The details of the charging process are still being studied by scientists, but there is general agreement on some of the basic concepts of thunderstorm electrification. The main charging area in a thunderstorm occurs in the central part of the storm where air is moving upward rapidly and temperatures range from −15 to −25 °C. At that place, the combination of temperature and rapid upward air movement produces a mixture of super-cooled cloud droplets, small ice crystals, and soft hail. The updraft carries the super-cooled cloud droplets and very small ice crystals upward. At the same time, the hail, which is considerably larger and denser, tends to fall or be suspended in the rising air. The differences in the movement of the precipitation cause collisions to occur. When the rising ice crystals collide with soft hail, the ice crystals become positively charged and the hail becomes negatively charged. The updraft carries the positively charged ice crystals upward toward the top of the storm cloud. The larger and denser hail is either suspended in the middle of the thunderstorm cloud or falls toward the lower part of the storm. The results are that the upper part of the thunderstorm cloud becomes positively charged while the middle to lower part of the thunderstorm cloud becomes negatively charged.

The upward motions within the storm and winds at higher levels in the atmosphere tend to cause the small ice crystals (and positive charge) in the upper part of the thunderstorm cloud to spread out horizontally some distance from thunderstorm cloud base. This part of the thunderstorm cloud is called the anvil. While this is the main charging process for the thunderstorm cloud, some of these charges can be redistributed by air movements within the storm (updrafts and downdrafts).

There are three primary types of lightning, defined by what is at the "ends" of a flash channel.

- Intracloud (IC), which occurs within a single thundercloud unit
- Cloud to cloud (CC) or intercloud, which starts and ends between two different "functional" thundercloud units
- Cloud to ground (CG), that primarily originates in the thundercloud and terminates on an Earth surface, but may also occur in the reverse direction, that is ground to cloud.