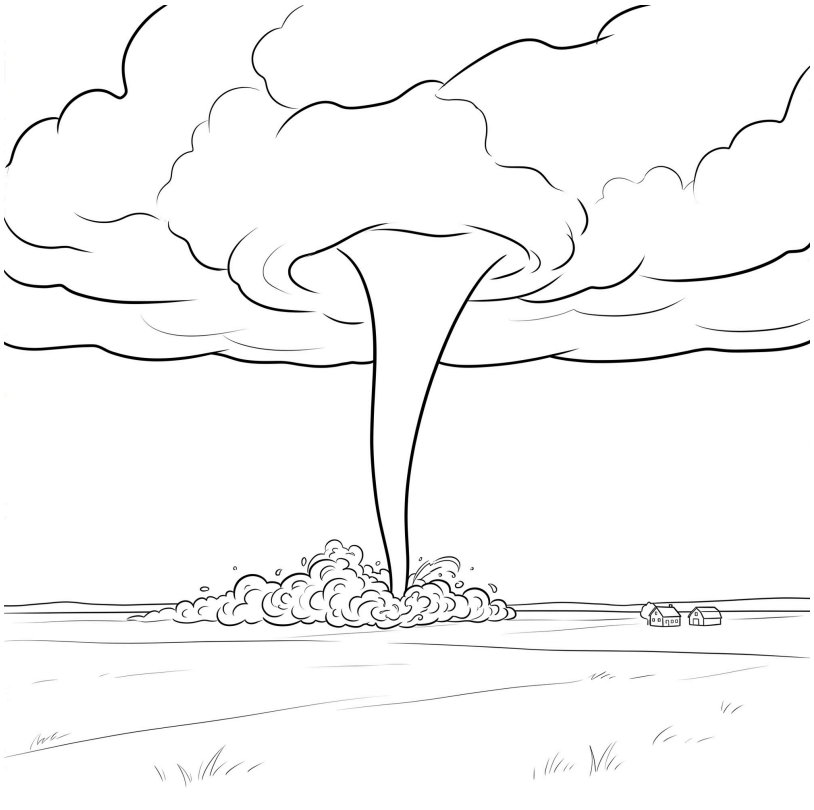
A Printable Scholar Weather Book

How Strong Is a Tornado?

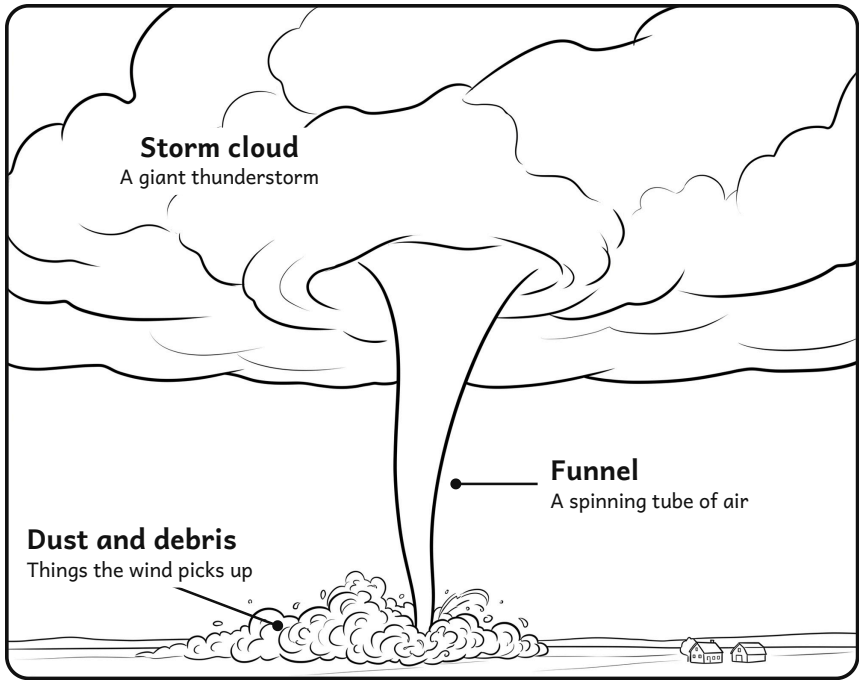
A book about the EF scale, from EF0 to EF5



This book belongs to

_____

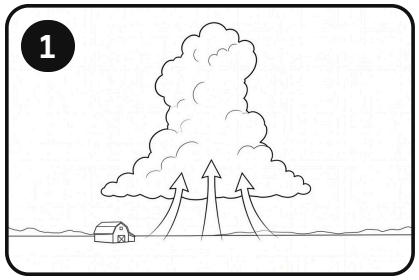
What Is a Tornado?



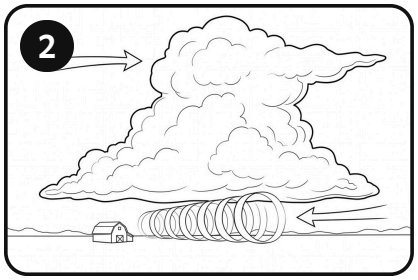
A tornado is a spinning tube of air that reaches from a storm cloud all the way down to the ground. You cannot see air. What you see is the cloud inside the funnel, and the dust and debris the wind picks up.

Tornadoes have the fastest winds on Earth.

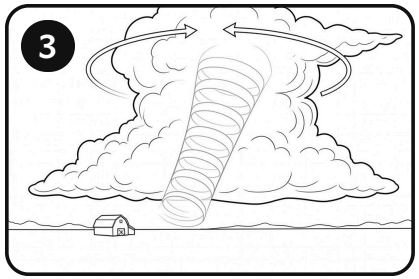
How a Tornado Forms



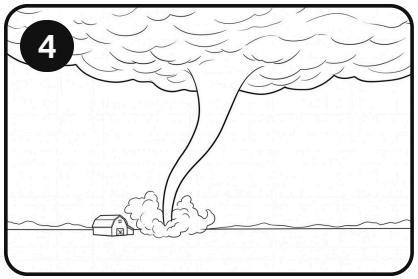
Warm, wet air rises from the ground and builds a tall cloud.



Wind high up and wind near the ground blow different ways. The air between them starts to roll.



The rising air tips the rolling air up on its end. Now the whole storm slowly turns.

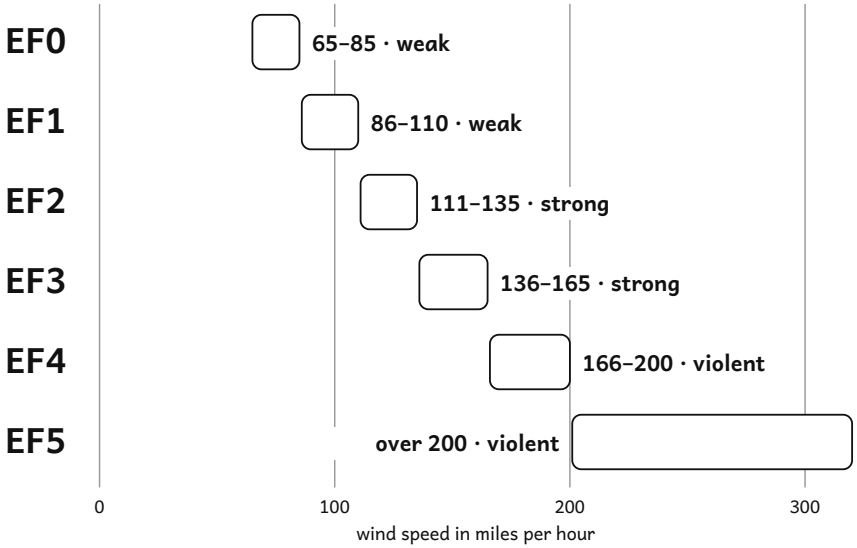


A spinning funnel drops from the cloud. When it touches the ground, it is a tornado.

Most thunderstorms never make a tornado. Scientists are still working out why some storms do and others do not.

The EF Scale

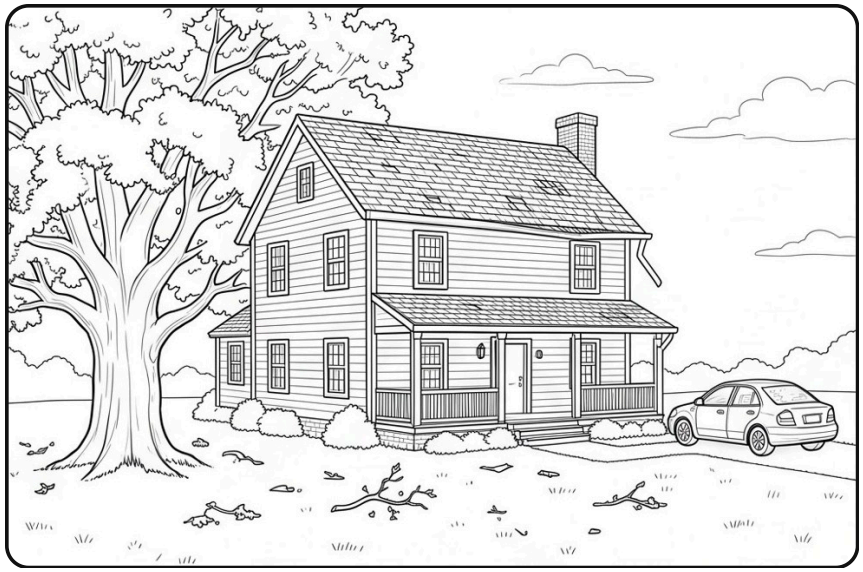
Nobody can hold a wind meter inside a tornado. So after the storm, experts look at the damage and work out how fast the wind must have been. Then they give the tornado a number from EF0 to EF5.



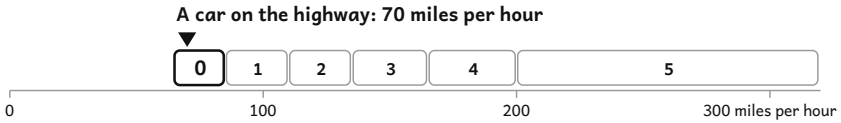
EF stands for Enhanced Fujita. Ted Fujita was the scientist who made the first tornado scale, in 1971.

The next six pages show the same house, tree and car after each kind of tornado.

EF0 Weak

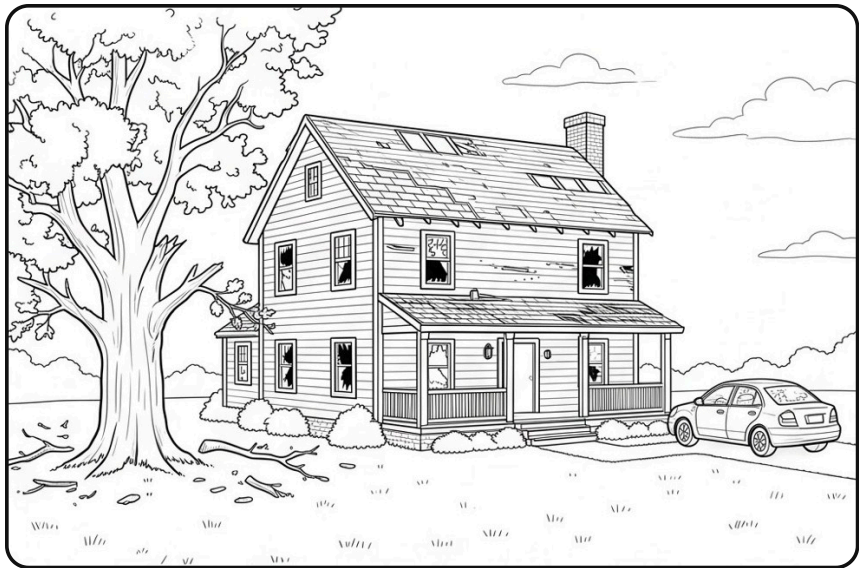


65–85 miles per hour
105 to 137 km per hour

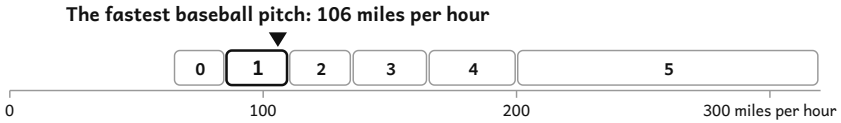


This is the weakest kind of tornado, but it is still stronger than most storms. It can peel shingles off a roof, snap branches and push over small trees. Its winds are about as fast as cars on a highway.

EF1 Weak



86–110 miles per hour
138 to 177 km per hour

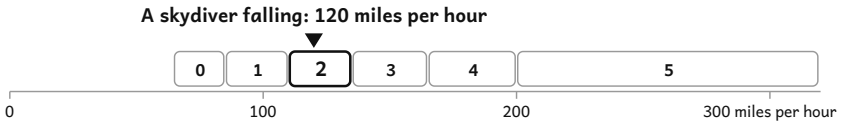


An EF1 strips big patches off a roof and breaks windows. It can tip over a mobile home and push a moving car off the road. Its winds can match the fastest baseball pitch ever thrown. About 8 of every 10 tornadoes are an EF0 or an EF1.

EF2 Strong

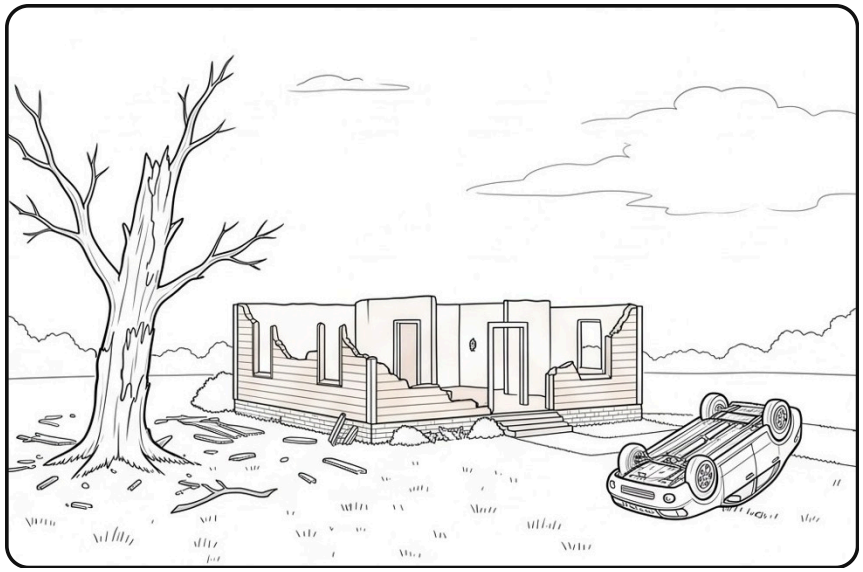


111–135 miles per hour
179 to 217 km per hour

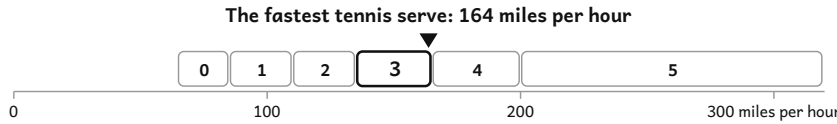


Now the tornado is strong. It can tear the roof off a well-built house, snap or uproot big trees, wreck mobile homes and lift cars off the ground. Its winds are about as fast as a skydiver falls.

EF3 Strong



136–165 miles per hour
219 to 266 km per hour

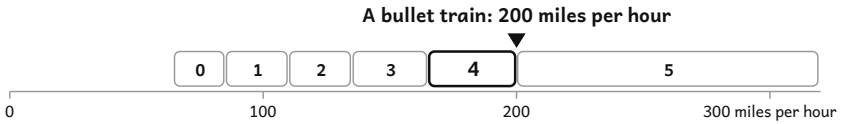


An EF3 can tear away a whole floor of a well-built house and knock down most of its walls. It can tip over a train and throw heavy cars. Trees lose their bark. Its winds can match the fastest tennis serve ever hit.

EF4 Violent

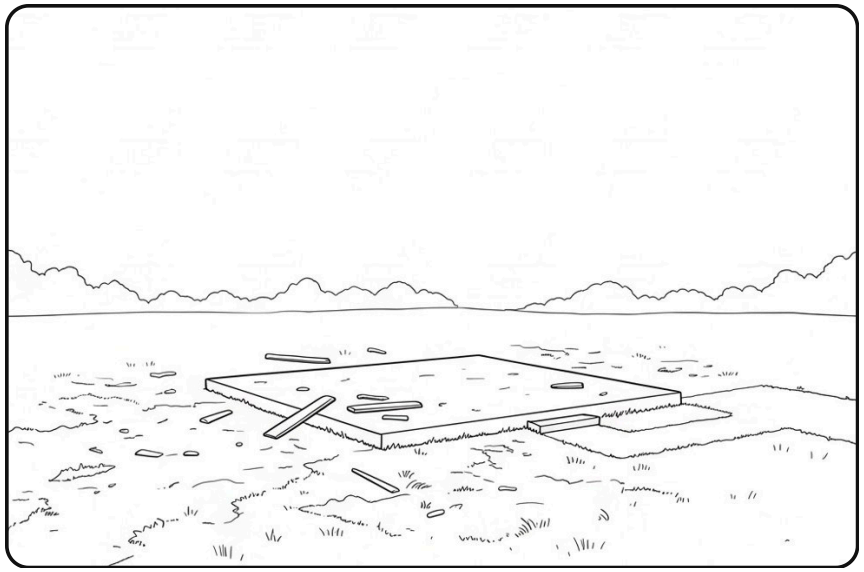


166–200 miles per hour
267 to 322 km per hour

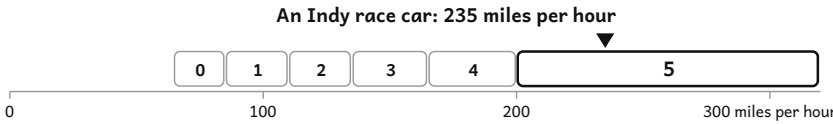


An EF4 is a violent tornado. It can flatten a well-built house into a pile of boards and bricks and throw cars through the air. Its winds are about as fast as a bullet train. Fewer than 1 of every 100 tornadoes is an EF4 or an EF5.

EF5 Violent



Over 200 miles per hour
over 322 km per hour



This is the strongest tornado there is. It can sweep a strong house away and leave only the concrete floor. It can throw cars farther than a football field. Only about 1 tornado in 1,000 is an EF5. The United States has had 60 since 1950.

Tornadoes by the Numbers

El Reno, Oklahoma, 2013 (4.2 km)

The widest tornado: 2.6 miles across



38 football fields, end to end

How many?

About 1,200 tornadoes hit the United States every year. That is more than in any other country.

How long?

Most tornadoes last less than 10 minutes. The longest one known lasted 3 and a half hours.

How fast do they travel?

Many cross the ground about as fast as a car driving through town. A few race along at 60 or 70 miles per hour.

How fast can the wind spin?

The fastest ever measured was about 300 miles per hour.

Tornadoes to Remember

The Tri-State Tornado, 1925

Missouri, Illinois and Indiana

It stayed on the ground for 219 miles and 3 and a half hours. It killed 695 people, more than any other tornado in United States history.

Bridge Creek and Moore, 1999

Oklahoma

Radar measured winds of about 300 miles per hour, the fastest wind ever measured on Earth. 36 people died.

Joplin, 2011

Missouri

An EF5 tornado up to a mile wide crossed the city. It killed 158 people and destroyed about 7,000 homes.

In 1925 there was no radar and there were no tornado warnings. People did not know the tornado was coming.

Today most people get a warning first. That is the biggest reason tornadoes kill far fewer people than they used to.

Staying Safe

Tornado watch

A tornado could form. Keep an eye on the weather. Know where you would go.

Tornado warning

A tornado has been seen, or radar shows one. Go to your safe place right now.

Your safe place

1 Go to the lowest floor. A basement or a storm shelter is best.

2 Pick a small room in the middle of the building, away from windows.

3 Get down low and cover your head and neck.

4 Cars and mobile homes are not safe. Get to a strong building.

Even in the strongest tornadoes, most people who take shelter come through safely.

Check What You Know

Circle the right answer. Look back in the book if you need to.

1. Which tornado is stronger?

EF1 | EF4

2. What do experts look at to rate a tornado?

Its color | The damage | Its shape

3. Most tornadoes are an...

EF0 or EF1 | EF2 or EF3 | EF4 or EF5

4. A tornado warning means...

One could form later | Take shelter now | The storm is over

5. Where is the safest place?

By a window | In a car | Lowest floor, middle room

6. About how many tornadoes hit the United States each year?

12 | 120 | 1,200

Answers: 1. EF4 • 2. The damage • 3. EF0 or EF1 • 4. Take shelter now • 5. Lowest floor, middle room • 6. 1,200

The numbers in this book come from the United States National Weather Service and NOAA.