

Why Do Earthquakes Happen?

When the Ground Shakes

Earthquakes happen when energy accumulated in the earth's crust is **released**. This happens when the crust breaks or moves. Rock fractures happen **underground**. The closer they are to the surface, the greater and more destructive the earthquake.

Ruptures create seismic **waves** that travel through the crust. There are two main types.

- › **P-waves or primary waves**. They are the fastest waves because they push and pull the rock they move through.
- › **S-waves or secondary waves**. They travel slow, and move rock particles perpendicular to the direction the wave travels in, either up and down or side-to-side. This generates ground movement.

The place where the energy is released is called the **hypocenter**. When waves leave the hypocenter, they travel in all directions. When they reach the surface, they are called surface waves. They cause the most **damage**.

 **02 Read "When the Ground Shakes." Write "T" if the sentence is true, "F" if it is false, or "NM" if it is not mentioned. Write one sentence of your own and ask a classmate to answer it.**

1. Seismic waves move out from a hypocenter.
2. Primary waves are the fastest ones.
3. Seismic waves travel primarily through water.
4. Surface waves are the highest.
5. S-waves are the ones that generate tsunamis.

What Do Earthquakes and Volcanoes Have in Common?

Match the halves to make full sentences

1. Once the big earthquake hits,

2. When lava comes out of the volcano,

3. By the year 3000, the earth's core

a. will have been cooling down for over 4.6 billion years.

b. energy will have been accumulating between the transform plate boundaries for decades.

c. magma in the mantle will have been heating at over 1000 °C over thousands of years.

Which Are the Most Dangerous Volcanic Eruptions?

When a Volcano Blows a Fuse

Out of the four types of volcanic **eruptions**, there are two that are the most **explosive**: Vulcanian and Plinian eruptions.

In Vulcanian eruptions, **viscous** lava solidifies in the volcanic crater and forms a solid dome. When the dome collapses, glowing clouds form. Glowing clouds are made of hot ash, dust, and rock that move fast. Also, they create eruption columns of gas and ash from 4 to 10 km high.

The ash from Plinian eruptions is **ejected** so **strongly**, it can reach the stratosphere and affect the climate. The eruptions form clouds as high as 20 km. The most violent eruptions cause a collapsed caldera, a large **circular** depression produced where the magma chamber is.

Read "When a Volcano Blows a Fuse." Choose if the statements are true or false.

- | | |
|---|--------------|
| 1. The most dangerous types of volcanic eruptions are Vulcanian and Hawaiian. | True / False |
| 2. Vulcanian eruptions can form domes in the volcanic crater. | True / False |
| 3. Plinian eruptions form glowing clouds. | True / False |
| 4. Depression caldera is formed in violent Plinian eruptions. | True / False |
| 5. Glowing clouds move fast and are made of hot ash, dust, and rock. | True / False |

 **OS** Complete the sentences with the verbs below in the correct form.

find

have

help

think

- Scientists are inclined _____ that Plinian eruptions are more violent than Vulcanian eruptions.
- Last week, newspapers reported Popocatepetl _____ spewed ash.
- After the eruption, nobody avoided _____ the affected victims.
- People who study volcanoes plan _____ a way to study the inside of craters.