



## What puts the THUNDER in the THUNDERstorm?

*Lightning bolts are extremely hot, with temperatures of 30,000 to 50,000°F — that's hotter than the surface of the sun! When the bolt suddenly heats the air around it to such an extreme, the air instantly expands, sending out a vibration or shock wave we hear as an explosion of sound. This is thunder. Light travels so fast that we see it instantly after a lightning flash. But the sound of the thunder, traveling at only about 330 m/sec takes longer to reach our ears.*

*If you are near the stroke of lightning you'll hear thunder as one sharp crack. When lightning is far away, thunder sounds more like a low rumble as the sound wave reflect and echo off hillsides, buildings and trees. Depending on wind direction and temperature, you may hear thunder for up to fifteen or twenty miles away.*

# LIGHTNING

## SAFETY

- Stay away from anything that could conduct electricity; this includes stoves, metal pipes, sinks and phones.
- Don't use any plug-in electrical appliances like hair dryers, electric toothbrushes or electric razors. If lightning strikes your house they can conduct the charge to you.
- Don't use the telephone during the storm. Lightning may strike telephone lines outside.
- Get out of the water. This includes getting off small boats on the water, pools or the sea.
- If you're outdoors, seek shelter from lightning! Buildings are best for shelter, but if no buildings are available, you can find protection in a cave or a vehicle. **Trees are not good cover!** Tall trees attract lightning.
- If you can't find shelter, avoid the tallest object in the area. If only isolated trees are nearby, your best protection is to crouch in the open, keeping twice as far away from isolated trees as the trees are high.
- When you feel the electrical charge — if your hair stands on end or your skin tingles — lightning may be about to strike you. **Drop to the ground immediately!**



Ministry of Tourism, Economic Affairs,  
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## Lightning & Thunder



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**Protecting lives and property  
against natural hazards**

## THUNDER HEADS

Have you ever seen tall, dark, puffy clouds forming on a hot humid afternoon? These are called cumulonimbus clouds, sometimes nicknamed “thunderheads” or “CB”.

They can actually form any time of day when the temperature falls rapidly, higher up in the sky. These tall, dark clouds are full of moisture and contain strong up and down air currents (up-drafts and down-drafts).

Cumulonimbus clouds may tower more than 50,000 feet, and cover from just a few square miles to two hundred square miles.



## WHAT IS LIGHTNING?

To put it simply, lightning is electricity. It forms in the strong up and down air currents inside tall, dark cumulonimbus clouds as water droplets, hail, and ice crystals collide with one another.

Scientists believe that these collisions build up charges of electricity in a cloud. The positive and negative electrical charges in the cloud separate from one another, the negative charges drop to the lower part of the cloud and the positive charges stay in the middle and upper parts. Positive electrical charges also build up on the ground below.

When the difference in the charges becomes large enough, a flow of electricity moves from the cloud to the ground or from one cloud to another cloud.

In typical lightning, these are down-flowing negative charges, and when the positive charges on the ground leap upward to meet them, the jagged downward path of the negative charges suddenly lights up with a brilliant flash of light. Because of this, our eyes fool us into thinking that the lightning bolt shoots down from a cloud, when in fact the lightning travels up from the ground. In some cases, positive charges come to the ground from severe thunderstorms or from the anvil at the very top of a thunderstorm cloud.

The whole process takes less than a millionth of a second.

## KINDS OF LIGHTNING

Here are some words to describe the various kinds of lightning:

**In-Cloud Lightning:** The most common type, it travels between positive and negative charges centered within the thunderstorm.

**Cloud-to-Ground Lightning:** This is lightning that reaches from a thunderstorm cloud to the ground.

**Cloud-to-Cloud Lightning:** A rare event, it is lightning that travels from one cloud to another.

**Sheet Lightning:** This is lightning within a cloud that lights up the cloud like a sheet of light.

**Ribbon Lightning:** This is when a cloud-to-ground flash is blown sideways by the wind, making it appear as two identical bolts side by side.

**Bead Lightning:** Also called ‘chain lightning,’ this is when the lightning bolt appears to be broken into fragments because of varying brightness or because parts of the bolt are covered by clouds.

**Ball Lightning:** Rarely seen, this is lightning in the form of a grapefruit-size ball, which lasts only a few seconds.

**Bolt from the blue:** A lightning bolt from a distant thunderstorm, seeming to come out of the clear blue sky, but really from the top or edge of a thunderstorm a few miles away.