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## Fun Facts about Weather





This booklet is designed to help you see the miles of Kansas scenic byways with new eyes.

Included are photos and brief descriptions of common sights. It is a booklet that young and old will enjoy whether you are a visitor to the state or a life-long Kansan.

There are many available identification booklets about the birds and wildlife in this region. However, this booklet will feature fun facts about the birds and wildlife that you see often on these byway miles.

Other booklets in this series are on: **farms and ranches; grasses, trees, wildflowers and shrubs; weather; architecture; rocks, fossils and the landscape** of Kansas; and the **roads** themselves. Each booklet has a map of the scenic byways of Kansas and a game for kids.

We hope that this little booklet will put a smile on your face as you drive around our scenic byways.



### My, that's a big Sun!

The sun is 100 times larger than the Earth and weighs 4 nonillion pounds (that's a 4 followed by 30 zeros!). To us that is big, but it is a very ordinary sized star compared to others.

**The sun is where our weather starts.** The sun heats the Earth and causes the moisture in the ground, oceans and plants to evaporate and become clouds, which then cool and become rain, hail, or snow. When the sun shines, the water evaporates and the cycle starts all over.

### Is it safe to look at the Sun?

**Definitely not.** Looking directly at the sun may damage your eyes, even if you wear sunglasses or only look for a short time.

If you want to know where the sun is, just look at your shadow. A short shadow means the sun is overhead and a longer shadow means the sun is lower in the sky.





## Why does the wind blow?

We cannot see the wind but we can certainly see what it does. Trees sway, flags wave, kites fly -- all because of the wind. The sun heats the earth unevenly -- some spots more than others. This uneven heating causes the air to move from place to place and this creates the wind.

Kansans know a lot about the wind. Because of our prevailing weather patterns, the large open expanses of the Great Plains and the lack of many urban areas with trees and large buildings, **Kansas is a great place to experience the wind.**



As you travel Kansas's scenic byways you will notice the effects of the wind in the waving wheat, the turning windmills, the blowing trees. *Notice that in some areas, rows of trees are permanently bent in the direction they are continuously blown.*



## What is a cloud?...

Even though we can't see it, the atmosphere contains at least some water vapor at all times. When this vapor is cooled, it condenses to form tiny water drops or, if it is cold enough, ice crystals. *If enough of these water droplets or ice crystals collect in the air, we see a cloud.*



## Rain cloud or ice cloud?

*It is easy to tell.* The clouds with the clear, distinct edges are rain clouds, and the clouds with fuzzy, indistinct edges are ice clouds. **You can see ice clouds even in the warm months.** This is because the air is much colder high above the Earth's surface. When the temperature is warm enough down here where we are, the ice in those clouds melts as it falls to the ground, causing rain.





## Name that Cloud!

There are names for every type of cloud you see in the sky. These names were given to clouds in the early 1800s by a British man named Luke Howard, and we have been using these names ever since.

The names are based on Latin words:

**Cirrus**, which means "lock of hair" in Latin, are high wispy clouds.

**Stratus**, which means "layer," are sheet clouds that seem to cover the entire sky. A very low stratus cloud that sits close to the earth is *fog*.

**Cumulus** clouds, based on the Latin word for "heap," are the big fluffy clouds shaped like cotton balls.

**Cumulonimbus**, meaning "heap of rain," are clouds that contain rain and ice and produce lightning and thunder.

They can also cause damaging winds, hail and tornadoes.



## Raindrops keep falling on my head!

Rain falls in many different ways. It can come down as a light mist, as a drenching downpour, or as a sudden shower.

*Drizzle* is the smallest form of rain and its drops are about 1/50" across. Normal raindrops are about 1/12" across. Rain also falls at different rates. The smallest drops float gently to Earth, while large drops can fall at up to 20 miles per hour.

Average rainfall differs throughout Kansas, with the eastern part of the state receiving more than the west. Along the *Frontier Military Scenic Byway*, rainfall averages around 40 inches a year; along the *Wetlands and Wildlife National Scenic Byway* it is around 25 inches a year; and along the *Smoky Valley Scenic Byway* it is 22 inches per year.





## What causes a storm?

When there is enough heat energy in the atmosphere, rain showers turn into thunderstorms. The cumulonimbus cloud grows very large and tall, and inside the air is rushing upwards. As the wind swirls around, particles of ice freeze and melt, carrying electrical energy with them. Eventually, a giant spark leaps across the sky or down to the ground. **This spark is lightning.** Because it is so hot -- *hotter than the surface of the sun* -- the lightning heats the air rapidly and explodes, causing the big boom of thunder.

## Lightning Fast Facts

- It is estimated that lightning occurs **100 to 125 times every second** somewhere on Earth.
- Lightning occurs in the U.S. **25 to 30 million times each year.**
- Lightning has been estimated to reach some **54,000 degrees (F)** -- *that's six times hotter than the sun!*

## How far away was that lightning?

You can calculate how far you are from lightning. Merely count the seconds (*1001, 1002, 1003, etc.*) from the time you see the lightning and the time you hear the thunder, and divide by five. That will give you the number of miles away you are from the lightning.



## What is a tornado?

Sometimes very powerful thunderstorms can produce tornadoes. A tornado is a violently rotating column of wind that touches the ground. While most tornadoes are fairly weak and don't last long, winds in a tornado can reach more than 300 miles per hour. Since wind is invisible, what we see in a tornado are water droplets, dust and debris being carried by the funnel. A tornado may sound like a screaming jet engine or a freight train as it approaches.

## Does Kansas have lots of tornadoes?

Kansas is part of **Tornado Alley**, an area of the country that is hit by more tornadoes than any other place in the world. The Alley also includes Missouri, Nebraska, Oklahoma, and Texas.

The idea of Kansas having more tornadoes than any other state was popularized by the movie *The Wizard of Oz*, but other states lead the nation in total number of tornadoes. Kansas can lay claim to the record for **the highest number of F-5 intensity** (the most intense) **tornadoes** since 1880.

## The cold, hard facts

### Can hail really be the size of a grapefruit?

Yes. Hail stones are classified according to their size. They range all the way from *pea sized*, .25" across, to *quarter sized*, about 1" across, to *golf ball sized*, 1.75" across, to *baseball sized*, 2.75" across, to *softball sized*, 4" across.



### World record hail

The largest recorded hail stone fell in Aurora, Nebraska, in June 2004. **It was nearly the size of a soccer ball** -- 7" in diameter! The previous record was a hail stone that fell in Coffeyville, Kansas, in September 1970. It was 5.7" across.

### What is snow?

Snow is not the same as frozen rain. Snow starts out as tiny ice crystals in a cold cloud. When these crystals become large enough they fall to Earth as snow. If the ground and air are cold enough, they will form a blanket of snow over the ground.



### Are snowflakes all different?

No two snowflakes are exactly alike, but they all have six sides. Snowflakes come in all sizes. If the temperature is well below freezing, the crystals will be small -- in the range of 1/25 of an inch. If the temperature is near the freezing mark, the crystals bond and make larger flakes -- some as large as 2 to 3 inches across.

### What is a blizzard?

A blizzard occurs when falling or blowing snow reduces visibility to 500 feet or less, with winds of 32 miles per hour or stronger. Because Kansas is mostly open plains and does experience strong winds, blizzards do happen occasionally.

A blizzard can cause **drifts of snow up to six feet or more** and makes driving very difficult because the blowing snow covers the edges of the roads.





## The dramatic skies of Kansas

With its wide open terrain, Kansas is one of the best places in the country to view the lovely skies above. Wonderful views of the open sky can be seen from the overlook on the *Flint Hills National Scenic Byway*, three miles south of Cottonwood Falls, the Wilson Dam overlook on the *Post Rock Scenic Byway*, and the overlooks along the *Gypsum Hills Scenic Byway*.



## Why is the sky so blue?

As light travels from the sun through the atmosphere, the light is bent and scattered. More short-wave blue rays are scattered than any other color, therefore we usually see the sky as blue.



## What causes such beautiful sunrises and sunsets?

Moisture or dust in the air make the short-wave blue rays of sunlight scatter and change directions, leaving the longer wave colors of red and orange to reach our eyes. Interesting cloud formations in front of the sun also add to the dramatic effect.

Along the *Smoky Valley Scenic Byway* you will see a beautiful hazy, blue-gray appearance at sunrise and sunset. This is what gave the Smoky Hills their name.





## What causes rainbows?

Sunlight bending as it passes through rain drops causes rainbows. They happen when the bright sun is low in the sky and you are located between the sun and the rain. Therefore, morning and afternoons are the best times to look for them.

**Rainbows happen during the rainy seasons** -- spring, summer and fall -- and it is not uncommon to see double rainbows during heavy rains.

## Can I see forever in Kansas?

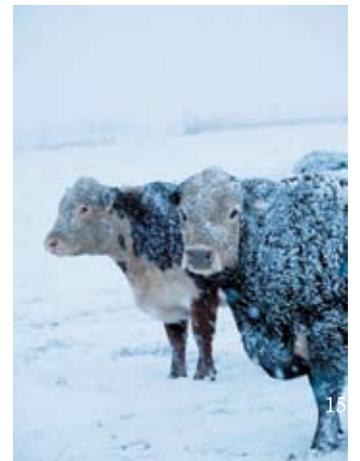
*It feels like you can.* Actually the human eye can see about 200 miles on a very clear day. You can see up to 500 miles at night if there is a very bright object on the horizon.

**Test your eyesight** along the *Smoky Valley Scenic Byway*. It is in the High Plains section of Kansas and you will truly feel that you can see forever.



## What should I do in case of bad weather?

- **Keep your eye on the weather**, and if it looks threatening, listen to a radio or television to hear if storm watches and warnings have been issued. A "watch" is when conditions are right for severe weather; a "warning" is issued if severe weather has actually been sighted.
- **If a tornado is forecast**, seek shelter in a basement or an interior room that does not have windows.
- If you are in your car, do not try to wait out a tornado or try to outrun it. Seek shelter inside a sturdy building. Better yet, *stay informed of severe weather and don't drive into dangerous storms.*
- **In a lightning storm**, do not stand under trees or in an open area. Take shelter in a car or a building.
- **In a snow storm**, stay off the roads as much as possible. If you venture out, be sure and take a *storm kit* -- flashlight, blanket, food, and water.



## A GAME FOR KIDS!

# Did you see it?

Place a check beside the weather conditions you experience and note the date and location.

1. Thunderstorm

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

2. Snow

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

3. Hail

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

4. Rain

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

5. Beautiful Sunset

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

6. Rainbow

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

7. Lightning

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

## CLOUD CHART

1. Cirrus Clouds

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

2. Stratus Clouds

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

3. Cumulus Clouds

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

4. Cumulonimbus Clouds

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

5. Rain Cloud

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

6. Ice Cloud

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

# SCENIC BYWAYS Etiquette

**K**ansas scenic byways are to be enjoyed by everyone.

Please help us preserve this beautiful land by not picking the flowers and native grasses, and by not straying onto private land.

Of course, please do not litter.

This magnificent scenic land is home to many Kansas residents who welcome you to their communities, shops, and restaurants.

Please respect their privacy by not photographing cowboys or their families.

Stay out of the way of cattle drives.

Do not climb fences or gates.

And please, help keep everyone safe

by obeying posted speed limits.

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**Enjoy Kansas Scenic Byways!**

