



IT'S ELECTRIC!

AT A GLANCE

GRADE LEVEL

- Grade K-2, 3-5, 6-8

TIME REQUIRED

- 5-10 minutes prep time
- 15-25 minutes classtime

FORMAT

- Individual exploration
- Small group
- Large group demonstration

MATERIALS

- $\frac{3}{4}$ inch diameter PVC pipe (2-3 feet in length)
- Aluminum foil, cut into small squares
- Paper towels or pieces of felt
- Pencils and science journal (or related materials to record observations)

THE SCIENCE EXPLAINED

Static electricity is the build-up of an electrical charge on the surface of an object – in this case, the PVC pipe. When you rub the pipe, it builds up a big charge. Objects can have a positive or negative charge, and opposite charges are attracted to each other.

Lightning begins as static charges in a rain cloud. As the charges build up, eventually they need to escape or discharge and ZAP! Lightning appears!

LESSON SUMMARY

Explore how lightning forms in this hands-on activity that demonstrates static electricity.

OBJECTIVES

The learner will:

- Model the concept of lightning as a sudden discharge of static electricity, using the movement of foil pieces as an analogy.
- Relate the demonstration to natural phenomena, specifically how lightning forms due to charge buildup and sudden discharge between clouds and the ground.

PROCEDURE

Step One

Take a piece of aluminum foil and cut or pull off small pieces. Place on a flat surface

Step Two

Rub a piece of felt or paper towel over the PVC pipe for one minute

Step Three

Wave the PVC pipe over the small pieces of aluminum foil

Step Four

Have students observe what happens, and record observations in their science journals

IT'S ELECTRIC AND NOAA GEOSTATIONARY SATELLITES



CONNECTIONS

GOES-19 continues the revolutionary improvements brought by GOES-16, 17, and 18, including mapping lightning from space.

The Geostationary Lightning Mapper (GLM) measures in-cloud, cloud-to-cloud and cloud-to-ground lightning. It is the first operational lightning mapper flown in geostationary orbit.

GLM provides critical information to forecasters, allowing them to focus on developing severe storms much earlier and before these storms produce damaging winds, hail or even tornadoes.

Did you know ...

GLM is unique to the GOES-R Series, debuting in 2016 onboard GOES-16. The first GLM images from GOES-16 were captured on February 14, 2017 when lightning was detected within a storm over Texas.

KEY RESOURCES

Learn more about lightning with SciJinks!

Select the link or scan the QR code to visit the page:

[SciJinks - What Causes Lightning and Thunder?](#)



THINKING OUTSIDE THE BOX

Discussion Prompts and Extension Activities



DISCUSSION AND JOURNAL PROMPTS

- Draw a stormy scene and include a thunderstorm with lightning.
- Create an illustrated vocabulary list. Define the following types of lightning and illustrate each:
 - Cloud-to-Cloud
 - Cloud-to-Ground
 - Intra-Cloud
 - Cloud-to-Air
- Create a table to track severe weather in your local area for 30 days. Note if any of the severe weather included lightning activity.

SUGGESTED EXTENSION ACTIVITIES

- Partner with an upper grade level (e.g. 2nd and 6th grades). Have the older students set up the demonstration, and then assist the younger students through the activity.