JULY 2009 NOTE: This publication is in the process of being reformatted and reprinted. The NWS expects this to be completed prior to the start of the 2010 spring severe weather season. At that time a new .pdf will also become available with an improved layout and many new graphics and images. **This current .pdf version only contains new text changes** – but we wanted to make that information available as soon as possible. Thanks for your patience as we work toward ensuring our publications contain the latest safety information promoted by the American Red Cross, Federal Emergency Management Administration and the NWS.

Thunderstorms... Tornadoes... Lightning...

Nature's Most Violent Storms

A PREPAREDNESS GUIDE

Including Tornado Safety Information for Schools

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

American Red Cross

FAMILY DISASTER PLAN

Families should be prepared for all hazards that could affect their area. The Federal Emergency Management Agency, the American Red Cross and the National Weather Service urge every family to develop a family disaster plan.

Where will your family be when disaster strikes? They could be anywhere - at work, at school, or in the car. How will you find each other? Will you know if your children are safe? Disaster may force you to evacuate your neighborhood or confine you to your home. What would you do if basic services - water, gas, electricity, or telephones - were cut off?

Follow these basic steps to develop a family disaster plan...

I. Gather information about hazards.

Contact your local emergency management office, American Red Cross chapter and National Weather Service office. Find out what type of disasters could occur and how you should respond. Learn your community's warning signals and evacuation plans. The Federal Emergency Management Agency can help you prepare for hazards at: www.fema.gov/plan/index.shtm

II. Meet with your family to create a plan.

Discuss the information you have gathered. Pick two places to meet:

- a spot outside your home for an emergency, such as fire,
- a location away from your neighborhood in case you can't return home.

Choose an out-of-state friend as your "family check-in contact" for everyone to call if the family gets separated. Discuss what you would do if advised to evacuate.

III. Implement your plan.

(1) Post emergency telephone numbers by phones; (2) Install safety features in your house, such as smoke detectors and fire extinguishers; (3) Inspect your home for potential hazards (such as items that can move, fall, break, or catch fire) and correct them; (4) Have your family learn basic safety measures, such as CPR and first aid; how to use a fire extinguisher; and how and when to turn off water, gas, and electricity in your home; (5) Teach children how and when to call 911 or your local Emergency Medical Services number; (6) Keep enough supplies in your home to meet your needs for at least three days. Assemble a disaster supplies kit with items you may need in case of an evacuation. Store these supplies in sturdy, easy-to-carry containers, such as backpacks or duffle bags. Keep important family documents in a waterproof container. Keep a smaller disaster supplies kit in the trunk of your car.

DISASTER SUPPLIES KIT

Assemble the following items to create kits for use at home, the office, at school and/or in a vehicle:

- **Water -** three gallons for each person who would use the kit and an additional four gallons per person or pet for use if you are confined to your home
- **Food -** a three-day supply in the kit and at least an additional four-day supply per person or pet for use at home. *You may want to consider stocking a two-week supply of food and water in your home.*
- **Items for infants -** including formula, diapers, bottles, pacifiers, powdered milk and medications not requiring refrigeration
- **Items for seniors, disabled persons or anyone with serious allergies—**including special foods, denture items, extra eyeglasses, hearing aid batteries, prescription and non-prescription medications that are regularly used, inhalers and other essential equipment.

- **Kitchen accessories -** a manual can opener; mess kits or disposable cups, plates and utensils; utility knife; sugar and salt; aluminum foil and plastic wrap; re-sealable plastic bags
- **A portable, battery-powered radio or television and extra, fresh batteries**
- **Several flashlights and extra, fresh batteries**
- **A first aid kit**
- **One complete change of clothing and footwear for each person -** including sturdy work shoes or boots, raingear and other items adjusted for the season, such as hats and gloves, thermal underwear, sunglasses, dust masks
- **Blankets or a sleeping bag for each person**
- **Sanitation and hygiene items -** shampoo, deodorant, toothpaste, toothbrushes, comb and brush, lip balm, sunscreen, contact lenses and supplies and any medications regularly used, toilet paper, towelettes, soap, hand sanitizer, liquid detergent, feminine supplies, plastic garbage bags (heavy-duty) and ties (for personal sanitation uses), medium-sized plastic bucket with tight lid, disinfectant, household chlorine bleach
- **Other essential items -** paper, pencil, needles, thread, small A-B-C-type fire extinguisher, medicine dropper, whistle, emergency preparedness manual
- **Entertainment -** including games and books, favorite dolls and stuffed animals for small children
- **A map of the area** marked with places you could go and their telephone numbers
- **An extra set of keys and ids -** including keys for cars and any properties owned and copies of driver's licenses, passports and work identification badges
- **Cash and coins and copies of credit cards**
- **Copies of medical prescriptions**
- **Matches** in a waterproof container
- **A small tent, compass and shovel**

Consider preparing a Disaster Supplies Kit for your pets. For more information please visit: www.redcross.org/preparedness/cdc_english/kit.asp

IV. Practice and maintain your plan.

Ask questions to make sure your family remembers meeting places, phone numbers, and safety rules. Conduct drills. Test your smoke detectors monthly and change the batteries two times each year. Test and recharge your fire extinguisher(s) according to manufacturer's instructions. Replace stored water and food every 6 months. Contact your local National Weather Service office, American Red Cross chapter, or local office of emergency management for a copy of "Your Family Disaster Plan" (L-191/ARC4466).

Introduction...

This preparedness guide explains thunderstorms and related hazards and suggests life-saving actions YOU can take. With this information, YOU can recognize severe weather, develop a plan, and be ready to act when threatening weather approaches. Remember...your safety, and the safety of those in your care, is up to YOU!

Why Talk About Thunderstorms? They Produce...

Tornadoes...

Cause an average of 62 fatalities and 1,500 injuries each year.
Produce wind speeds in excess of 250 mph.
Can be one mile wide and stay on the ground over 50 miles.

Lightning...

Causes an average of between 55-60 fatalities and 300 injuries each year.
Occur with all thunderstorms.

High Winds...

Can exceed 125 mph.
Can cause damage equal to a tornado.
Can be extremely dangerous to aviation.

Flash Flooding...

Is the #1 cause of deaths associated with thunderstorms...more than 70 fatalities each year.

Hail...

Can be larger than a softball (5 inches in diameter)
Causes more than $1 billion in crop and property damage each year.

For More Information

Safety and preparedness brochures can be viewed and downloaded at:

American Red Cross: **www.redcross.org**
Federal Emergency Management Agency: **www.ready.gov/america**
National Weather Service: **www.nws.noaa.gov/om/brochures.shtml**

Thunderstorms...

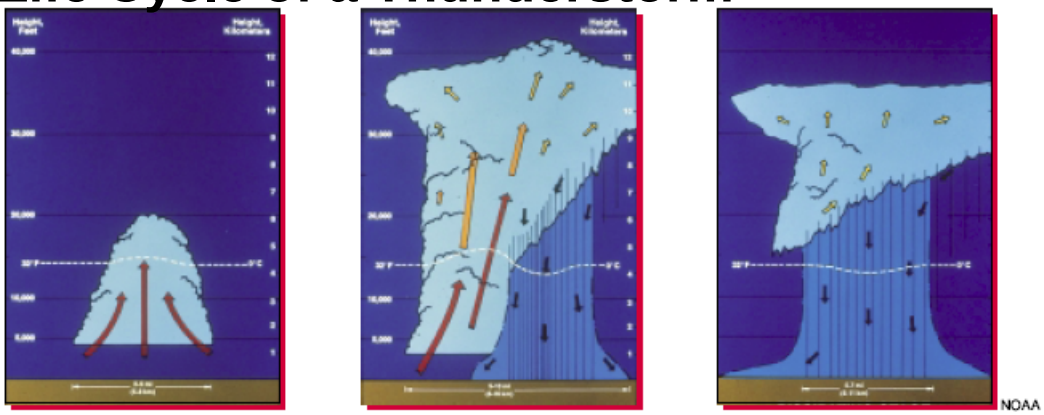
A Thunderstorm, affects a relatively small area when compared to a hurricane or a winter storm. The typical thunderstorm is 15 miles in diameter and, lasts an average of 30 minutes. Despite their small size, ALL thunderstorms are dangerous! Of the estimated 100,000 thunderstorms that occur each year in the United States, about 10 percent are classified as severe. The National Weather Service considers a thunderstorm severe if it produces hail at least one inch in diameter, winds of 58 mph or stronger, or a tornado.

1,800 thunderstorms occur at any moment around the world. That's 16 million a year!

What Are Thunderstorms? What Causes Them?

Every Thunderstorm Needs:
Moisture-to form clouds and rain.
Unstable air-warm air that can rise rapidly.
Lift-cold or warm fronts, sea breezes, mountains, or the sun's heat are capable of lifting air to help form thunderstorms.

Life Cycle of a Thunderstorm



NOAA

Developing Stage

- Towering cumulus cloud indicates rising air.
- Usually little if any rain during this stage.
- Lasts about 10 minutes.
- Occasional lightning.

Mature Stage

Most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes.
Storm occasionally has a black or dark green appearance.
Lasts an average of 10 to 20 minutes but some storms may last much longer

Dissipating Stage

- Downdrafts, downward flowing air, dominate the storm
- Rainfall decreases in intensity.
- Can still produce a burst of strong winds.
- Lightning remains a danger.

Tornadoes...

Although tornadoes occur in many parts of the world, they are found most frequently in the United States. In an average year, 1,200 tornadoes cause 62 fatalities and 1,500 injuries nationwide. You can find statistical information on tornadoes at **www.spc.noaa.gov**.

Tornado Facts

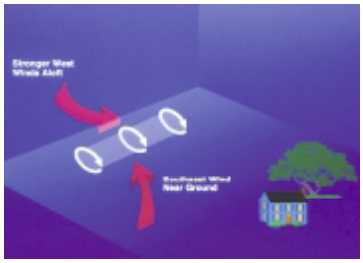
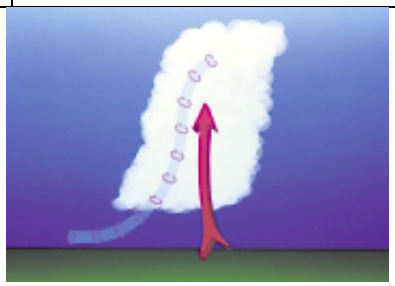
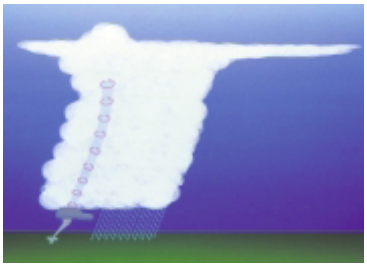
- A tornado is a violently rotating column of air extending from a thunderstorm to the ground.
- Tornadoes may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. The average tornado moves from southwest to northeast, but tornadoes can move in any direction, and suddenly change their direction of motion
- The average forward speed is 30 mph but may vary from nearly stationary to 70 mph.
- The strongest tornadoes have rotating winds of more than 250 mph.
- Tornadoes can accompany tropical storms and hurricanes as they move onto land.
- Waterspouts are tornadoes which form over warm water. They can move onshore and cause damage to coastal areas.

When and Where Tornadoes Occur

- Tornadoes can occur at any time of day, any day of the year.
- Have a plan of action before severe weather threatens; it may be too late to react when a warning is issued or a tornado is spotted.
- Seek out weather information when conditions are war, humid, and windy, or skies are threatening.
- Monitor for severe weather watches and warnings using NOAA All-Hazards Radio, weather.gov on the internet, local television and radio.

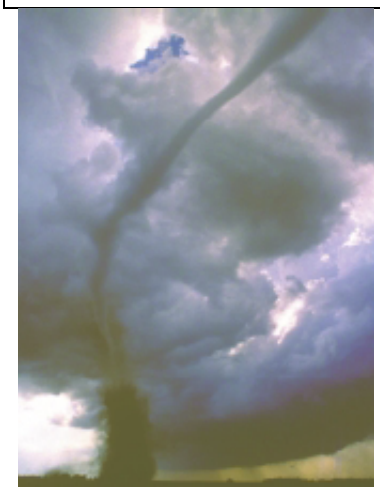
How Tornadoes Form

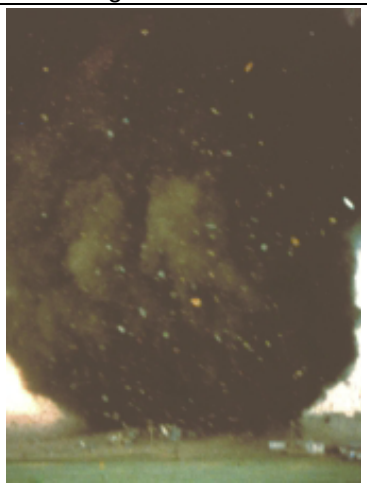
Before thunderstorms develop, a change in wind direction and an increase in wind speed with increasing height creates an invisible, horizontal spinning effect in the lower atmosphere.	Rising air within the thunderstorm updraft tilts the rotating air from horizontal to vertical.	An area of rotation, 2-6 miles wide, now extends through much of the storm. Most tornadoes form within this area of strong rotation.

Tornadoes Take Many Shapes and Sizes

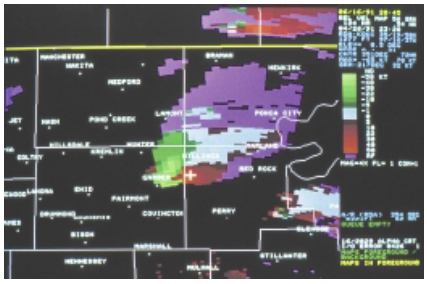
Weak Tornadoes	Strong Tornadoes	Violent Tornadoes
• 88% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1 – 10+ minutes • Winds less than 110 mph • Produces EF0 or EF1 damage	• 11% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 111-165 mph • Produces EF2 or EF3 damage	• Less than 1% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed 1 hour • Winds greater than 166 mph • Produces EF4 or EF5 damage





Weather Radar Watches the Sky

The National Weather Service has strategically located a Doppler radar network across the country that can detect air movement toward or away from a radar. Early detection of increasing rotation aloft within a thunderstorm can allow life-saving warnings to be issued before the tornado forms. In the figure below left, Weather Service Doppler radar detected strong rotation within the storm where red colors (winds moving away from the radar) and green (winds blowing toward the radar) are close together. The photograph at below right shows a violent tornado in northern Oklahoma at the same time the radar image was taken.



Tornado Myths and Truths

MYTH: Lakes, rivers, and mountains protect areas from tornadoes.
TRUTH: No place is safe from tornadoes. A tornado near Yellowstone National Park left a path of destruction up and down a 10,000 foot mountain.

MYTH: A tornado causes buildings to “explode” as the tornado passes overhead.
TRUTH: Violent winds and debris slamming into buildings cause most structural damage.

MYTH: Open windows before a tornado approaches to equalize pressure and minimize damage.
TRUTH: **Virtually all buildings leak!** Leave the windows alone. The most important action is to immediately go to a safe shelter.

MYTH: If you see a tornado while driving, you should turn and drive at right angles to the storm.
TRUTH: You should immediately seek the best available shelter. Many people are injured or killed when they remain in their vehicles.

MYTH: Highway overpasses provide shelter from tornadoes
TRUTH: Take shelter in a sturdy reinforced building if at all possible. The funneling of wind through an overpass will actually increase the wind speed. Ditches, and culverts may provide limited protection from a tornado, but your risk will be greatly reduced by moving inside a strong building.

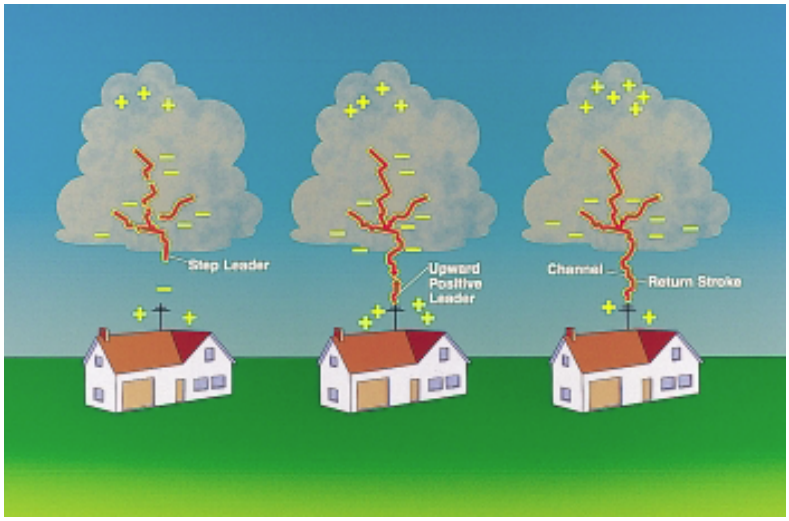
Frequently asked questions about tornadoes can be found on the Internet at:
www.spc.noaa.gov/faq/tornado/index.html

Lightning...

What Causes Lightning

The rising air in a thunderstorm cloud causes various types of frozen precipitation to form within the cloud. Included in these precipitation types are very small ice crystals and much larger pellets of snow and ice. The smaller ice crystals are carried upward toward the top of the clouds by the rising air while the heavier and denser pellets are either suspended by the rising air or start falling toward the ground. Collisions occur between the ice crystals and the pellets, and these collisions serve as the charging mechanism of the thunderstorm. The small ice crystals become positively charged while the pellets become negatively charged. As a result, the top of the cloud becomes positively charged and the middle to lower part of the storm becomes negatively charged. At the same time, the ground underneath the cloud becomes charged oppositely of the charges directly overhead.

When the charge difference between the ground and the cloud becomes too large, a conductive channel of air develops between the cloud and the ground, and a small amount of charge (step leader) starts moving toward the ground. When it nears the ground, an upward leader of opposite charge connects with the step leader. At the instant this connection is made, a powerful discharge occurs between the cloud and the ground. We see this discharge as a bright visible flash of lightning.



Lightning Facts

- There is no safe place in a thunderstorm.
- Lightning causes an average of between 55 and 60 fatalities each year.
- The energy from one lightning flash could light a 100-watt light bulb for more than 3 months.
- Lightning fatalities are most common during the summer and during the afternoon and evening
- Many fires in the western United States and Alaska are started by lightning.
- The channel air through which lightning passes can be heated to 50,000°F- *hotter than the surface of the sun!* The rapid heating and cooling of the air near the lightning channel causes a shock wave that results in thunder.

How far away is the Lightning?

- Count the number of seconds between a flash of lightning and the resulting thunder.
- Divide this number by 5 to get an estimate of the distance to the lightning (in miles) to the lightning strike.

In recent years, almost all lightning deaths have occurred outdoors. Fatal activities have included:

- ✔ boating
- ✔ swimming
- ✔ golfing
- ✔ loading a truck
- ✔ camping
- ✔ standing under a tree
- ✔ riding on a lawnmower
- ✔ watching the storm
- ✔ mountain climbing
- ✔ running to shelter
- ✔ riding horses
- ✔ playing soccer
- ✔ walking
- ✔ fishing

Lightning Myths and Truths

MYTH: If it is not raining, then there is no danger from lightning.
TRUTH: Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall. This is especially true in the western United States where thunderstorms sometimes produce very little rain.

MYTH: The rubber soles of shoes or rubber tires on a car will protect you from being struck by lightning.
TRUTH: Rubber-soled shoes and rubber tires provide NO protection from lightning. The steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.

MYTH: People struck by lightning should not be touched because they carry an electrical charge
TRUTH: Lightning-strike victims carry no electrical charge and should be attended to immediately. Call for help and begin CPR immediately if the person is unresponsive and nor breathing. Contact your local American Red Cross chapter for information on CPR and first aid classes.

MYTH: “Heat lightning” occurs after very hot summer days and poses no threat.
TRUTH: “Heat lightning” is a term used to describe lightning from a thunderstorm too far away for the thunder to be heard.

When thunder roars, go indoors!!!

Straight-line Winds...

- Straight-line winds are responsible for most thunderstorm wind damage.
- Winds can exceed 125 mph!
- ✡ downburst, is a small area of rapidly descending air beneath a thunderstorm (see center of photograph below).
- A downburst can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation.
- A “dry microburst” is a downburst that occurs with little or no rain. These destructive winds are most common in the western United States.

Flash Floods / Floods...

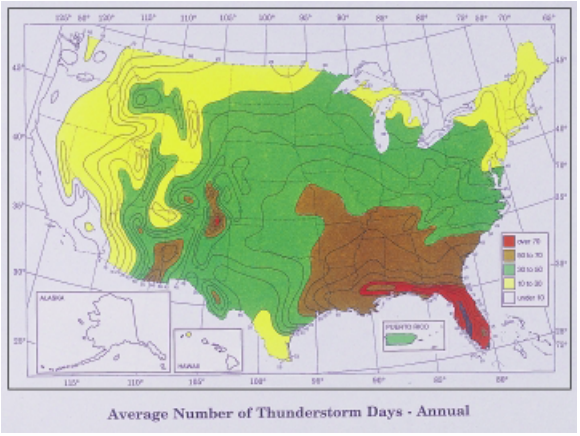
- Flash floods and floods are the #1 cause of deaths associated with thunderstorms...more than 140 fatalities each year.
- Many flash flood fatalities occur at night. More than half of all flood-related drownings occur when a vehicle is driven into hazardous flood water..
- Six inches of fast-moving water can knock you off your feet; a depth of two feet will cause most vehicles to float.

For more information, refer to the Flash Floods and Floods...The Awesome Power brochure on the Internet at ***www.nws.noaa.gov/om/brochures.shtml***

Large Hail...

- Strong rising currents of air within a storm, called updrafts, carry water droplets to a height where they freeze
- Ice particles grow in size, becoming too heavy to be supported by the updraft, and fall to the ground.
- Causes more than $1 billion in damage to property and crops each year.
- Large stones fall at speeds faster than 100 mph.

Who's Most At Risk from Thunderstorms?



From Lightning
People who are outdoors, or anyone who stays outdoors when thunderstorms are nearby.

From Flash Flooding
People who walk or drive through flood waters.

From Tornadoes
People who are in mobile homes or outdoors.

Be Prepared...

It's Up to YOU!

Each year, many people are killed or seriously injured by tornadoes and severe thunderstorms despite advance warning. Some did not hear the warning, others heard the warning but did not believe it would happen to them. The following preparedness information, combined with timely severe weather watches and warnings, may save your life. If you hear a warning or observe threatening skies, only YOU can make the decision to seek safety. This could be the most important decision you will ever make.

What YOU Can Do Before Severe Weather Strikes

Develop a plan for you and your family at home, work, school, and when outdoors. The American Red Cross offers planning tips at: www.redcross.org, and the Federal Emergency Management Agency at: www.ready.gov/america

Having a safe room in your home or small business can help provide "near-absolute protection" for you and your family or your employees from injury or death caused by the dangerous forces of extreme winds. Information on how to build a Safe Room (shown in the photos below) in your home or school is available from the Federal Emergency Management Agency at: http://www.fema.gov/plan/prevent/saferoom/fema320.shtm

Practice your plan.

Know the county/parish in which you live or visit. A National Weather Service warning identifies the counties or parishes at risk.

Keep a state or county highway map nearby to follow storm movement from weather warnings.

Have a NOAA Weather Radio with a warning alarm tone and battery back-up to receive warnings.

National Weather Service watches and warnings are also available on the Internet. Select and bookmark your local National Weather Service office from www.weather.gov

Listen to radio and television for weather, watch, and warning information.

If severe weather threatens, check on people who are elderly, very young, or physically or mentally disabled.

What You Can Do
When Threatening Weather Approaches

Avoid the Lightning Threat

- **Have a lightning safety plan**. Know where you'll go for safety and how much time it will take to get there. Make sure your plan allows enough time to reach safety

- **Postpone activities**. Before going outdoors, check the forecast for thunderstorms. Consider postponing activities to avoid being caught in a dangerous situation.

- **Monitor the weather**. Look for signs of a developing thunderstorm such as darkening skies, flashes of lightning or increasing wind.

- **Get to a safe place**. If you hear thunder, even a distant rumble, immediately move to a safe place. When thunder roars, go indoors! Fully enclosed buildings with wiring and plumbing provide the best protection. Sheds, picnic shelters, tents or covered porches do not protect you from lightning. If a sturdy building is not nearby, get into a hard-topped metal vehicle and close all the windows. Stay inside until 30 minutes after the last rumble of thunder.

- **If you hear thunder, don't use a corded phone in any case**. Cordless phones and cell phones are safe to use.

- **Keep away from electrical equipment, wiring and water pipes.** Sensitive electronics should be unplugged well in advance of thunderstorms. Don't take a bath, shower or use other plumbing during a thunderstorm.

What You Should Know About Being Caught Outside Near a Thunderstorm

There is no safe place outside in a thunderstorm. Plan ahead to avoid this dangerous situation! If you're outside and hear thunder, the only way to significantly reduce your risk of becoming a lightning casualty is to get inside a substantial building or hard-topped metal vehicle as fast as you can. In addition, you should avoid the following situations which could increase your risk of becoming a lightning casualty. Remember-there is no substitute for getting to a safe place.

- **Avoid open areas and stay away from isolated tall trees, towers, or utility poles**. Do not be the tallest object in the area. Lightning tends to strike the taller objects in the area.

- **Stay away from metal conductors such as wires or fences.** Metal does not attract lightning, but lightning can travel long distances through it.

Remember, if you can hear thunder – you are close enough to be struck by lightning!

Tornado Safety Rules

- The safest place to be is an underground shelter, basement, or safe room.
- If no underground shelter or safe room is available, a small, windowless interior room or hallway on the lowest level of a sturdy building is the safest alternative.
- Mobile homes are not safe during tornadoes. Abandon mobile homes and go to the nearest sturdy building or shelter immediately.
- If you are caught outdoors, seek shelter in a basement, shelter or sturdy building. If you cannot quickly walk to a shelter:
    - Immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy shelter.
    - If flying debris occurs while you are driving, pull over and park. Now you have the following options as a last resort:
        - Stay in the car with the seat belt on. Put your head down below the windows, covering with your hands and a blanket if possible.
        - If you can safely get noticeably lower than the level of the roadway, exit your car, and lie in that area, covering your head with your hands.
    - Your choice should be driven by your specific circumstances.

. Flash Flood Safety Rules

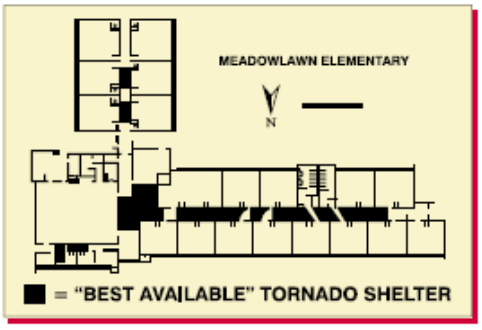
- Avoid driving, walking, or swimming, in flood waters.
- Stay away from high water, storm drains, ditches, ravines, or culverts. Even moving water only six inches deep can knock you off your feet.
- If you come upon flood waters, Turn Around Don't Drown. Climb to higher ground.
- Do not let children play near storm drains.

Occasionally, tornadoes develop so rapidly that advance warning is not possible. Remain alert for signs of an approaching tornado such as a dark, often greenish sky, large hail, or a loud roar similar to a freight train.
WATCH THE SKY!!!

Tornado Safety in Schools...

Every School Should Have a Plan

- Develop an action plan with frequent drills.
- Each school should be inspected and shelter areas designated by a registered engineer or architect.
- Basements offer the best protection. Schools without basements should use interior rooms and hallways on the lowest floor and away from windows, know the location of safe rooms if available



- Ensure students know the protection position (shown at right).

- Each school should have a NOAA Weather Radio with battery back-up.
- If the school's alarm system relies on electricity, have an alternative method to notify teachers and students in case of power failure.
- Make special provisions for disabled students and those in portable classrooms.
- Delay lunches or assemblies in large rooms if severe weather is anticipated. Rooms with large roof spans (e.g. gymnasiums, cafeterias, and auditoriums) offer little or no protection from tornado-strength winds.
- Keep children at school beyond regular hours until threatening weather passes. School buses and cars are not as safe as the school.

Hospitals, nursing homes, and other institutions should develop similar plans.

The National Weather Service, the Federal Emergency Management Agency, and the American Red Cross work to inform community officials and the public about the dangers posed by tornadoes and severe thunderstorms. You can prepare for the possibility of tornadoes or severe thunderstorms by learning the safest places to seek shelter when at home, work, school, or outdoors. Many public buildings now provide safe rooms for shelter during tornado emergencies. Safe rooms in your home or small business can help provide "near-absolute protection" for you and your family or your employees from injury or death caused by the dangerous forces of extreme winds. By near-absolute protection we mean, that there is a very high probability that the occupants of a safe room built according to current guidance will avoid injury or death

Stay Informed. . . Use NOAA Weather Radio

NOAA Weather Radio is the best means to receive warnings from the National Weather Service

The National Weather Service continuously broadcasts warnings and forecasts that can be received on a NOAA Weather Radio, which can be bought in many stores. The average range of a NOAA Weather Radio is 40 miles, depending on topography. Purchase a radio that has a battery back-up and a Specific Area Message Encoding feature, which automatically alerts you when a watch or warning is issued for your county or parish.

When conditions are favorable for severe weather to develop, a severe thunderstorm or tornado WATCH is issued. Weather Service meteorologists use information from weather radar, spotters, and other sources to issue severe thunderstorm and tornado WARNINGS for areas where severe weather is imminent. Severe thunderstorm and tornado warnings are disseminated through a variety of means, such as local radio and television stations, and the Internet. They are also broadcast over local NOAA Weather Radio transmitters serving the warned areas. Local emergency management and public safety officials are also notified as they can activate local warning systems to alert communities. If a tornado warning is issued for your area or the sky becomes threatening, move to your pre-designated place of safety.

Working with the Federal Communication Commission's Emergency Alert System (EAS), NOAA Weather Radio is an all-hazards radio network, making it a great source for comprehensive weather and emergency information. Please visit www.weather.gov/nwr for more information.

What to Listen For...

Tornado Watch:
NWS Meteorologists have determined that tornadoes are possible in your area. Remain alert for approaching storms. Know what counties or parishes are in the watch area by listening to NOAA Weather Radio, visiting www.weather.gov or tuning into local radio and television broadcasts.

Severe Thunderstorm Watch:
NWS Meteorologists have determined that severe thunderstorms are likely to occur in your area. Watch the sky and stay tuned in for when warnings are issued.

Tornado Warning:
NWS Meteorologists have determined that a tornado is occurring or likely to occur.

Severe Thunderstorm Warning:
NWS Meteorologists have determined that a tornado is occurring or likely to occur. Warnings indicate imminent danger to life and property to those in the path of the storm.