Boxwork weathering essay

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Internal processes which have been involved in the formation of boxwork weathered rocks. The major internal processes for my surface feature are: 1. The rock cycle and the formation of greywacke. 2. The uplift that brought the rocks from under the ocean up to the shore level. The rock cycle The rock cycle refers to the diverse set of natural processes that lead to the formation and transformation of igneous, sedimentary, and metamorphic rocks. The rock cycle shows that each type of rock can change in a certain way to form another. The driving force of the rock cycle is plate tectonics.

The transition to igneous is when rocks are pushed deep under the earth’s surface and may melt into magma, if there is no condition for the magma to stay in a liquid state, it will cool and solidify into an igneous rock. The three main types of rocks can melt into magma and cool to form igneous rocks. The start of the cycle can be placed at the mid-ocean divergent boundaries where new magma is produced by mantle upwelling and a shallow melting zone. This new magma is the first phase of the igneous part of the cycle. The types of igneous rocks are Granite, Pumice, Obsidian, Andesite, Rhyolite and Basalt.

There are large amounts of Rhyolite found in Taupo and Rangitoto Island is made of Basalt. The transition to metamorphic is when sedimentary or igneous rocks change in structure and appearance by the exposure of high temperatures and pressure over time. As the oceanic crust is pulled back into the mantle, the increasing pressure and temperature conditions cause a reform of the mineralogy of the rock, this metamorphism. My surface feature is a greywacke rock and greywacke is semi-metamorphosed. The types of metamorphic rocks are Greywacke, Slate, Schist, Marble and Sandstone.

The transition to sedimentary the earth’s surface is always eroding this means rocks are being broken into smaller pieces by weathering of wind, water and ice. By erosion and weathering sediments are formed, sediments from flat layers and over a long period of time the layers are compressed and cemented to form a solid rock called sedimentary. The types of sedimentary rocks are Sandstone, Limestone, Greywacke, Shale and Mudstone. Forces that drive the rock cycle Plate tectonics are one of the driving forces of the rock cycle and provides the subduction which a way of recycling igneous, metamorphic and sedimentary rocks.

It becomes subducted deep into the mantle to be completely melted. Plate tectonics provides a mechanism for uplift, exposing pre-existing rock to erosion. Formation of greywacke Greywacke is a hard type of sandstone and it makes up most of New Zealand’s landmass. Sandstone is a type of sedimentary rock which is made from sediments that have been though the process of deposition. Deposition is the geological process by which sediments, soil, and rocks are added to a landform or land mass.

Fluids such as wind and water, as well as sediment flowing via gravity, transport previously eroded sediment, which, at the loss of enough kinetic energy in the fluid, is deposited, building up layers of sediment. The formation of greywacke is the sand is mixed with mud and clay and is compacted so that all the water disappears and the particles are pushed close together. The uplift that brought the rocks from under the ocean up to the shore level was caused by the movement of tectonic plates, which caused the continent Gondwanaland to break apart.

Tectonic plates are made up of 12 pieces of the earth’s crust; there are six large continental plates that are named the North American, South American, Eurasian, African, Indo-Australian, and Antarctic, one large oceanic plate called the pacific plate and five smaller tectonic plates. New Zealand lies on the Indo-Australian plate and Pacific plate. The driving force of tectonic plates is convection currents. The location where two plates meet is called a plate boundary; there are four main types of plate boundaries, the divergent boundary, the convergent boundary, continental collision and transform boundary.

Convection currents Convection currents are the driving force of the tectonic plates that move around the earth’s surface. The mantle is made of much denser and thicker material, because of this the plates “ float” on it like oil floats on water and the mantel flows because of convection currents. The Earth’s surface is divided into a 12 tectonic plates that are continuously being created and consumed at their opposite plate boundaries. Formation occurs as mantle is added to the growing edges of a plate.

This hot added material cools down by conduction and convection of heat. At the consumption edges of the plate, the material has thermally contracted to become dense, and it sinks under its own weight in the process of subduction at an ocean trench. This subducted material sinks to some depth in the Earth’s interior where it is prohibited from sinking further. The subducted oceanic crust triggers volcanism. Plate boundaries There are four main types of plate boundaries the divergent boundary, the convergent boundary, continental collision and transform boundary.

The divergent boundary occurs when two plates pull apart and away from each other and is caused when new oceanic crust called mid-ocean ridges, form at the edges of some plates. Another plate boundary is the convergent boundary. This is where two tectonic plates move toward one another and collide and one plate is force down beneath the other to form either a subduction zone or a continental collision. When this happens crust is destroyed and recycled back into the earth. As a result of pressure, friction and melting in the mantle, earthquakes and volcanoes are common near convergent boundaries.

The collision between the Australian Plate and the Pacific Plate formed the Southern Alps in New Zealand. The third plate boundary is the continental collision which occurs at convergent boundaries and is a variation on the fundamental process of subduction, whereby the subduction zone is destroyed, mountains produced, and two continents join together . The final type of boundary is the transform boundary which is where the two plates slide against each other in a sideways motion. Most transform faults are found on the ocean floor.

External processes which have been involved in the formation of boxwork weathered rocks. The major external processes for my surface feature are: 1. Weathering of the boxwork weathered rock. 2. Erosion on the boxwork weathered rock. Weathering Weathering is the breaking off and wearing of the land by natural and chemical processes. Heat, cold, water and oxygen are all forces of weathering. The breaking up of rocks is when rocks are exposed in a landscape and the various mineral constituents are attacked by mechanical and chemical processes.

Mechanical weathering is caused by physical agents such as temperature changes, like a repeated expansion and contraction and water freezing in rock crevices which causes expansion. Chemical weathering is the minerals composing, by water, acids and oxygen; this also causes rocks to crumble. Heating of rocks during the day and cooling during the night produces alternate expansion and contraction within the rocks. This means rocks go through a mechanical process, which eventually mineral grains separate and the rock crumbles.

Water provides the medium for the chemical process and water seeps into the rocks down the cracks. The water often contains acids and other chemicals and over a long period of time the water attack the more sensitive of the minerals in the rocks. Also oxygen in the air oxidise rocks and greywacke is grey when it is freshly exposed but, it changes into an orange/brown colour when it is oxidise by air. Erosion Erosion is the process of transporting weathered material by wind, running water, glaciers and mass wasting, which is landslides, mudflows, avalanches and soil creep.