

Traditional: 08-08

Themed: 05-10

Lightning

Electrostatics: Capacitance (internet source 1)

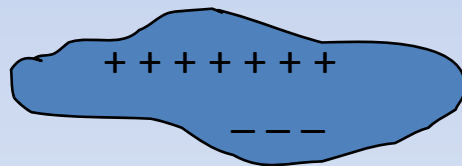
Lightning



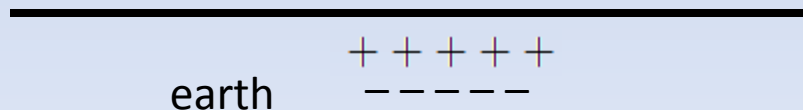
Moisture accumulates in the atmosphere as a cloud containing millions upon millions of suspended water droplets and ice.

These ice droplets collide with each other as the moisture rises. **The importance of these collisions is that electrons are transferred between particles.**

The larger ones accumulate electrons and fall toward earth from gravity. The smaller ones have a positive potential and rise to the top of the clouds.

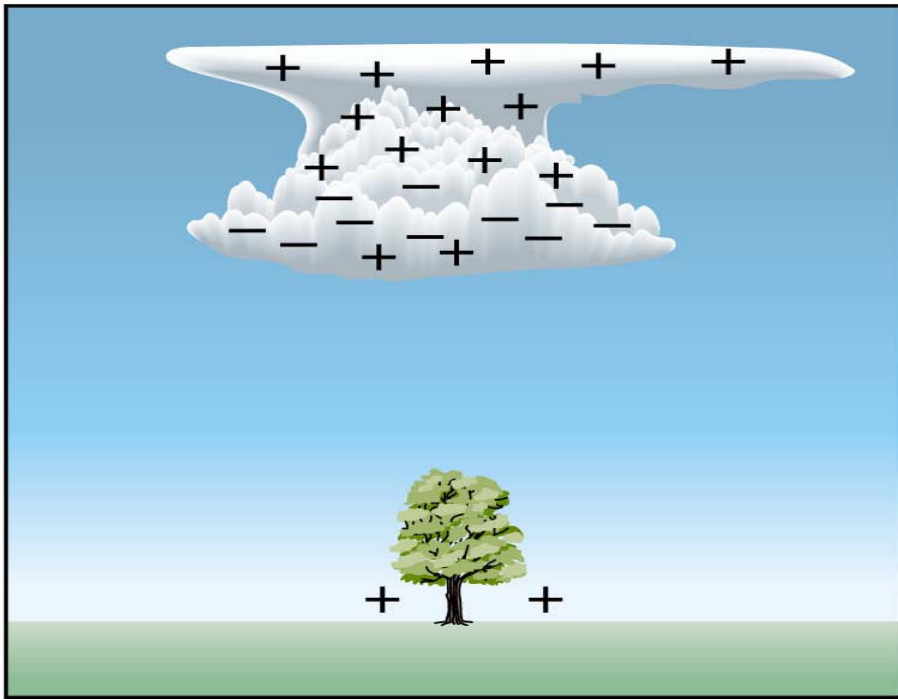


This mimics a capacitor. When the voltage becomes high enough, lightning strikes by ionizing the air and creating a conductive path to ground.

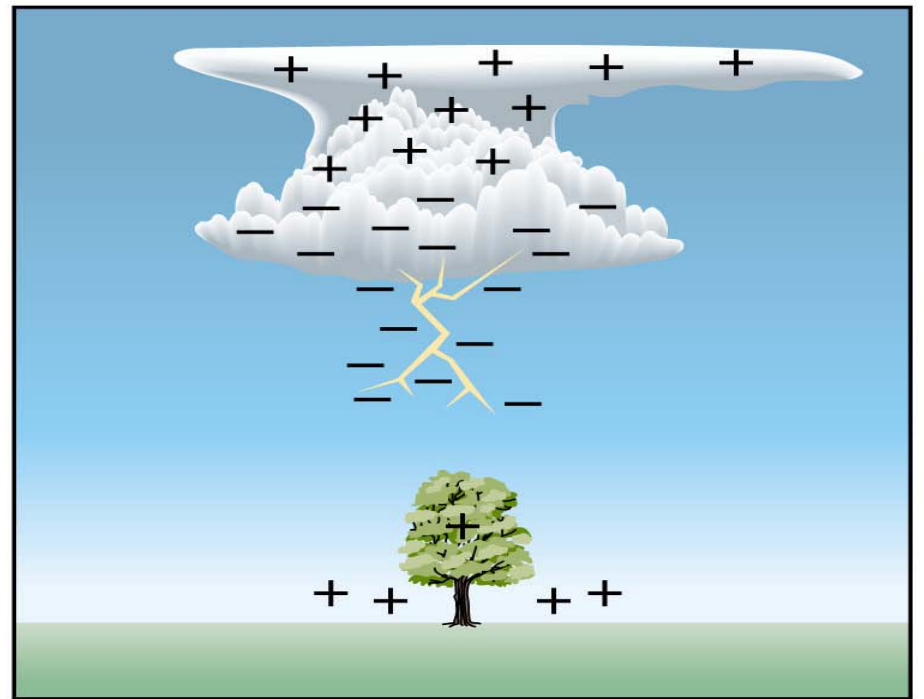


Lightning/capacitor: <http://micro.magnet.fsu.edu/electromag/java/lightning/index.html>

Development of lightning

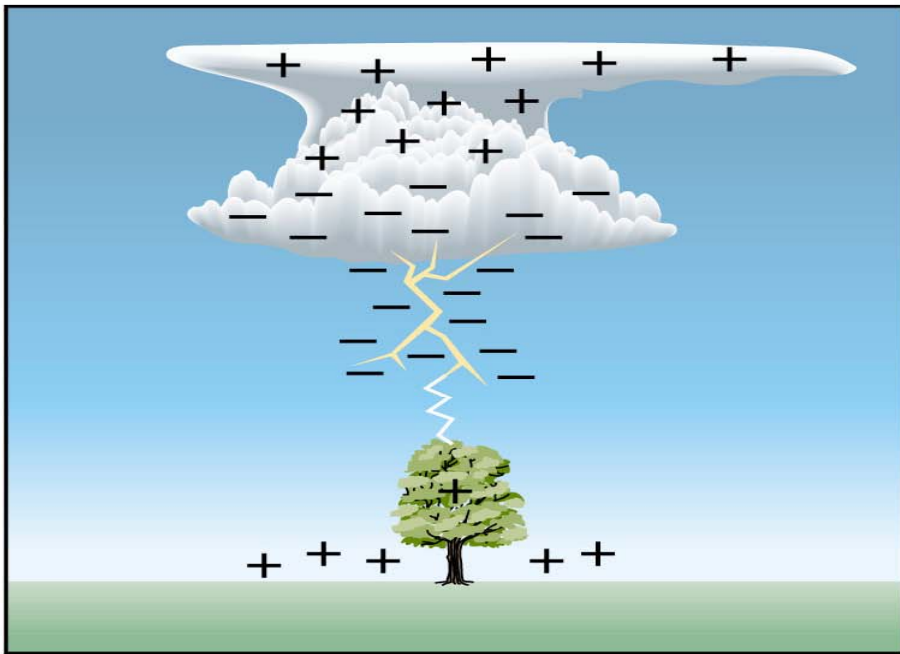


(a)

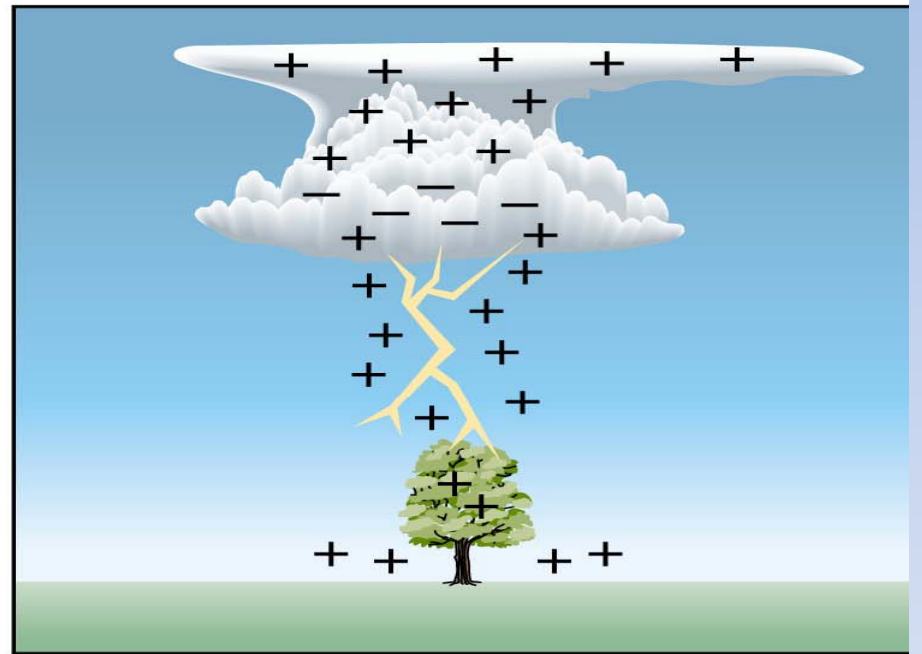


(b)

Development of lightning



(c)



(d)

Thunder

- The explosive expansion of air associated with a lightning stroke causes thunder**
- Sound lags behind sight of lightning by 5 sec./mile (**Memorize this!**)
- Lightning without thunder being heard is sometimes called *heat lightning*
- Rumbling caused by sound echoing off topographic features and buildings

Lightning Safety

- The safest area to be during a thunderstorm is indoors
- One should not be in contact with electrical appliances or telephones
- Do not stand under trees
- Automobiles are also safe as electricity will be conducted to the ground through the shell and not the interior (*Faraday cage*)