Name: _____

Date: _____ Period: _____

Supplemental: Continental Drift II

Continental Drift: Theory & Definition

http://www.livescience.com/37529-continental-drift.html

Continental drift was a theory that explained how continents shift position on Earth's surface. Set forth in 1912 by Alfred Wegener, a geophysicist and meteorologist, continental drift also explained why look-alike animal and plant fossils, and similar rock formations, are found on different continents.

Wegener thought all the continents were once joined together in an "Urkontinent" before breaking up and drifting to their current positions. But geologists soundly denounced Wegener's theory of continental drift after he published the details in a 1915 book called "The Origin of Continents and Oceans." Part of the opposition was because Wegener didn't have a good model to explain how the continents moved apart.

Though most of Wegener's observations about fossils and rocks were correct, he was outlandishly wrong on a couple of key points. For instance, Wegener thought the continents might have plowed through the ocean crust like ice-breakers smashing through ice.

"There's an irony that the key objection to continent drift was that there is no mechanism, and plate tectonics was accepted without a mechanism," to move the continents, said Henry Frankel, an emeritus professor at the University of Missouri-Kansas City and author of the four volume "The Continental Drift Controversy" (Cambridge University Press, 2012).

Although Wegener's "continental drift" theory was discarded, it did introduce the idea of moving continents to geoscience. And decades later, scientists would confirm some of Wegener's ideas, such as the past existence of a supercontinent joining all the world's landmasses as one. Pangaea was a supercontinent that formed roughly 300 million years ago, and was responsible for the fossil and rock clues that led Wegener to his theory. [Have There Always Been Continents?]

The Incredible Shrinking Planet

When Wegener proposed continental drift, many geologists were contractionists. They thought Earth's incredible mountains were created because our planet was cooling and shrinking since its formation, Frankel said. And to account for the identical fossils discovered on continents such as South America and Africa, scientists invoked ancient land bridges, now vanished beneath the sea.

Researchers argued over the land bridges right up until the plate tectonics theory was developed, Frankel said. For instance, as geophysicists began to realize that continental rocks were too light to sink down to the ocean floor, prominent paleontologists instead suggested that the similarities between fossils had been overestimated, Frankel said.

Plate tectonics is the widely accepted theory that Earth's crust is fractured into rigid, moving plates. In the 1950s and 1960s, scientists discovered the plate edges through magnetic surveys of the ocean floor and through the seismic listening networks built to monitor nuclear testing. Alternating patterns of magnetic anomalies on the ocean floor indicated seafloor spreading, where new plate material is born. Magnetic minerals aligned in ancient rocks on continents also showed that the continents have shifted relative to one another.

Supplemental: Continental Drift II

Evidence for Continental Drift

A map of the continents inspired Wegener's quest to explain Earth's geologic history. Trained as a meteorologist, he was intrigued by the interlocking fit of Africa's and South America's shorelines. Wegener then assembled an impressive amount of evidence to show that Earth's continents were once connected in a single supercontinent.

Wegener knew that fossil plants and animals such as mesosaurs, a freshwater reptile found only South America and Africa during the Permian period, could be found on many continents. He also matched up rocks on either side of the Atlantic Ocean like puzzle pieces. For example, the Appalachian Mountains (United States) and Caledonian Mountains (Scotland) fit together, as do the Karroo strata in South Africa and Santa Catarina rocks in Brazil.

Despite his incredible evidence for continental drift, Wegener never lived to see his theory gain wider acceptance. He died in 1930 at age 50 of a probable heart attack while on a scientific expedition in Greenland.

Questions:

1. Name three things that the Theory of Continental Drift explained?

2. Name a synonym for “urkontinent”.

3. How did “contractionists” account for identical fossils being on the continents of South America and Africa?

4. What is Plate Tectonics and name one piece of evidence to support its discovery in the 1950’s and 1960’s?

5. What was it about the World map that made Wegener believe there was once a single Supercontinent?