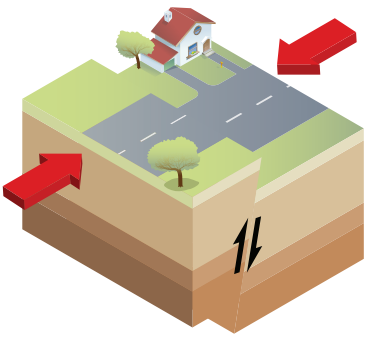
Earthquake Ready



Earthquakes happen when gigantic slabs of rock in the Earth rub together and slide past each other with a sudden jolt. An earthquake usually lasts only a few seconds to a few minutes, but it causes the ground to shake for miles around. The biggest earthquakes last the longest. You may have learned the word *aftershocks*. These too are earthquakes and can happen days, weeks, or even months after the main earthquake is felt.

An earthquake shakes everything in a home. Windows break. Pictures drop from the wall. Books shake off their shelves, and the whole bookcase might even tip over. In fact, the whole house sometimes shakes so much that it falls off its *foundation* – that is the part underneath that holds the house to the ground. Luckily, scientists and engineers have figured out ways to make houses earthquake-ready.

Find out how by matching the descriptions below to the correct places on this house. The first one is filled in to help you get started.

A. Pictures and mirrors screwed to the wall.

B. Bookcases and shelves attached to the wall.

C. Television screen strapped to the wall.

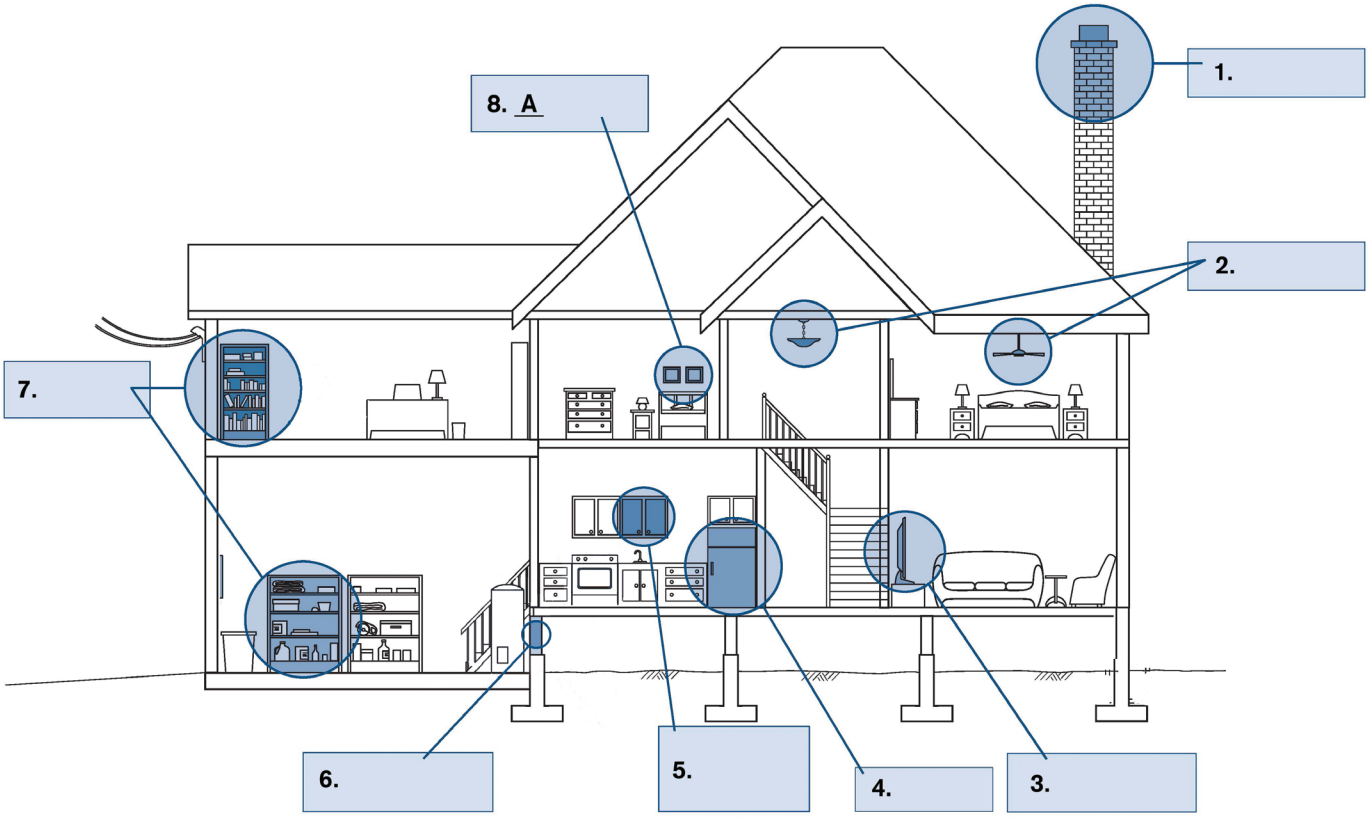
D. No ceiling fans or hanging lamps.

E. Chimney braced to keep it attached to the house.

F. Roller-blocks to keep appliances from rolling around.

G. House bolted to the foundation.

H. Cabinets fastened to keep them from flying open.



ANSWERS: 1-E; 2-D; 3-C; 4-F; 5-H; 6-G; 7-B; 8-A

Be Prepared! If you feel an earthquake, Drop, Cover, and Hold On! DROP to the floor and, if you can, crawl under a piece of furniture that will COVER and protect you from things that fall. Then HOLD ON to your cover so it can't shake away from you.

To Learn More about earthquakes, visit **www.earthquake.usgs.gov/learn/kids** and **www.ready.gov/kids/know-the-facts/earthquakes**, and play the earthquake episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Flood Season

Flooding is part of the life cycle of many large rivers around the world. The people who live along these rivers expect flooding almost every year. How do they prepare for this emergency? How could they prevent it?

Read about flood season along the Nile River in ancient Egypt and today. Use the word bank to fill in the missing words.

Ancient Egypt

My name is Nadia and I live on the Nile River. My family has farmed here for hundreds of years. Each year the Nile **f** ___ ___ ___ ___ ___ and covers our farm with muddy water. The **w** ___ ___ ___ ___ soaks into the soil and the mud is left behind, making our land very good for farming. We call this flood time *Akhet*, the first **s** ___ ___ ___ ___ ___ of the year.

When the flooding starts, my family moves away from the river to higher **g** ___ ___ ___ ___ ___ . We pack up our belongings and herd our animals with us. Sometimes we have to stay away for weeks, but those are good times because a big flood brings more soil and water to our farm. We know how to stay **s** ___ ___ ___ when the Nile overflows, and we always bounce back when the flooding ends.

Egypt Today

My name is Anwar and I live on a **f** ___ ___ ___ near the Nile River. For centuries, the Nile flooded this land every year, but since 1970, our farm has been protected by the Aswan Dam. The dam holds back the **r** ___ ___ ___ ___, storing its water in a giant lake.

Water from the lake flows through canals to farms all along the **N** ___ ___ ___. We use the water for *irrigation* – that means we use it to water our crops. There is always water in the **c** ___ ___ ___ ___ ___, so we can grow crops all year long. In ancient Egypt, the farmers could only grow crops after flood time, and they had to leave their **h** ___ ___ ___ ___ every year. I'm glad that we are protected from flooding today.

Word Bank canals farm floods ground homes Nile river safe season water

ANSWERS: Ancient Egypt: floods, water, season, ground, safe; Egypt Today: farm, river, Nile, canals, homes

Be Prepared! Floods can happen in any part of the country and sometimes occur with little warning. Make a plan with the grownups in your home, have more than one route to get to safety, and talk about what you will do to stay safe. Remember: never walk or drive through floodwater; never play in or near a flooded or fast-moving stream; and when you come to an area covered with water, Turn Around, Don't Drown!

To Learn More about flooding in the U. S., visit **www.noaa.gov/resource-collections/watersheds-flooding-pollution** and **www.ready.gov/kids/know-the-facts/floods**, and play the flood episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

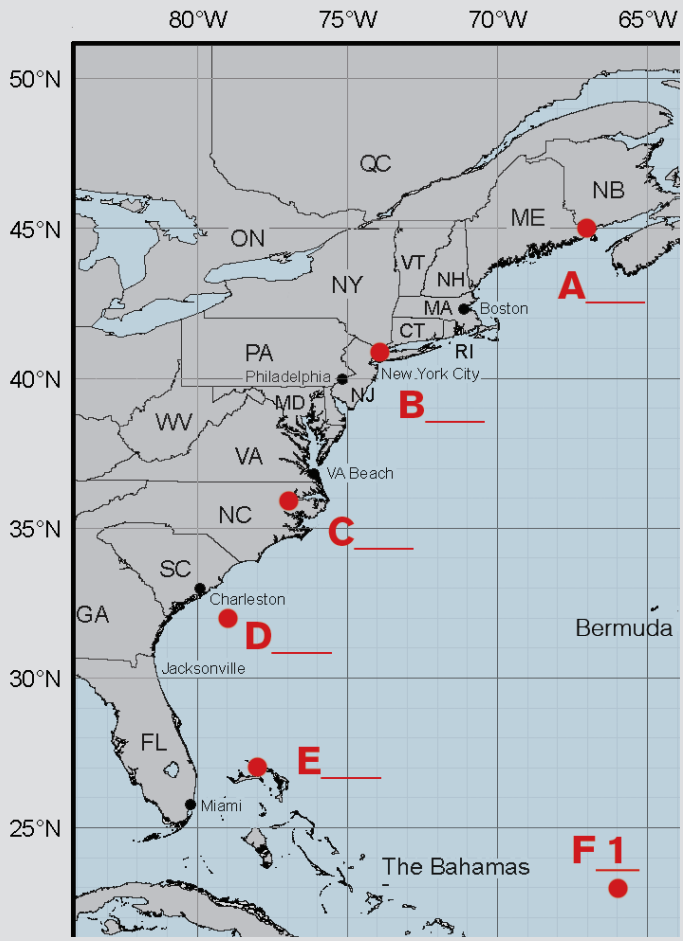
American Red Cross

Track the Hurricane

When a hurricane is on its way, weather forecasters use satellites to track it so that they can warn people to move away from dangerous areas. Here's your chance to be a weather forecaster.

Use this grid map to track the locations of a hurricane as it heads toward the east coast of the United States. For each date and time, there are two numbers that describe the hurricane's location – *latitude* and *longitude*. Look at the numbers along the left side of the grid map to find the *latitude* number. Look at the numbers along the top of the grid map to find the *longitude* number. Follow the lines over from the left and down from the top to find where they cross. That is the location of the hurricane for that date and time.

All the locations are already marked on the map. Match each one to its date and time. (The first one is filled in for you.) Then draw a line connecting the dots to show the full path of the hurricane.



ANSWERS: A-6; B-5; C-4; D-3; E-2; F-1

1. **September 12 at noon**
   Latitude 23N, Longitude 66W
   The hurricane is heading west toward the Bahamas Islands with winds at 105 miles per hour.
2. **September 15 at midnight**
   Latitude 27N, Longitude 78W
   The hurricane is still moving west, toward Florida, with winds now at 115 miles per hour.
3. **September 16 at midnight**
   Latitude 32N, Longitude 79W
   The hurricane suddenly turns north with winds at 90 miles per hour.
4. **September 16 at noon**
   Latitude 36N, Longitude 77W
   Just 12 hours later, the hurricane hits North Carolina with 74 mile per hour winds.
5. **September 17 at midnight**
   Latitude 41N, Longitude 74W
   For 12 hours the hurricane roars up the coast, reaching New York City with winds of 50 miles per hour.
6. **September 18 at midnight**
   Latitude 45N, Longitude 67W
   By the next day, the hurricane has crossed New England and reached Canada. It will head back out to sea on September 19.

Be Prepared! Plan ahead to evacuate when a hurricane heads your way. Be sure the grownups in your home listen to the news to find out what to do for hurricane watches and warnings. Make sure your Pillowcase Kit is ready to go. Remind grownups to get plenty of gas for the car and cash from an ATM. Have more than one route to get to safety in case floods block your way. When you go back home after the hurricane, be careful not to hurt yourself on broken glass or other sharp things, and don't walk in puddles – they could be dangerous. Help toss out any food that might have spoiled in the fridge or freezer – when in doubt, toss it out!

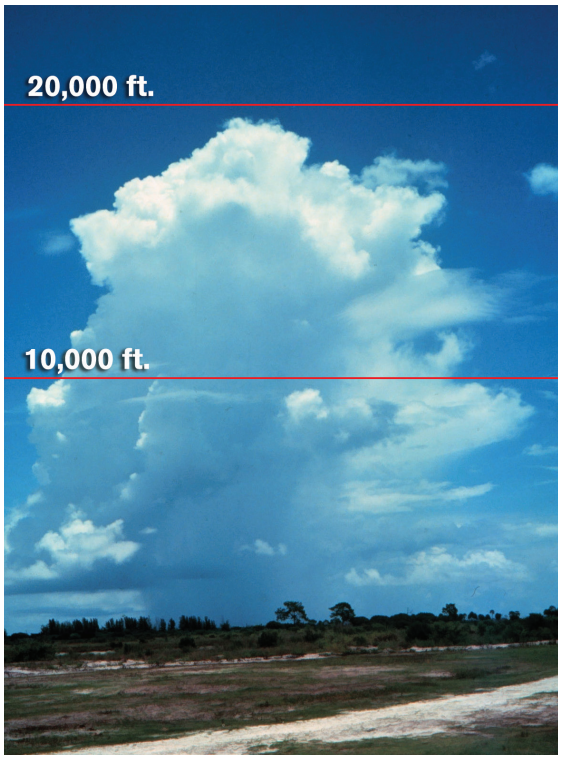
To Learn More about hurricanes, visit **www.noaa.gov/resource-collections/hurricanes**, and **www.ready.gov/kids/know-the-facts/hurricanes**, and play the hurricane episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Thunderstorms and Lightning

Thunderstorms can happen anytime conditions are right. They start out as a *cumulus* cloud, which is a white puffy cloud. But instead of floating across the sky, this cumulus cloud starts to pile up, soaring miles high as it fills up with warm, moist air.

Once the cloud grows about 8 miles high, the air at the top becomes cooler and the moisture in the air *condenses*. That



means it turns into water drops that start to fall in the form of rain or hail. As the rain or hail falls, it pulls air from the cloud down with it, creating wind that drives the rain or hail toward the ground. That's why, during a thunderstorm, it can seem like a giant bucket is dumping water down from the sky!

1. Use your estimation skills to decide whether this thunderstorm cloud is tall enough to start producing rain or hail. (Remember: 1 mile = 5,280 feet.)
Yes ___ No ___

Thunderstorms usually last only about 30 minutes, but they can produce a downpour of rain that causes flooding or a burst of hail that breaks windows and dents cars. Some can even produce tornadoes. The most dangerous part of every thunderstorm is lightning. Thunder is the sound of lightning, so whenever you hear thunder, you know there is lightning nearby.

Lightning is a gigantic spark of electricity that connects the thundercloud to the ground. It's so hot that it causes the air to "explode" – that's the sound we hear as thunder. However, thunder travels much slower than the light from a lightning bolt, so we usually hear thunder a few seconds after we see lightning.

It takes thunder 5 seconds to travel one mile from the lightning that caused it. So if you see a flash of lightning and hear thunder 5 seconds later, you know the lightning was one mile away. To be safe, you should always go indoors when you hear thunder, especially if it comes less than 30 seconds after you see a flash of lightning.

2. Use your division skills to figure out how far away the lightning is when you hear thunder 30 seconds after you see the flash.
30 seconds ÷ 5 seconds to travel 1 mile = _____ miles

ANSWERS: 1-No; 2-Approximately 6 miles away

Be Prepared! Remember the safety rule: *When the thunder roars, go indoors!* Always pay attention to weather reports. If there is a chance of thunderstorms, stay indoors and save outdoor fun for another day! During a thunderstorm, stay away from windows and glass doors in case they break. Lightning can come in through the plumbing, so don't do things that need running water. If you can't get inside, stay away from trees and power lines, and make sure you aren't the tallest object in the area. If you are in a car, stay there and don't touch anything metal. If you are in the water when a thunderstorm happens, get out immediately and go indoors for safety.

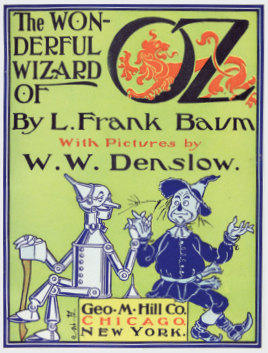
To Learn More about thunderstorms and lightning, visit **www.lightningsafety.noaa.gov** and **www.ready.gov/kids/know-the-facts/thunder**, and play the thunderstorm episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Tornado Tales

Do you remember the story of *The Wizard of Oz*? It starts in Kansas, which is in a part of the United States where many tornadoes happen. In fact, more tornadoes happen in the central and southern U.S. than anywhere else in the world!

The Wizard of Oz starts with a tornado. (The author, L. Frank Baum, uses a different word – *cyclone* – but in this case it means the same thing.) Read the beginning of the story, then answer the questions below.



Dorothy lived in the midst of the great Kansas prairies, with Uncle Henry, who was a farmer, and Aunt Em, who was the farmer's wife.

Uncle Henry looked anxiously at the sky, which was even grayer than usual. From the far north came a low wail of the wind, and Uncle Henry and Dorothy could see where the long grass bowed in waves before the coming storm. Then they heard a sharp whistling in the air from the south, and as they turned their eyes that way they saw ripples in the grass coming from that direction.

Suddenly Uncle Henry stood up. "There's a cyclone coming, Em," he called to his wife. Aunt Em dropped her work. "Quick, Dorothy!" she screamed. "Run for the storm cellar!"

Dorothy's little dog, Toto, jumped out of her arms and hid under the bed, and the girl started to get him. Aunt Em, badly frightened, threw open the trap door in the floor and climbed down the ladder into a small, dark hole where they would be safe. Dorothy caught Toto at last and started to follow her aunt, but when she was halfway across the room there came a great shriek from the wind. The house shook so hard that she lost her footing and sat down suddenly upon the floor.

Then a strange thing happened. The house whirled around two or three times and rose slowly through the air. Dorothy felt as if she were going up in a balloon.

This is a wonderful way to start a story, but do you think it could ever really happen? Find out about real tornadoes by visiting **www.ready.gov/kids/know-the-facts/tornado**. Then answer these questions:

1. Does the wind always come from opposite directions when a real tornado forms? _____
2. What sound does a real tornado make when it is nearby? _____
3. What do you think would happen to Dorothy's house if it were hit by a real tornado? _____

_____

ANSWERS: 1-No, the wind can come from any direction; 2-Tornadoes sound like a train or jet engine; 3-The house would probably be broken apart.

Be Prepared! Talk to grownups about tornadoes. Make a plan about what to do if you live where tornadoes happen, then practice your plan. Remind grownups to listen to the news to find out what to do for tornado watches and warnings. The best way to stay safe during a tornado is to have a storm shelter or a safe room. (Finding out about these special rooms ahead of time might be a good project for your family or school class.) If a storm shelter or safe room is not available, find a safety spot like a basement or a windowless room on the lowest floor of your home, kneel down and bend over as tight as ball with your hands over your head to protect yourself from things blown around by the wind. Stay there until the tornado goes away. If you live in a manufactured or mobile home, and you hear there is a tornado warning, get out and go to a safety spot, safe room, or storm shelter in a sturdy building.

To Learn More about tornadoes, visit **www.noaa.gov/resource-collections/tornadoes** and **www.ready.gov/kids/know-the-facts/tornado**, play the tornado episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Tilly Spots a Tsunami

A tsunami (soo-nah-mee) is a series of waves that can cause dangerous surges of water along shorelines. These surges can last minutes, hours, or even days. Most tsunamis are caused by earthquakes under the ocean. The energy released from the earthquake pushes the entire column of ocean water and sends waves rushing through the ocean until they run up on the shore. The word *tsunami* is Japanese for harbor (tsu) and wave (nami).

Tsunamis move fast when they are in the ocean, sometimes as fast as a jet plane. They can be caused by earthquakes, volcanoes, or meteor impacts thousands of miles away. Sometimes, even landslides can cause tsunamis. That's why it's important to be on the lookout for the warning signs of a tsunami when you are near the ocean, so that you can get away from the water and as high as possible before the tsunami comes to shore.

What are the warning signs of a tsunami? Here's the story of a 10-year-old girl named Tilly Smith who learned about tsunamis in school. Tilly shared what she learned when a tsunami was on its way to a beach where her family was taking a vacation. See if you can spot the warning signs that helped Tilly save the day. This is Tilly's story:

It was another beautiful day on the beach in Thailand. Back home in England, most people were bundled up against the cold on the day after Christmas, but Tilly Smith and her family were spending the holidays where the sun was warm and the water was bright blue.

One day, Tilly noticed fizzy bubbles on the water, and the water seemed to be rolling farther up the beach than it had a few minutes ago. "That's strange," Tilly said to her mom. "It looks like the beach is getting smaller."

Then Tilly remembered where she had seen this before.

"We should get off the beach," Tilly told her mother. "I think there may be a tsunami coming!"

"What's a tsunami?" her mother asked.

Tilly explained that she had learned about tsunamis at school a few weeks ago. "They are strong waves caused by undersea earthquakes," she said. "And they travel very fast. We have to leave the beach now!"

Even though Tilly's mom and dad had never heard of a tsunami, they could see that the ocean was behaving in an unusual way, so they started back to their hotel. They told the hotel staff what Tilly had seen, and the staff immediately ran out to the beach and told everyone to get away from the water. Then, a few minutes later, a tsunami did crash onto the beach, spilling water past the hotel and for miles beyond.

Thanks to Tilly, everyone on that beach was safe!

What warning sign made Tilly think that a tsunami was coming?

ANSWER: Ocean water rising quickly up the beach, making it look smaller

Be Prepared! If you see the warning signs of a tsunami or hear a tsunami warning on the news, move immediately away from the shoreline and as high up as possible. If you feel an earthquake while you are near a beach, that could be the start of a tsunami, too. Drop, Cover, and Hold On to protect yourself from the earthquake. Then, once the shaking stops, move as quickly as possible away from the shoreline and as high up as possible. Don't try to watch a tsunami – if you can see the waves, you are too close for safety.

To Learn More about tsunamis, visit **www.tsunami.noaa.gov** and **www.ready.gov/kids/know-the-facts/tsunamis**, and play the tsunami episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can see Tilly Smith talk about her experience at **http://youtu.be/V0s2i7Cc7wA**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

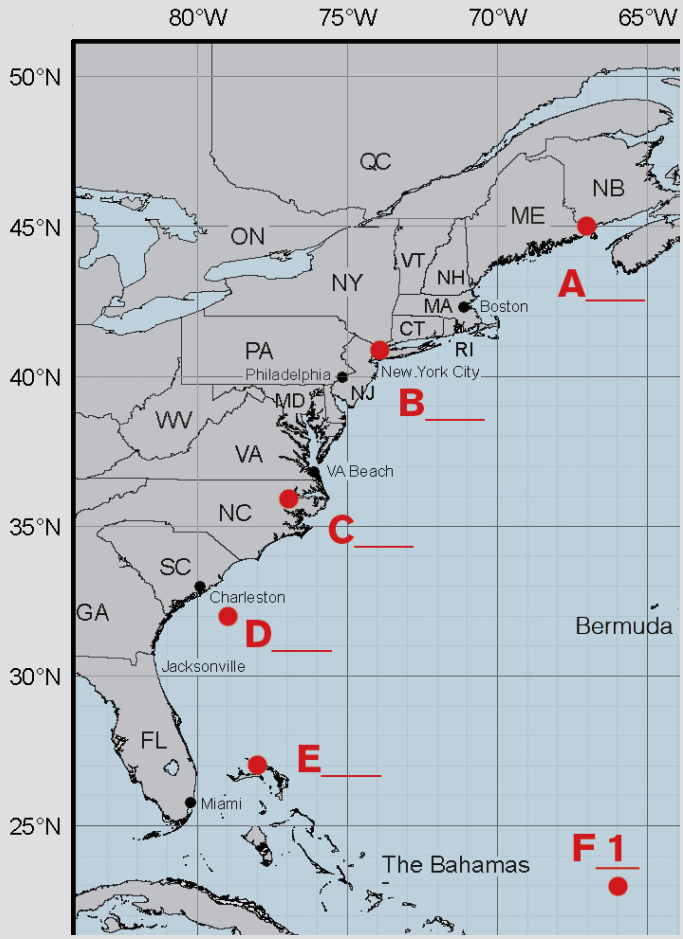
American Red Cross

Track the Typhoon

When a typhoon is on its way, weather forecasters use satellites to track it so that they can warn people to move away from dangerous areas. Here's your chance to be a weather forecaster.

Use this grid map to track the locations of a typhoon as it heads toward the east coast of the United States. For each date and time, there are two numbers that describe the typhoon's location—*latitude* and *longitude*. Look at the numbers along the left side of the grid map to find the *latitude* number. Look at the numbers along the top of the grid map to find the *longitude* number. Follow the lines over from the left and down from the top to find where they cross. That is the location of the typhoon for that date and time.

All the locations are already marked on the map. Match each one to its date and time. (The first one is filled in for you.) Then draw a line connecting the dots to show the full path of the typhoon.



ANSWERS: A-6; B-5; C-4; D-3; E-2; F-1

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6. **September 18 at midnight**
   Latitude 45N, Longitude 67W
   By the next day, the typhoon has crossed New England and reached Canada. It will head back out to sea on September 19.

Be Prepared! Plan ahead to evacuate when a typhoon heads your way. Be sure the grownups in your home listen to the news to find out what to do for typhoon watches and warnings. Make sure your Pillowcase Kit is ready to go. Remind grownups to get plenty of gas for the car and cash from an ATM. Have more than one route to get to safety in case floods block your way. When you go back home after the hurricane, be careful not to hurt yourself on broken glass or other sharp things, and don't walk in puddles—they could be dangerous. Help toss out any food that might have spoiled in the fridge or freezer—when in doubt, toss it out!

To Learn More about typhoons, visit **noaa.gov/resource-collections/hurricanes**, and **ready.gov/kids/know-the-facts/hurricanes**, and play the typhoon episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

The Ring of Fire

Why are so many of the world's volcanoes found along the edges of the Pacific Ocean in a region called *The Ring of Fire*?

Scientists have discovered that the surface of the Earth is made up of *tectonic plates* – gigantic slabs of rock that fit together like the pieces of a puzzle. Some of these slabs are bigger than a continent, and the biggest is at the bottom of the Pacific Ocean.

Unlike the pieces of a puzzle, the tectonic plates can move and slowly shift positions. Over millions of years, they push and rub against each other. Around the Pacific Ocean plate, this pushing and rubbing sometimes causes earthquakes. It has also created a string of volcanoes that runs from New Zealand all the way around to the tip of South America – The Ring of Fire.

This map shows the locations of some volcanoes on The Ring of Fire. Read the descriptions of these volcanoes, then use your geography skills to match each number on the map to the correct volcano.

___**A.** Krakatau, in Indonesia, created the loudest sound ever heard on Earth when it erupted in 1883.

___**B.** Popocatepetl (an Aztec word for "smoking mountain") covered thousands of homes with ash and stopped air travel into Mexico City when it erupted in 2013.

___**C.** Mount Cleveland, in the Aleutian Islands, is so far out to sea that no one knew it had erupted in 2006 until astronauts spotted it from the International Space Station.

___**D.** Mount Saint Helens, in the U.S., had been quiet almost 150 years before it exploded in 1980, blasting away the mountain top and leaving a mile-wide crater.

___**E.** Mount Pinatubo, in the Philippines, created a cloud of volcanic gas that blocked sunlight around the world when it erupted in 1991.

___**F.** Mount Fuji, Japan's highest mountain, buried Tokyo in volcanic ash when it last erupted in 1707.

ANSWER: A-1; B-6; C-4; D-5; E-2; F-3

Be Prepared! Scientists monitor volcanoes for signs that they may erupt. If you live near a volcano, listen for volcano warnings and leave your home immediately if local authorities tell you to evacuate. Protect yourself from volcanic ash by wearing long sleeves, long pants, goggles, and a dust mask (or breathe through a wet cloth). Avoid river valleys, which can fill with volcanic mudflows, and get to higher ground as fast as possible if you hear a mudflow roaring toward you. Remind the grownups in your home to check the emergency supply kit, especially for clean drinking water.

To Learn More about volcanoes, visit **volcanoes.usgs.gov/index.html** and **www.ready.gov/kids/know-the-facts/volcano**, and play the volcano episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Wildfire Home Protection

Wildfires destroy millions of acres of forests and grasslands each year. They happen most often in the western states, but a wildfire can start almost anywhere. Some are caused by lightning, but nine out of ten wildfires are started by people who are careless with fire outdoors.

Each year, wildfires also damage or destroy hundreds of homes. To help protect homes from wildfire, experts recommend creating a wide space around the home where there are few trees and plants for the fire to burn. This open space helps keep a wildfire away from the home by reducing the fuel it needs to spread.

Here is a home at risk of being damaged or destroyed in a wildfire. Which **six tips** on the list below could help this family protect their home? All of the tips are good ways to keep wildfire away from a home, but this family doesn't need to do everything on the list. Look at the picture to decide which six tips are right for their home. Check off those tips so this family knows what chores they need to do to help keep their home safe from wildfire.

Tips for Protecting a Home from Wildfire

☐ **1.** Keep the lawn mowed to a height of four inches or less, and water frequently to keep the grass green.

☐ **2.** Keep all trees and shrubs at least five feet away from the home.

☐ **3.** Trim low hanging tree branches and keep branches far away from the chimney.

☐ **4.** Trim or remove trees and shrubs so that they are spaced far apart around the home.

☐ **5.** Remove all dead leaves, pine needles, and branches from the lawn, decks and porches, the roof, and rain gutters.

☐ **6.** Clear dead leaves, pine needles, and other debris out from under decks and porches, and remove anything stored underneath a deck or porch.

☐ **7.** Keep firewood and propane tanks at least 30 feet away from the home.

☐ **8.** Make the home address easy to see so firefighters can find it quickly in an emergency.

Now here's a bonus question: You can't see it in the picture, but this house has a pile of firewood and a deck in the back. Find two more tips on the list above that this family should know about to protect their home from wildfire. Write the tip numbers in the answer spaces below.

TIP____ TIP____

ANSWERS: 1, 2, 3, 4, 5, and 8; Bonus: 6 and 7

Be Prepared! Ask your neighborhood firefighters if you live in an area with a wildfire risk. If you do, get together with the people in your home and make your own "to-do list" to help protect your home from wildfire. Make it a fun project for everyone – assign "chores," check them off your list, and afterwards, plan a "we did it" activity. If a wildfire happens in your area, make sure the grownups in your home listen to the news to find out if the authorities say you should evacuate from your neighborhood. If you do evacuate, be aware of where the wildfire's smoke is, and be prepared to move away from the fire if it suddenly changes directions.

To Learn More about preventing wildfires, visit **smokeybear.com/en/smokey-for-kids**. To learn how to protect your home from wildfire, visit **www.firewise.org** and **www.readyforwildfire.org**, and play the wildfire episode of Monster Guard, a free app available at **redcross.org/monsterguard**. To learn how to stay safe when a wildfire happens, visit **www.ready.gov/kids/know-the-facts/wildfires**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

American Red Cross

Wind Chill and Winter Storms

You've probably heard weather reporters talk about the wind chill factor. They might say, "It's 15 degrees outside, but with the wind chill factor, it feels like 2 below zero!" Did you ever wonder how it can feel so much colder than it really is?

Your body knows the answer. It produces heat – that's why your temperature is usually 98.6° Fahrenheit. This heat warms up the air next to your bare skin, creating a thin layer of warmer air on your face and hands. When it is windy, this thin layer of air gets pushed away, and your body has to work harder to keep your bare skin warm. To your body, it feels colder than it really is, because it has to produce as much heat as it would on a much colder day.

Weather forecasters have created a chart that anyone can use to look up the wind chill factor. You just need to know the temperature and the wind speed. The chart also shows how quickly you can get frostbite when the wind chill factor is really low. Frostbite happens when a part of your body starts to freeze. If you get a tingly or numb feeling, especially in a part of your body that is exposed to the cold, like your ears or nose, that could be frostbite. But with the wind chill chart, you can plan to come inside and warm up before that happens!

Wind Chill Chart

Use this wind chill chart to give winter weather advice to the kids in the situations described below. For each situation, look up the wind chill factor, and write it in the space provided. Then use your math skills to figure out when the kids need to come inside to avoid frostbite and what they should do.

Wind Speed (mph) \ Temperature (°F)	20	15	10	5	0	-5	-10	-15	-20
5	13	7	1	-5	-11	-16	-22	-28	-34
10	9	3	-4	-10	-16	-22	-28	-35	-41
15	6	0	-7	-13	-19	-26	-32	-39	-45
20	4	-2	-9	-15	-22	-29	-35	-42	-48
25	3	-4	-11	-17	-24	-31	-37	-44	-51
30	1	-5	-12	-19	-26	-33	-39	-46	-53
35	0	-7	-14	-21	-27	-34	-41	-48	-55
40	-1	-8	-15	-22	-29	-36	-43	-50	-64
Frostbite Times									
	30 minutes			10 minutes			5 minutes		

The Shovelers

Temperature: 5°F Wind Speed: 30 mph
Wind Chill Factor: _____°F

Josh and his brother had been shoveling snow for 20 minutes, but the driveway was only halfway done. "Let's keep going until we get this finished," said Josh.

How long can Josh and his brother safely stay outside?
___ minutes

Should they try to finish shoveling before they go inside?
___ Yes ___ No

Visiting a Friend

Temperature: -20°F Wind Speed: 15 mph
Wind Chill Factor: _____°F

School was closed because of a big snow storm and Samantha wanted to play with her friend, Lia. It was only a 5-minute walk and Samantha knew how to dress to stay warm.

How long can Samantha safely stay outside? ___ minutes

Is it okay for Samantha to walk to her friend's house?
___ Yes ___ No

ANSWERS: The Shovelers – Wind Chill Factor: -19°F; 30 minutes; No. Visiting a Friend – Wind Chill Factor: -45°F; 10 minutes; Yes.

Be Prepared! Wear layers of clothing when it's cold outside, and always wear a hat. Go inside to warm up if your fingers, toes, ears, or nose feel tingly or numb – that's a sign of frostbite. Go inside quickly if you start to shiver – that's a sign that your body has lost too much heat, which can cause a dangerous illness called *hypothermia*. During a winter storm, stay inside and off the roads. If grownups need to be on the road when the news is warning about winter storms, remind them to have an emergency kit in the car and to say in the car if they get stuck – it's dangerous to go looking for help.

To Learn More about winter storms, visit **www.nssl.noaa.gov/education/svrwx101/winter** and **www.ready.gov/kids/know-the-facts/winter-storms-extreme-cold**, and play the winter storm episode of Monster Guard, a free app available at **redcross.org/monsterguard**. You can also ask an adult to download the free Red Cross emergency apps at **redcross.org/mobile-apps**. To learn more about all kinds of emergencies, visit **redcross.org/pillowcase**.

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