Layers of the Earth

* Rank the layers
  + Crust
  + Mantle
  + Outer Core
  + Inner Core
* Lithosphere – crust and solid part of the upper mantle (broken into plates)
* Asthenosphere – more liquidy layer below the lithosphere.
* Key Characteristics
  + Crust – two types Oceanic (thin dense) and Continental (thicker less dense); made of the greatest variety of elements
  + Mantle – Most mass and volume
  + Outer Core – liquid metal and generates our magnetic field
  + Inner Core – solid metal due to extreme pressure

Continental Drift (CDT)

* CDT – the Earth’s continents were once connected as upper continent called Pangaea and since broken up and drifted around the Earth
* CDT author Alfred Wegener
* Evidence

1. Puzzle Piece Idea – continents looks as though they fit together
2. Climate Data- evidence of glaciers in tropical locations
3. Rocks – similar rock age and types when continents back together
4. Fossils – matching fossils on spate continents

* Rejected because Wegener could never provide a mechanism to how the continents moved
* Pangaea was where all of the continents were together as a single landmass over what is today the Atlantic Ocean

Sea Floor Spreading (SFS)

* SFS – magma from within mantle comes up along the mid ocean ridges and cools. These new rocks push old rock out along the ocean floor and eventually subducts back into the Earth
* SFS author Harry Hess
* Evidence –

1. Rock ages on either side of the Mid Ocean Ridges matched
2. Magnetic Lines

* SFS helped explain CDT by explaining how the continents moved. They were connected to the ocean floor and the ocean floor was moving.

Theory of Plate Tectonics (PT)

* PT – earth’s surface is broken up into approximately 15 different plates that move and interact with each other
* Crust – two types Oceanic (thin dense and can subduct) and Continental (thicker less dense and can’t subduct)
* Divergent occur along MOR and the plates move away from each other
* Convergent
  + Ocean Continent – ocean floor subducts creating a trench. The continent will contain volcanic mountain chains – Andes Mts (south America)
  + Ocean Ocean – ocean floor subducts creating a trench. The other floor will contain volcanic islands – Japan
  + Continent – Continent – neither subducts because not dense enough. Instead the crust buckles and folds creating mountains – Himalayas
* Subduction –when ocean floor goes under and re-enters the Earth’s mantle.
* Transform Boundaries- the plates attempt to “slide” past one another
  + Example – San Andreas Fault
* Ring of Fire is the Pacific Ocean border where 75% of all EQ and Volcanoes occur due to Subduction of Pacific Ocean
* Plates move with the assistance of Convection currents in the semi-liquid asthenosphere mantle)