Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per \_\_\_\_\_\_\_\_\_

**EARTHQUAKES**

**Earthquake Causes**

* The bending and breaking of wooden craft sticks are similar to how \_\_\_\_\_\_\_\_ bend and break
* When a \_\_\_\_\_\_\_\_\_\_ is first applied to the stick, it will bend and change shape There is a limit to how far a wooden craft stick can bend.This is called its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* Once its elastic limit is passed, the stick remains bent or breaks. Rocks behave in a similar way.
* Once the elastic limit is passed, the rocks may break. When rocks break, they move along surfaces called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* A tremendous amount of force is required to overcome the strength of rocks and to cause movement along a fault……..
* Convection in the mantle which moves the tectonic plates puts \_\_\_\_\_\_\_\_\_\_\_ on the rocks near the plate edges.
* To relieve this stress, the rocks tend to bend, compress, or stretch. If the force is great enough, the rocks will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the vibrations produced by the breaking of rock.
* Most earthquakes occur near \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Types of Faults**

1**. Normal Fault** Along a **\_\_\_\_\_\_\_\_\_\_\_** rock above the fault surface moves downward in relation to rock below the fault surface.

2. **Reverse Fault** If rock breaks from forces pushing from opposite directions, rock above a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ surface is forced up and over the rock below the fault surface.

Reverse faults result from compression forces that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock.

3. **Strike Slip Fault** At a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, rocks on either side of the fault are moving past each other without much upward or downward movement. Ex. San Andreas Fault in California

**Seismic Waves**

* **\_\_\_\_\_\_\_\_\_\_\_** **waves** generated by an earthquake travel through Earth
* The point where this energy release first occurs is the **\_\_\_\_\_\_\_\_\_\_\_\_** (plural, *foci*) of the earthquake.
* Seismic waves are produced and travel **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** from the earthquake focus.
* When earthquakes occur, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ different types of seismic waves are produced
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (P-waves) cause particles in rocks to move back and forth in the same direction that the wave is traveling.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (S-waves) move through Earth by causing particles in rocks to move at right angles to the direction of wave travel.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**move rock particles in a backward, rolling motion and a side-to-side, swaying motion.
* Surface waves cause most of the destruction resulting from earthquakes. Surface waves are produced when earthquake energy reaches the surface of Earth. Surface waves travel outward from the epicenter.
* The earthquake **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is the point on Earth’s surface directly above the earthquake focus.

**Locating an Epicenter**

* Different seismic waves travel through Earth at different speeds.
* Primary waves are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, secondary waves are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and surface waves are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Scientists have learned how to use the different speeds of seismic waves to determine the distance to an earthquake epicenter.

**Measuring Seismic Waves**

* Seismic waves from earthquakes are measured with an instrument known as a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Seismographs register the waves and record the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that each arrived.

**Seismograph Stations**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ arrive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at seismograph stations, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_waves, which travel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, arrive second.

Because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ waves travel slowest, they arrive at seismograph stations last. This difference in arrival times is used to calculate the distance from the seismograph station to the earthquake epicenter.

* If seismic waves reach three or more seismograph stations, the location of the epicenter can be located
* To locate an epicenter, scientists draw circles around each station on a map.
* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of each circle equals that station’s distance from the earthquake epicenter.
* The point where all three circles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the location of the earthquake epicenter.

**Mapping the Earth’s Internal Structure**

* The speeds and paths of seismic waves change as they travel through materials with different densities.
* Secondary waves are not transmitted through a liquid, so they \_\_\_\_ when they hit the liquid outer core.

Primary waves are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but not stopped by the liquid outer core. Because of this, scientists concluded that the outer core and mantle are made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Earthquake Activity**

* Earthquakes are natural geological events that provide information about Earth.

Unfortunately, they also cause billions of dollars in property damage and kill and average of 10,000 people every year. The height of the lines traced on the paper of a seismograph is a measure of the energy that is released, or the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, of the earthquake

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ magnitude scale is used to describe the strength of an earthquake and is based on the height of the lines on the seismogram.
* The Richter scale has no upper limit. However, scientists think that a value of about 9.5 would be the maximum strength an earthquake could register.
* For each increase of 1.0 on the Richter scale, the height of the line on a seismogram is \_\_\_\_\_\_\_ times greater.….but …..about 32 times as much energy is released for every increase of 1.0 on the scale.
* Mercalli intensity scale measures intensity based on damage
* Past earthquakes/Earth quake safety
* Tsunamis -An earthquake under the ocean causes a sudden movement of the ocean floor.
* The movement pushes against the water, causing a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can travel thousands of kilometers in all directions

