**FROM WWW.ULPA.ORG**
Question and Answer Facts and Myths:

There are many myths about lightning and lightning protection systems. Here are just a few to help understand more about the destructive force of lightning.

Q: All modern buildings are "grounded" and don't need lightning protection, right?
A: NO! This refers to the electrical service being grounded and is not adequate to handle a lightning strike.

Q: If I put lightning protection on my house, will it attract lightning to the air terminals?
A: NO! Lightning rods don't attract lightning to a structure; they merely provide it a safe path to ground in the event of a strike.

Q: Will lightning rods prevent lightning from striking?
A: No, just as lightning rods will not attract lightning, they will not prevent a strike either. Nothing can prevent a lightning strike from occurring, but you can handle it safely with a properly installed lightning protection system.

Q: I don't need lightning rods because only tall buildings do/ my neighbors houses are much taller than my house.
A: No! Lower roof levels and structures are just as likely to be hit as tall objects. Lightning zigs and zags in the air looking for the lowest resistance path to ground and won't pick its target until within 150 ft. of where it will strike.

Q: Do lightning rods really work?
A: YES! A properly protected building can withstand a multitude of lightning strikes. Major buildings like the Sears Tower or Empire State Building take dozens of strikes a year and they are still standing!

**FROM LIGHTNING SAFETY ALLIANCE (http://www.lightningsafetyalliance.org/)**

Basic Questions and Answers:

What causes lightning?
Lightning originates around 15,000 to 25,000 feet above sea level when raindrops are carried upward until some of them convert to ice. For reasons that are not widely agreed upon, a cloud-to-ground lightning flash originates in this mixed water and ice region. The charge then moves downward in 50-yard sections called step leaders. It keeps moving toward the ground in these steps and produces a channel along which charge is deposited. Eventually, it encounters something on the ground that is a good connection. The circuit is complete at that time, and the charge is lowered from cloud to ground. The flow of charge (current) produces a luminosity that is very much brighter than the part that came down. This entire event usually takes less than half a second.

Where does lightning usually strike?

Lightning comes from a parent cumulonimbus cloud. These thunderstorm clouds are formed wherever there is enough upward motion, instability in the vertical, and moisture to produce a deep cloud that reaches up to levels somewhat colder than freezing. These conditions are most often met in summer. In

general, the US mainland has a decreasing amount of lightning toward the northwest. Over the entire year, the highest frequency of cloud-to-ground lightning is in Florida between Tampa and Orlando. This is due to the presence, on many days during the year, of a large moisture content in the atmosphere at low levels (below 5,000 feet), as well as high surface temperatures that produce strong sea breezes along the Florida coasts. The western mountains of the US also produce strong upward motions and contribute to frequent cloud-to-ground lightning. There are also high frequencies along the Gulf of Mexico coast westward to Texas, the Atlantic coast in the southeast US, and inland from the Gulf. Regions along the Pacific west coast have the least cloud-to-ground lightning. Flashes that do not strike the surface are called cloud flashes. They may be inside a cloud, travel from one part of a cloud to another, or from cloud to air.

Can lightning be detected?

Since the 1980s, cloud-to-ground lightning flashes have been detected and mapped in real time across the entire US by several networks. In 1994, the networks were combined into one national network consisting of antennas that detect the angle from ground strike points to an antenna (direction-finder antenna), that detect the time it took for them to arrive at an antenna (time-of-arrival method), or a combination of both detection methods. The network is operated by Global Atmospherics, Inc. Flashes have also been detected from space during the past few years by an optical sensor. This experimental satellite covers the earth twice a day in tropical regions. The satellite also detects flashes that do not strike the ground, but cannot tell the difference between ground strikes and cloud flashes.

How many flashes are there?

Over the continental 48 states, an average of 20,000,000 cloud-to-ground flashes have been detected every year since the lightning detection network covered all of the continental US in 1989. In addition, about half of all flashes have more than one ground strike point, so at least 30 million points on the ground are struck on the average each year in the US. Besides cloud-to-ground flashes, there are roughly 5 to 10 times as many cloud flashes as there are to ground.

What types of damage can lightning cause?

Cloud-to-ground lightning can kill or injure people by direct or indirect means. The lightning current can branch off to a person from a tree, fence, pole, or other tall object. It is not known if all people are killed who are directly struck by the flash itself. In addition, flashes may conduct their current through the ground to a person after the flash strikes a nearby tree, antenna, or other tall object. The current also may travel through power or telephone lines, or plumbing pipes to a person who is in contact with an electric appliance, telephone, or plumbing fixture. Similarly, objects can be directly struck and this impact may result in an explosion, burn, or total destruction. Or, the damage may be indirect when the current passes through or near it. Sometimes, current may enter a building and transfer through wires or plumbing and damage everything in its path. Similarly, in urban areas, it may strike a pole or tree and the current then travels to several nearby houses and other structures and enter them through wiring or plumbing.

How to stay safe when lightning is around: use the 30-30 Rule! The best defense is to plan ahead and avoid exposure to lightning when a thunderstorm occurs. Know where safe shelter is located and leave enough time to reach safe shelter before your danger level is high. Don't be an isolated tall object, and don't be connected to anything that may be an isolated tall object. Use the 'flash-to-bang' method to

find the distance to lightning. Safe shelter must be reached by the time a flash is within 30 seconds flash-to-bang. In most cases, then, when you can hear thunder you are no longer safe. The best shelter is a substantial building that has plumbing and wiring--in other words, one that is used or lived in by people for a major portion of the day. A very unsafe building for lightning has only a roof and some supports, but no wiring or pipes extending into the ground. A vehicle with a metal roof provides good shelter, and is much better than being in the open or in an ungrounded building, but is not as good as being in a building that is grounded by wires and pipes.