

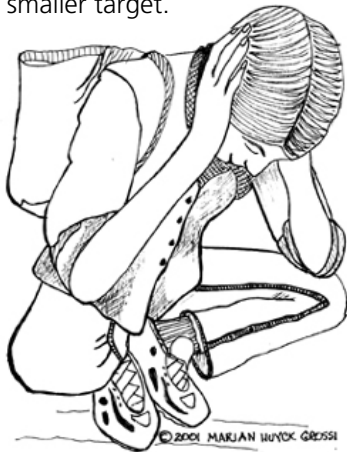
- ◆ Lightning is a powerful electrical spark from a thunderstorm that can kill instantly.
- ◆ If your hair stands on end or your skin prickles, an electrical charge is building near you and lightning may strike you.
- ◆ During 1997-2000, lightning struck somewhere in Grand Canyon National Park 104,294 times, averaging 26,073 strikes per year. [Data courtesy of Global Atmospherics, Inc.]

Be Lightning Smart

Tips from the National Severe Storms Laboratory, National Oceanic and Atmospheric Administration

www.nssl.noaa.gov

As a last resort, crouch to become a smaller target.



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Make a lightning safety plan for your group and be prepared to follow it.

Avoid dangerous situations!

- ◆ Plan ahead; check at the Visitor Center, campground, or lodge for weather forecasts.
- ◆ Arrange activities to minimize your exposure to lightning danger.
- ◆ Be aware of the nearest safe structure or vehicle, and how long it will take to reach it.
- ◆ On hikes watch for locations that may offer some protection.
- ◆ Listen for thunder, watch for lightning, and observe the direction of storm movement.
- ◆ If a storm is coming your way, use your safety plan. Do not wait until the last minute.

If thunderstorms are near, recognize the danger and take cover.

- ◆ *Move away from the canyon rim*, rocky outcrops, and other open areas.
- ◆ Get to an appropriate shelter—a substantial building, enclosed car (windows closed), or shuttle bus—quickly.
- ◆ **CAMPERS:** wait out the storm in your vehicle or other safe structure, *not in a tent*.
- ◆ Do not touch or be in contact with any metal on the vehicle or structure.

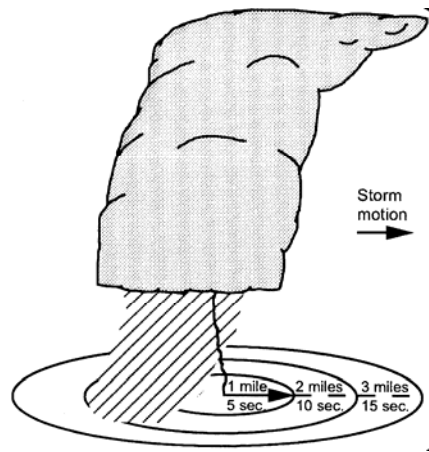
When storms are near, or you are caught in one, and if no shelter is available:

This can be a dangerous situation. Be calm and use good judgment. Lightning avoidance now becomes a matter of taking the less risky alternative.

- ◆ **Anywhere:** *Move away from the canyon rim*, rocky outcrops, cliff edges, lone trees, tallest trees, poles, and bodies of water. Do not touch metal guardrails. If possible, spread out from other people.
- ◆ **In a forest:** Seek a group of small trees surrounded by tall trees or look for dry, lower ground (ravine, depression, etc.). Avoid individual tall trees.
- ◆ **In open space:** Seek lower ground and become a smaller target. *Crouch*, as best you can, on the balls of your feet – heels touching, head down, and hands covering ears. Hands should not touch the ground. *Do not lie flat on the ground*. When seeking lower ground, avoid areas likely to be flooded.

The Kolb brothers took this dramatic photograph of a lightning storm over the canyon more than 100 years ago. ©1907 Emery C. Kolb





Flash to Bang
National Severe Storms Laboratory

30 – 30 lightning rule: If the sound of thunder follows a lightning flash within *30 seconds* or less, take shelter. High danger may continue for as long as *30 minutes* after the last lightning or thunder event.

Flash to bang – find the distance to the last lightning flash (see illustration):

1. Count the seconds between the FLASH of lightning and BANG of thunder.
2. Divide the number of seconds by 5 to find the distance in miles from you to the lightning (5 seconds = 1 mile). To find the distance in kilometers, divide seconds by 3.

Lightning distance safety facts:

- ◆ If you are within 6 miles (10 km) of lightning flashes—30 seconds flash to bang—you are in the **HIGH DANGER ZONE**. Seek shelter!
- ◆ Lightning can reach more than 10 miles (16 km) from a cloud. As a general rule, if you can hear thunder, you are at risk from lightning.
- ◆ Very dangerous times include just before or just after rain occurs, as lightning can reach far beyond the area where rain is falling.

Assist lightning victims

Medical information for lightning survivors:
M. A. Cooper MD
Univ. of Illinois at Chicago
www.uic.edu/labs/lightninginjury

It is **NOT** dangerous to touch a person injured by lightning.

Safety considerations

- ◆ If lightning victims are in a precarious position, such as on or near a cliff, protect them from falling or other hazards.
- ◆ If lightning danger continues, move the victim(s) to avoid further strikes to victim(s) and rescuer(s).

Vital signs: Check victim(s) for pulse and breathing

- ◆ Pulse present, but no breathing: apply mouth- to- mouth resuscitation.
- ◆ No pulse, no breathing: administer CPR and continue checking for a pulse.

Be aware of victims' condition

- ◆ Lightning victims may be confused, temporarily blinded, or unable to hear.
- ◆ They may suffer from burns, broken bones, and head injuries.
- ◆ Lightning victims may be unable to make appropriate safety decisions.

Lightning facts

- Lightning moves at 90,000 miles (144,000 km) per second. Its current is 20,000 amperes.
- A lightning flash, or channel, is approximately 1 inch (2.5 cm) in diameter.
- Lightning is 54,000°F (30,000°C), three times hotter than the sun's surface; however, serious burns are uncommon as the current "flashes over" the victim.
- Air expanding rapidly due to the heat of a lightning flash causes thunder.
- Lightning strikes in the U.S.A. 25 million times per year, killing about 100 people.
- Lightning can hit a tree and "splash" on to you or pass through the ground to you.
- Many lightning bolts split and simultaneously strike points up to five miles apart.
- Lightning may strike when blue sky is visible.

Kid's corner



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1. Can you find trees along the canyon rim that lightning may have struck?
2. If the "flash to bang" time is 30 seconds, how many miles away is the flash?
3. How far from a cloud can lightning travel?
4. Can lightning strike where it is not raining?
5. If you feel your hair begin to stand up, what might it mean?
6. If you see lightning or hear thunder that you think is nearby, and a friend says, "Don't worry, its just a little lightning," what should you do?

Lightning information for all ages: www.kidslighting.info