

Lightning

Demonstrate the principle by which lightning occurs by taking advantage of water's polarization properties.

Difficulty / Time Commitment:

2 out of 10

Coolness Factor:

7 out of 10

Materials:

· plastic comb · sink

Instructions:

1. Rub the comb through your hair several times.
2. Run a steady, narrow stream of water from the sink.
3. Slowly bring the comb towards the stream of water and watch the stream of water bend towards the comb.

What Happened?

The stream of water from the sink was attracted to the comb because they had opposite charges, just like lightning. We can think of the comb as the base of the cloud and the stream of water as the ground. After we ran the comb through hair, the comb acquired a negative charge, just like the base of a thunderstorm cloud. Through induced polarization, the stream of water (ground) acquired an opposite charge (positive). Negative and positive charges attract, just as the comb and the water attracted, and this is how lightning occurs.

Basic Concepts Learned:

- Opposite charges attract.
- Lightning is usually an attraction between negative charges in the lower part of thunderstorm clouds (cumulonimbus) and positive charges on the ground.
- The cloud obtains a negative charge first, and in response, the ground obtains a positive charge.