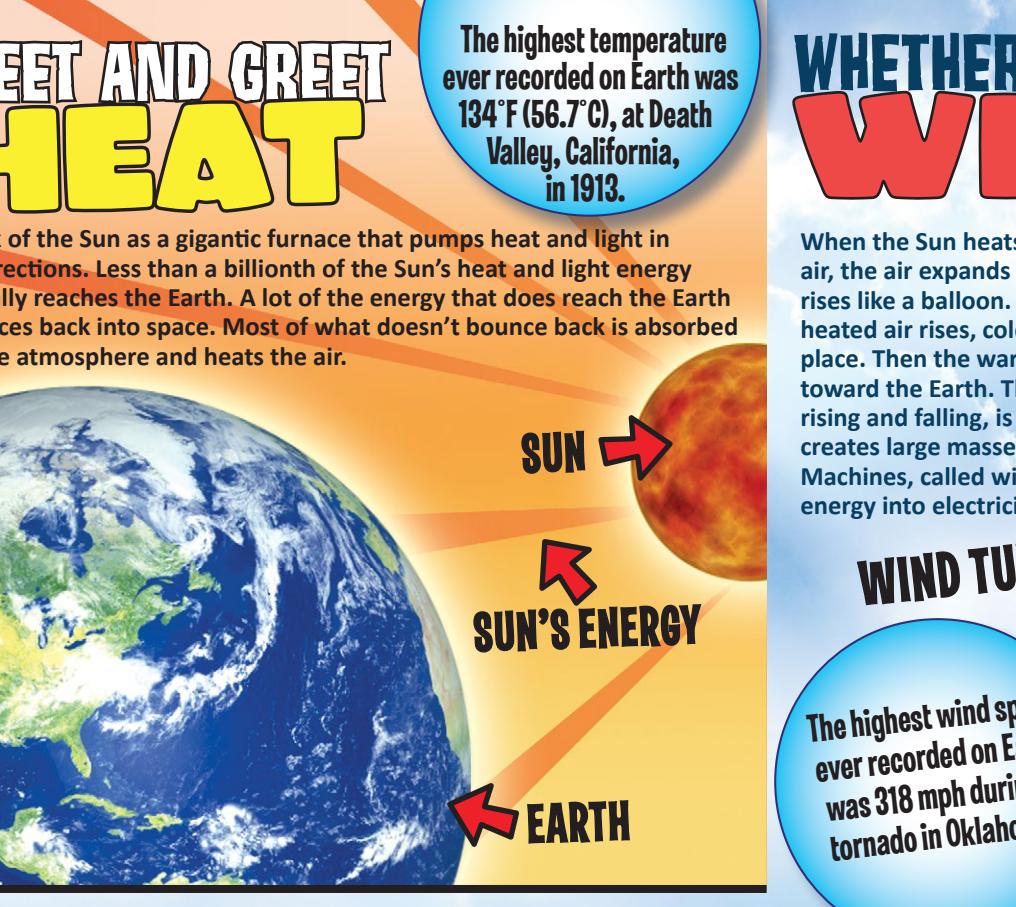


MEET AND GREET HEAT

The highest temperature ever recorded on Earth was 134°F (56.7°C), at Death Valley, California, in 1913.

Think of the Sun as a gigantic furnace that pumps heat and light in all directions. Less than a billionth of the Sun's heat and light energy actually reaches the Earth. A lot of the energy that does reach the Earth bounces back into space. Most of what doesn't bounce back is absorbed by the atmosphere and heats the air.



SUN →
SUN'S ENERGY
← **EARTH**

WATER FALLS

Precipitation (pre-sip-uh-TAY-shin) is water that falls from the sky. Rain, snow, sleet, and hail are different forms of precipitation and different forms of water. Water can be a solid, a liquid, and a gas. Water falls to Earth, where it is heated by the Sun and changed into water vapor. The water vapor returns to the atmosphere and forms clouds.

WHETHER THE WEATHER BE WINDY...

When the Sun heats the air, the air expands and rises like a balloon. As the heated air rises, colder air rushes in and takes its place. Then the warm air cools down and falls back toward the Earth. This cycle of heating and cooling, rising and falling, is called convection. Convection creates large masses of moving air, called wind. Machines, called wind turbines, convert wind energy into electricity.



WIND TURBINES →
The highest wind speed ever recorded on Earth was 318 mph during a tornado in Oklahoma!

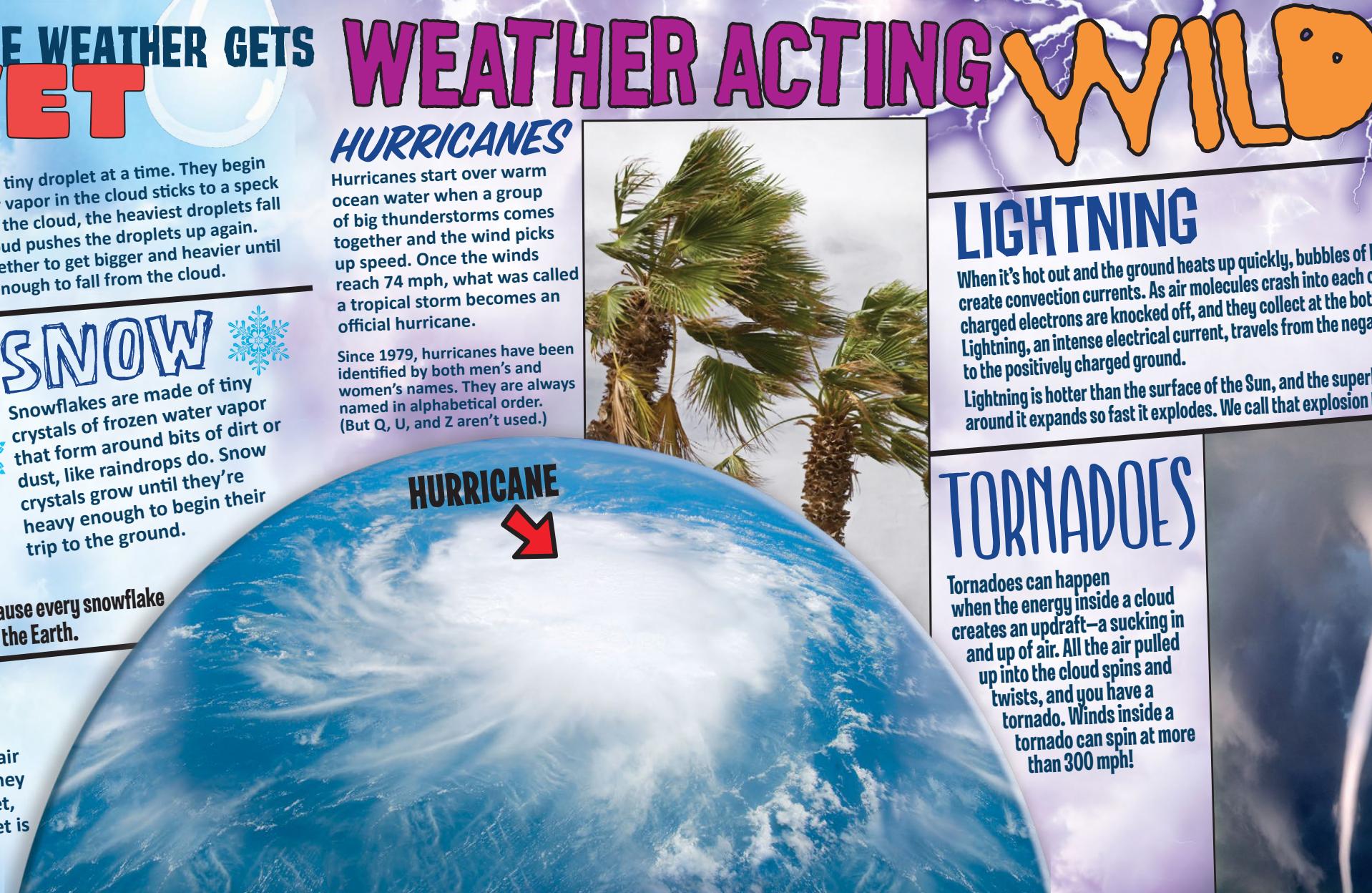
OR WHETHER THE WEATHER GETS WET

RAIN

Raindrops form in clouds, one tiny droplet at a time. They begin to take shape when the water vapor in the cloud sticks to a speck of dust, smoke, or salt. Inside the cloud, the heaviest droplets fall slowly. Then air inside the cloud pushes the droplets up again. More water droplets join together to get bigger and heavier until the droplets become heavy enough to fall from the cloud.

SNOW

Snowflakes are made of tiny crystals of frozen water vapor that form around bits of dirt or dust, like raindrops do. Snow crystals grow until they're heavy enough to begin their trip to the ground.



No two snowflakes are identical, because every snowflake takes its own path from the clouds to the Earth.

HURRICANE

SLEET

If partially melted snowflakes or raindrops fall through a layer of air near the ground that is colder, they can freeze again and turn to sleet, also known as freezing rain. Sleet is made up of clear pellets of ice.

WEATHER ACTING WILD

HURRICANES

Hurricanes start over warm ocean water when a group of big thunderstorms comes together and the wind picks up speed. Once the winds reach 74 mph, what was called a tropical storm becomes an official hurricane.

LIGHTNING

When it's hot out and the ground has expanded quickly, bubbles of hot air float up and create convection currents. As air molecules crash into each other, negatively charged electrons are knocked off, and they collect at the bottom of a cloud. Lightning, an intense electrical current, travels from the negatively charged cloud to the positively charged ground. Lightning is hotter than the surface of the Sun, and the superheated air around it expands so fast it explodes. When that explosion is over, lightning is gone.

TORNADOES

Tornadoes can happen when the energy inside a cloud creates an updraft—a sucking in and up of air. All the air pulled up into the cloud spins and twists, and you have a tornado. Winds inside a tornado can spin at more than 300 mph!

WEATHER SATELLITE

Weather stations launch weather balloons every day. These special balloons tell meteorologists about temperature, humidity, and wind speed.

MEET THE METEOROLOGIST meteology

The study of weather is called (MEET-e-uh-LOH-uh-gee). Scientists who examine the weather and predict how it will change are called **METEOROLOGISTS**. Meteorologists use Doppler radar, weather satellites, and computers to tell them what's happening on and around Earth.

EXPERIMENT #1: WEATHER WATCHING

Try making your own weather observation chart to find patterns in your local weather.

WEATHER OBSERVATION CHART

REMEMBER:
YOUR READINGS AT THE SAME TIME AND PLACE EACH DAY.

- 
 - 1 AFTER A MONTH, TAKE A LOOK AT YOUR DATA:
CAN YOU FIND ANY PATTERNS?
 - 2 DID IT RAIN MORE WHEN IT WAS WARMER
OR WHEN IT WAS COOLER?
 - 3 IS THERE A CONNECTION BETWEEN THE
TEMPERATURE AND THE WIND SPEED?

WEATHER WATCHING

TAMING THE WIND

WEATHER

Try making your own weather observation chart to find patterns in your local weather.

- The image features a 'WEATHER OBSERVATION CHART' on the left with columns for time, temperature, wind speed, wind direction, rainfall, and cloud type. Below it is a reminder to take readings at the same time and place each day. On the right is a '5-DAY FORECAST' graphic with a red frame and a blue background, showing days from Monday to Friday.

IS THERE A CONNECTION BETWEEN THE TEMPERATURE AND THE WIND SPEED?

EXPERIMENT #4: Six-Legged Thermometers

Did you know crickets can be accurate thermometers?

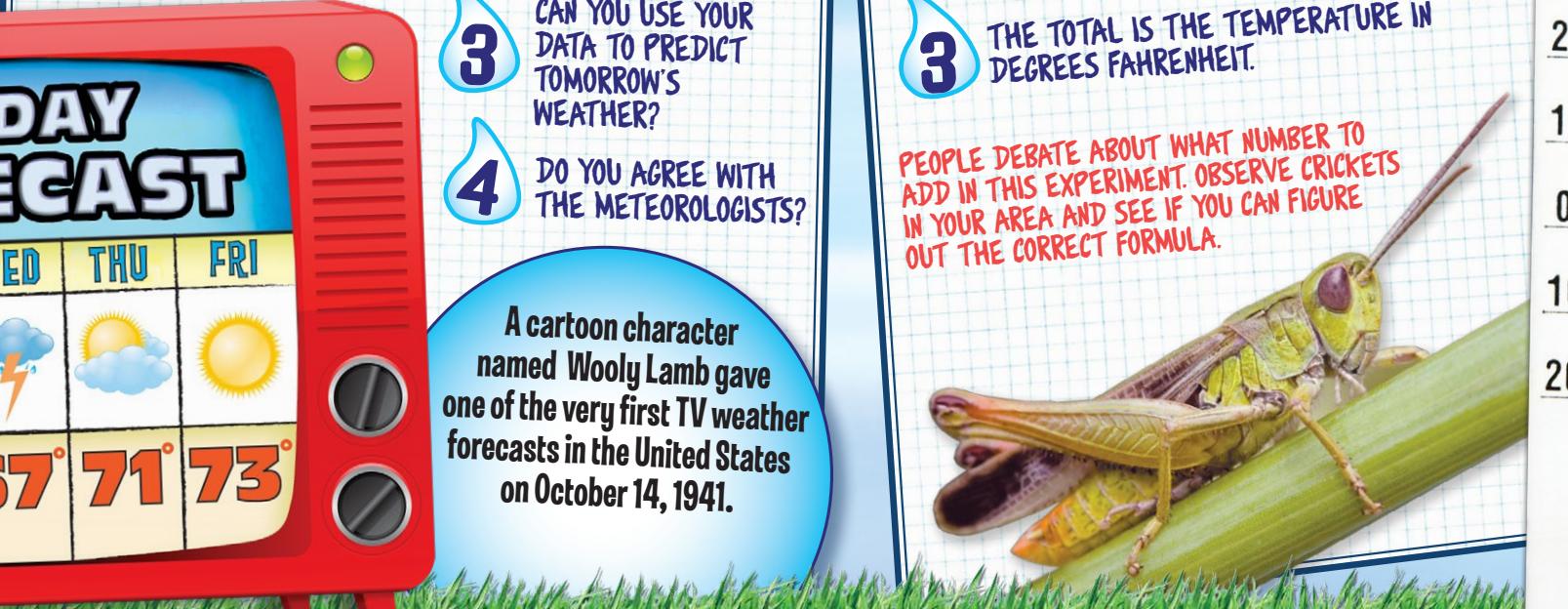
- YOU
DO USE YOUR
EARS TO PREDICT
HOW IT'S GOING TO
BE OUTSIDE
TODAY?

DO YOU AGREE WITH
METEOROLOGISTS?

 - 1 COUNT HOW MANY TIMES A CRICKET CHIRPS IN 15 SECONDS.
 - 2 ADD 37.
 - 3 THE TOTAL IS THE TEMPERATURE IN DEGREES FAHRENHEIT.

PEOPLE DEBATE ABOUT WHAT NUMBER TO ADD IN THIS EXPERIMENT. OBSERVE CRICKETS IN YOUR AREA AND SEE IF YOU CAN FIGURE IT OUT.

DO YOU AGREE WITH METEOROLOGISTS? PEOPLE DEBATE ABOUT WHAT NUMBER TO ADD IN THIS EXPERIMENT. OBSERVE CRICKETS IN YOUR AREA AND SEE IF YOU CAN FIGURE OUT THE CORRECT FORMULA.



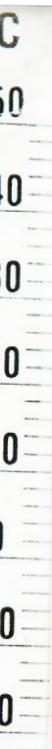
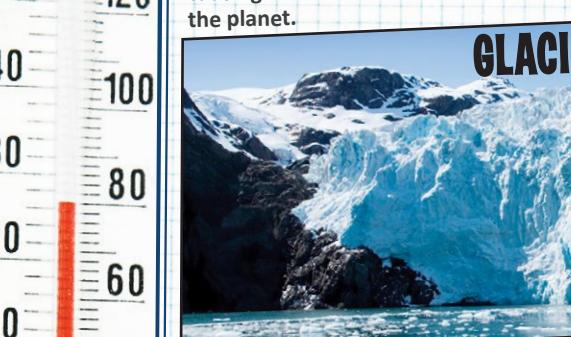
EXPERIMENT # OPERATION GREEN

Recently, the amount of gases that trap heat increased. This is what people call **global warming**. If the Earth's temperature gets a lot hotter, it will cause the ocean to rise. The melting ice will cause the sea level to rise.

- A large glacier with a blue-tinted ice face and snow-covered peaks under a clear sky. The word "GLACI" is written vertically on the right side of the image.

40 Most scientists believe human activity is causing global warming. Here are some ideas for reducing your impact on the environment.

- When you can, walk, use your bicycle,



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Book and instructions contain important information.
Illustrations by www.illustrationsby.com

PLANET PAIN

- has caused this increase.
ngs you can do to slow
r your final experiment:
ant more trees. They absorb carbon
oxide from the air.
rn off lights, the television, and the
computer when you finish using them.

OR SHINE!

**DON'T COMPLAIN ABOUT THE WEATHER.
DO SOMETHING ABOUT IT.**

Rain or snow, fog or sunshine, no matter where you live, the weather affects you every day. That's why the study of weather is so important. With the help of your You-Track-It Weather Lab and this booklet, you'll learn how weather happens. When you're done, you'll be able to track the wind, chart temperature changes, and measure rainfall.

the wind, chart temperature changes, and measure rainfall.

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TAB

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