

## **Marine Fossils Plate Tectonics**

### **Plate Tectonics**

This model states that the surface of the Earth is made up of a series of relatively thin, but rigid, plates which are constantly moving. The surface layer is composed of oceanic crust, continental crust, or a combination of both. The lower part consists of a rigid upper layer of the Earth's mantle. Each plate moves at a different velocity.

### **Convergent vs. Divergent vs. Transform Plates**

- ~ Convergent Plate Boundaries occurs when two plates are in motion towards each other.
  - One plate slides underneath the other plate to form a subduction zone (earth crust is lost).
  - This movement often creates earthquakes.
  - The descending plate melts and the magma rises to the surface and erupts in volcanoes.
  - The initial point of descent is marked on the surface by a deep ocean trench
- ~ Divergent Plate Boundaries occur when two plates are in motion away from each other.
  - Crust is created at this plate boundary and is referred to as sea floor spreading.
  - A rise or a ridge often marks this boundary
  - Examples of this boundary are the Mid-Atlantic Ridge and the East Pacific Rise.
- ~ Transform Plate Boundaries occur when plates move laterally past each other.
  - Crust is not created or destroyed
  - This movement often creates earthquakes.
  - An example of this boundary is the San Andreas fault in California.

### **What Causes the Plates to Move? (Four Hypotheses)**

1. Convection Currents suggests that flow in the mantle is induced by convection currents which drag and move the plates.
  - ~ These currents rise and spread below divergent plate boundaries and converge and descend along convergent plate boundaries.
  - ~ The three sources of heat that produce these currents are the cooling of the Earth's core, radioactivity within the mantle and crust, and cooling of the mantle.
2. Magma Injection suggest that the injection of magma at a spreading center pushes plates apart and thus causes plate movement.
3. The Gravity Hypothesis suggests that the oceanic lithosphere thickens as it moves away from a spreading center and cools.
  - ~ This induces plates to slide under the force of gravity from a divergent boundary towards a converging boundary.
4. The Descending Plates Hypothesis suggests that a cold dense plate descending

into the mantle at a subduction zone may pull the rest of the plate with it and thus cause plate motion.