Geology 12
Unit 2 – Earth: Core to Surface
Day 1 – Plate Tectonics

Name: _____

Date: _____

Block: _____

A Grand Unifying Theory: a set of ideas that is central and essential to a field of study
ex: theory of gravity in physics or the theory of evolution in biology

theory: well-supported explanation for a natural phenomenon that still cannot be completely proven

Theory of Plate Tectonics: The Grand Unifying Theory of geology. defines the outer portion of the earth as a brittle outer layer that is broken into moving pieces called tectonic plates

This theory is supported by many lines of evidence including: the shape of the continents, the distribution ~~of fossils and rocks, the distribution of environmental indicators, as well as the location of mou~~ntains, volcanoes, trenches, and earthquakes.
~~The movement of plates can be observed on human timescales and measured using GPS sat~~ellites.

Integral to the study of Geology because:

- aids in reconstructing earth's history
- explain how the first continents were built
- explains how oceans formed
- helps inform hypotheses for the origin of life
- helps assess risks of geologic catastrophes (earthquakes and volcanoes)
- helps explain mountains, volcanoes, rift valleys, and trenches

Evidence that the continents were all once connected:

idea first appeared in the writings of Sir Francis Bacon in 1620. hypothesis: the shapes of the continents fit together ~~because they were once connected and have since broken apart and moved~~

Alfred Wegener (1912) compiled rock types, fossil occurrences, and environmental indicators within the rock record on different continents(focusing on Africa and South America) that appear to have been joined in the past and found remarkable similarities

Alfred Wagner coined Pangea (continents were linked in the past in a supercontinent)

How we know Earth isn't Homogenous:

This is here by mistake.... ooooops

Hot Spots: Another piece of evidence that can be used to track plate motion

volcanically active areas on the Earth's surface that are caused by hot mantle rocks underneath

This heat is the result of a mantle plume that rises from deep in the mantle toward the surface resulting in melted rocks and volcanoes

Mantle Plume: occur deep in the Earth such that they are unaffected by the movement of the continents or the crust under the ocean

appear to be stationary through time, but as the tectonic plate moves over the hot spot a series of volcanoes are produced

gives geologists a view of the movement of a plate through time

Hawaiian Island Chain: created by a hot spot ithat is currently underneath Hawaii

The mantle plume generates heat that results in an active volcano on the surface of ~~the crust. Each eruption causes the volcano to grow until it eventually breaks the~~ surface of the ocean and forms an island. As the crust shifts the it breaks off the hot ~~spot tand he volcano loses its heat and becomes inactive~~