



WILD and WOOLLY WEATHER

I CAN'T TAKE THIS PRESSURE

Low Pressure When air warms up, the air molecules spread out so there are fewer air molecules in the same space. Warm air weighs less than cool air, which means that warm air presses down on the earth less than cool air. Less pressing = low pressure. A mass of warming air is an area of low pressure. Warm air rises and produces clouds, so low pressure areas usually bring rain or storms.

High Pressure When air cools, the air molecules bunch together so there are more air molecules in the same space. The air mass becomes heavier and sinks toward the earth, creating an area of high pressure. More pressing = high pressure. No clouds are formed in this process, so clear skies and fair weather usually come with a high pressure area.

Measurement of air pressure is done with a barometer. This instrument measures the weight of air on one square inch of surface area at sea level. The measure is given in inches, because the early barometers were set up to see how many inches high the pressure would push a column of mercury.

BLOWING HOT AND COLD

The three temperature scales we use are Fahrenheit, Celsius (also known as Centigrade), and Kelvin, named after their inventors. In the United States, Fahrenheit is commonly used to record air and body temperatures. Celsius is used in most of the world, where the metric system is used. Kelvin is for scientific use. Here's how they stack up:

System	Fahrenheit	Celsius	Kelvin
Boiling point of water (at sea level)	212°	100°	373°
Normal human body temperature	98.6°	37°	310°
Comfortable room temperature	70°	21°	294°
Freezing point of water (at sea level)	32°	0°	273°
Absolute zero (the coldest anything can theoretically be)	-460°	-273°	0°

Measuring Up

Barometers measure air pressure.

Thermometers measure air temperature.

Anemometers measure wind speed.

Psychrometers and **Hygrometers** measure humidity, the amount of water vapor in the air.

Rain gauges measure precipitation.

Sunshine recorders measure hours of sunshine in a day.

Weather balloons take temperature, humidity, and pressure readings in the atmosphere and transmit data to weather stations on the ground.

Famous U.S. Weather Disasters

Year	Type	Location	Damage	Lives Lost
1888	Blizzard ("Blizzard of '88")	Maryland to Maine	200 ships sunk, buildings and trains buried under 40- to 50-foot snowdrifts	400+
1925	Tri-State Tornado	Missouri, Illinois, Indiana	\$18 million (1925 dollars)	695
1988	Drought/Heat Wave	Central and Eastern U.S.	\$40 billion	5,000+
1992	Hurricane Andrew	Florida, Louisiana	\$27 billion	58
1993	Great Midwest Flood	Central U.S.	\$21 billion	48

How Close Is That Thunderstorm?

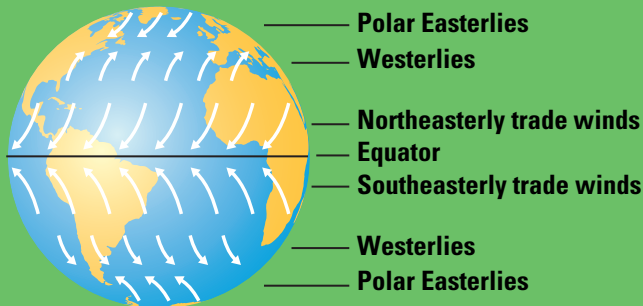
Thunder happens at about the same time as lightning, but from a distance you see the lightning first because light travels much faster than sound. To find how far away the storm is, try this “flash to bang” technique:

Count the number of seconds from a “flash” of lightning to the “bang” of thunder. Divide that number by five, because sound travels one mile in five seconds. If you counted eight seconds from flash to bang, the storm would be about 1.6 miles (2.6 km) away.

To find out if a storm is coming closer or moving away, use the “flash to bang” technique again in a minute or two. If the second time is shorter, the storm is getting closer. If the second time is longer, the storm is moving away. A thunderstorm usually can't be heard more than 10 miles (16 km) away, although you may see the lightning.



whirl winds



Weather changes with the wind. The air doesn't stand still for long because air temperature varies with the uneven heating of the earth by the sun and produces the world's wind patterns.

1. The equator receives the sun's rays most directly. The warmed air expands and rises.
2. Cooler air flows in from the poles to take the place of the rising air. Winds are created that flow toward the equator, but not in a straight path. Because the earth is spinning, the winds end up curving toward the east in the Northern Hemisphere and toward the west in the Southern Hemisphere. This is called the Coriolis effect.

The jet streams are paths of high-speed wind moving at 100–200 mph (160–320 kph) that flow around the earth at approximately 30,000 feet (9,000 m)—about as high as the highest clouds.

Bends and loops in the jet stream change often, and the position of the jet stream affects the weather in the atmosphere below. Low pressure areas, where storms form, often occur under a bend in the jet stream.

Lightning Safety Tips



Lightning can strike even when it's not raining. Thunderstorms can also produce hail, high winds, heavy rain, flooding, and tornadoes.

AT HOME

- ▶ Stay away from doors and windows, metal sinks and faucets, radiators and the phone unless you're making an emergency call.
- ▶ Take off headsets and turn off computers, TVs, and appliances.

IN OPEN COUNTRY

- ▶ Crouch (rather than lie) in a ditch or other low area with your hands around your knees or head, so your body has the least possible contact with the ground.
- ▶ Keep at least 15 feet (4.5 m) from other people. If lightning strikes nearby, it can travel along the ground from person to person.
- ▶ Stay away from water, metal fences or poles, and tall objects including trees, picnic shelters, or buildings that stand alone.
- ▶ Don't hold a golf club, a fishing pole, or an umbrella.
- ▶ Don't resume outdoor activities until half an hour after the thunder and lightning have stopped.

LIGHTNING FAST FACTS

- ▶ Ninety percent of lightning flashes happen within a cloud or between clouds.
- ▶ Lightning strikes the earth somewhere in the world about 100 times every minute.
- ▶ An average of 9,000 fires a year are started by lightning in U.S. forests and grasslands.
- ▶ Your chances of being hit by lightning are very low. Some estimates put the odds at 1 in 350,000. Other estimates put the odds at 1 in 600,000.
- ▶ Nevertheless, 325–500 people in the U.S. are struck by lightning each year.
- ▶ Lightning comes in a variety of forms. What do you think each of these looks like? Anvil, ball, bead, heat, ribbon, sheet, staccato, streak (or forked).