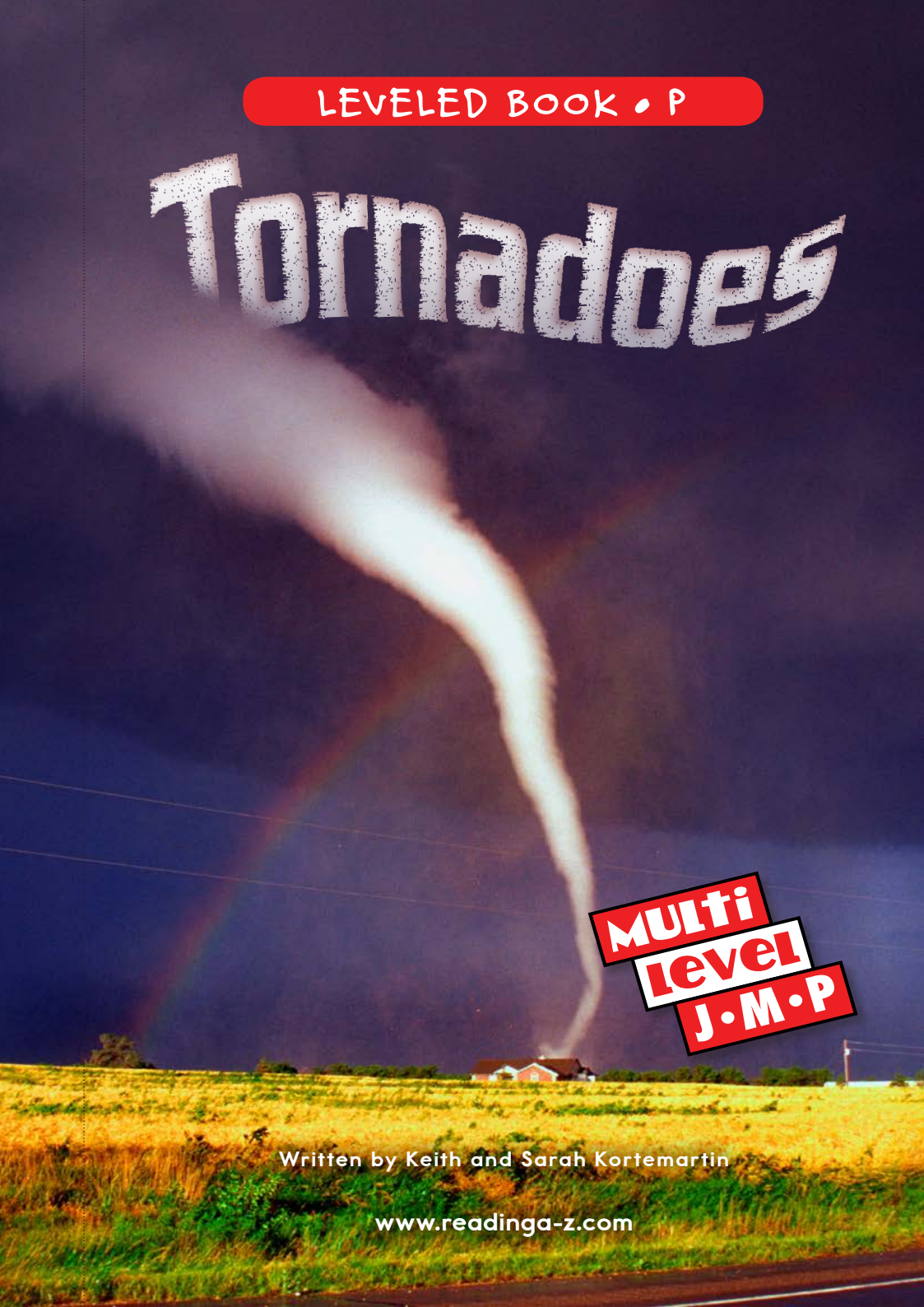
LEVELED BOOK • P

Tornadoes



Multi Level J•M•P

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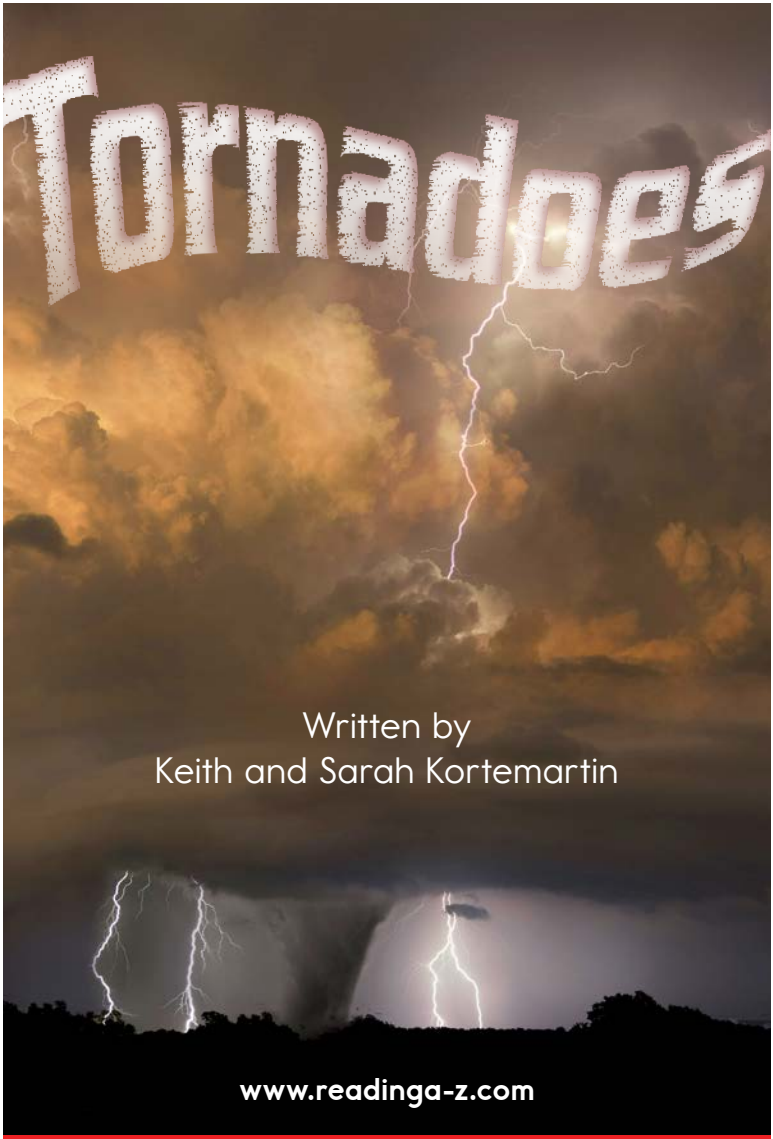

Focus Question

What are tornadoes, and why are they dangerous?

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A powerful tornado that struck St. Louis, Missouri, in 2011 nearly destroyed this home and overturned an SUV in the driveway.

Introduction

What can lift roofs from buildings, sweep houses into the air, and rip trees out by the roots? **Tornadoes** can! Tornadoes come in many sizes. Some tornadoes are narrow—only a few feet (1 meter) across. Others are more than a mile (1.6 km) wide. The biggest tornado on record was almost 2.6 miles wide (4.2 km). It **struck** Oklahoma in 2013.

Some tornadoes touch down for a short period of time. Others can travel for hundreds of miles, destroying everything in their paths while carrying houses and cars over long distances.

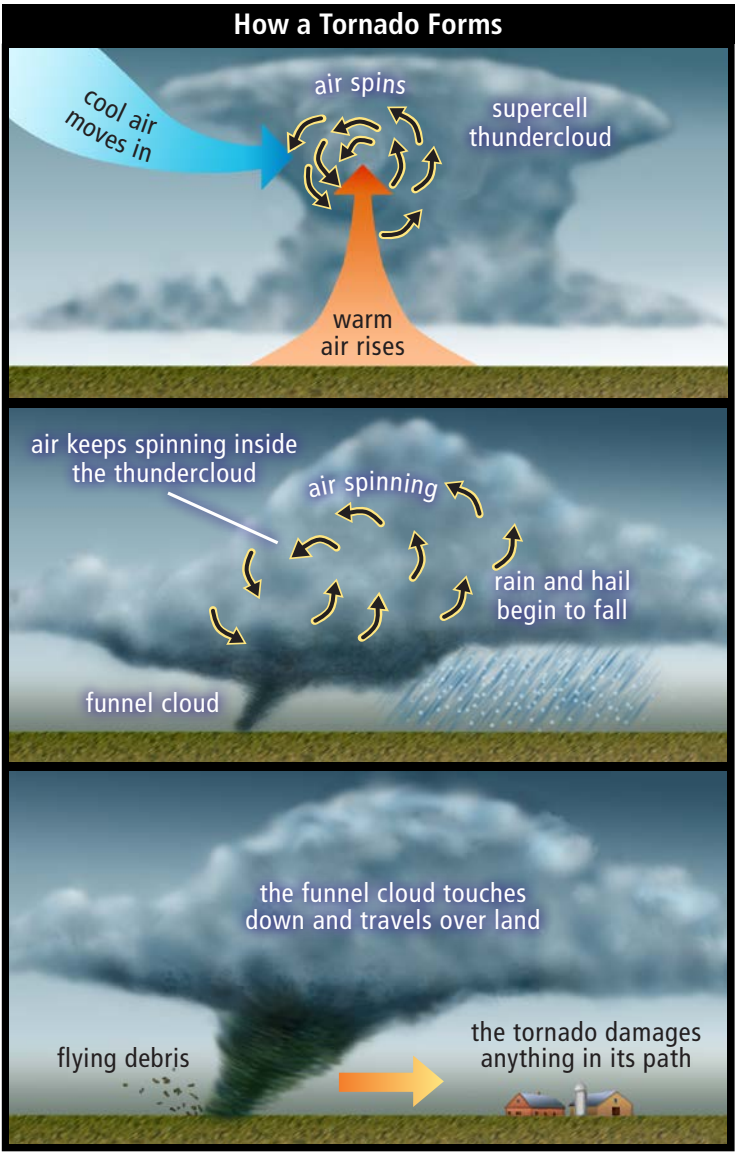
How Tornadoes Form

What causes tornadoes? Scientists aren't sure. They know that the strongest and most violent tornadoes come from large thunderstorms called *supercells.* These thunderstorms form when warm, **moist** air rises into the **atmosphere** and mixes with cold, dry air higher in the sky.

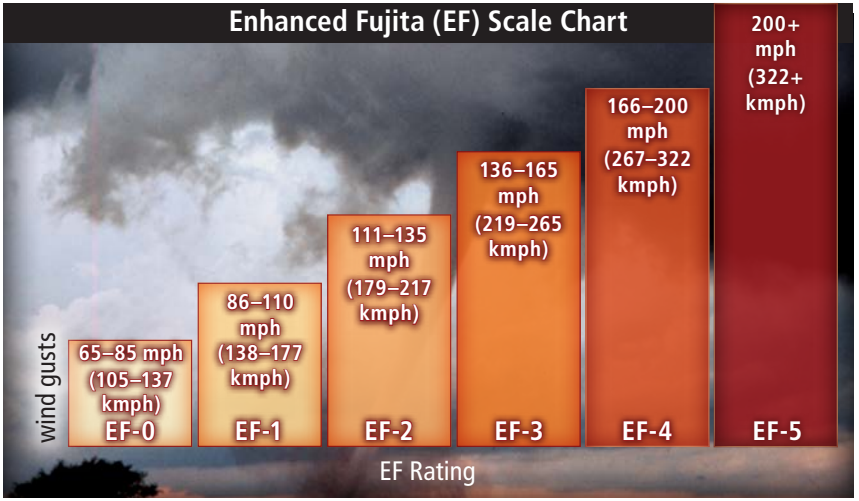
A supercell thunderstorm moves across Nebraska in June 2004, leaving a few tornadoes in its path.

Scientists think that in some supercells, the warm air rises quickly and the cold air rushes in to replace it. This causes the air to **rotate**. The spinning air begins to form clouds into a **funnel** shape. The funnel cloud stretches downward with winds up to 300 miles (483 km) per hour. When the funnel touches the ground, it officially becomes a tornado.

This funnel cloud eventually developed into a strong tornado that hit Kansas in 2004 with hail as large as softballs.



Some scientists think that tornadoes occur to balance the temperature and moisture levels in the air.



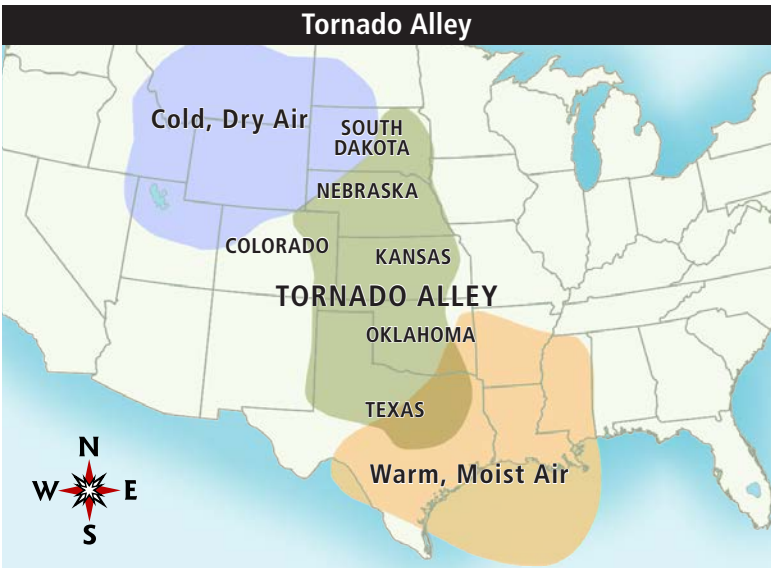
Measuring Tornadoes

While scientists are still researching the causes of tornadoes, they have a system for estimating their strength. A scientist named T. Theodore Fujita developed the Enhanced Fujita scale, known as the EF Scale, as a way to rate a tornado's strength based on wind speed. Because it's difficult to get close to a tornado, scientists estimate its wind speed by examining the **damage** it causes. The most powerful tornadoes are rated EF-5. They have winds greater than 200 miles (322 km) per hour.

Where Tornadoes Form

Tornadoes may be hard to measure, but scientists have a good idea where they will occur.

Although tornadoes can strike anywhere in the world, most tornadoes happen in the United States. More than one thousand tornadoes per year occur in the central part of the country, also known as Tornado Alley. It includes parts of South Dakota, Nebraska, Colorado, Kansas, Oklahoma, and Texas.

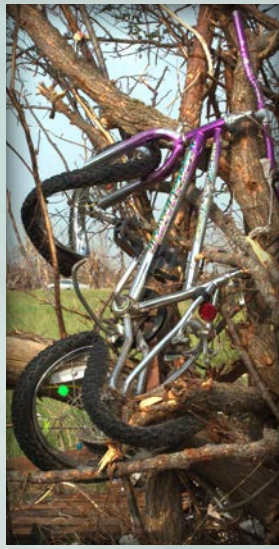


A massive tornado in Moore, Oklahoma, in 2013 left behind a clear path of its destruction.

Tornadoes are most active in the warmer months of the year when thunderstorms are more common. In Tornado Alley, warm, moist air travels north from the Gulf of Mexico. This air mixes with cool, dry air moving south from Canada. The mixing of the air from the north and south creates perfect conditions for a tornado.

Famous Tornadoes

- A tornado in 1925 traveled more than 300 miles (483 km) through Missouri, Illinois, and Indiana. It killed 695 people, the highest number of people killed by a tornado in U.S. history.
- In 1992, a tornado in Mississippi carried a baby up into the air and left the child hanging from the branch of a tree. The baby was hurt but lived.
- Two huge storm systems in April 1974 and April 2011 each produced hundreds of tornadoes.
- In May 2011, an EF-5 tornado struck Missouri. This tornado crushed cars and trucks and destroyed more than seven thousand homes.



A tornado that hit Kansas in 2003 was so powerful that it caused a child's bicycle to wrap around a tree.

- In March 2012, a giant tornado swept through Henryville, Indiana. It was enormous—150 yards (137 m) wide—and traveled a far distance—52 miles (84 km).

The tornado that struck Henryville, Indiana, in March 2012 caused thirty-nine deaths in five states.

Tornado Safety

Tornadoes are very dangerous, so scientists try to warn people before a tornado strikes. At the National Severe Storm Laboratory, scientists use tools that **scan** a thunderstorm for possible tornado conditions in less than a minute. However, there's no way to predict when a tornado will strike.

The National Weather Service (NWS) has a system to try to help people stay safe during tornadoes. The NWS issues a tornado *watch* when it's very possible that a tornado will strike soon. During a tornado watch, people should prepare in case a tornado does actually form. The NWS issues a tornado *warning* when a tornado has actually been spotted. At this point, it's time to take action and get to a safe place.

Some towns and cities install sirens that sound to warn people once a tornado has been spotted.

This underground shelter was built to provide protection from tornadoes, such as the one that destroyed the house next to the shelter.

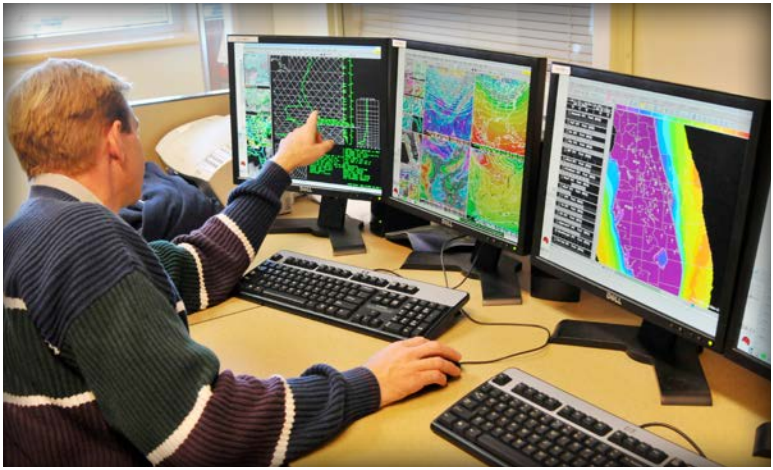
In the event of a tornado warning, go indoors, into a basement if possible. You can also go into a closet or bathroom. Try to stay away from windows because a tornado can easily blast through the glass. Flying **debris** becomes very dangerous during a tornado, so it is a good idea to have protection against it. Crouch down low to the ground, beneath a heavy table or desk if possible.

This sign alerts people that a shelter is nearby where they can find safety in the event of a tornado.

Otherwise, cover yourself with a mattress or blankets. You can even crouch down in a bathtub. Always place your hands over your head.

If you are in a tall building, go into a stairwell. Do not stay inside a mobile home. If you're in a car and can't escape the tornado, park the car, leave your seatbelt on, and lean forward. If you're stuck outdoors and can't find shelter, lie down flat on the ground, far away from trees.

Students prepare for a tornado strike in school by crouching under their desks.



A weather scientist studies approaching storms on weather maps.

Conclusion

Tornadoes are amazing—and scary—examples of the power of nature. Much more work needs to be done before we can fully understand these awesome weather events. Weather scientists are working to invent better ways to tell when a tornado is coming.

Many questions remain, however. What are the exact conditions within a supercell that cause a tornado to form? What is the inside of a tornado really like? Perhaps one day we'll find out.

Glossary

atmosphere *(n.)* a layer of gases surrounding a planet, star, or moon (p. 5)

damage *(n.)* harm done to someone or something (p. 8)

debris *(n.)* scattered pieces of something that are left after the rest has been destroyed or is gone (p. 13)

funnel *(n.)* a cone-shaped tube that is wider at the top and is often used to pour liquid or powder into a small opening (p. 6)

moist *(adj.)* slightly wet; damp (p. 5)

rotate *(v.)* turn on a center or axis; spin (p. 6)

scan *(v.)* to examine the inside of something using a special machine (p. 12)

struck *(v.)* past tense of "strike"; to happen suddenly or appear (p. 4)

tornadoes *(n.)* fast-spinning, funnel-shaped clouds that touch Earth's surface (p. 4)

Words to Know

atmosphere
damage
debris
funnel
moist
rotate
scan
struck
tornadoes

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Correlation

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Fountas & Pinnell	M
Reading Recovery	28
DRA	28

Tornadoes

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Connections

Writing

Write a newspaper article for children about tornadoes. Include facts from the book in your article.

Social Studies and Art

Make a poster explaining how to stay safe during a tornado. Share your poster with your class.