



TEACHER GUIDE

NATURAL DISASTERS GRADES 3-5

COMMON MISCONCEPTIONS

- **There is nothing that we can do to reduce the impact of natural hazards.**
We can use scientific data for many purposes, such as to observe patterns of occurrence of natural hazards and understand the magnitude of these hazards. We can also use this scientific data along with math to develop engineering solutions that help reduce the impact of these hazards to organisms and the environment.
- **Engineers design skyscrapers, bridges and tunnels - they don't work on projects like reducing the impact of natural hazards.**
An engineer uses science and math to solve problems. These problems can include creating skyscrapers, bridges, or tunnels. But they can also involve designing buildings and structures that can withstand natural disasters.
- **Volcanoes cause earthquakes.**
Volcanoes do not cause earthquakes. But activity at Earth's plate boundaries contributes to the formation of both volcanoes and earthquakes.
- **Scientists can predict earthquakes.**
Scientists cannot predict earthquakes, but they can characterize and understand the causes of earthquakes.

SEISMOGRAPHS

Scientists are unable to predict earthquakes, but they can detect and record earthquakes. This is done by using an instrument called a seismograph. It records the seismic waves that are caused by an earthquake. Seismographs are not only used to record activity from an earthquake, they can also be used to record activity for an explosion or any other Earth-shaking event. This instrument contains an electromagnetic sensor, which is used to translate any motion on the ground into an electrical signal. This signal is processed and recorded by the instrument. The output that people see from the seismograph, which is recorded on a paper, is called a seismogram. Each line peak seen on the paper represents a seismic wave. Scientists use these lines on the graph to determine information about an earthquake, such as its strength or whether one is even occurring.

EARTHQUAKES

Earthquakes are a natural way of Earth releasing stress or tension. These events occur when Earth's plates move against each other, which usually takes place along fault lines or cracks in Earth's crust. This movement puts stress on Earth's lithosphere (which is where the continents are located). If this stress is great enough, the lithosphere will break or shift. The plates are able to move because they float on molten rock - this means the plates are constantly moving. When a break or shift in the lithosphere occurs, stress is released. This release is a form of energy, which travels in the forms of waves. A seismograph can record those waves, which are called seismic waves.

TSUNAMIS

Characterized as large ocean waves, tsunamis are triggered by large underwater earthquakes. They are considered to be underwater because they occur near or under the ocean. These earthquakes can also happen near volcanic eruptions, and by landslides when large amount of debris fall into the water. Unlike a normal ocean wave, tsunami waves can travel much farther inland. They do not consist of just one large wave that moves inland. Rather, tsunamis consist of multiple waves that rush ashore. The tsunami wave increases in height as it continues to travel inland.

VOLCANOES

A volcano is a hole in Earth's crust or an opening on the surface of Earth. Through this opening, molten rock or lava is allowed to escape from Earth's interior and travel onto Earth's surface. This molten rock is released as hot gas and rock particles. As it escapes, it causes an eruption. The strength of the eruption can vary - it can be explosive, where large volumes of the molten material travel high into the sky, or it can be calmer. When volcanoes erupt, they impact the organisms and environment. They can change the landscape of an area by destroying a forest of trees or burying an entire town under hot molten rock and debris. This change in landscape of Earth's surface can either happen quickly or slowly.