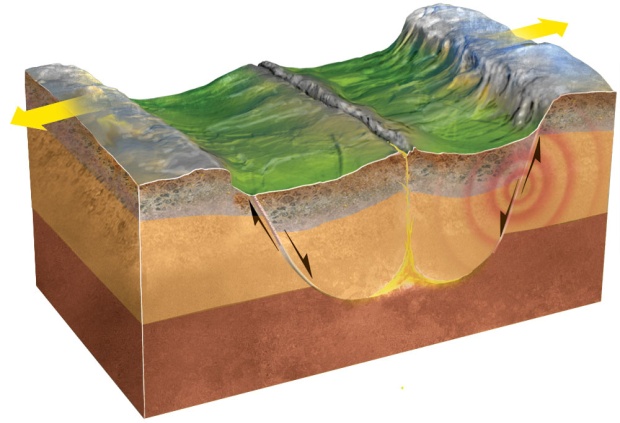
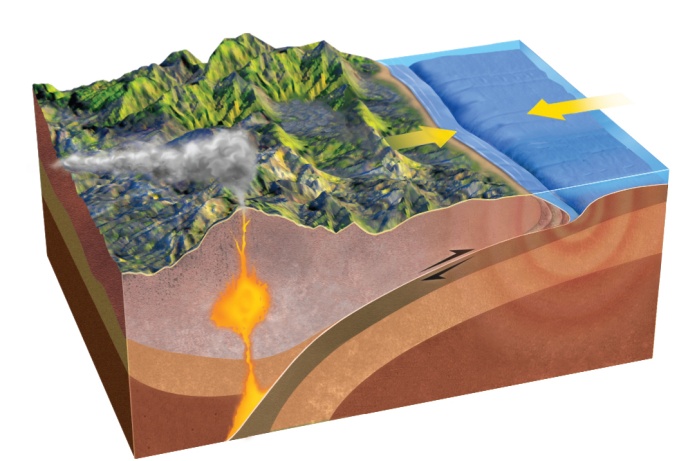
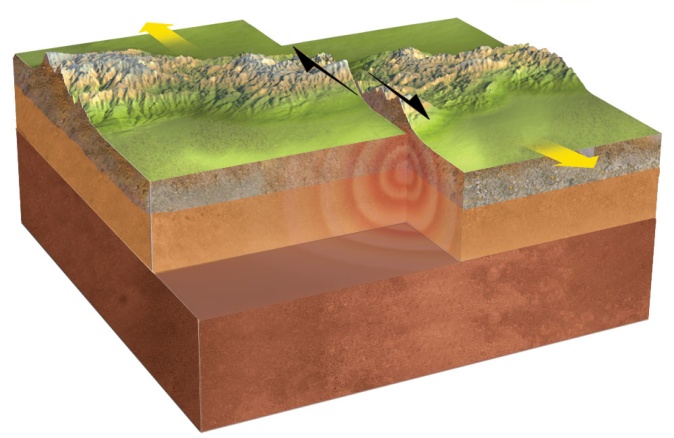
Unit 4 Lesson 5 Earthquakes

1. What is an Earthquake?
   1. **Earthquakes** are ground movements that occur when blocks of rock in Earth move suddenly and release energy.
   2. The energy is released as seismic waves that cause the ground to move.
   3. The **focus** is a place within Earth along a fault where the first motion of an earthquake occurs.
   4. The place on Earth’s surface directly above the focus is called the **epicenter**.
   5. Seismic waves flow outward from the focus in all directions.
2. What Causes Earthquakes?
   1. Most earthquakes occur near a **tectonic plate boundary**, which is where two or more tectonic plates meet.
   2. The movement of tectonic plates breaks Earth’s crust into a series of **faults**, which are breaks in Earth’s crust along which blocks of rocks move.
   3. The release of energy that accompanies the movement of rock along a fault causes an earthquake.
   4. Stress on the rock causes **deformation**, which is the process by which the rock becomes deformed and changes shape.
   5. As the stress on rock increases, the energy stored in it increases.
   6. When the stress is released, the rock may return to its original shape.
   7. When rock returns to nearly the same shape after the stress is removed, the process is called *elastic deformation*.
   8. The return of rock to its original shape after elastic deformation is called **elastic rebound**.
3. Where do earthquakes happen?
   1. At divergent boundaries, *tension* stress causes normal faults to form. Earthquakes tend to be shallow because the crust is thin.  
      
   2. At convergent boundaries, rock is squeezed, and the stress is called *compression*. Reverse faults are formed, and earthquakes can be strong and deep.  
      
   3. At transform boundaries, *shear stress* pushes tectonic plates in opposite directions. Earthquakes tend to be relatively shallow.  
      
4. What are some effects of earthquakes?
   1. Most earthquakes do not cause damage, but some strong earthquakes can cause major damage and loss of life, especially in areas closest to the epicenter.
   2. When the shaking of an earthquake is more than structures can withstand, major destruction can occur.
   3. Much of the injury and loss of life after an earthquake is caused by structures that collapse.
   4. An earthquake under the ocean can cause a vertical movement of the sea floor, displacing an enormous amount of water and generating a tsunami.
   5. A *tsunami* is a series of extremely long waves that can travel across the ocean at speeds of up to   
      800 km/h.
   6. As the waves reach the shoreline, the height of the waves increases. The huge waves can cause major destruction.
5. Killer Quake
   1. In 2004, an earthquake generated a tsunami that wiped out half the population of Banda Aceh, Indonesia.
   2. The tsunami traveled outward from the epicenter in the Indian Ocean. Banda Aceh was very close to the epicenter.
   3. The destruction to parts of Asia was so massive that geographers had to redraw the maps of some countries.