What Causes Earthquakes and Volcanoes?

Name: _____ Date: _____

What Causes Earthquakes?

- Where do earthquakes occur?
- How often do they occur?
- One famous earthquake in the United States was in _____ earthquake in San Francisco.
- It occurred along a transform _____ boundary.
- The earthquake caused massive _____ throughout the city.

Earthquakes and Faults

- Have you experienced an earthquake? How would you describe it?
- The _____ describes earthquakes as "great" and "violent."
  - Matthew 28:2, Acts 16:26, Revelations 6:12
- Earthquakes occur when the rocks in Earth's crust _____ suddenly.
- The rupture releases a massive amount of _____.
- This energy travels through the _____, producing violent shaking and movement in Earth's surface.
- This rupture occurs along large _____ in the crust.
- The earthquake's _____ is the location where rocks ruptures.
- Directly above the focus is the earthquake's _____.
- The cracks in Earth where earthquakes occur are called _____.
- The movement of Earth along a fault can be _____ or vertical.
- The horizontal movement produces a _____ fault.
- _____ movement occurs when one portion of the crust moves upward and the other portion moves downward.
- Imagine that the fault is a _____ slant through the crust.
- The rock below the fault is called the _____ _____.
- The rock above the fault is called the _____ _____.
- The hanging wall can be higher or lower than the foot wall, depending on the type of _____.
- In the hanging wall moves up during the earthquake, it produces a _____ fault.
- If the hanging wall moves down, it produces a _____ fault.
- Different forces produce the movement along the _____ faults.

- Just like you can compress molding clay, the same type of _____ _____ produces a reverse fault.
- The _____ _____, or pulling force, produces a normal fault.
- A tearing force called _____ _____ pulls on the rubbing surfaces of each block of clay.
- This _____ creates a strike-slip fault.

Scripture Spotlight

- *The Bible describes an earthquake with miraculous results at the death of Christ. Read about it in* ***Matthew 27:50-53****.*

Earthquakes Waves

- Have you ever tried to break a rock?
- Rocks in the crust experience considerable forces that build up until the rock _____.
- The rupture releases energy that radiates from the _____.
- The energy travels as two main types of waves: body waves, such as _____ and _____, and surface waves, such as L-waves.

Earthquake Waves: Primary Waves (P-wave)

- _____ _____ (P-waves) also referred to as compressional waves
- Travels _____ to the direction of motion
- Travels through the _____
- Travels through _____ and liquids
- The _____ earthquakes wave

Earthquake Waves: Secondary Waves (S-wave)

- _____ _____ (S-wave) travels perpendicular to direction of motion
- Travels through the _____
- Travels through _____
- Travels _____ than P-waves

Earthquake Waves: Surface Wave (L-wave)

- _____ _____ (L-wave) travels across the surface of the planet

- It causes the _____ to move side to side and up and down, like the waves created when you toss a rock into a lake or pond
- It travels _____ than a P-wave or S-wave.

Measuring and Locating Earthquakes

- What type of damage is caused by earthquakes?
- The damage caused by an earthquake depends on different _____.
- The depth of the focus can impact the _____ of the waves and the distance they travel.
- Typically, an earthquake with a shallow focus produces _____ waves that travel farther and cause more damage.
- The type of rock, soil, or building foundation can also affect the amount of _____.
- The _____ _____ measures the amplitude of the large seismic waves.
- The _____ are presented on a logarithmic scale.
- Each whole number of the scale represents _____ the power.
- A 5.0 earthquake produces 10 times more _____ than a 4.0 earthquake.
- The _____ _____ measures the power of an earthquake by observed destruction caused by the shaking.

Effects of Earthquakes

- What is your biggest concern during an earthquake?
- Look around you. If an earthquake happened right now, what objects would become hazards?
- Earthquakes often only last a _____ seconds, but the damages are enormous.
- As the ground shakes up and down and back and forth, _____ can be hurled across the room and structures can crumble.
- Not only do earthquakes damage human-made structures, they often cause _____, a movement of surface material down a slope.
- _____ occurs when water-saturated soil loses strength during the shaking and flows like a liquid.
- The rapid displacement of crust along the coast can add _____ to the ocean.
- When an earthquake occurs in the ocean or along the coast, the vertical displacement of land can produce a _____
- A tsunami is a series of _____ with an average wavelength of 217 miles.

- A tsunami wave travels through the ocean as a shallow-water wave, reaching up to _____.
- What happens as a tsunami wave being to interact with the sea floor?
- Friction slows the wave, causing the wavelength to decrease and the wave height to _____.
- Once the initial wave passes, a succession of wave will arrive every 5 to 90 _____, depending on the period of the tsunami wave.
- The _____ wave in the tsunami set is often not the first wave but is one of the later waves.