

# Volcanic Eruptions

## MASSIVE OUTBURSTS

A volcano is a mountain with molten rock (magma) below the surface and a top that can open. Sometimes, magma can find its way to the surface, which generally happens when there is an increase in pressure. Finally, an eruption occurs. Volcanic eruptions are extremely powerful, and are capable of destroying entire villages and forests. A volcanic eruption can also cause other natural disasters such as earthquakes, tsunamis, rock falls, and mudflows.

When magma under the surface works its way to the outside, a volcanic eruption is born. Lava are flows of molten rock out of a volcano, and there are massive ash deposits. When a volcano starts erupting, it will continue for a long period, and get bigger and bigger.

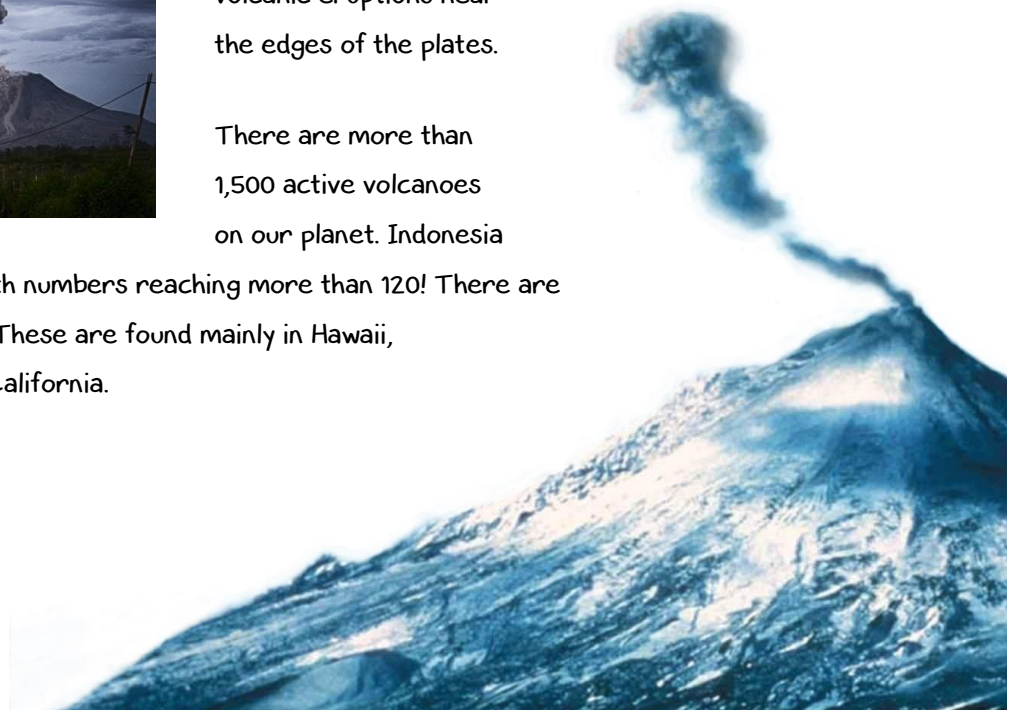
There are three kinds of volcanoes: extinct, dormant, and active. A volcano that is extinct has erupted thousands of years ago, and will not erupt again. A dormant volcano is kind of a sleeping volcano. It has not erupted in a long time, but there is a chance that it may happen in the future. A volcano that is active has recently erupted, and may erupt again soon.



The crust of the Earth consists of many plates, called tectonic plates, that fit together like a jigsaw puzzle. Sometimes, these plates move, which causes friction between them. This is the cause of earthquakes and volcanic eruptions near the edges of the plates.

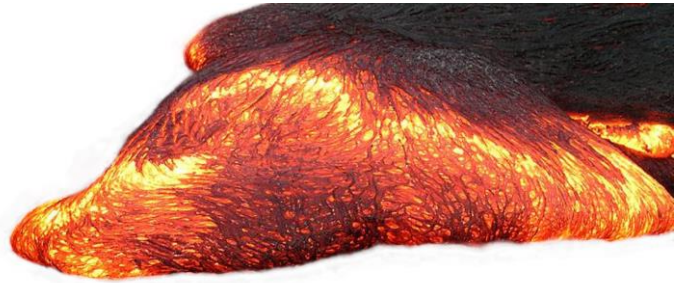
There are more than 1,500 active volcanoes on our planet. Indonesia

has the most active volcanoes, with numbers reaching more than 120! There are also active volcanoes in the USA. These are found mainly in Hawaii, Alaska, Washington, Oregon and California.



Are the following statements true or false?

- 1) A volcano has an opening at the top of the mountain. ( )
- 2) A volcanic eruption can cause other natural disasters. ( )
- 3) Volcanic eruptions become stronger after the first eruption. ( )
- 4) Most volcanoes in the USA are found in Washington D.C. ( )
- 5) Eruptions occur when the Earth's plates are moving. ( )
- 6) Shifting tectonic plates cause earthquakes and volcanic eruptions. ( )



- 7) Magma and lava are the same thing. ( )
- 8) A volcano is filled with magma. ( )
- 9) An extinct volcano might erupt again after thousands of years. ( )
- 10) There are 1500 volcanoes in the world. ( )

Unscramble the words, hints are given below.

1) satiumn      \_ \_ \_ \_ \_  
A volcanic eruption may cause a .....

2) mamag      \_ \_ \_ \_ \_  
Molten rock under the surface.

3) rnadotm      \_ \_ \_ \_ \_  
A sleeping volcano.

4) rutcs      \_ \_ \_ \_ \_  
The outermost layer of the planet.

5) avla      \_ \_ \_ \_ \_  
Molten rock outside a volcano.

6) cttniex      \_ \_ \_ \_ \_  
A volcano that won't erupt anymore.

7) iiahaw      \_ \_ \_ \_ \_  
An American state that has volcanoes.

8) tecvai      \_ \_ \_ \_ \_  
A volcano that may erupt soon.

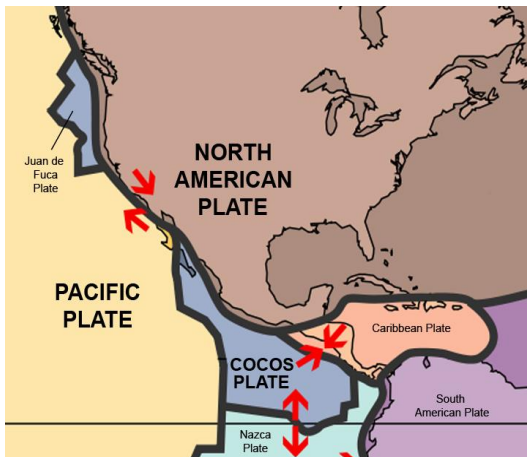




# Earthquakes

## KILLER SHAKES

Earthquakes result in the shaking of the surface of the Earth. It is a natural way of the Earth to release stress. More than a million earthquakes hit our planet each year. The west coast of the United States is an area where earthquakes occur. Other risky areas in the world are Indonesia, Japan, China, and Iran. When an earthquake occurs, they can be felt over a large area, but usually last less than a minute. Unfortunately, earthquakes cannot be predicted, but scientists are working hard to find a way to do so.



The Earth has around 20 plates near its surface that move slowly past each other. Sometimes, these plates stretch or squeeze, as a result of which massive rocks are formed at the edges and these then shift with an amazing force. When such a situation occurs, earthquakes are the result. It is similar to breaking a pencil. When you hold both ends and apply force, the pencil will bend. After more force is applied, the pencil will eventually break. Stress is released in the middle, where it is broken. The crust of the earth works in a similar way. When plates move, they put force on other plates and

also on themselves. When the force is strong enough, the crust will break. The result is that tremendous amounts of energy are released at the time the crust breaks. This energy will move through the Earth in the form of waves, and when this happens, we feel an earthquake.



Answer the questions below.

1) Write in your own words how earthquakes are formed.

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2) How many earthquakes occur each year?

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3) Which countries are often hit by earthquakes? Do you know any other countries that are not mentioned in the text?

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4) Why are the earth's plates moving?

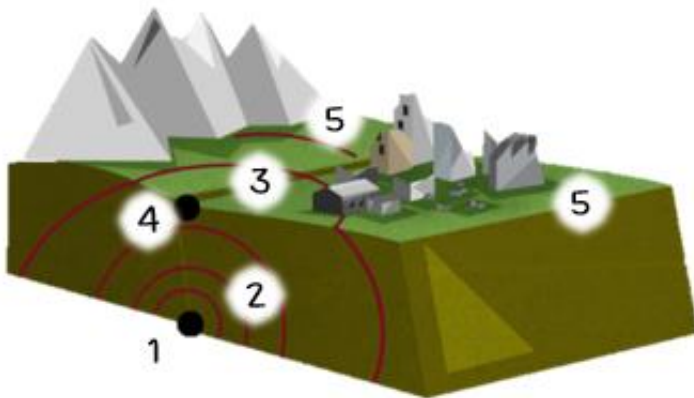
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Match the descriptions with the numbers in the illustration.



- 1) ( ) **Plates** (2x)  
Massive rocks that make up the surface of the Earth. They move along the faults.
- 2) ( ) **Fault**  
A fracture in the Earth's crust.
- 3) ( ) **Focus** (Hypocenter)  
A point under the surface where the earthquake starts.
- 4) ( ) **Seismic Waves**  
Energy that is released from moving or breaking crusts.
- 5) ( ) **Epicenter**  
The place at the surface above the focus of the earthquake.



# Tornadoes

## DEADLY TWISTERS

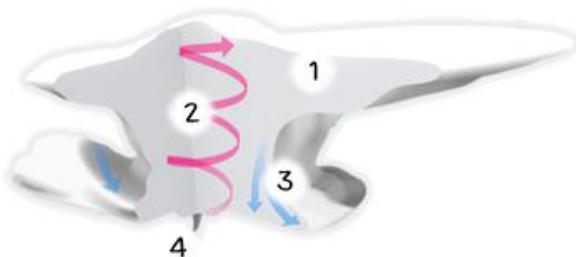
Tornadoes are violent storms with a rotating column of air that extends from a thunderstorm to the ground. Some of the most violent tornadoes cause tremendous destruction, with winds that can reach speeds up to 300 mph. They are able to hurl vehicles hundreds of yards, uproot trees, and even destroy large buildings. The damage paths of these violent storms can be up to 50 miles wide. There are around 1,000 tornadoes in the USA each year.

Most of the time, tornadoes are caused by thunderstorms. The ingredients for a tornado to form are warm and moist air (from the Gulf of Mexico) and cool and dry air (from Canada). When these two masses of air meet, they create instability in the atmosphere. An increase in the speed of the winds and a change in direction creates an invisible, horizontal spinning effect in the lower atmosphere. The air that is rising tilts the rotating air from a horizontal to a vertical position. The area where the winds rotate is usually between 2 and 6 miles wide. Most tornadoes are formed in these areas where the rotation is the strongest.

Create a drawing showing how tornadoes form, use the picture and labels below.

Answer the questions below.

5)



( 3 ) Cold air

( 4 ) Tornado

( 1 ) Cloud base

( 2 ) Warm air



1) Write in your own words how tornadoes form.

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2) What are the differences between tornadoes and hurricanes?

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3) Why are there so many tornadoes in the US?

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4) What are the maximum wind speeds of a tornado?

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# Droughts

## EXTREME DEHYDRATION



A drought is a long period of time without rain. Unlike most other natural disasters, a drought develops very slowly. It takes months or even years for a drought to fully develop, and they are generally very difficult to predict. Weather conditions play an important role for droughts to develop. Natural events such as global warming, ocean temperatures and changes in jet streams all affect droughts.

The effects of droughts can be devastating for the people who live in those areas. When there is a lack of water, plants will not grow and there is not enough water for people to drink. People will have insufficient nutrition, which leads to all kinds of health issues.

When there is not enough rain, farmers cannot grow crops and there will not be enough food to go around. This means that farmers cannot generate an income, and whole areas become very poor. The people in these troubled regions often have conflicts about who should be able to access the limited food supply. In some cases these events result in violent conflicts.

There are three types of droughts:

- Meteorological drought – a long period without rain.
- Agricultural drought – not enough water for crops to grow.
- Hydrological drought – low levels of water in lakes, reservoirs or underground.

Complete the sentences below.

1) A drought ..

- a. can occur quickly
- b. can easily be predicted
- c. takes a long time to develop
- d. B and C are correct

2) The effects of a drought are dangerous because ..

- a. farmers cannot grow crops
- b. conflicts may arise
- c. it leads to various diseases
- d. all are correct

3) Droughts can be caused by ..

- a. a lack of rain
- b. violent conflicts
- c. changing weather conditions
- d. A and C are correct

4) Droughts ..

- a. can easily be prevented and solved
- b. are often caused by human activities
- c. only happen in areas without much rain
- d. can cause poverty in large areas

5) A long period without rain can cause ..

- a. a meteorological drought
- b. an agricultural drought
- c. a hydrological drought
- d. all are correct

Unscramble the words and find them in the word search.

sDsteria

orDuthg

oaHgrlyioldc

iaRn

mtpuTrreaee

eterahW

N P T S T E Q S W P E U  
W E A T H E R W Y D A T  
L A C I G O L O R D Y H  
R E T S A S I D A W B G  
W C D D J N M T I Y Z U  
Z S U G V O I X N M Z O  
T E M P E R A T U R E R  
C R A U N Y V Y Q G L D

# Floods

## MASSIVE FLOWS



A flood is an overflow of water onto land. Most floods are caused by too much rain that cannot be absorbed by the soil. Another cause for floods are rivers that burst their banks, or strong winds that make huge sea waves that surge onto the land. Floods are the most common natural disaster in the world. In some situations there may only be a few inches of water, but some floods can even cover a house to the rooftop.



River floods occur when there is too much water in a river that cannot be carried away. The extra water can be a result of rain or melting snow. When there is too much water it starts rising and overflows onto normal land. This can destroy farmlands, wash away houses and may even drown people and animals.

Coastal floods are caused by strong winds that blow massive waves onto the land. Most of the time, violent storms like hurricanes cause coastal floods. In many countries, large groups of people live near coastal areas; therefore, many people are affected.

Flash floods happen quickly and are usually the result of heavy rain or thunderstorms. The huge amount of water that falls in a short time cannot be handled by the sewage, and complete cities become flooded.

Sometimes flash floods happen so rapidly that people cannot prepare themselves.



Are the statements true, false or not given?

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| 1) Floods are always caused by excessive rain. ( )                       | 7) Floods are the most commonly occurring natural disaster in the world. ( ) |
| 2) Global warming causes serious floods. ( )                             | 8) Coastal floods are the most destructive. ( )                              |
| 3) Flash floods mostly occur near rivers and coastal areas. ( )          | 9) Most coastal floods are caused by violent storms. ( )                     |
| 4) All floods have a massive impact and cause serious damage. ( )        | 10) The sewers of many cities cannot handle large flows of water. ( )        |
| 5) Areas near rivers or coastal areas are more vulnerable to floods. ( ) | 11) Flash floods usually develop slowly. ( )                                 |
| 6) Flash floods are caused by hurricanes. ( )                            |  |

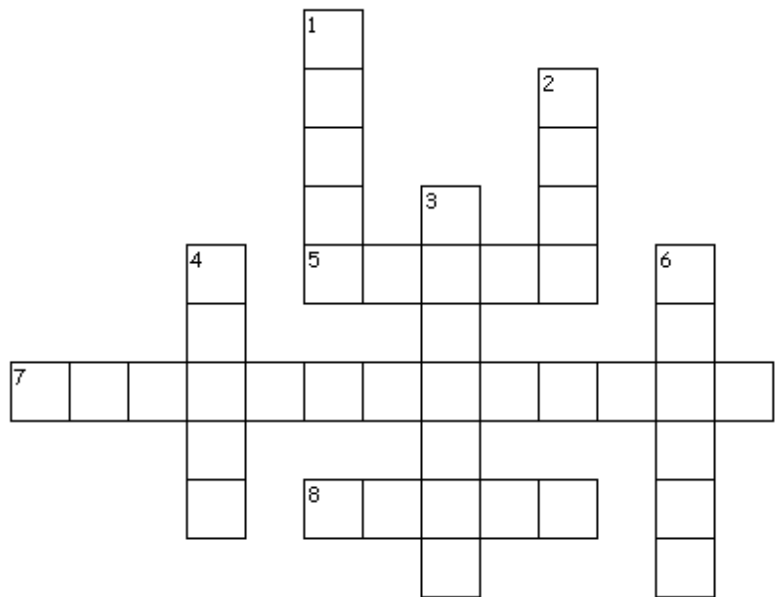
Complete the crossword puzzle.

#### Across

- 5) Some people may even ..... in a flood.  
 7) Flash floods are usually caused by .....  
 8) ..... floods happen very quickly.

#### Down

- 1) An overflow of a large amount of water.  
 2) Floods can be caused by too much .....  
 3) People who live near the sea can be affected by ..... floods.  
 4) Coastal floods are caused by strong .....  
 6) Floods are the most ..... natural disaster.





# Landslides

## KILLER SLIDES



Landslides are movements of rock, debris or earth down a slope. Sometimes, landslides are very small, and barely noticeable, but they can also be massive; when the whole side of a hill or mountain slides down. Landslides can be caused by different events. The most common cause is rain, which increases the weight of the side of a slope and causes it to slide. Erosion is another factor that can cause these slides. When the base of a slope is removed, or when trees are cut, the entire side of a mountain weakens.

When a slide occurs it can reach enormous speed and energy. There are reported cases of landslides that have moved at over 200 miles per hour! Many landslides are caused by natural phenomena, but in some cases they are the result of human activity. There are basically four different kinds of landslides:

A fall is a sudden and quick movement of ground or rocks falling down. Falls are usually triggered by erosion or earthquakes.

A topple is caused by falling or sliding rocks that move very quickly. This type of landslide is normally caused by a fracture pattern in a rock. The rocks suddenly fall, slide, bounce or roll down a hill.

A flow is the most dangerous and destructive kind of landslide. Large amounts of water weaken the side of a hill and destroy anything that is in its way.

A slide is a common form of landslide, and is caused by the removal of the base of a slope. The ground of the slope can be broken into pieces or may move entirely downhill.



Choose the best answers to complete the sentences below.

1) Landslides can be a result of ...

- a. heavy rainfall
- b. cutting trees
- c. falling rocks
- d. A and B are correct

2) Landslides occur ...

- a. in areas with mountains or hills
- b. in places with loose soil
- c. in regions where many trees are cut
- d. all of the above

3) A ... landslide involves a lot of water and mud.

- a. fall
- b. topple
- c. flow
- d. slide

4) Large stones falling downhill are an example of a ...

- a. fall
- b. topple
- c. flow
- d. slide

5) A ... is mostly the result of cutting trees.

- a. fall
- b. topple
- c. flow
- d. slide

6) When large rocks break, a ... can be the result.

- a. fall
- b. topple
- c. flow
- d. slide

7) A ... causes the most damage.

- a. fall
- b. topple
- c. flow
- d. slide

The words below are chopped in half. Find the pieces that fit together.

DE	DOWN	SLIDE	LAND
ERO	BRIS	HILL	PLE
TAIN	SION	TOP	MOUN

1) \_\_\_\_\_ 4) \_\_\_\_\_

2) \_\_\_\_\_ 5) \_\_\_\_\_

3) \_\_\_\_\_ 6) \_\_\_\_\_

# Thunderstorms

## ELECTRIC STORMS

A thunderstorm is a storm with lightning and thunder. Most of the time these are accompanied by heavy rains. The lightning in these storms creates the loud sound that is typical of a thunderstorm. The heat of the lightning causes the air to expand quickly and contract afterwards, which causes the noise that we hear in thunderstorms. Most of these electric storms happen in hot and humid weather conditions. Most thunderstorms are formed in tropical areas where the climate is very hot and wet. The worst thunderstorm area on our planet is in Kampala (the capital city of Uganda). This place has around 240 thunderstorms per year! There are roughly 1,800 thunderstorms every day on our planet.

These electric storms occur when the air is very warm and heavy with moisture. The heated air expands, evaporates and forms clouds. As warm and moist air rises from the ground, giant peaks of clouds form. These kinds of clouds are called cumulonimbus clouds. Storms rage when warm air rushes into the cloud. The force of the winds inside these clouds is so strong that it is capable of damaging airplanes. The upward winds in a thundercloud can reach speeds of over 100 miles per hour. When the cloud cannot hold any more water inside, the rain falls suddenly and heavily.



Cumulonimbus cloud

The rising air in a thundercloud carries a negative charge of electricity. The raindrops, on the other hand, carry a positive charge of electricity. When these two charges meet inside the cloud, electricity is sparked, and lightning is formed.



People can estimate how many miles away a thunderstorm is by counting the number of seconds between the flash of the lightning and the clap of thunder. If you divide that number of seconds by 5, then you get the distance in miles. You can see the lightning before you can hear the thunder because light travels faster than sound. In other words; the smaller the gap between the lightning and the thunder, the closer you are to the storm.

Answer the questions about thunderstorms.

1) How is the sound of thunder created?

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2) In which areas do most thunderstorms occur?

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3) What is a cumulonimbus cloud?

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4) How do thunderstorms form?

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5) Why don't airplanes fly through cumulonimbus clouds?

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6) How is lightning formed?

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7) Why do you always see the lightning before you hear the thunder?

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8) If you hear the thunder 25 seconds after you see the lightning, how far away is the thunderstorm?

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# Epidemics

## A DISEASE OUTBREAK

An epidemic is an outbreak of an infectious disease which affects many people in a certain region. When an outbreak spreads over a very large area in more continents or even world-wide, it is called a pandemic. An example of a pandemic is HIV/AIDS or the H1N1 outbreak in 2009. Examples of epidemics include diseases such as influenza, SARS, smallpox and Ebola.



Ebola Virus

Most epidemics are caused by natural disasters, such as floods, droughts, earthquakes and tropical storms. These outbreaks can affect animals which, in turn, cause local economic disasters. Apart from natural disasters, epidemics can also be caused by infected food and water, the introduction of a new disease, lower resistance to a disease, or viruses that become more harmful.

Epidemics are spread in different ways. Insects that carry diseases can infect people. Examples of insect-borne diseases are malaria and the bubonic plague. Airborne transmission occurs when the infection travels through the air when a person sneezes or coughs. Examples of this kind of infection are influenza, tuberculosis and measles. Epidemics can also spread because of infected food and water, such as cholera and dysentery.

Even though epidemics can spread quickly and kill many people, they eventually run their course. There are a few reasons why epidemics end. When an outbreak starts, it attacks the weakest people. Some people may die, but others survive. The people who survive the disease may build up immunity to the disease. Over time, the disease finds fewer people to attack and weakens. Other diseases only spread in a specific season. An example of this is the flu, which normally affects people in winter and dies out in spring. Another reason why epidemics come to an end is that the carriers of the disease become inactive. Malaria is an example of this. This disease is transmitted by mosquitoes and these flies become inactive in winter or during cold weather.



Choose the best answers for the questions below.

1) What is the difference between an epidemic and a pandemic?

- a. The number of infected people.
- b. The scale of the outbreak.
- c. The kind of disease that spreads.
- d. All of the above are correct.

2) How do epidemics spread?

- a. Through the winds of violent storms.
- b. By insects who infect people.
- c. When infections travel through the air.
- d. B and C are correct.

3) What can be the cause of an epidemic?

- a. A natural disaster
- b. Animals
- c. Infected food and water
- d. A and C are correct

4) What is an example of a pandemic?

- a. Ebola
- b. Earthquake
- c. HIV/AIDS
- d. Influenza

5) What is airborne transmission?

- a. Diseases that spread through insects.
- b. An epidemic that is caused by a natural disaster.
- c. Infections through coughing and sneezing people.
- d. None of the above.

6) How do epidemics come to an end?

- a. When people develop immunity against a disease.
- b. A change in weather conditions.
- c. By airborne transmission.
- d. A and B are correct.

The words below are chopped in half. Find the pieces that fit together.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_

6) \_\_\_\_\_

BORNE

SMALL

DEMIC

EPI

DIS

BREAK

PAN

EASE

POX

DEMIC

AIR

OUT



# Wildfires

## MASSIVE FIRES



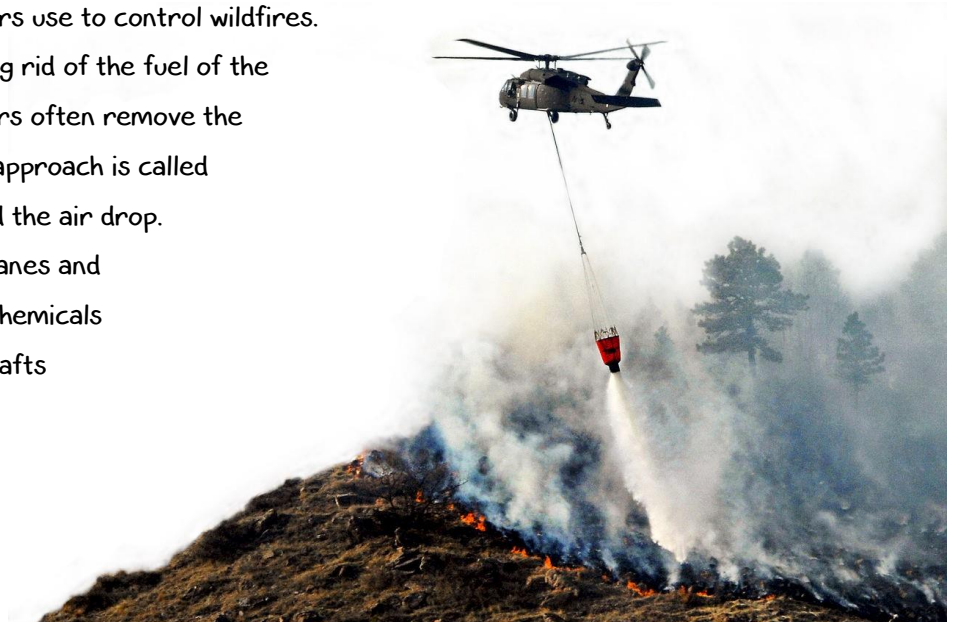
Wildfires are also known as forest fires or bush fires. A wildfire is an uncontrollable fire that occurs in a wild land area, but is also capable of destroying houses and farmlands. Generally, wildfires start in a small area without anyone noticing, but they can spread very quickly over very large areas.

Wildfires are usually caused by lightning, arson or volcanic eruptions. Droughts, heat waves, and a change in climate also dramatically affect the risk of wildfires. Nevertheless, more than 80% of all wildfires are caused by people.



These destructive fires can basically happen anywhere, but they are most common in forested areas in Canada and the United States. They actually happen in many other places around the world. The forested areas of Australia and South Africa are prone areas as well. The climates of areas where wildfires occur are usually moist enough for plants to grow, but experience a long, dry and hot period. Most wildfires break out during the summer and fall, when fallen branches and leaves dry out and become highly flammable.

Wildfires can be very difficult to control or put out. Some of them are enormous in size and can quickly change direction. They sometimes move over 6 miles per hour, and can even jump over rivers and roads. However, firefighters are trained to tackle these massive fires. There are basically two techniques that firefighters use to control wildfires. The best way to stop a fire is by getting rid of the fuel of the fire, such as trees or grass. Firefighters often remove the trees in which the fire is moving. This approach is called a firebreak. The other method is called the air drop. On some occasions, firefighters use planes and helicopters to drop water, or special chemicals onto the fire from the air. These aircrafts are able to carry thousands of gallons of liquid and drop it in areas that are difficult to reach on land.





Are the following statements true or false?

- |   |   |
|---|---|
| 1) Wildfires often occur in residential areas. ( )                          | 6) Most wildfires are caused by people. ( )                                 |
| 2) Wildfires can be caused by other natural disasters. ( )                  | 7) Many wildfires occur in tropical rain forests. ( )                       |
| 3) It is impossible to put out large forest fires. ( )                      | 8) In a firebreak, aircrafts drop massive amounts of water on the fire. ( ) |
| 4) Some wild fires can cross rivers and roads. ( )                          | 9) Wildfires happen all over the world. ( )                                 |
| 5) Firefighters sometimes remove trees and plants to control wildfires. ( ) |   |

Unscramble the words, hints are given below.

1) guordht \_ \_ \_ \_ \_  
Wildfires can be caused by a .....

2) eeolpp \_ \_ \_ \_ \_  
Most wildfires are caused by .....

3) ilctame \_ \_ \_ \_ \_  
A change in ..... can cause wildfires.

4) terofs \_ \_ \_ \_ \_  
Wildfires are also called ..... fires.

5) ufle \_ \_ \_ \_ \_  
Removing the ..... of a fire is a way to stop a wildfire.

6) rai rpdo \_ \_ \_ \_ \_  
An ..... is a method to stop a wildfire.

7) alpnes \_ \_ \_ \_ \_  
Firefighters use ..... to drop water.

8) aacnda \_ \_ \_ \_ \_  
Wildfires are common in .....

