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# THUNDERSTORM AND LIGHTNING



## WHAT IS THUNDERSTORM AND LIGHTNING?

Thunderstorm is a storm with flashes of electricity called lightning along with sound called thunder.

## HOW DOES IT OCCUR

Thunderclouds are tall, dark and puffy clouds. In this type of cloud there are drops of water, hailstones and specks of ice. As the water drops and the ice particles rub and bump against each other, they become charged with electricity. There are positive charges (called protons) and negative charges (called electrons) in electricity and during the storm these charges separate. The positive charges form at the top of the cloud and negative charges form at the bottom of the cloud.

Positive and negative charges are attracted to each other and as they travel through the air the electric current causes a spark, which is lightning. So lightning happens inside a cloud and between clouds.

As the storm builds the negative electrical charge at the bottom of a cloud creates a positive charge in the ground below. As the negative charge gets stronger, the air cannot stop it from jumping from the cloud towards the positive charge on the ground. This giant spark of electricity is the **lightning** that we see.

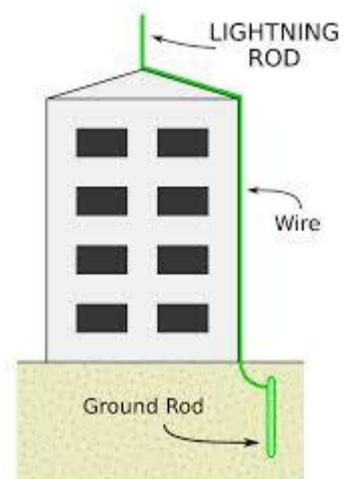
As the lightning heats the air around it, the air expands outwards at great speed, and there is a hole left in the air, called a channel. When the lightning is gone, the air collapses back in, creating the sound that we hear as **thunder**.

The temperature of lightning can be six times hotter than the temperature on the surface of the sun. All thunderstorms produce lightning and are very dangerous. If you hear the sound of thunder, then you are in danger from lightning. Lightning is very dangerous and will strike anything that stands high above the ground; mountains, people, and buildings. Trees are often struck by lightning causing them to fall, or catch fire. Every year hundreds of people are killed by lightning.

Have you ever rubbed your feet across carpet and then touched a metal door handle? If so, then you know that you can get shocked! Lightning works in the same way.

How do you know if lightning is nearby? If you see dark clouds, then lightning could be present, but the best thing you can do is to listen for thunder. If you hear thunder, then you need to go indoors or get in a car. If your hair stands on end or your skin starts to tingle, lightning maybe about to strike. Get down on your hands and knees and keep your head tucked in.

How far away can you see lightning and hear thunder? Within those distant thunderstorms, the lightning bolts can be seen as much as 100 miles from us, depending on the height of the bolt, the clarity of the air, and our elevation. Thunder, in comparison, has a much shorter range of detection - usually less than 15 miles in a quiet rural setting and under 5 miles in a noisy city environment.



### INTERESTING FACT!

Can you tell how far away a storm is? Yes, you can!

Use thunder to tell how far away a storm is. Next time you see a storm, count the number of seconds between when you see the lightning and hear the thunder. Take the number of seconds and divide by 5 and that will tell you how far away the storm is in miles. For example: If you counted 10 seconds between the lightning and the thunder, the lightning is 2 miles away! ( $10 / 5 = 2$  Miles)

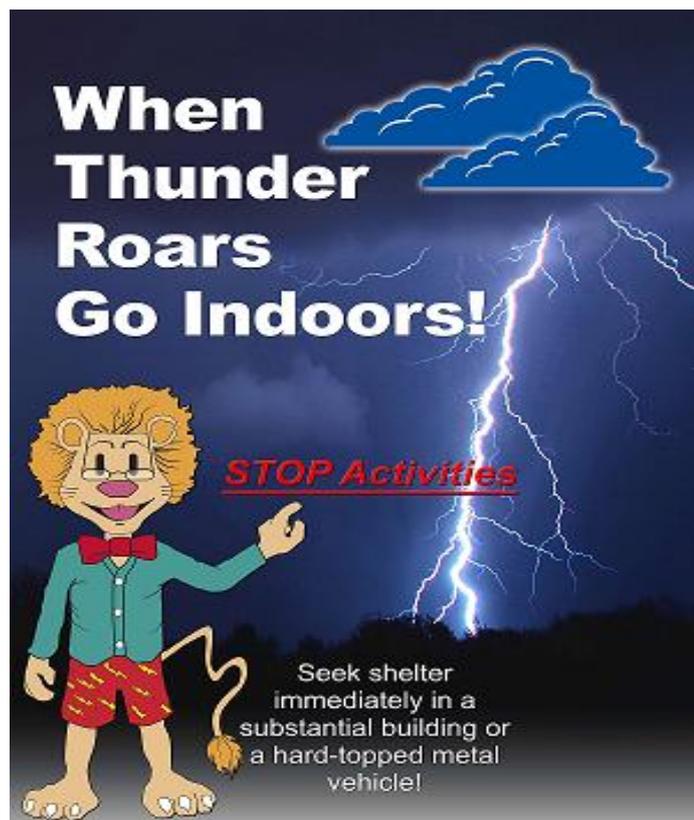
## SOME SAFETY MEASURES

### BEFORE

- ✓ Use the 30/30 Rule! Go indoors if you see lightning and can't count to 30 before hearing thunder. Stay inside for 30 minutes after hearing the last clap of thunder.

### DURING

- ✓ Stay inside.
- ✓ Don't use items that plug into electrical outlets. Power surges from lightning can come through the cords and hurt you.



✓ Don't wash your hands, take a bath or take a shower. Taps can conduct electricity.

✓ Stay away from windows and doors.

✓ If you are caught outdoors, don't open an umbrella and avoid standing in open spaces.

✓ Don't lie on concrete floors or lean against concrete walls. They conduct electricity.

✓ Don't touch anything metal outside – bikes, playgrounds, fences.

✓ Stay away from open fields, hills, or the beach.

✓ Do not lay flat because it can give lightning a better chance to strike you.

✓ If you are in the forest, find an area with the shortest trees and get as far away from the tree trunks as you can.

✓ If you are on land, find a spot away from long objects, pipes, fences, trees or any metal objects and as low as possible

✓ Stay away from all water, even just puddles, as it can be dangerous during an electrical storm.



## AFTER

✓ Stay away from loose or dangling power lines.

✓ Stay away from areas damaged by lightning and thunderstorm.

# TEST YOUR KNOWLEDGE

## I. Unscramble the following

1. IGH LINTIGN
2. HUTDR CNLEUOSD
3. TUTHODSRNEMR

## II. Fill in the blanks from the following words

*Lightning rods, Electricity, High, Water*

1. Lightning is a giant spark of \_\_\_\_\_
2. During a thunderstorm, stay away from \_\_\_\_\_
3. Metal rods or similar objects that divert lightning safely to the ground and are often seen at the top of tall buildings are called \_\_\_\_\_
4. Lightning is dangerous and will strike anything that stands \_\_\_\_\_ above the ground

## III. Match the column

Sl no.	Column A	Column B
1	When thunder roars	Stay away from tall trees
2	If you are in water	Thunder
3	If you are outside	Go indoors
4	Sound caused by lightning	Come out of water

## DID YOU KNOW?

- ✓ It is estimated that there are around 1,800 thunderstorms that occur across our planet every day.
- ✓ The reason we see lightning before we hear thunder is because light travels faster than sound.

- ✓ Thunderstorms can occur year-round and at all hours. But they are most likely to happen in the spring and summer months and during the afternoon and evening hours.
- ✓ When lightning strikes the ground it seeks out the shortest route to something with a positive charge, this might be a tree, a tall building or if they're very unlucky, a person.
- ✓ What we see as a flash of lightning may actually be three or four different strokes in exactly the same place, one right after another. That's why lightning seems to flicker.
- ✓ Lightning rods (also called conductors) are metal rods or similar objects that divert lightning safely to the ground; they can often be seen at the top of tall buildings.
- ✓ There are bolts of lightning striking somewhere on Earth every second.

# DROUGHT



## WHAT IS A DROUGHT?

A drought happens when there is no rain for a long period of time. The land becomes dry and there is no water anywhere as there is no rainfall.

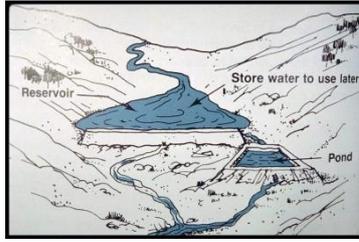
## WHAT HAPPENS?

In a drought plants do not grow properly. As streams and rivers dry up plants and animals die. Because farm crops and animals die due to lack of water, there is less food for people to eat, and what food is available, it costs more. If a drought lasts a long time, people may also die of starvation and the land may become a desert.

In areas where trees have been cut down, hot winds blow away the dry topsoil. This is called erosion. Planting trees may help stop the soil being blown away in times of drought. Droughts can happen anywhere in the earth, and droughts increase the risk of other hazards like wildfires.

A drought is not determined by the number of days that go by. It depends on the amount of *moisture* before and after the dry period and the length and size of the area without water.

**Moisture:** Water present in the air that causes wetness



**Reservoir:** A natural or manmade lake that collects and stores water

## SOME SAFETY MEASURES

### BEFORE

- ✓ Do not pour water down the drain! There may be another use for it, like watering indoor plants.
- ✓ Use water carefully, do not waste water.

### DURING

- ✓ Follow rules from authorities. They want to make sure there is enough water for the things we really need.
- ✓ Take short showers, not baths. Showers use less water.
- ✓ Do not let the water run when you brush your teeth.

- ✓ Take a break from using your outdoor water toys. When the drought ends, you can play with them again.

# AFTER

- ✓ Learn various ways to conserve water.
- ✓ Plant trees.



## TEST YOUR KNOWLEDGE

### I. Unscramble the following

1. RODGUHT
2. AOVRCSTNOENI
3. ARNIALFL
4. OIMSTRUE

## II. Fill in the blanks from the following words

*Streams and rivers, Wildfire, Reservoirs, Drought*

1. When there has not been enough rainfall and the water levels get low, it causes \_\_\_\_\_
2. Drought increases risk of \_\_\_\_\_
3. \_\_\_\_\_ dry up in a drought
4. Shared water resources are known as \_\_\_\_\_

## III. Match the column

Sl no.	Column A	Column B
1	Planting trees may control	Showers use less water
2	During drought there is lack of	Conserve water
3	Take short showers, not baths because	Soil erosion
4	Learn various ways to	Water

### ACTIVITY

Find out the following:

1. States in India which suffer from drought?
2. Various ways in which people in such drought affected states cope with the disaster
3. Steps taken by the government to overcome the problem

## DID YOU KNOW?

- ✓ Of all the water on earth, only .003 percent is available fresh water that is not polluted, trapped in soil, or too far underground. During a drought, shared sources of

water such as reservoirs, rivers and groundwater for wells are in danger of running dry.

- ✓ The water that exists today is the same water that existed a billion years ago. Water is always on the move, travelling through the oceans, rivers, ground and atmosphere.

# WINDSTORM

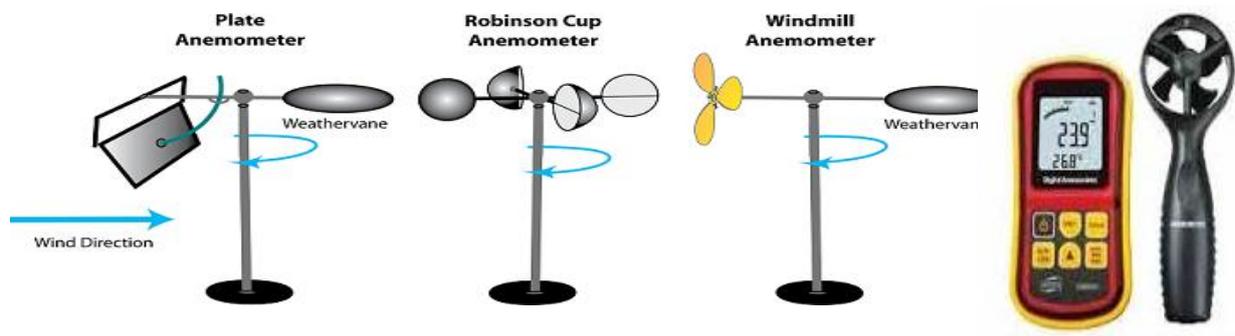


WHAT IS A WINDSTORM?

Windstorm is a strong blowing of high winds with or without rain.

WHAT HAPPENS?

Wind is air in motion. It is produced by the uneven heating of the earth's surface by the sun. Since the earth's surface is made of various land and water formations, it absorbs the sun's radiation unevenly. Two factors are necessary to specify wind: speed and direction.



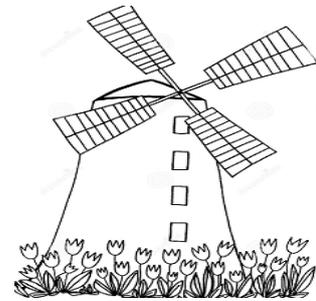
**Types of Anemometer:** Instruments to measure wind speed



**Wind vane:** Instrument that shows the direction the wind is blowing

When wind moves gently, it is called a **breeze**. It can blow harder too. When the winds are very strong, they can become **gales** and **storms**. A **windstorm** is just a storm with high winds or violent gusts but little or no rain. Very strong winds can become **hurricanes**, **typhoons**, **cyclones** and **tornadoes**. These can cause disasters.

**Windmill:** A machine that uses the energy of the wind to get a job done. A windmill may be used to generate electricity, etc.



## SOME SAFETY MEASURES

### BEFORE

- ✓ Make an emergency kit.
- ✓ Make an emergency plan.
- ✓ Check if there are trees near your home or classroom that could fall in windstorm.
- ✓ Check if there objects hanging loose in your home and school. If yes, fasten them.

# DURING

- ✓ Do not panic. Take quick action to protect yourself and help others.
- ✓ Ask elders to turn off stove and natural gas appliances.
- ✓ If you are outdoors, move into a building. Avoid electric power lines, utility poles and trees.
- ✓ If you are indoors, move away from windows or objects that could fall.
- ✓ If you are in vehicle, ask the driver to stop. Stay away from trees, power lines and other hazards. If possible, walk into a safe building.
- ✓ Listen to radio for emergency instructions.

# AFTER

- ✓ Check yourself and those around you for injuries.
- ✓ Evacuate damaged buildings. Do not re-enter until declared safe by authorities.
- ✓ If you smell gas or hear a hissing sound indoors — open windows and leave the building. Ask an adult to turn off the gas source and call for help. Do not use matches, candles, open flames or electric switches indoors.

## TEST YOUR KNOWLEDGE

### **I. Unscramble the following**

1. INWD
2. NAEMEOTRME
3. IWDN AVEN
4. WNILMDLI

## II. Fill in the blanks from the following words

*Stop, Anemometer, Wind, Wind comes from*

1. Air in motion is called \_\_\_\_\_
2. Wind direction is always the direction \_\_\_\_\_
3. In you are in a car during a windstorm, ask the driver to \_\_\_\_\_
4. Instrument to measure wind speed is called \_\_\_\_\_

## III. Match the column

Sl no.	Column A	Column B
1	Wind vane	Measures wind speed
2	Wind power is a	Electricity
3	Wind can be used to create	Shows the direction of wind
4	Anemometer	Renewable energy source

# DID YOU KNOW?

- ✓ Wind power is the cheapest, pollution free, renewable energy source.
- ✓ Wind can be used to create electricity through wind power.
- ✓ People have been harnessing wind energy since as early as 5000 BC.
- ✓ The wind is not always predictable. Some days may have a lot of wind and others may have no wind at all.
- ✓ The highest documented wind speeds ever were in a 1999 tornado at 318 miles per hour.
- ✓ Wind direction is always the direction the wind comes from for e.g. East wind comes from the East.
- ✓ One wind turbine can produce enough electricity to power up to 300 homes. A wind turbine works the opposite of a fan. Instead of using electricity to make wind, a turbine uses wind to make electricity

# VEHICULAR ACCIDENT



WHAT IS VEHICULAR ACCIDENT?

An *accident* that involves vehicles e.g. cars, trucks, etc is called vehicular accident. A vehicular accident may cause serious injury or damage or even loss of life so it is important to be careful from vehicles while you are on road.

## SOME SAFETY MEASURES

### BEFORE

- ✓ Be careful while walking in the roads.
- ✓ Always look to your left and right before crossing the road.
- ✓ Do not play in the road.
- ✓ If you are in a vehicle and the driver is speeding, ask the driver to slow down.
- ✓ If you are in vehicle, do not distract the driver.

**Accident:** An unexpected event which may result in damage or harm

- ✓ Obey traffic signals.
- ✓ If you spot a drunken driver, report to an adult.

## DURING

- ✓ Do not go near an accident area, it may disturb rescue workers.
- ✓ If you spot an accident, inform adults or call police no. 100.
- ✓ If you are in an accident, do not run or walk around too much. Ask for help.

## AFTER

- ✓ When in an accident, always inform your parents or elders. Do not hide the fact from your parents or elders.
- ✓ Ask for a thorough medical checkup.

## TEST YOUR KNOWLEDGE

### I. Unscramble the following with the help of the meanings given

1. RCTFAIF (movement of vehicles)
2. OARD AFETSY (to be free from harm in roads)
3. ESTA TEBL (belt used in car for safety)
4. CAICTEDN (an unexpected event which may result in damage or harm)

### II. Fill in the blanks from the following words

*Driver, Traffic signals, Roads, Medical checkup*

1. When in road, obey \_\_\_\_\_
2. In a car, do not distract the \_\_\_\_\_
3. Do not play in \_\_\_\_\_
4. If you are in an accident, ask for \_\_\_\_\_

### III. Match the column

Sl no.	Column A	Column B
1	Before crossing the road	Do not listen to loud music
2	If you are in car	It may disturb rescue workers
3	If you spot a drunken driver	Look to your left and right
4	Do not go near an accident area	Report to an adult

#### ACTIVITY

Collect at least ten pictures of different road signs and present them to your class. Try to collect signs that your friends do not have.

## DID YOU KNOW?

- ✓ More than 1.2 million people die in road traffic crashes every year.
- ✓ As many as 50 million people are injured or disabled by road traffic crashes every year.