

Impact of continental drift on evolution assignment



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Continental drift has helped create the diversity we see present in modern day plants and animals. Through a process of speciation, the movement of the continents has had a generous role throughout evolution, effecting and distributing flora and fauna. The Earth's continents were once one, a large supercontinent called Pangea that later separated into two smaller ones known as Gondwana and Laurasia.

The separation and collision of continents has not only created some of the valleys and mountain ranges which are significant landmarks on the Earth's surface, but it has also brought species together and apart again, consequently letting natural selection take over and lead to the animals we see today. " The timescale on which continents have drifted about is the same slow timescale on which animal lineages have evolved, and we cannot ignore continental drift if we are to understand the patterns of animal evolution on those continents. [1] The Process of Speciation Although speciation could be seen as both a natural and a manmade phenomenon, in the case of continental drift it is a naturally occurring one. The process of speciation takes place when a group of animals of the same species find themselves isolated from one another. [2] There are many cases in which speciation can occur outside of continental drift, some examples are mountain ranges and large bodies of water.

Continental drift mainly effects plant species and animal species that live in a wide range; the drifting of the continents broke up and separated species in such a way it was no longer possible for them to come in contact with one another. The non-contact relationship members of that species share with each other would eventually result in genetic isolation in which it would no

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longer be possible for those species to exchange genes and reproduce with each other. Therefore those now separate species would change themselves for natural selection so they can fit and adapt to their new environments.

Pangea[3] to Gondwana and Laurasia[4] Up until roughly 120 ??? 160 million years ago, the world was only one large supercontinent known to scientists and geologists and Pangea. Pangea saw hundreds of millions of years of animal life, from simple arthropods and ferns to reptilian dinosaurs. The whole time Pangea was drifting apart, and consequently took hundreds of million years to form two major landmasses: Gondwana and Laurasia. Due to the different climates on these two continents, species of plants and animals changed themselves to adapt to their natural surroundings, even though they had once lived on the same landmass.

Gondwana contained what is present day Africa, South America, India, Australia and Antarctica leaving Laurasia North America, Europe, Greenland and Europe. Placental Vs. Marsupials ??? Survival of the Fittest Marsupials evolved roughly 20 million years before Placental animals did. Although both animals evolved in Laurasia, marsupials were traced to having evolved in southern Laurasia and placental animals closer to the central area of the continent. Because of their time of evolution and locations, many of the marsupials moved from Laurasia to Gondwana just as the split between the two supercontinents were occurring.

The marsupials spread throughout South America / Africa continent of Gondwana and through that the bridge to the Australia / Antarctica continent. By the time placental animals had fully adapted, there was no

longer a bridge connecting Gondwana and Laurasia, so the marsupials stayed on one supercontinent, and placental animals on another. But the continents did not stop drifting. When the continents of Gondwana crashed into Laurasia, placental animals subsequently spread into the South America / Africa area. Being better adapted in general, they out competed nearly all the marsupials in that area and the marsupials in turn died out.

The bridge from the South America / Africa area to the Australia / Antarctica area closed out, so placental animals could not completely dominate there. Whether it be through speciation or survival of the fittest, every aspect of animal life as we know it has been affected by continental drift one way or another. Geologists and Biologists alike could trace the shifting of the tectonic plates and note the effects it has on both the Earth's surface and the Earth's biodiversity. Continental drift is responsible for the diversity we see in animals today, and in the far future it will likely be still responsible for it.

Appendix FIGURE A Alfred Wegner was the first person to make the suggestion that all the continents were once one. Because he had no proof, he was disregarded. We now know today that the tectonic plates are in fact moving, and bringing the continents with them and that Pangea did in fact exist. One of Wegner's proofs of Pangea was the jigsaw fit between South America and Africa. Image is courtesy of [http://www. canadiangeographic. ca](http://www.canadiangeographic.ca)

FIGURE B After Pangea and before the continents drifted to the way they are today; there were only two major continents: Laurasia and Gondwana, as you see in the figure on the left.

Image is courtesy of <http://anthro.palomar.edu> Bibliography 1. Dawkins, Richard. The Selfish Gene. Oxford University Press. 1976. 2. Van Nostrand's Scientific Encyclopaedia. Volume 3 page 147 3. <http://biology.clc.uc.edu/courses/bio303/contdrift.htm> 4. <http://saif181.tripod.com/id2.html>
————— [1] Quote by Richard Dawkins. [2] Definition courtesy of <http://saif181.tripod.com/id2.html>. [3] Refer to Figure A in appendix [4] Refer to Figure B in appendix