



Making Lightning

Overview

What is lightning? When does it occur and why does it happen? In this activity, we explore how lightning forms and how we can make our own lightning at home using static electricity.



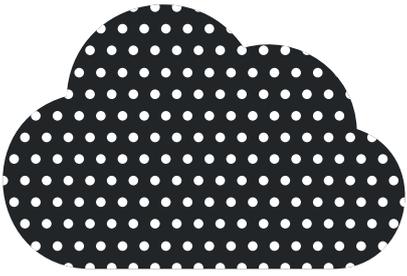
Time required

60 minutes



Materials required

- Balloon
- Metal spoon (anything metal)
- Wool jumper
- Dark room
- Internet



Activity Steps

01 What is lightning and what causes it?

Lightning is a huge electrical discharge that flows between clouds, from a cloud to air, or from a cloud to the ground.

As many water droplets form inside a storm cloud, they are propelled towards the top of the cloud by strong internal winds (updraughts) where they turn to ice. Some of the pieces of ice grow into hail, but others remain very small. Some of the hail that forms becomes too heavy to be propelled by the updraughts and so begin to fall back through the cloud, bumping into smaller ice particles as they do so. During these collisions, electrons are transferred to the hail giving the hail a negative charge, while the ice particles that have lost electrons gain a positive charge.

The updraughts continue to carry the ice particles upwards, giving the top of the cloud a positive charge. The hail continues to fall through in the lower part of the cloud, giving it a negative charge. As well as being attracted to the positive charge in the top of the cloud, the surplus of electrons in the cloud base are attracted to positive charge in other clouds and on the ground. If the attraction is strong enough, the electrons will rapidly move towards the positive atoms. The path they make in doing so forms the channel we see during a flash of lightning.

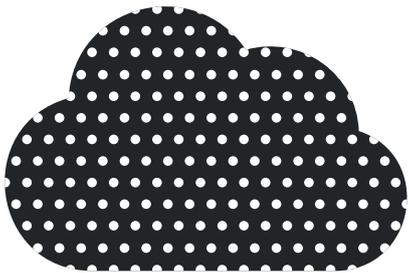
As negative charge builds at the base of the cloud, the electrons near the ground's surface are repelled. This leaves the ground and the objects on it with a positive charge. As the attraction between the cloud and the ground grows stronger, electrons shoot down from the cloud cutting through the air at around 270,000 miles per hour.

You can read more on this [here](#).

02 Experiment

Let's see if we can make our own Lightning! Follow the steps below:

- Blow up a balloon and tie the end.
- Go to a dark room with all the materials.
- Hold the balloon where it's tied.
- Rub the inflated balloon on a wool jumper or your head quickly.
- Get the balloon close to the metal spoon or object and when it is close enough, you will see a tiny spark jump from the balloon to the metal.
- If you don't see any sparks, try rubbing the balloon on the wool jumper or on your head while you're sitting on a chair, or wearing shoes.



03 What happened?

Lightning happens when static electricity is produced inside a thundercloud. Unlike lightning, however, our tiny spark of static electricity moves from the balloon to the metal object, and not a cloud to the ground.

When you rub the balloon on the wool you are transferring positive electrical charge to the balloon leaving negative electrical charge the wool. So, when you take the metal spoon and touch the balloon you return the positive charge back to you through the spoon and to the ground, creating a spark.

The inflated balloon is used to create the static electricity. When it is placed near to a metal object or surface, the imbalance is equalized through the spark that is created. The metal spoon is acting as a conductor. A conductor is an object that electricity can easily move through. When the spoon comes down to touch the positively charged balloon, the positive charge connects to meet the negative charge in the spoon.

This creates the “lightning” we see, because this is very similar to what happens in clouds.

Tip

To find out more, have a look at our [Lightning map](#) which you can use to see if there's been any strikes in your location.