectives:

The student will:

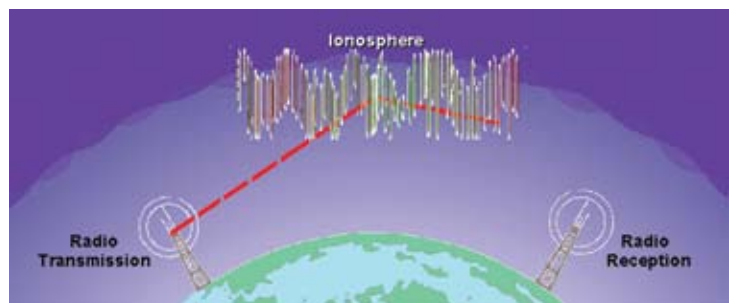
- review the terms “cause” and “effect;”
- discuss how the aurora affects the environment; and
- examine basic risk analysis.

Materials:

- *Aurora Alive* multimedia video playlist
- STUDENT WORKSHEET: “Cause and Effect”

Activity Procedure:

1. Review the terms “cause” and “effect.”
2. Hand out the STUDENT WORKSHEET: “Cause and Effect” and ask students to review the Aurora Effects unit on the *Aurora Alive* multimedia video playlist.
3. Help students complete the worksheet.



Answers to Student Worksheet:

1. *A large aurora display can create a different kind of electricity current that can heat up transformers, causing them to fail.*
2. *satellites destroyed*
3. *Aurora can interfere with the process of radar absorbing or reflecting the waves, causing them to bounce off in different directions.*
4. *The trans-Alaska pipeline is eaten up by a destructive process known as corrosion.*

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Directions: Review the Aurora Effects Unit on the *Aurora Alive* playlist to fill in the chart below.

Cause <i>(Why did it happen?)</i>	Effect <i>(What Happened?)</i>
EXAMPLE A large aurora can deform the ionosphere creating a dimple. These dimples can absorb radio waves, or cause them to bounce back to Earth in unexpected places.	EXAMPLE Radio communication disrupted.
1.	Electrical power outage in Quebec, Canada
Electrical energy from the aurora can heat and expand Earth's atmosphere. This expansion slows down some satellites, causing them to travel at lower and lower altitudes.	2.
3.	Radar works improperly.
The aurora creates an electric current underground. This electric current travels through metal objects such as the trans-Alaska pipeline.	4.