



Primary types of lightning

Cloud-to-Ground:

- Most damaging and dangerous
- Best understood
- Most flashes originate near the lower negative charge center and deliver negative charge to Earth—a negative lightning strike
- However, an appreciable minority of flashes carry positive charge to Earth—a *positive* lightning strike
 Often occur during the dissipating stage of a
 - thunderstorm's life
 - More common as a percentage of total ground strikes during the winter months.

Primary types of lightning

Intra-Cloud: (in-cloud)

- Most common form
- Occurs between oppositely charged centers within the same cloud
- Usually takes place within the cloud
- From the outside, it looks like a diffuse brightening that flickers
- The flash may exit the boundary of the cloud such that a bright channel, similar to a cloud-to-ground flash, can be visible for many miles

Primary types of lightning

Inter-Cloud: (cloud-cloud)

- Occurs between charge centers in two different ÷. clouds
- Discharge bridges a gap of clear air between them

Additional types of electric phenomena above the cloud

Red sprites, blue jets, elves (flashes above the cloud toward the ionosphere)







Thunder

- Lightning is very hot (~30,000°C).
- Violently expanding air causes an audible shock wave
- Close lightning
 - Initial tearing: Stepped leader
 - Sharp click/crack: Ascending ground streamer
 - Most sonic energy: Return streamers
- Distant lightning
 - Thunder sounds like a low rumble–we're hearing the sound from different parts of the lightning channel
 - Why? Attenuation of high-frequency components of original sound















Great websites to check out:

- https://www.weather.gov/safety/lightning
- <u>https://www.nssl.noaa.gov/education/svrwx101/lightning/</u>

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