

How Does Our Earth Work? - Project Write-Up - Student Examples

The project write-up should use R.A.C.E (Re-state + Answer + Cite Evidence + EXPLAIN Evidence) and include two specific examples that come from a source that support the response and at least one connection.

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Project Write Up

12/6/18

How Do Crystals Form?

According to Smithsonian Education crystals form through a process called crystallization in which material is added to the outside of a smaller crystal. University of Wisconsin-Madison's Molecular Structure Laboratory explains this process saying it starts with nucleation which is when a few molecules bond in a repeatable pattern. The second part is growth which is when more molecules attach following the same pattern. In the final stage 'termination' growth stops.

How Do Tectonic Plates Create Landforms?

Plate tectonics can create landforms by moving in different directions, the three main ones being convergent, divergent and transform.

According to the orange Dynamic Earth textbook, when two tectonic plates move together or converge, the denser plate slips under and the magma in the mantle builds up to create a mountain or volcano. This is important because it shows how landforms can form. Evidence from <http://www.burkemuseum.org> shows that the Cascadian Mountain Range is an example of where the Nazca plate is going under and the magma begins to build itself upward to create the range.

Another way tectonic plates move is by diverging, or pulling apart. When this occurs, the magma will ooze up to fill in the space between the plates, forming a ridge called a mid-ocean ridge. Divergent plates can also create rift valleys, where the rock hasn't come apart enough to create a ridge, so the magma sits underneath the rock until the plates pull apart again and it can go through to the top. I learned this through the OMSI Earthquakes Lab.

[Www.aquatic.uoguelph.ca](http://www.aquatic.uoguelph.ca) explains that the Mid Atlantic Ridge that sits on the floor of the Atlantic ocean and is part of the biggest mountain range in the world. As the two plates pull apart, the magma continues to fill the space, creating towering mountains on the ocean floor. The last way that tectonic plates can create landforms is by transforming, also known as moving past each other. The orange Dynamic Earth textbook shows that when the two plates pass each other, they can get caught and become stuck. When this occurs the tension will begin to build and the pressure will continue to grow until part of one of the plates breaks off and the tension is released. We know this as an earthquake. Earthquakes can cause mass destruction depending on how long it takes for the plates to come apart. These three main movements explain how our earth's continents continue to grow and change, although its movement can either be very subtle or have a huge affect on human life.

What is seafloor spreading, and how does it help the theory of Continental Drift?

Seafloor spreading is a geological concept that is important to how our earth works. According to orange Dynamic Earth textbook, seafloor spreading is where the mid-ocean ridge (bottom middle ocean) gets pushed out by the up merging mantle, which makes the seafloor literally spread apart. And as nittygrittyscience.com stated, Seafloor spreading helps explain the theory of Continental Drift. It helps explain, because when the mantle pushes up through the oceanic crust it pushes it to the side, and the continents are floating on the oceanic crust. So this makes the continents literally drift across the seas. When people didn't believe Alfred Wegener (the person who discovered continental drift) now they have to,

because Seafloor spreading has too many facts to back it up. And to add even more, once the oceanic crust has moved out, it grows more and more, so the mid ocean ridge has the youngest oceanic crust. A connection I had when learning about Alfred Wegener is when my parents' didn't believe me about how I could create this project. Like Wegener, I was doubted, but eventually proved my parents wrong by creating the project you see here today. If you look at the project in the left you will understand more.

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How Does Seafloor Spreading Affect My Life?

Seafloor spreading affects my life in the way of earthquakes and volcanoes (along with other things). One way seafloor spreading connects to earthquakes is that according to the *Orange Dynamic Earth Textbook* the subduction of the oceanic plate causes a ton of friction which over time builds up and then when released, can cause earthquakes. These earthquakes then shake the ground violently and that can affect my life because that violent shaking of the ground will also violently shake the things attached to the ground like the houses, apartments and other buildings we live in.

Another example of how seafloor spreading affects my life is through volcanoes. How volcanoes are connected to seafloor spreading, according to the *Earth - the Inside Story* movie we watched in class, is that when the oceanic crust gets subducted it is forced deep into the mantle, when something is that deep into the mantle it is under immense heat and pressure which will eventually cause the oceanic crust to melt and when the oceanic crust melts great big globs of molten rock (better known a magma), rise to the surface and build up in the continental crust. After a while the pressure is so great that the magma explodes out onto the surface sometimes blowing ash clouds, sometimes exploding lava and sometimes oozing lava. These volcanic eruptions can wipe out the forest we live in and also cover everything with ash and make it impossible for us to breathe without masks. Also the lava that explodes or oozes can and will burn everything in its path including houses, cars, plants and animals. All that can affect my life.

One connection that I made about seafloor spreading was when I was reading about it in the *Orange Dynamic Earth Textbook* and it talked about ships using sonar to make a image of what the bottom of the ocean looks like I remembered back to a time last year and I was in a boat with my friend and his friend and we were in the Willamette river and they used sonar to see if there were any fish below us. Another connection I had was that my mom's cat died in the 1980 eruption of Mt. Saint Helens, this connects to seafloor spreading because seafloor spreading connects to volcanos. Enjoy my interactive project to learn more.