

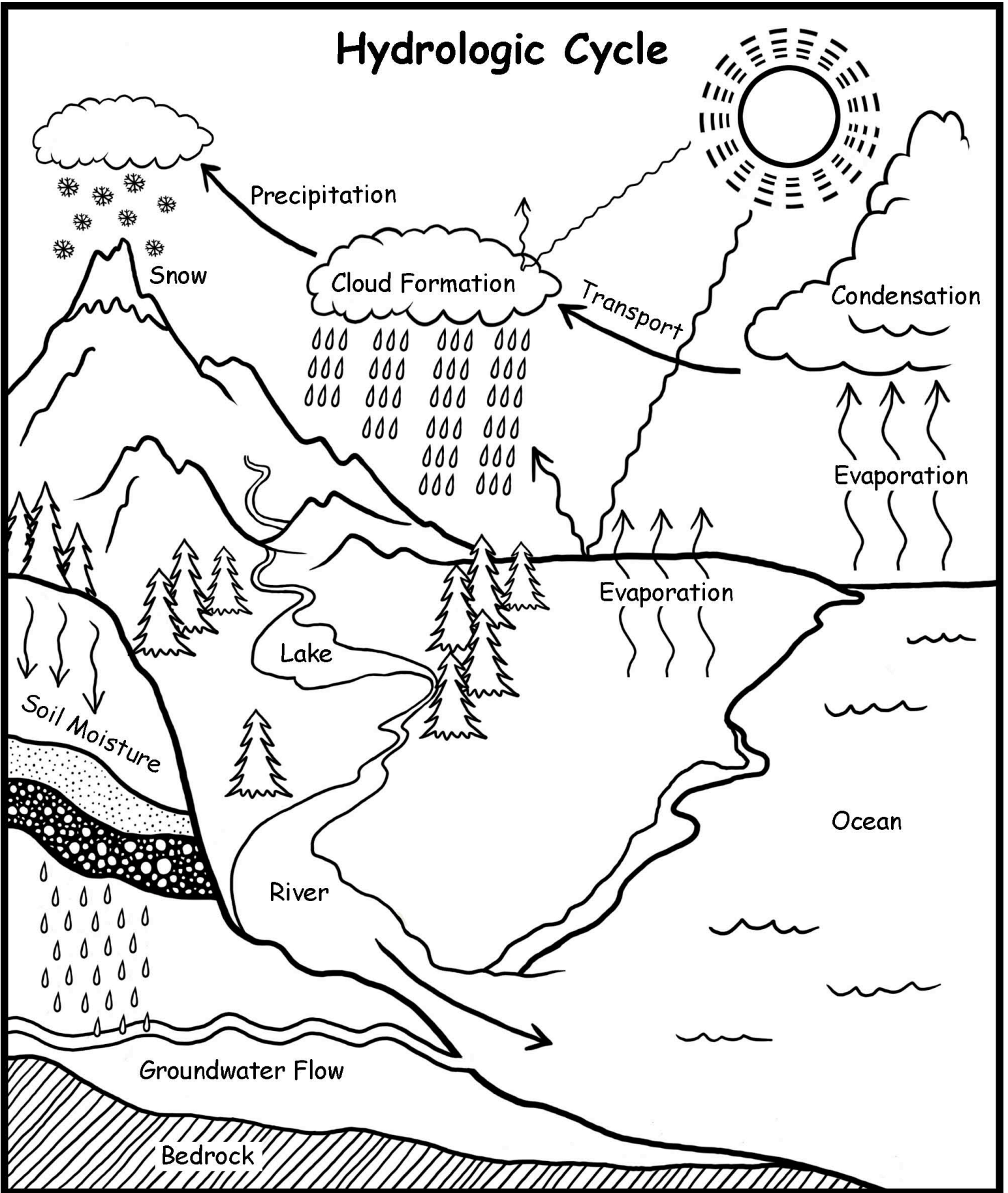
Weather Science

These informative worksheets will help your student "weather the storm" in 5th grade science.

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Name

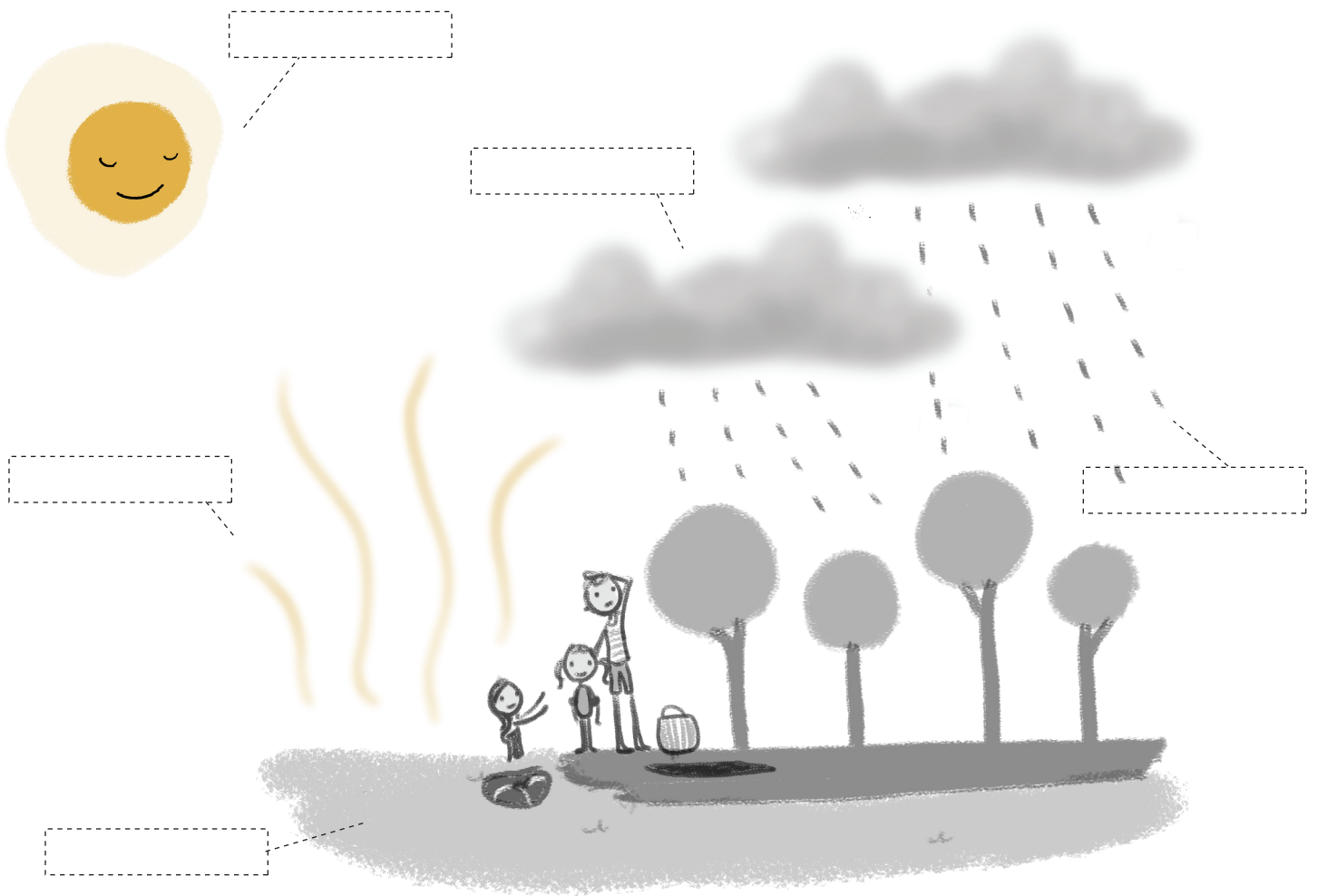
Date

The Water Cycle

Since the very first years of Earth's existence, there has been water present. No water is ever added or taken away from our atmosphere, because it's constantly moving in a water cycle.

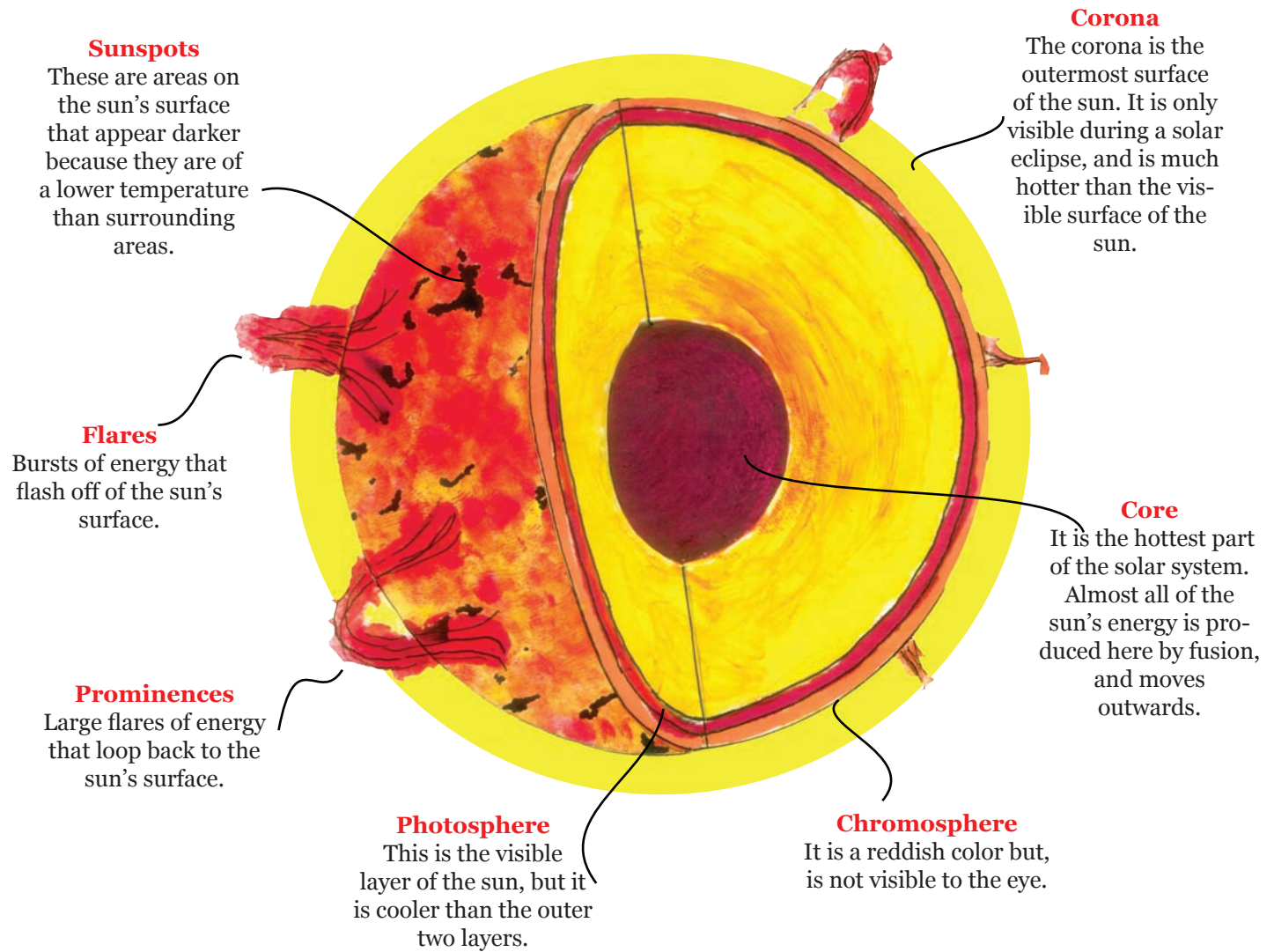
Read the definitions below and put the corresponding term in the spaces marking each part of the cycle in the diagram.

- **Evaporation:** Liquid water is heated by the sun until it rises as water vapor into the atmosphere.
- **Precipitation:** Water falling to the Earth in the form of weather — including rain, sleet, hail and snow
- **Condensation:** Water vapor molecules join together, becoming liquid, in the form of clouds.
- **The Sun:** Creates all of the weather on Earth through the uneven heating of Earth's surface.
- **Liquid Water:** All living things need this to survive and it is an important part of the weather system.



The Sun

The sun is our star. All of the planets in our solar system orbit around it. It is made of very hot gases, mostly hydrogen and helium, that provide the light and heat for our solar system. Answer the questions at the bottom of the page using what you have learned.



Questions

What is the difference between a flare and a prominence?

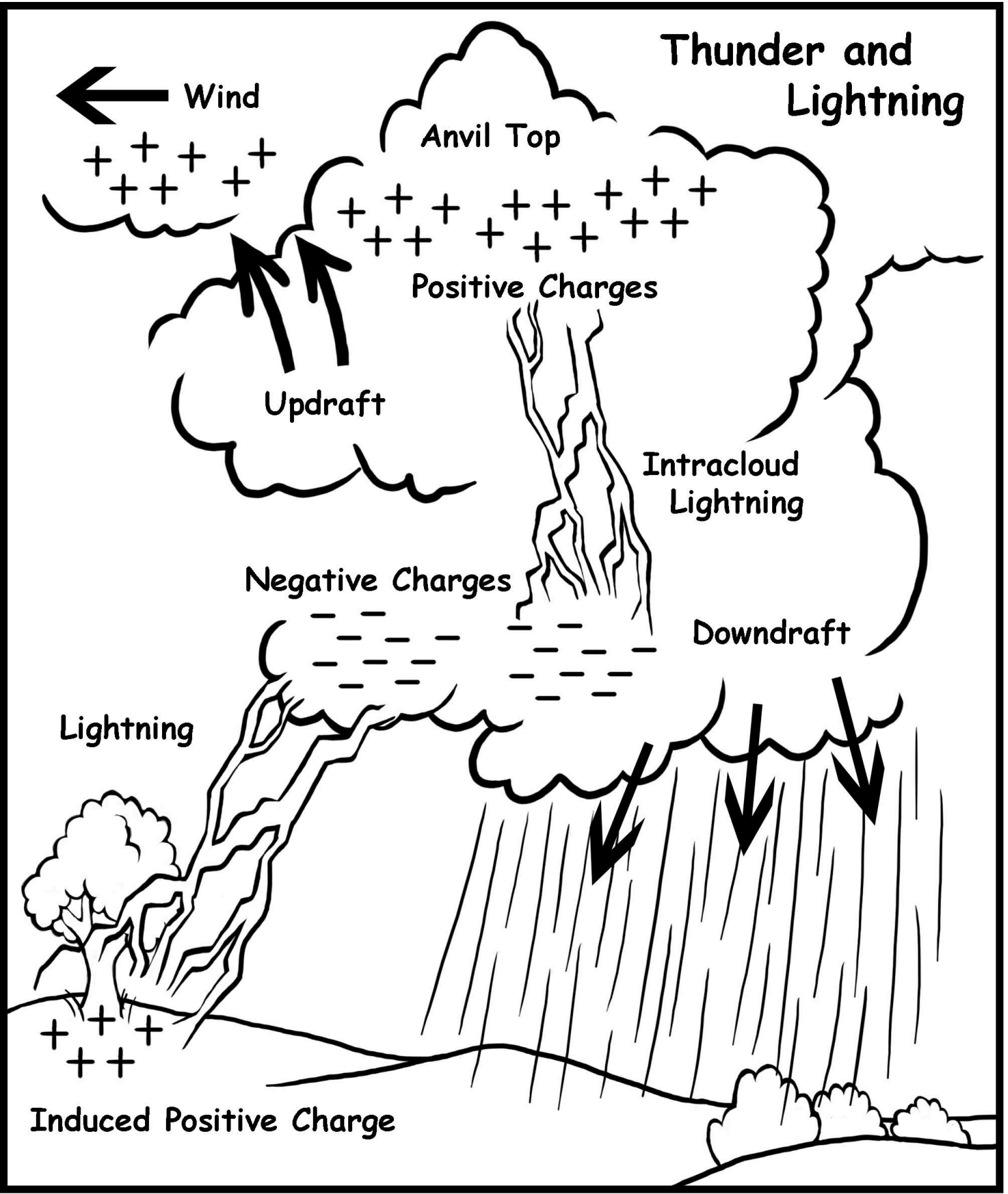
What part of the sun produces the majority of heat and light?

What two parts of the sun's outer layer are only visible from Earth during a solar eclipse?

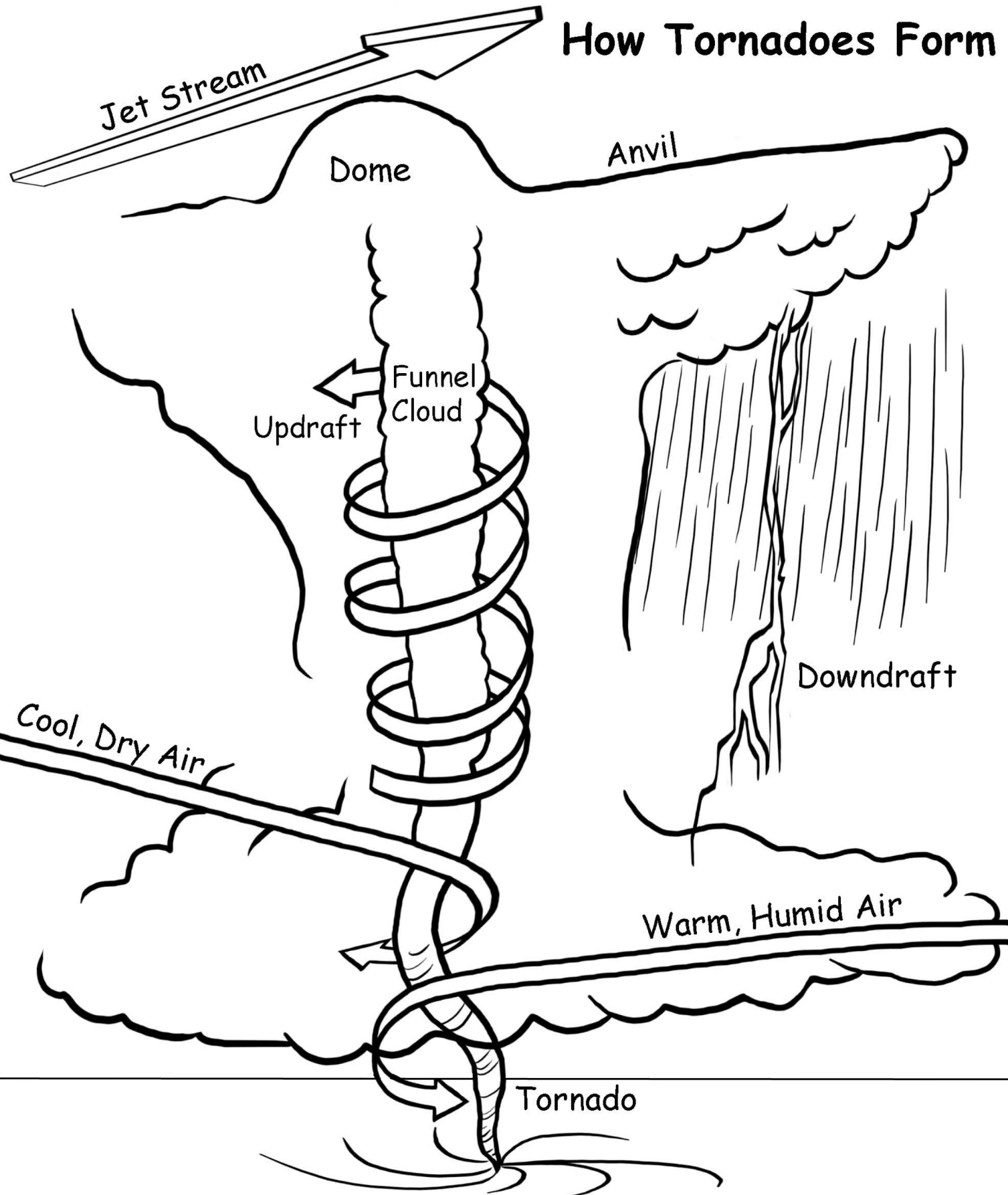
Why are sunspots darker than surrounding areas?

What part of the sun do we see from Earth?

Thunder and Lightning



How Tornadoes Form



Explore Tornadoes!

phenomenal science

A **tornado** is an amazing, awesome act of nature that can leave citizens dumbfounded. It's a huge, swirling, beast of a storm that can appear to have a mind of its own.

Tornadoes start with a massive thundercloud. The cloud sucks huge amounts of air up its center. In the largest clouds, called **super cells**, there is enough energy in that upswelling of air to spawn a **tornado**. As warm, wet air collides with cool, dry air, the storm will spin faster and faster. It finally twists down to the ground, creating a **tornado**.

If you've ever seen a whirlpool form in a drain, you have seen how a **tornado** works. A drain's whirlpool, also known as a **vortex**, forms because of the down draft that the drain creates in the body of water. The downward flow of water into the drain begins to rotate, and as the rotation speeds up the **vortex** forms.

Tornadoes move and devour the ground, following a path controlled by the thundercloud it came from. Sometimes the **tornado** will appear to hop. The hops occur when the **vortex** is disturbed. The **tornado's vortex** will hop, form, and collapse along the thundercloud's path.

Scientists measure **tornado** strength on the **Fujita Scale**, also known as the **F-Scale**. Wind speeds are estimated by the damage accumulated from a **tornado**. Once those wind speeds are established, a **tornado** can be placed on the **F-Scale**. The weakest **tornadoes** are rated **F-0** with wind speeds of up to 72MPH. **F-2 tornadoes** can tear roofs from houses and destroy mobile homes. **F-4 tornadoes** are able to toss cars up in the sky with winds of up to 260mph. **F-5 tornadoes** bring total devastation at over 300 mph, no faster winds have ever been recorded by scientists. An **F-5 tornado** can pick up a cow and launch it as a projectile.

Despite modern radar technology, experts cannot predict exactly when and where a **tornado** will touch down. It's important to pay attention to emergency broadcasts if you live in a **tornado zone**. Should a **tornado** happen where you live, the safest place to be is an underground storm shelter with a very strong door such as a basement or emergency shelter.

Historical Tornadoes

1840

Great Natchez Tornado

The 2nd deadliest tornado in US history, this storm killed 317 people and injured 109.

1925

Tri-State Tornado

This giant storm left the longest recorded track in the world at 219 miles in length.

1974

Super Outbreak

Over 148 tornadoes hit 13 states, with nearly 30 of the tornadoes ranked on the Fujita Scale as F5.

2011

Joplin Tornado

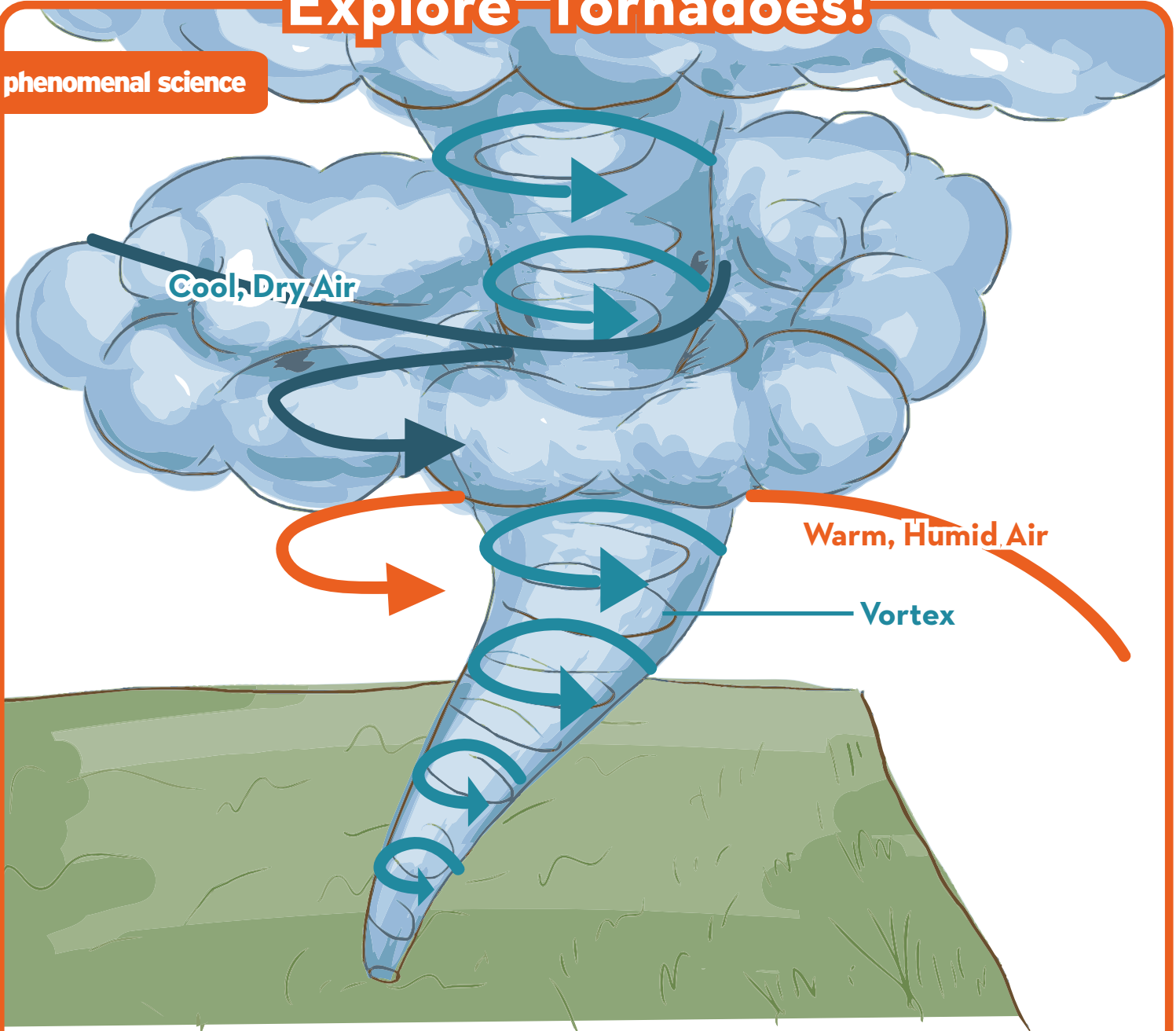
One of the costliest single tornadoes in US history, the cost to rebuild after the Joplin disaster reached \$3 billion.

Safety Tips

- 1 Seek shelter immediately during a tornado.
- 2 Keep away from windows.
- 3 Keep away from electric sockets and wires.
- 4 Keep an emergency radio.
- 5 Move to a basement or under a sturdy table.
- 6 Research ways to secure and prepare your home.
- 7 Lay face down on the ground and cover yourself.

Explore Tornadoes!

phenomenal science



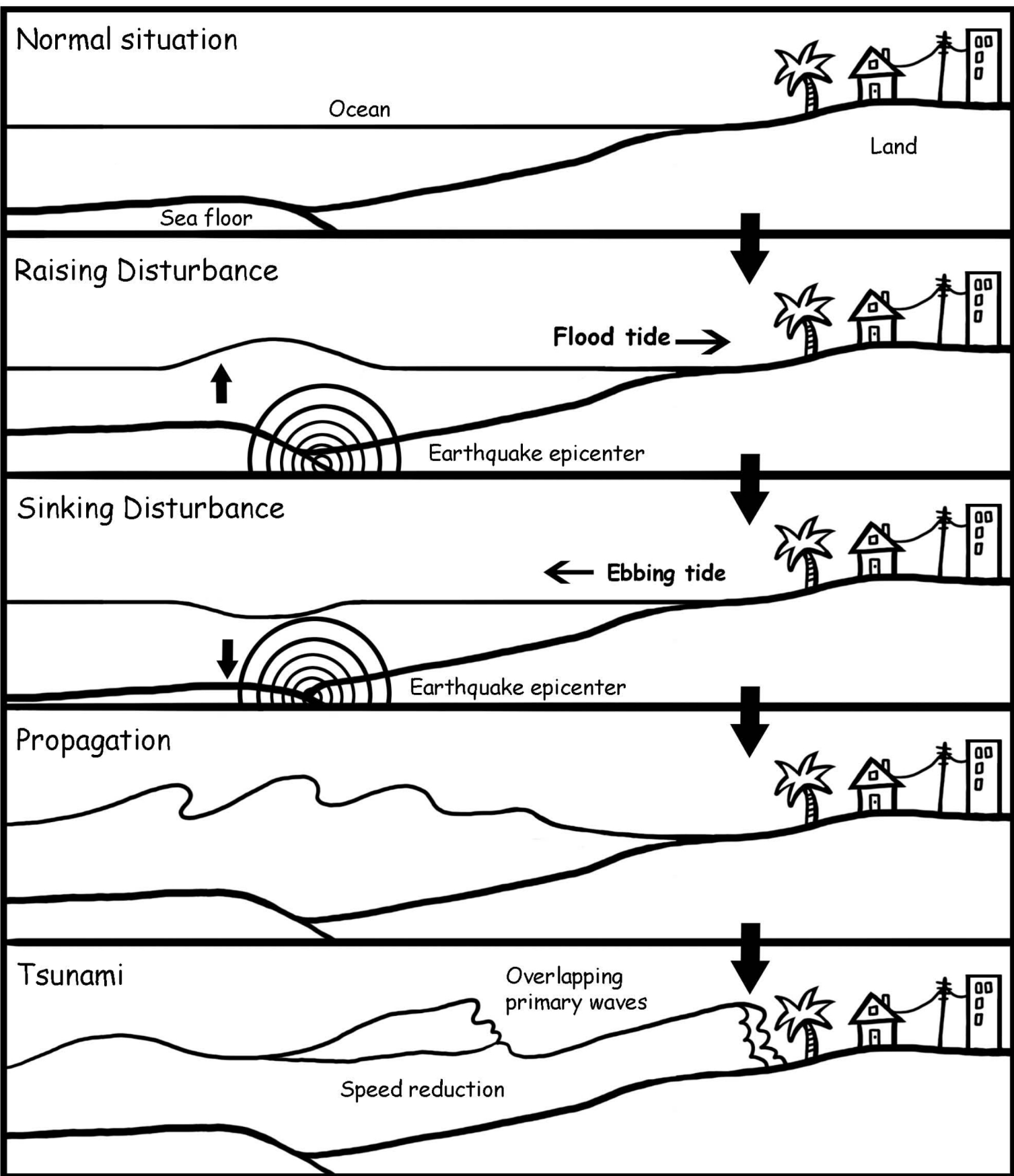
After reading the article on tornadoes, please answer the following questions:

What makes a tornado spin? _____

What is the Fujita Scale? _____

Describe how a tornado moves. _____

Tsunami Formation



Explore Tsunamis!

phenomenal science

On **December 26th 2004**, a massive **tsunami** rose from the Indian Ocean. This **tsunami** was one of the most destructive natural disasters anyone had ever seen before. Where did these disastrous waves come from, and how was this **tsunami** able to hit so quickly, without warning?

There are several different situations that can cause a **tsunami**: **underwater volcanic eruptions**, **meteor strikes**, **coastal landslides**, and, most commonly, **underwater earthquakes**.

Earthquakes that cause **tsunamis** involve the earth's **tectonic plates**. These plates are constantly moving over and under one another. The upper plate can get stuck on the lower one, building pressure. When the pressure grows large enough, the upper plate will snap upwards *very* quickly. When the plate snaps up by several inches, it also pushes an entire section of the ocean with it. This part of the ocean will suddenly be several inches above sea level. Once this spike happens, the water will spread out in order to restore equilibrium. This bump will spread out with incredible speed, moving at *hundreds of miles per hour*. When the wave reaches the shallower waters of the coast, the compressed energy of the wave will transform it into a **tsunami**. A typical **tsunami** approaching land will slow down to speeds of 30mph as the wave grows to *heights of up to 90ft above sea level*. A **tsunami** almost always promises flooding, destruction, and sometimes loss of life.

Scientists have the equipment to detect underwater earthquakes, just before a **tsunami** can hit the coast. However, because these giant waves form so quickly and hit coastal areas at hundreds of miles per hour, these detections often come too late. If you live near the coast, be aware of **tsunami zones**. Make sure your family has a plan in case you are caught near the wave.

Historical Tsunamis

1755

Lisbon Tsunami

Following the devastating Lisbon earthquake, the tsunami nearly destroyed the Portuguese city of Lisbon.

1883

Krakatoa Tsunami

The volcanic island of Krakatoa destroyed two-thirds of the Indonesian island, and sent high waves across the Indian Ocean, killing 36,000 people.

2004

Indonesian Tsunami

Over 230,000 people in 14 countries died after this tsunami hit. It was one of the deadliest natural disasters in recorded history.

2011

Tohoku Tsunami

Following one of the most powerful earthquakes, a series of giant tsunamis hit Japan. The disaster cost Japan 15,000 lives and \$235 billion in economic loss.

Safety Tips

1

If you live near the coast, look up your local tsunami broadcast.

2

Be aware of nature's warning signs. Tsunamis often follow after earthquakes, landslides near the coast, volcanic eruptions, and meteor strikes.

3

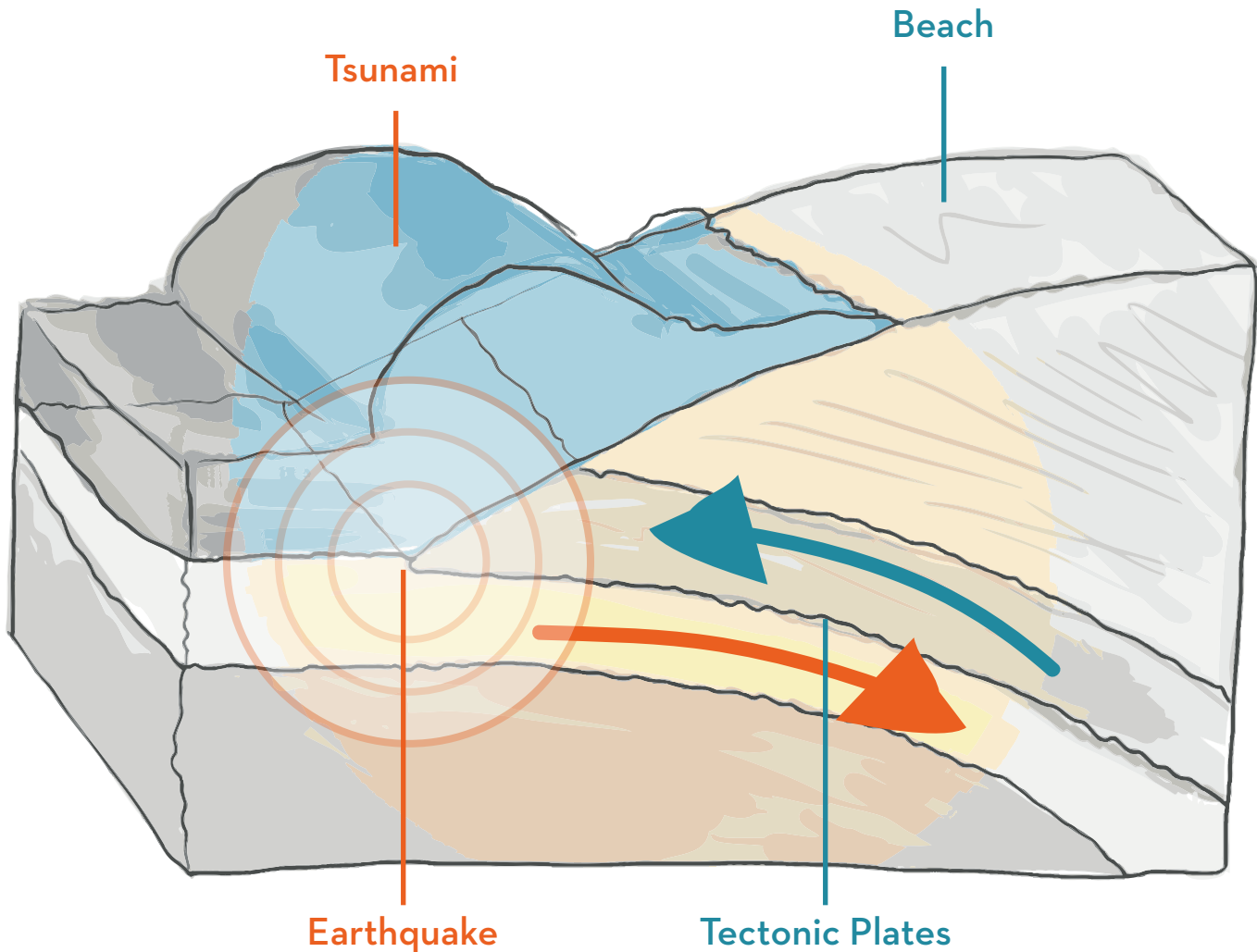
If you see a tsunami happening, leave the beach immediately and go to higher ground.

4

If you don't have an emergency kit, help your family put together one that includes a first aid kit, a supply of fresh water and canned food.

Explore Tsunamis!

phenomenal science



After reading the article on tsunamis, please answer the following questions:

Name two different events that would cause a tsunami. _____

How do tectonic plates cause earthquakes? _____

What are some ways you can prepare for a tsunami? _____

Learn About Tornadoes

A tornado is a spiraling _____ of air that reaches from a cloud to land. Tornadoes can reach speeds of up to _____ miles per hour and can cause significant destruction! In the _____ there are about 1,000 tornadoes each year. Most of these tornadoes occur in an area called Tornado Alley. Tornado alley is right in the middle of the country and includes the states Texas, Kansas and _____

Most tornadoes form during _____. When warm, moist air and cool, dry air mix the atmosphere becomes unstable. With a change in wind speed and direction a spinning effect begins to take place.

Rising air within this _____ tilts the rotating air into a vertical position. This column of rotating air is usually between two and six miles wide.

_____ clouds can form within this area.

When a funnel cloud reaches the _____

it is called a tornado.

Use the word bank below to fill the empty spaces in the paragraph.

WORD BANK

300

GROUND

THUNDERSTORMS

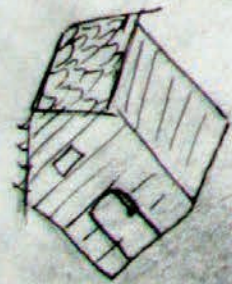
UPDRAFT

FUNNEL

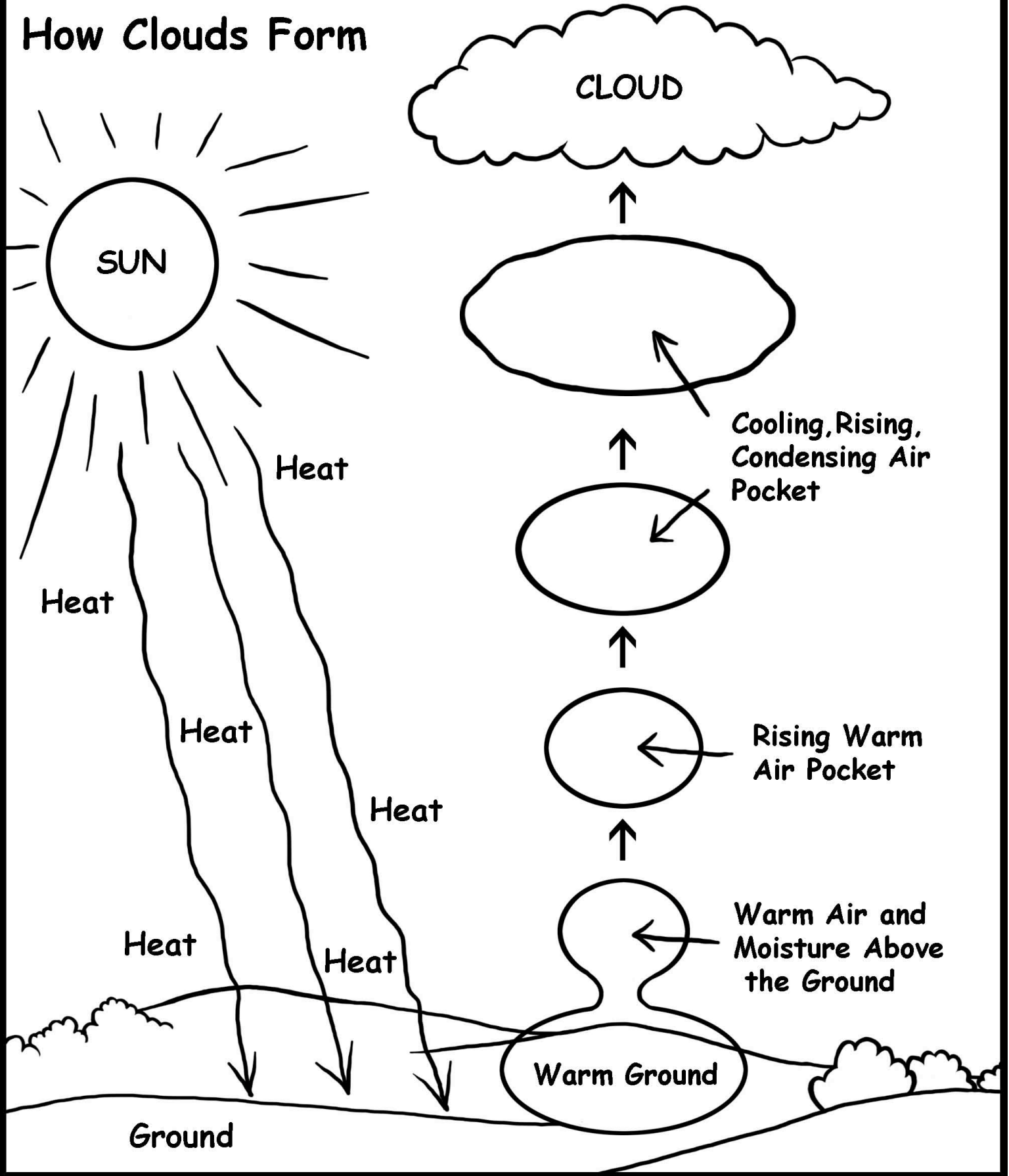
COLUMN

U.S.A.

OKLAHOMA



How Clouds Form



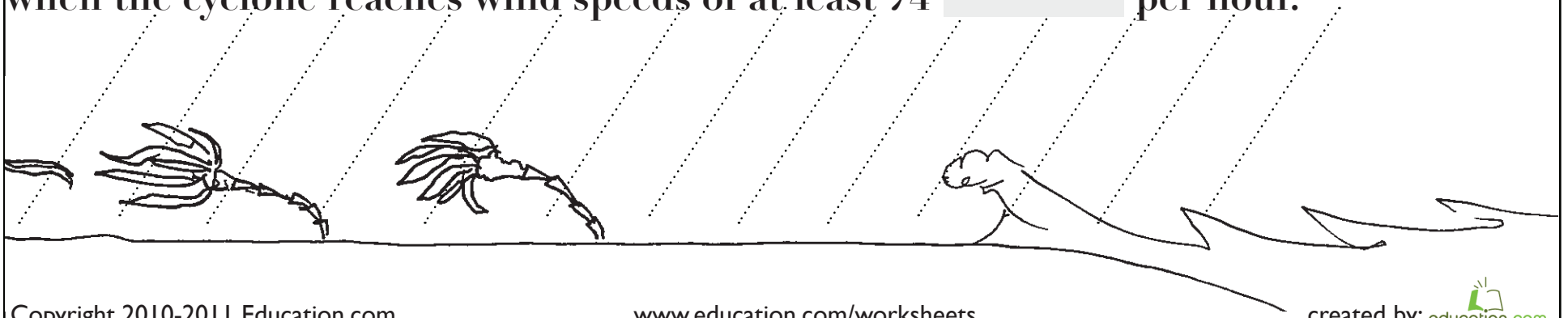
Learn About Hurricanes

Use the word bank to fill the empty spaces in the paragraph.

WORD BANK

ISLANDS
HUMID
OCEAN
ENERGY
RAIN
MILES
WINDS
SPIRALS

A hurricane is a huge storm that forms over the open [REDACTED]. Hurricanes are made up of strong [REDACTED] and are usually accompanied by heavy [REDACTED]. They can create large waves and cause a great amount of damage. Because a hurricane only travels over open ocean waters the places most at risk are [REDACTED] and coastal towns. Hurricanes are formed over ocean water that is 80° F or warmer. The warm water provides [REDACTED] for the hurricane. Winds come together above the water and force the air upward. [REDACTED] air, which is hot and moist, rises from the water to create storm-clouds. Above the storm clouds wind flows outward and allows the air to rise. The wind [REDACTED] around and around the storm. This storm becomes a hurricane when the cyclone reaches wind speeds of at least 74 [REDACTED] per hour.



Explore Earthquakes!

phenomenal science

Have you ever felt an earthquake? If you have, you'd know it's a sickening feeling. It seems impossible that the entire earth can move so dramatically, but during an **earthquake** it actually does.

So how does the ground shake and move the way it does during an **earthquake**? In order to answer that question, it's important to know exactly what is happening. An **earthquake** is a vibration that travels through the earth's crust. **A volcanic eruption, a large meteor impact, or any sort of big underground explosion** can create that vibration.

The most common cause of **earthquakes** are the earth's **tectonic plates**. These plates are in constant motion and when they bump into one another it can cause underground vibrations. Each year, more than *three million earthquakes* are an after effect of **tectonic plates** moving.

There are three different ways for plates to interact with each other. In a **normal fault**, the plates are separating. In a **reverse fault**, the plates are running into each other. In a **slip fault**, the plates move in opposite directions, with one plate sliding against the other. **Slip faults** cause the most dramatic **earthquakes**. The edges of these plates can actually lock together as they slide against each other, building up pressure. Then, in an instant, the pressure releases.

When the shift occurs in the earth's crust, the energy radiates **seismic waves**. These waves are like waves of water in a pond, but here the waves radiate through the earth and make the ground shake. There are three kinds of waves: **P waves, S waves, and L waves**. **P waves** cause the thud in the beginning of the quake, while **S waves** and **L waves** cause the most damage because they both move plate foundations.

The largest **earthquake** ever registered on earth measured 9.5 on the **Richter scale**. **Earthquakes** that register at 3 aren't usually felt by humans. For us to feel an **earthquake**, it must measure around 5 on the **Richter scale**.

Historical Earthquakes

1811

Madrid Missouri Quakes

These earthquakes happened along the Mississippi river, lasting for months. These quakes actually caused the river to run backwards.

1906

San Francisco Earthquake

One of the most famous US disasters, the fires started by this earthquake actually did more damage than the quake itself.

1970

Ancash Earthquake

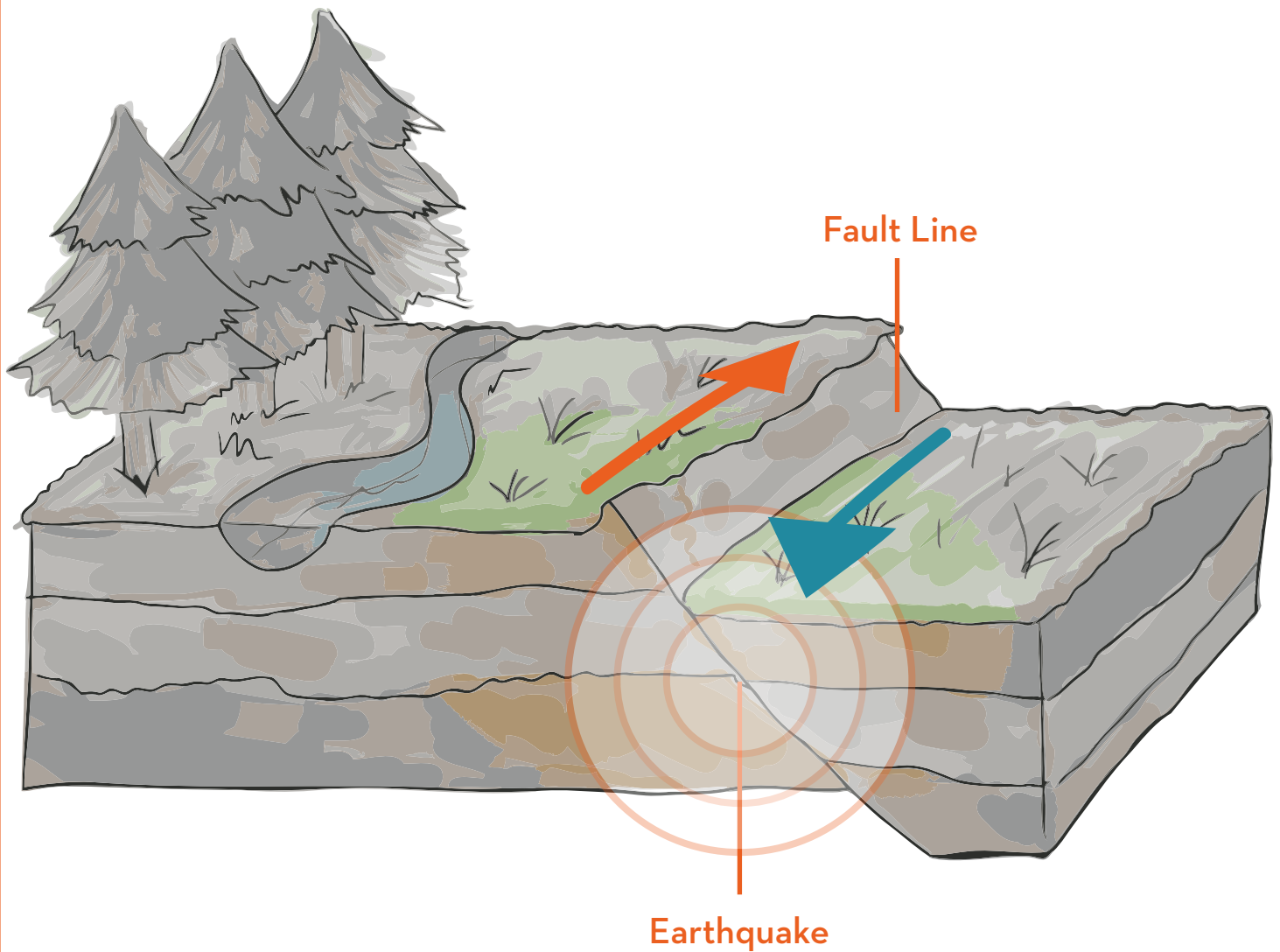
One of the biggest earthquakes ever recorded, the Ancash earthquake caused landslides, destroyed homes and took away many lives. This quake hit 7.8 on the Richter scale.

Safety Tips

- 1 Stay away from windows.
- 2 Stay indoors.
- 3 Take cover under a sturdy piece of furniture.
- 4 Secure shelves and heavy objects against the wall.
- 5 Plan an earthquake preparation kit with your family.
- 6 If advised to evacuate, do so immediately.
- 7 Stay away from electrical wires.

Explore Earthquakes!

phenomenal science



After reading the article on earthquakes, please answer the following questions:

Name two different events that would cause an earthquake. _____

What are the three ways tectonic plates interact with each other? _____

What are seismic waves? _____

Explore Hurricanes!

phenomenal science

Anyone who has ever lived through a **hurricane** knows that they are the biggest, baddest storm nature can dish out. A large **hurricane** can grow to be *600 miles* across and packs the power of *many* nuclear bombs. These super-storms unleash high winds and rain on states like Florida and Louisiana year after year.

In contrast to the tremendous power they have when they arrive on American shores, **hurricanes** start in a simple way. A normal thunderstorm in North Africa will blow out into the Atlantic ocean, near the earth's equator. Once the storm is over the water, it will begin to gain *more* power. The water around the equator collects a lot of solar energy, which adds to the storm's power. Hot air rises up the center of the thunderstorm, cooling off as it makes contact with a colder atmosphere and dumping moisture. **All that energy only adds to the storm.**

This exchange of hot air and moisture creates a giant column of air. As the storm picks up more energy, a rotation will form, causing the storm to start spinning faster and faster, picking up wind speeds. **As soon as the winds begin to blow at 75 mph or more, a hurricane is born.**

How does a hurricane move from the Atlantic ocean to North America? Over the summer, trade winds blow from Africa to the United States. These winds *push* newly-formed **hurricanes** across the Atlantic, helping the storm build up power. By the time the storm reaches the United States, its winds will have reached speeds of 100 mph or *more*.

Once a storm hits the US, the storm can "*come undone*" or the winds can shift and blow the **hurricane** harmlessly up the coast. In worst-case scenarios, the storm will hit land and cause massive damage to land and property. The storm's strong winds are capable of ripping out trees from the ground, and producing 1-2 feet of rainwater in less than a day. Over the course of one season, a **hurricane** will often leave some towns flooded and devastated.

Historical Hurricanes

1900

Galveston Hurricane

This hurricane hit Texas with winds of 145 mph. It is estimated about 6,000 - 12,000 people were killed.

1969

Hurricane Camille

The 2nd of three category 5 hurricanes to make landfall in the US during the 20th century. This storm is also the first named after a person.

1992

Hurricane Andrew

This storm caused \$26.5 billion in damages across Florida and Louisiana.

2005

Hurricane Katrina

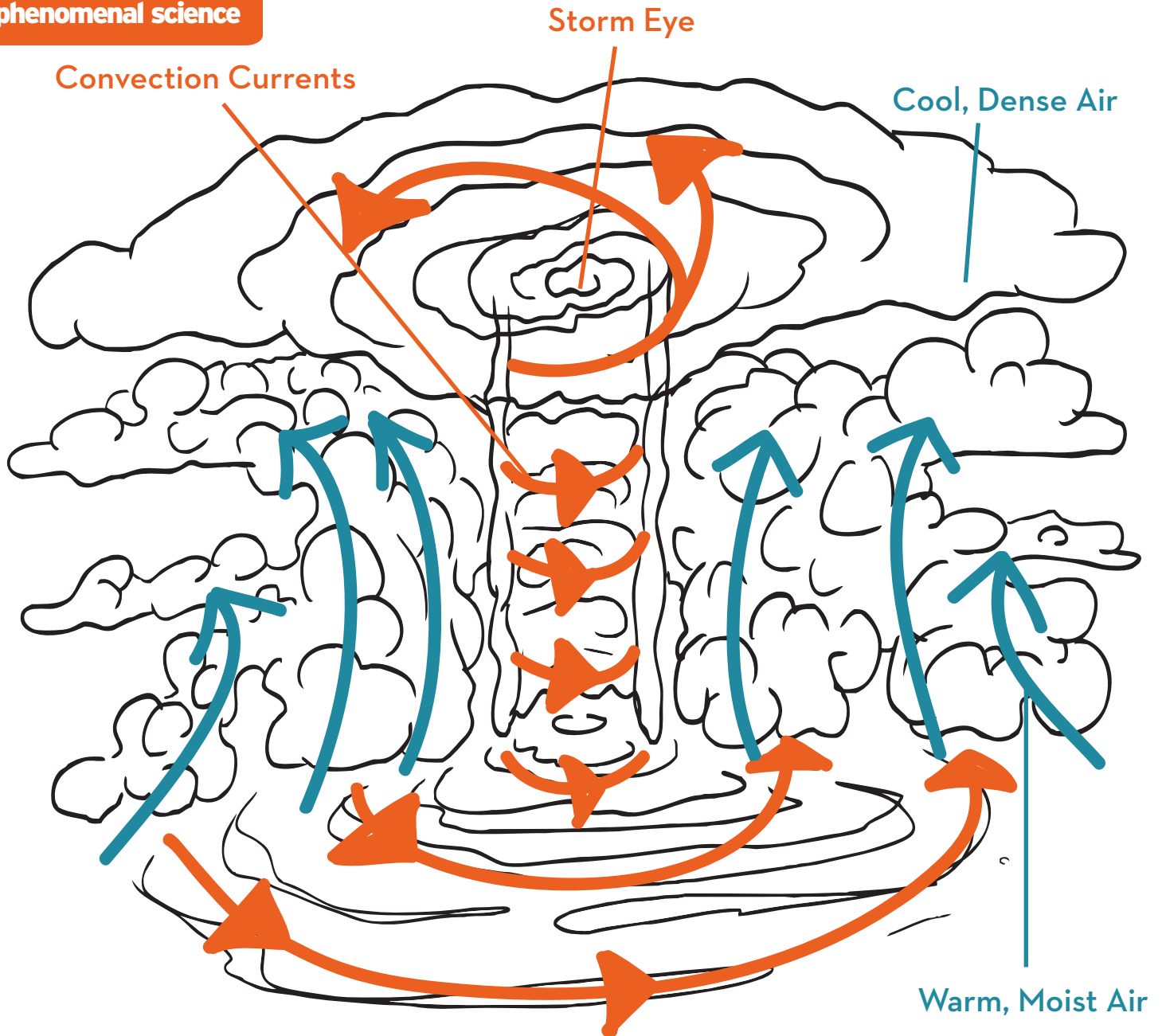
One of the deadliest hurricanes in US history, Katrina killed over 1,000 people and cost \$81 billion in damages.

Safety Tips

- 1 Help your family put together a disaster kit.
- 2 Keep records of your valuables.
- 3 Plan an evacuation route with your family.
- 4 Keep an emergency radio.
- 5 During a storm, stay clear of electrical wires.
- 6 Research ways to secure and prepare your home.
- 7 If major flooding occurs, try staying above the water.

Explore Hurricanes!

phenomenal science



After reading the article on hurricanes, please answer the following questions:

Where do North American hurricanes originate? _____

What was the first US Hurricane named after a person? _____

How does a hurricane move across the Atlantic ocean? _____

Explore Heat Waves!

phenomenal science

Nine years ago, in 2003, Europeans had to deal with one of the scariest natural events in recent history. From July to August 2003, one of the hottest summers in record devoured European countries. The giant heat wave led to a catastrophic crisis, causing drought and famine in Southern Europe and *killing around 35,000 people*.

Not all **heat waves** are the same. While the lethal **2003 European Heat Wave** stuck around for a full month, other waves can last only a few days. Some **heat waves** have high humidity, while others are dry. **Heat waves** vary in length, temperature, and conditions.

Heat waves can form in many ways. Often, these prolonged periods of excessive hot weather forms when warm, high pressure systems stop moving and stick around in a certain region. Flows of air called **jet streams** steer the movements of these high and low pressure areas, and can sometimes bring in unusually hot air into the area. This causes a **heat wave**. If there's no rain or clouds to cool things off, the heat will persist. Cities are especially vulnerable to heat waves since they lack forests and cooling pools of water, like lakes. This is known as the '**urban heat island**' effect, and can make a heat wave hotter and longer.

It's important to stay safe during hot summer periods. *Heat waves are dangerous*. The hot air can kill people by exhausting their bodies and can cause heat stroke, exhaustion, cramps, and many other ailments.

Historical Heat Waves

1980

1980 U.S. Heat Wave

Most of the midwestern U.S. and Southern Plains were devastated by this great heat wave, over the summer of 1980. 1,700 lives were lost during this tragic event, costing the U.S. nearly \$20 billion dollars in agricultural damages.

2003

2003 European Heat Wave

The European summer of 2003 was one of the hottest recorded summers in history - reaching temperatures unseen since the 1500s. The heat wave hit several countries, creating droughts, famines, and power outages. 35,000 Europeans lost their lives due to the excessive heat.

2006

2006 N. American Heat Wave

This heat wave spread throughout the United States and Canada, killing nearly 225 people. In some areas, temperatures reached 117 °F.

Safety Tips

1

Stay hydrated!

2

Drink water. Avoid drinking salty, syrupy, carbonated, or caffeinated drinks.

3

If you do go outside, stick with a buddy.

4

Wear light, loose fitting clothes.

5

Try to stay indoors.

6

If you don't have access to air conditioning, take a towel, soak it in cold water, and wear it around your neck. It will keep your body cool.

Explore Heat Waves!

phenomenal science



EARTH'S GREENHOUSE EFFECT

When energy from the sun enters the Earth's atmosphere, it can get trapped. This is called **The Greenhouse Effect**.

When sunlight warms the surface of the Earth, the heat will radiate through the atmosphere and back towards space. Some of this heat is able to escape the planet, but much of the sun's energy is absorbed

by the ocean, the land, reflected back to the earth by clouds, and green house gases like methane and carbon dioxide. This heat then recycles back to our planet and can continue to warm the surface.

Many scientists believe the recent increase in heat wave activities are correlated with the **Earth's Greenhouse Effect**.

After reading the article on heat waves, please answer the following questions:

What are a few tips to stay safe during a heat wave? _____

How do heat waves form? _____

What is the **urban heat island effect**? _____

Explore Dust Storms!

phenomenal science

Life in the Great Plains was difficult in the 1930s. Midwestern Americans faced the **Great Depression**, years of drought, and relentless dust storms that lasted for months. Just when it seemed like life couldn't get worse, a terrible, shaking dust storm devoured the Great Plains on April 14th, 1935. A dark wall of blowing sand submerged Oklahoma and Texas. The sun and sky were completely blacked out by the storm. The following day, these terrible events would be summarized by three words: **The Dust Bowl**.

The Dust Bowl was a tragic event that ruined many lives. Natural events combined with human activity helped prolong the sand storms in the 1930s. Dust storms often have a bad reputation, but these storms are also very valuable. Every year winds transport *20 million tons of dust* across the Atlantic Ocean from the Sahara desert in Africa to the South American Amazon basin. These storms carry over rare nutrients that the Amazon Rainforest needs.

The Sahara is a perfect place for dust storms to brew: the land is large and has a lot of dry, loose soil. Ideal dust sources include deserts and dry lands. When a wind sweeps through an ideal area, it can lift dust nearly *2,269 ft in the air!* Upon closer inspection, the dust isn't just being thrown up and up; particles actually bounce off of each other and generate an electrical charge that carries it higher and higher.

Over the years, more and more human activity has encouraged dust storms. Cutting down trees, bad farming, and overgrazing animals can leave dry, crumbly soil that is easily carried by the wind, creating an entirely new desert. Scientists call this process **desertification**.

Desertification is extremely scary, especially since it's happening more and more. However, it's possible to stop it from spreading. Twenty to thirty years after the **Dust Bowl**, government programs and conservation groups were able to transform the Great Plains from a desert to a fertile land.

The Dust Bowl

1935

Black Sunday

This giant sand storm covered Oklahoma and Texas, blacking out the sun as it rattled these states. It was the biggest and baddest storm during The Dust Bowl.

2010

Beijing Sand Storm

China is one of the world's major victims of desertification. In 2010, the Chinese city of Beijing was hit by ten sand storms. Dust storms have increased by six fold over the last 50 years, affecting not only China, but also South Korea, Japan, and other neighboring countries.

2011

Phoenix Dust Storm

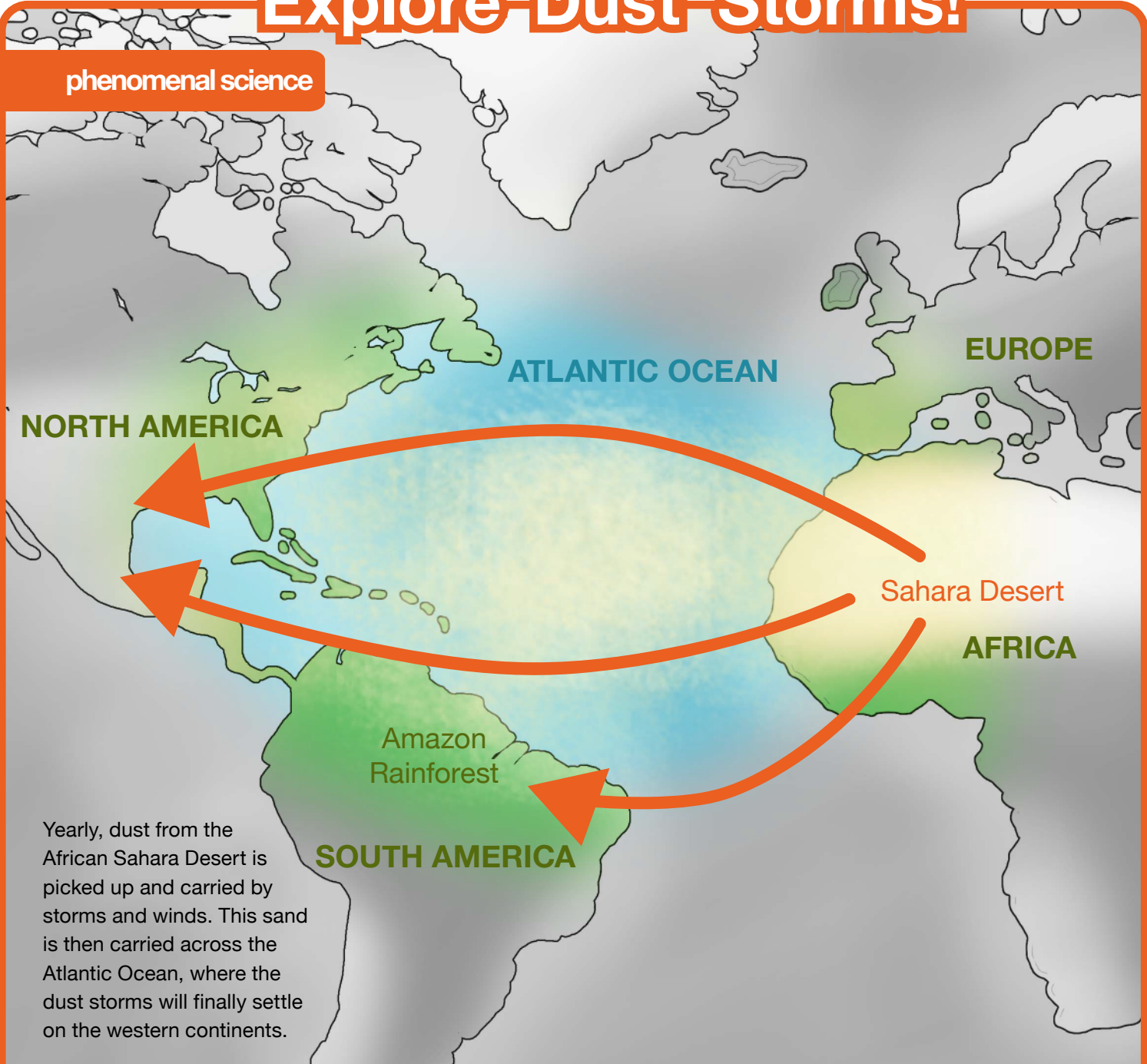
Reaching heights between 8,000 - 10,000 feet, this giant dust storm swept Phoenix, Arizona under a coat of sand.

Safety Tips

- 1 Be aware of dust storm warnings.
- 2 If you're outside during a dust storm, take cover and stay put.
- 3 Be prepared if you live in a dust storm prone area.
- 4 Carry a good breathing mask to filter dust particles.
- 5 Wear airtight goggles during sand storms.
- 6 Try to stay close to a group.
- 7 In a pinch, use a wet shirt or cloth to cover your mouth and nose.

Explore Dust Storms!

phenomenal science



After reading the article on dust storms, please answer the following questions:

What are a few tips to stay safe during a sand storm? _____

What are the perfect conditions for dust storms to brew? _____

Define desertification. _____

Answer Sheets

Weather Science

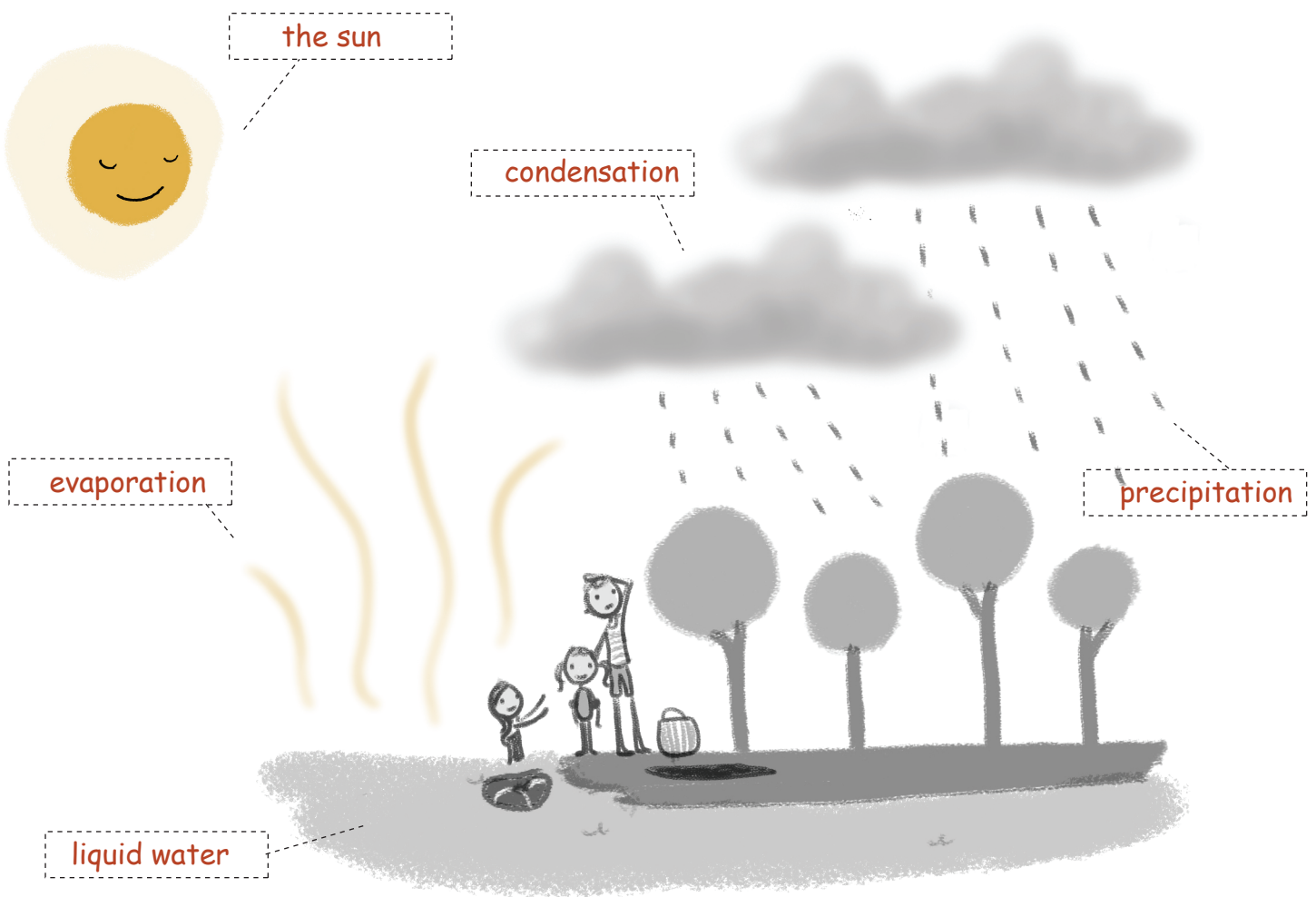
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The Sun: A Diagram Review Sheet
Tornado Science
Tsunami Science
Tornado Fill-In-the-Blank
Learn About Hurricanes
Earthquake Science
Hurricane Science
Weather Science: Heat Waves
Dust Storms

The Water Cycle

Since the very first years of Earth's existence, there has been water present. No water is ever added or taken away from our atmosphere, because it's constantly moving in a water cycle.

Read the definitions below and put the corresponding term in the spaces marking each part of the cycle in the diagram.

- **Evaporation:** Liquid water is heated by the sun until it rises as water vapor into the atmosphere.
- **Precipitation:** Water falling to the Earth in the form of weather — including rain, sleet, hail and snow.
- **Condensation:** Water vapor molecules join together, becoming liquid, in the form of clouds.
- **The Sun:** Creates all of the weather on Earth through the uneven heating of Earth's surface.
- **Liquid Water:** All living things need this to survive and it is an important part of the weather system.



The Sun

Answer Sheet

What is the difference between a flare and a prominence?

A flare flashes off of the sun's surface, while a prominence loops back to the sun's surface.

What part of the sun produces the majority of heat and light?

The core produces the majority of the sun's heat and light.

What two parts of the sun's outer layer are only visible from Earth during a solar eclipse?

The corona and the chromosphere are both visible during a solar eclipse, but normally are not visible to the naked eye.

Why are sunspots darker than surrounding areas?

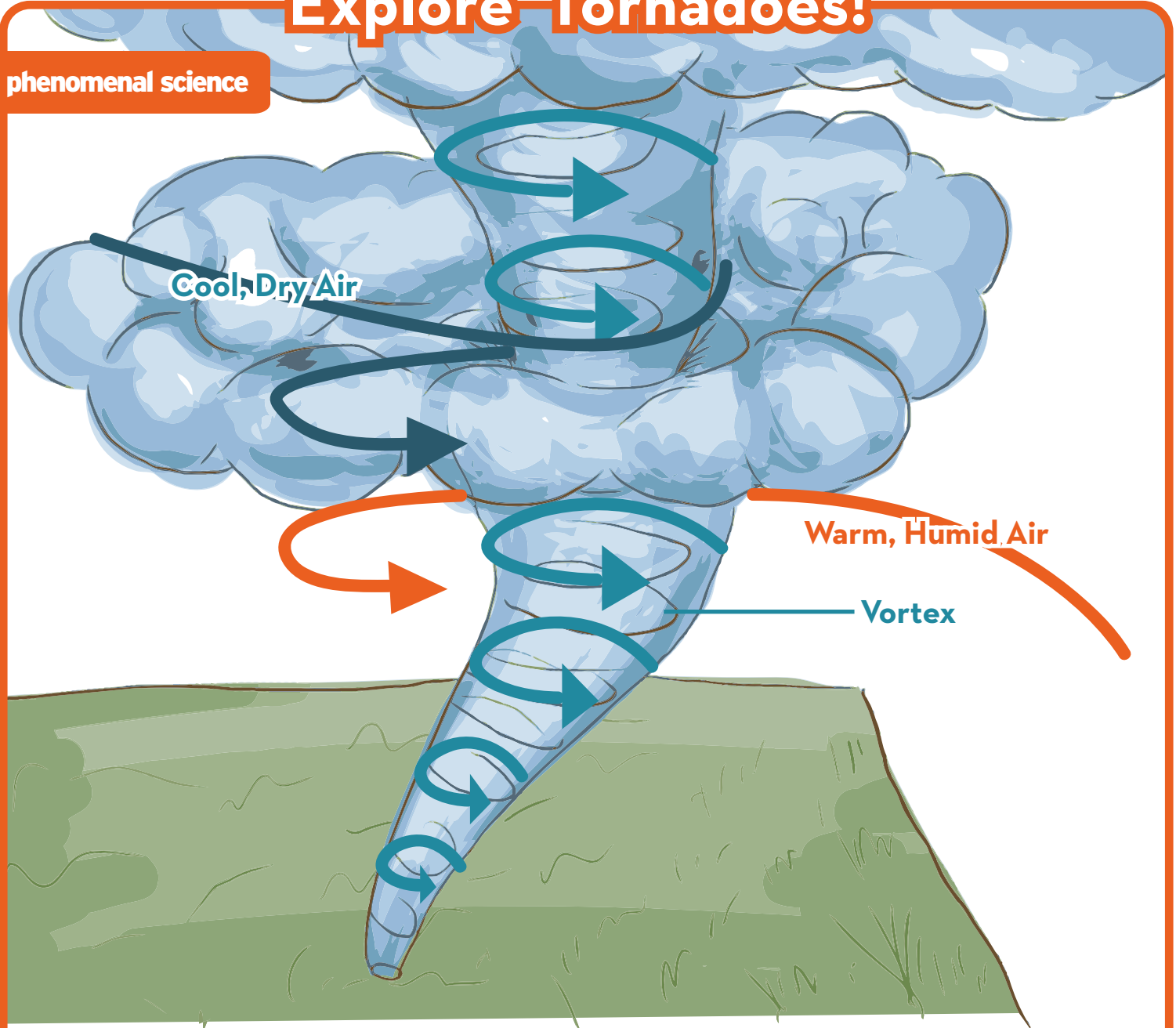
Sunspots are darker than surrounding areas because they are a lower temperature.

What part of the sun do we see from Earth?

We can see the photosphere from Earth.

Explore Tornadoes!

phenomenal science



After reading the article on tornadoes, please answer the following questions:

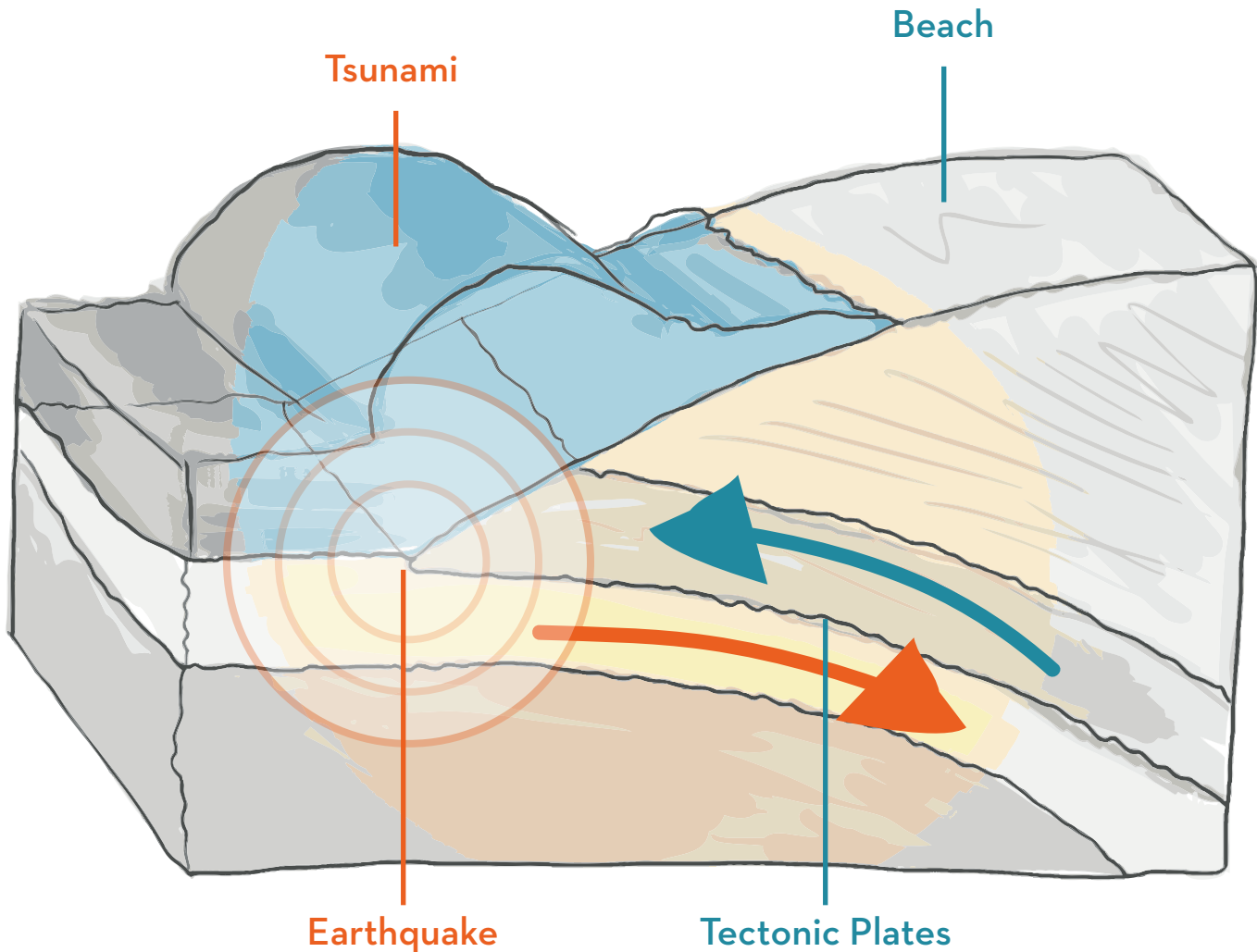
What makes a tornado spin? **When warm, wet air collides with cool, dry air causing the storm to spin faster and faster, creating a vortex.**

What is the Fujita Scale? **The Fujita Scale measures a tornado's strength.**

Describe how a tornado moves. **The tornado follows a path that is controlled by its parent thunder cloud. When the vortex is disturbed, the tornado appears to hop and skip.**

Explore Tsunamis!

phenomenal science



After reading the article on tsunamis, please answer the following questions:

Name two different events that would cause a tsunami. **Underwater volcanic eruptions, meteor strikes, coastal landslides, and underwater earthquakes.**

How do tectonic plates cause earthquakes? **Pressure builds as the plates move against each other. Releasing the pressure creates earthquakes.**

What are some ways you can prepare for a tsunami? **Refer to 'Safety Tips' in the article.**

Learn About Tornadoes

Answer Key!

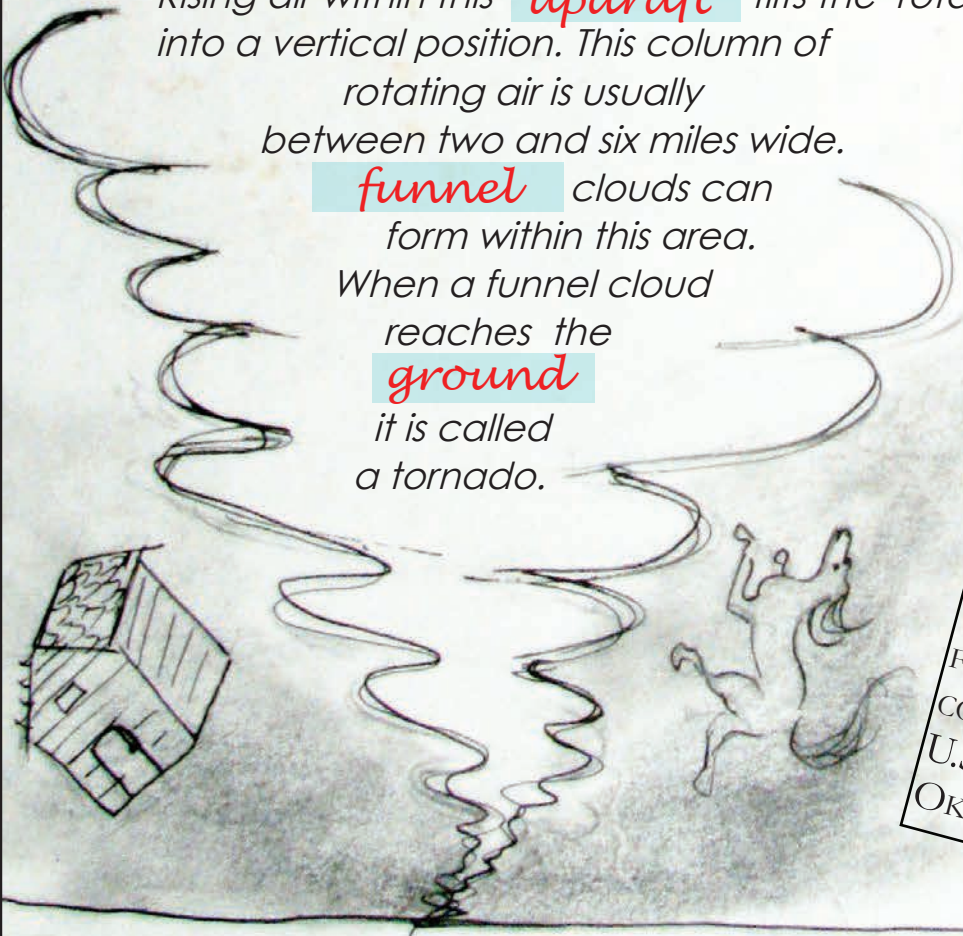
A tornado is a spiraling **column** of air that reaches from a cloud to land. Tornadoes can reach speeds of up to **300** miles per hour and can cause significant destruction! In the **U.S.A.** there are about 1,000 tornadoes each year. Most of these tornadoes occur in an area called Tornado Alley. Tornado alley is right in the middle of the country and includes the states Texas, Kansas and **Oklahoma**

Most tornadoes form during **thunderstorms**. When warm, moist air and cool, dry air mix the atmosphere becomes unstable. With a change in wind speed and direction a spinning effect begins to take place.

Rising air within this **updraft** tilts the rotating air into a vertical position. This column of rotating air is usually between two and six miles wide.

funnel clouds can form within this area.

When a funnel cloud reaches the **ground** it is called a tornado.



Use the word bank below to fill the empty spaces in the paragraph.

WORD BANK

300
GROUND
THUNDERSTORMS
UPDRAFT
FUNNEL
COLUMN
U.S.A.
OKLAHOMA

Learn About Hurricanes

Use the word bank to fill the empty spaces in the paragraph.

ANSWER SHEET

A hurricane is a huge storm that forms over the open **ocean**. Hurricanes are made up of strong **winds** and are usually accompanied by heavy **rain**. They can create large waves and cause a great amount of damage. Because a hurricane only travels over open ocean waters the places most at risk are **islands** and coastal towns. Hurricanes are formed over ocean water that is 80° F or warmer. The warm water provides **energy** for the hurricane. Winds come together above the water and force the air upward. **Humid** air, which is hot and moist, rises from the water to create storm-clouds. Above the storm clouds wind flows outward and allows the air to rise. The wind **spirals** around and around the storm. This storm becomes a hurricane when the cyclone reaches wind speeds of at least 74 **miles** per hour.

WORD BANK

ISLANDS

HUMID

OCEAN

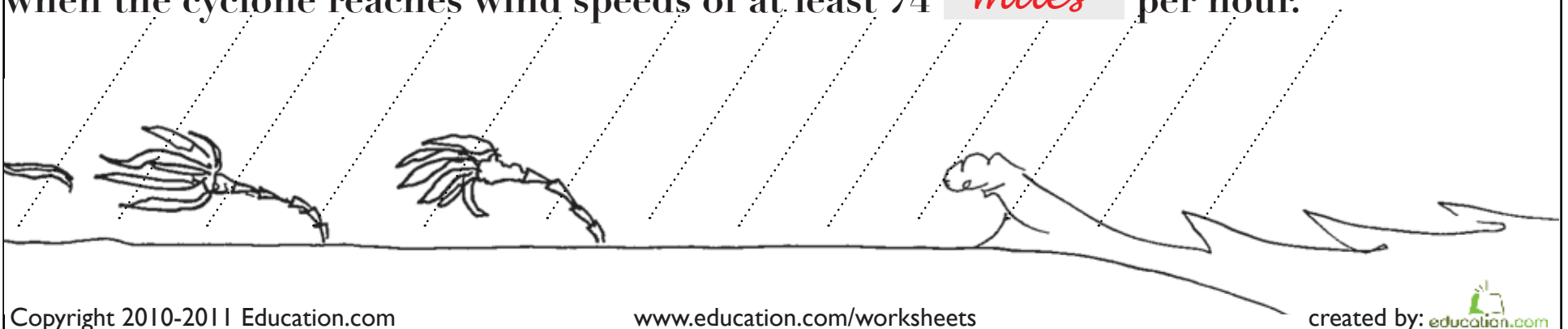
ENERGY

RAIN

MILES

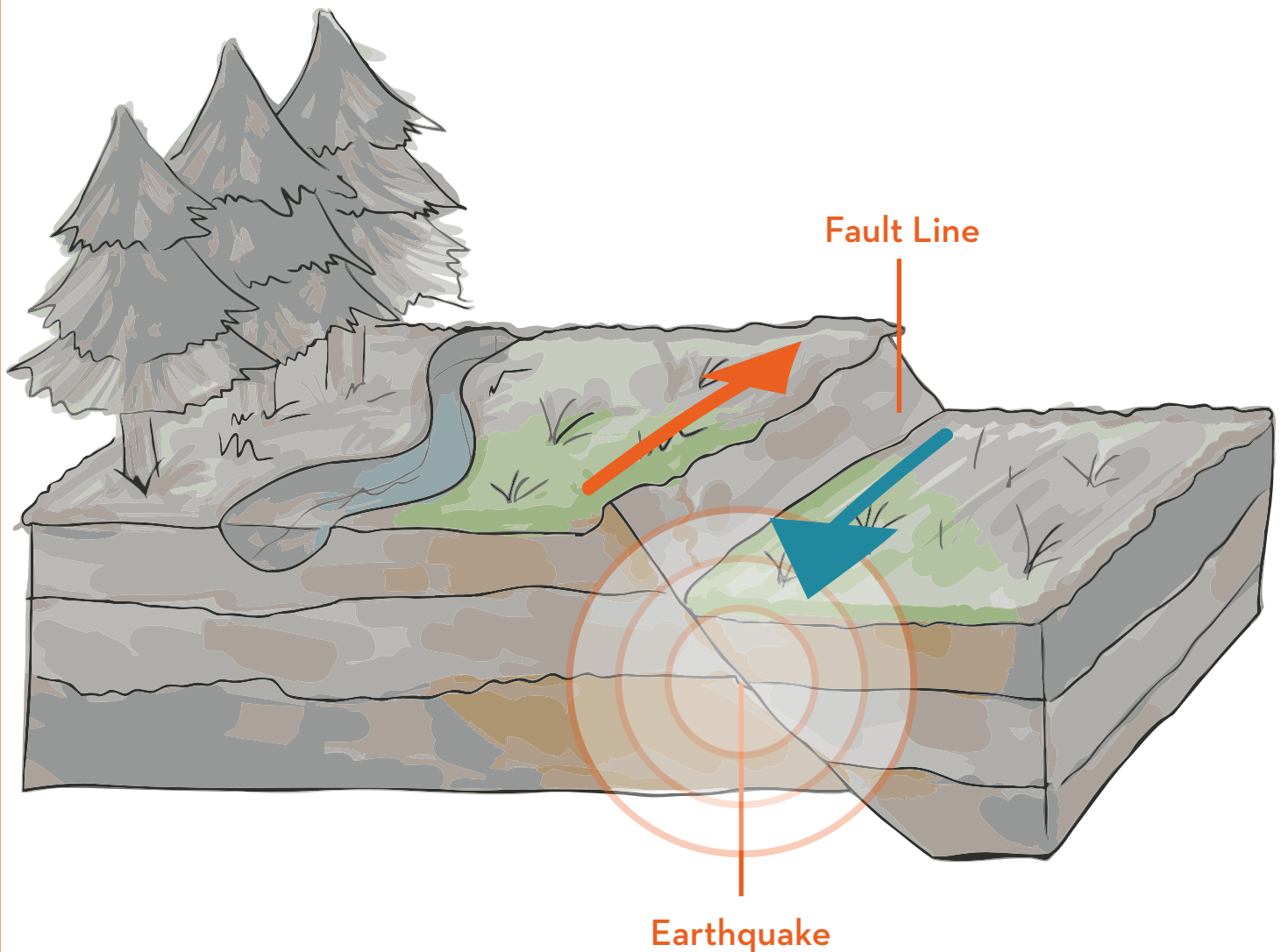
WINDS

SPIRALS



Explore Earthquakes!

phenomenal science



After reading the article on earthquakes, please answer the following questions:

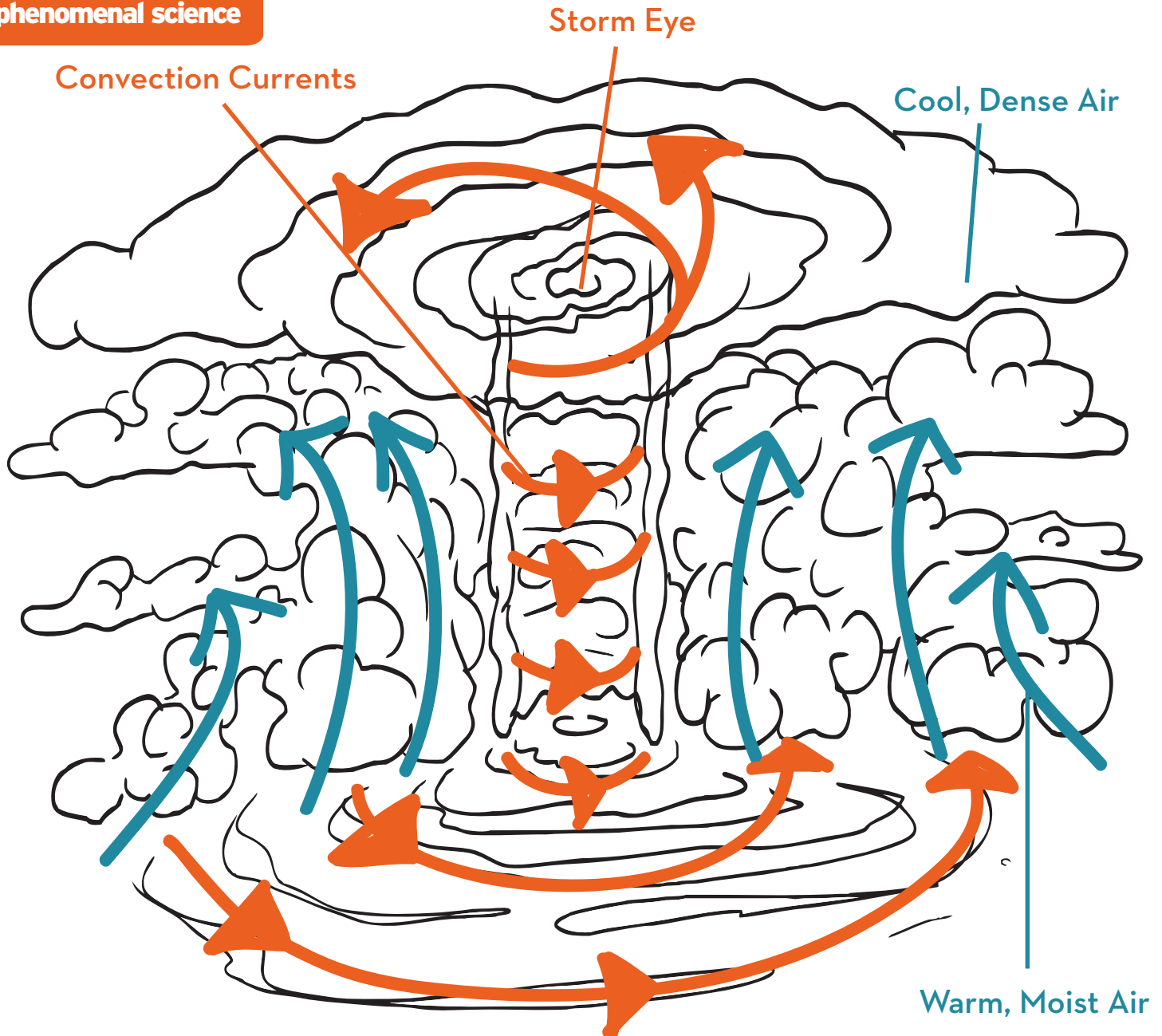
Name two different events that would cause an earthquake. **Volcanic eruptions, Meteor strikes, big underground explosions, and/or the earth's tectonic plates.**

What are the three ways tectonic plates interact with each other? **Normal fault, reverse fault, and slip fault**

What are seismic waves? **Waves that radiate through the ground and cause the earth to shake.**

Explore Hurricanes!

phenomenal science



After reading the article on hurricanes, please answer the following questions:

Where do North American hurricanes originate? **Hurricanes start as thunderstorms in Africa that are blown east into the Atlantic ocean.**

What was the first US Hurricane named after a person? **Hurricane Camille.**

How does a hurricane move across the Atlantic ocean? **Trade winds from Africa will push the hurricane east, towards the US.**

Explore Heat Waves!

phenomenal science



EARTH'S GREENHOUSE EFFECT

When energy from the sun enters the Earth's atmosphere, it can get trapped. This is called **The Greenhouse Effect**.

When sunlight warms the surface of the Earth, the heat will radiate through the atmosphere and back towards space. Some of this heat is able to escape the planet, but much of the sun's energy is absorbed

by the ocean, the land, reflected back to the earth by clouds, and green house gases like methane and carbon dioxide. This heat then recycles back to our planet and can continue to warm the surface.

Many scientists believe the recent increase in heat wave activities are correlated with the **Earth's Greenhouse Effect**.

After reading the article on heat waves, please answer the following questions:

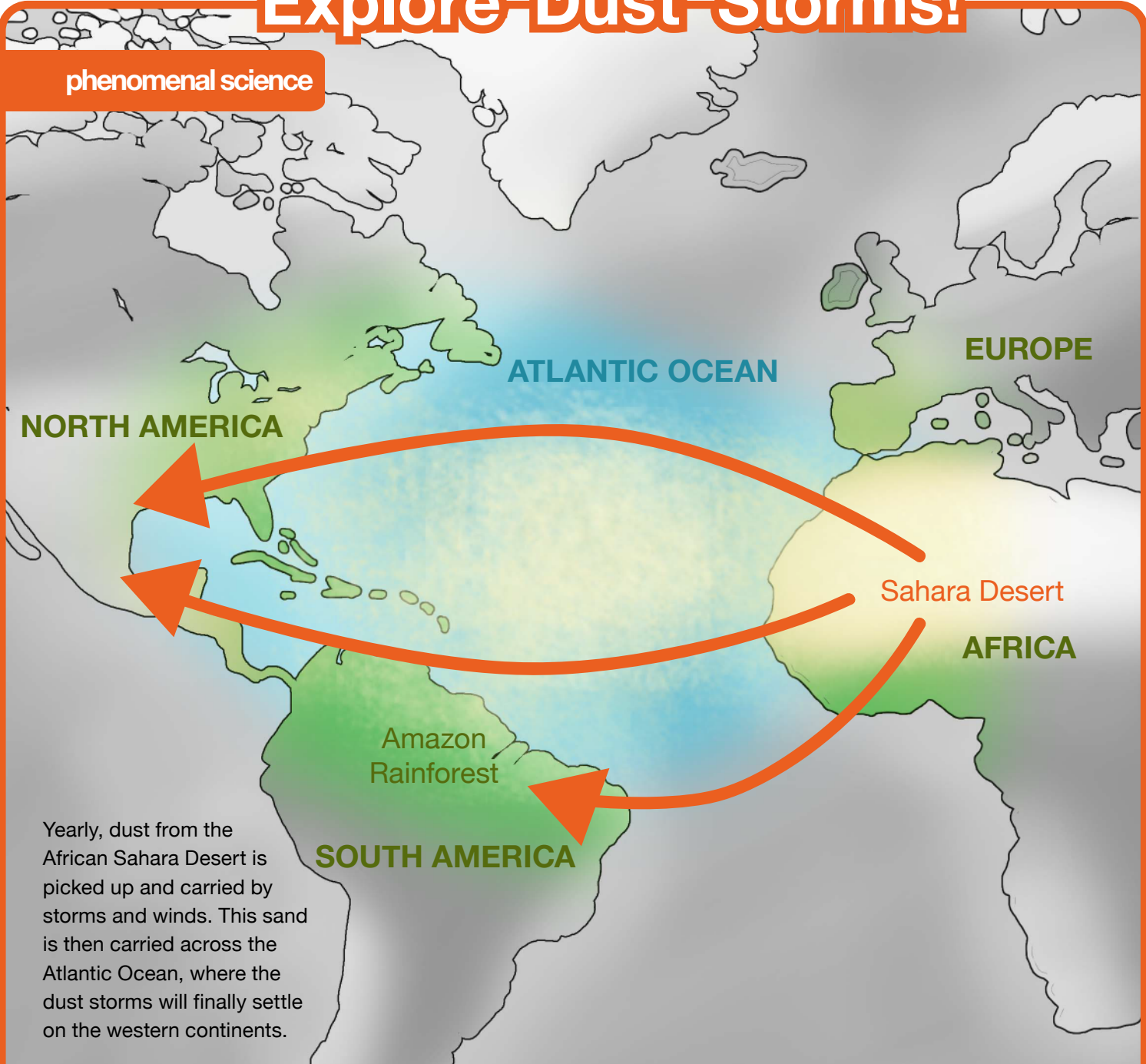
What are a few tips to stay safe during a heat wave? See 'Safety Tips'.

How do heat waves form? Heat waves can form when warm, high pressure systems stop moving and stick around in a certain region.

What is the **urban heat island effect**? When a city's conditions prolong a heat wave.

Explore Dust Storms!

phenomenal science



After reading the article on dust storms, please answer the following questions:

What are a few tips to stay safe during a sand storm? See 'Safety Tips'.

What are the perfect conditions for dust storms to brew? A dry, arid environment with loose top soil, e.g. a desert.

Define desertification. The man-made or natural process when fertile land transforms into a desert.