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**SYNOPSIS:**

Seen from a distance, lightning can look like a spectacular fireworks show. But this most frequent of weather phenomena, striking earth more than 100 times every second, is responsible for hundreds of deaths and millions of dollars worth of property damage every year.

What is lightning? What causes it? This program takes a close look at this awesome force of nature. Learn about the different kinds of lightning, what scientists are doing to increase our knowledge about it and help us deal with it, and what we can do to protect ourselves in the event that we are caught in a thunderstorm.

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**CURRICULUM UNITS:**

Earth Science  
General Science  
Meteorology  
Safety

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**CAREER OPPORTUNITIES:**

Climatologist  
Data Analyst  
Electrical Engineer  
Electrician  
Electronic Technician  
Meteorologist  
Test Engineer  
TV Weather Reporter  
Weather Forecaster

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**PROGRAM OVERVIEW:**

Lightning can occur within a cloud, between clouds, or between a cloud and earth. The direction of movement is usually cloud to earth, but it can also be from earth to cloud. This program explains the relationship between thunderstorms and lightning; and shows various kinds of lightning including common sheet lightning, rare ball lightning, and two newly observed forms, red sprites and blue jets.

The program shows how scientists are able to study this very powerful and essentially unpredictable force. Researchers at the National Severe Storms Laboratory in Okalahoma gather data using weather balloons or highflying aircraft. Scientists at the Kennedy Space Center Lightning Research and Test Facility draw lightning where they want it by launching wire-trailing rockets during thunderstorms. The National Lightning Detection Network tracks and issues warnings of dangerous approaching electrical storms as it records lightning strikes nationwide.

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**ISSUES AND CRITICAL THINKING:**

1. After viewing this program:  
What is lightning?  
What are the different kinds of lightning?  
What are some ways researchers study lightning?  
What does the National Lightning Detection Network do with the information it collects?  
What are some do's and don'ts during thunder storms?
2. Lightning is very frequent in Florida and the Great Plains states. Is lightning common in your area of the country? What time of the year does it often occur? Ask the students to tell what precautions their families take during electrical storms. Lead a discussion about how the NOAA safety tips may be adapted for your area.
3. Have students research the type of equipment they would need to forecast the weather from earth and the type of equipments they would need to forecast the weather from space.
4. Ask students to think of different ways technology might be able to modify weather.

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**GLOSSARY:**

**BALL LIGHTNING-** a rare mysterious lightning that appears as a glowing ball, usually seen moving along power and telephone lines. It has been observed passing through solids without damaging them. Also known as St. Elmo's Fire, ball lightning has been recreated in a laboratory.

**BLUE JET-** a form of lightning recently observed from a space shuttle as blue jets of light shooting from the tops of high clouds into space.

**ELECTRICAL DISCHARGE-** a release of static electricity, which has built up in an object, such as a bolt of lightning.

**LIGHTNING ROD-** a metal rod and grounding wire, which is fastened to tall structures such as buildings and towers, to protect them from lightning damage by safely attracting and discharging static electricity.

**RED SPRITE-** another recently discovered form of lightning, observed from a space shuttle as giant red flashes of light shooting into space from the tops of high clouds.

**ST. ELMO'S FIRE-** the name originally given to ball lightning by sailors who observed it in the rigging of their tall ships.

**SHEET LIGHTNING-** the most common form of lightning, occurring within a single cloud or between clouds, and often appearing as a pulsing glow.

**STATIC ELECTRICITY-** a form of electricity that builds up in or on an object until in discharges.

**VOLTAGE-** a measurement of the force or power of an electrical discharge or current.

## The Wonders of Earth Science



K4521DVD

# METEOROLOGY: LIGHTNING - MYSTERIOUS POWER



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