

Spinning Thunderstorms

This article is provided courtesy of the American Museum of Natural History.

On a spring night in 2007, disaster struck a small town in Kansas called Greensburg. Shortly before 10 p.m., a siren went off. A mile-wide tornado was approaching Greensburg. And it wasn't just any tornado. It was a category EF5, the most powerful kind there is.

Its winds were estimated to be more than 200 miles per hour. In less than ten minutes, the town was destroyed and ten people lost their lives.

When the fury had passed, people clambered through the rubble. Cars and trucks had been thrown about. Homes were crushed, or simply ripped from the ground. "I'm in downtown Greensburg. There's really nothing left," said one resident.



Credit: FEMA Photo by Michael Raphael

The tornado destroyed much of the town. Many residents needed temporary housing.

How do tornadoes form?

A tornado is a swirling, funnel-shaped column of wind that gets its start from a thunderstorm. Thunderclouds form when warm, wet air collides with cool, dry air. Then, strong winds form into a wide tube of spinning air. When the tube touches the ground, it becomes a tornado.



Credit: NOAA

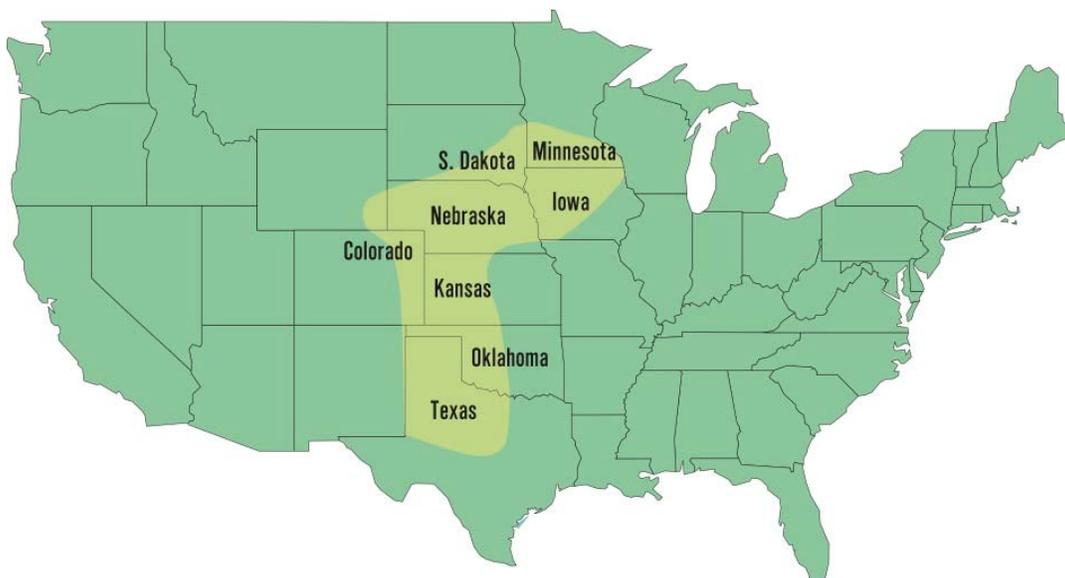
A tornado is a swirling, funnel-shaped column of wind. It stretches from a thunderstorm cloud down to the ground. A tornado gets its start when strong winds at high altitudes set a thunderstorm's winds rotating.



Credit: The Field Museum

The 200-plus-mph winds of a tornado can bend a stop sign.

Kansans are used to tornadoes. The people of Greensburg live smack in the middle of "Tornado Alley," an area that spans eight states in the Central United States. This region is a perfect thunderstorm factory. It has just what storms need to get started: cool, dry air from the Arctic mixing with warm, humid air from the Gulf of Mexico. Above the flat Great Plains, far from mountains and coastal weather, thunderstorms can form undisturbed. These conditions spawn more than 600 tornadoes, on average, in "Tornado Alley" every year.



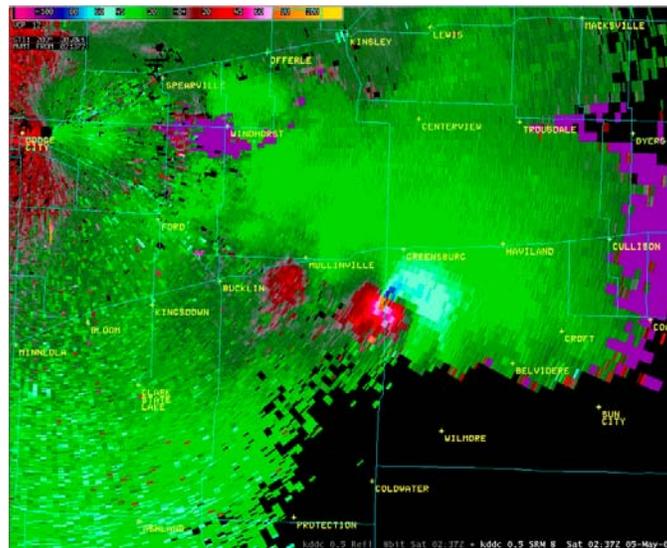
Credit: The Field Museum

More than 75% of all tornadoes in the world take place in "Tornado Alley."

How do scientists predict dangerous storms?

Meteorologists are scientists who study and forecast weather. They use a technology called radar to track storms. Weather radar works by detecting the precipitation (rain, snow, or hail) in approaching storms. The radar unit sends out a radio wave towards the storm. The radio wave bounces off the raindrops, hail or snow that is in the storm, and then returns to the radar unit. The amount of time it takes for the wave to return tells meteorologists how far away the storm is. Most radar units send out about 1,000 radio waves per second. This gives them detailed, up-to-the-minute information about the storm.

Using radar, forecasters can track the formation and path of severe storms like tornadoes. When a tornado takes shape, its winds blow raindrops in a circular pattern. When scientists see that pattern on a radar screen, they know that a tornado is developing. Although tornadoes have fast swirling winds, tornadoes themselves move relatively slowly across the land (18-30 miles per hour). So scientists can make reasonable forecasts about where they are headed. A system of tornado watches and warnings are used to alert the public to danger. A tornado “watch” means thunderstorm conditions exist that could spawn tornadoes. A “warning” means a tornado has touched down and been spotted.



Credit: NOAA

Doppler radar map shows the tornado shortly before it leveled most of Greensburg, Kansas.

This system saved many lives in Greensburg. After the tornado sirens shrieked, people had 20 minutes to escape to their basements and storm shelters before the tornado destroyed their town.

Name: _____ Date: _____

1. What happened to the town of Greensburg in 2007?

- A It was destroyed by a fire.
- B It was destroyed by a tornado.
- C It was destroyed by a hurricane.
- D It was destroyed by an earthquake.

2. What does this article explain?

- A how scientists use radar to track storms
- B how the town of Greensburg was rebuilt
- C how the system of tornado watches and warnings developed
- D how cool, dry air moves from the Arctic to the middle of the United States

3. Read this sentence from the article: "Kansans are used to tornadoes."

What evidence in the article supports this statement?

- A The tornado that destroyed Greensburg was a mile wide and had winds that were moving faster than 200 miles an hour.
- B A tornado came through Greensburg and destroyed the town 20 minutes after tornado sirens went off.
- C Kansans live in an area of the United States where a lot of tornadoes happen.
- D "Tornado Alley" has cool, dry air from the Arctic that mixes with warm, wet air from the Gulf of Mexico.

4. What might be a reason why scientists track tornadoes?

- A to encourage more people to use radar technology
- B to warn people against living in "Tornado Alley"
- C to lower the number of tornadoes that happen every year
- D to gather information that is used to warn people that a tornado is approaching

5. What is the main idea of this article?

- A Tornadoes are dangerous spinning storms, but storm tracking and a system of watches and warnings can lessen their danger.
- B "Tornado Alley" is an area in the middle of the United States where cool, dry air mixes with warm, wet air.
- C The tornado that struck Greensburg threw cars and trucks through the air, pulled homes out of the ground, and killed 10 people.
- D Radio waves give scientists information about approaching storms by traveling from a radar unit toward a storm and then returning to the radar unit.

6. Why might the author use headings such as “How do tornadoes form?” and “How do scientists predict dangerous storms?”

- A to make readers think more deeply about the effects of tornadoes
- B to suggest that there is still a lot to be learned about tornadoes
- C to provide information about the pictures included with the article
- D to help organize the information in the article

7. Select the word that best completes the sentence.

A tornado warning saved many lives in Greensburg _____ the town itself was destroyed.

- A after
- B although
- C because
- D for example

8. What is a tornado?

9. Explain how radar could be used to track a tornado. Support your answer with evidence from the article.

10. Could using radar to track a tornado help save lives? Explain why or why not, using evidence from the article.
