

Science Lessons for Grades 6-8

“Our Island”

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Discipline: Island biogeography, evolution, natural selection, colonization, speciation

Grade: 6 to 8

Standard

Understand changes occurring within the lithosphere and the atmosphere of the earth. Land form changes, and plate tectonics. Describe and explain the theory of natural selection.

Purpose/Goal

To set up a fun framework for teaching about colonization, reef formation, endemism, evolution, invasive species, erosion, island formation. By the end of the lesson students will know how ecosystems can become established and evolve where none existed before.

Motivation

Plate tectonics and island formation are essential background. Associated with this lesson we also taught lessons about plankton life cycles, natural selection, endemism, erosion and genetics. It fits well with the MARE Island curriculum (Lawrence Hall of Science). It also goes well with earth science or any evolution/natural selections lessons.

Preparation

Large sheet of butcher paper, 3x5 note cards

Website

Environmental Graffiti; “10 incredible underwater volcanoes”,
<http://www.environmentalgraffiti.com/featured/incredible-underwater-volcanoes/7827>

Motivation

You could pose the question, “How do plants and animals get to new islands? Have a brainstorming session. Talk about animals that are fairly stationary as adults and then surprise the students with their larvae.

Description

Make an Island out of butcher paper on a bulletin board. Introduce it as a brand new island in the tropical Pacific that is 3,000 miles from the nearest continent. It emerges from the ocean in the year 2,000,000 BCE. Until erosion takes place, it is not hospitable to most organisms.

Week 1: After a discussion of the elements of a functioning ecosystem (primary producers, herbivores, carnivores, and decomposers), students are told that they will be adding organisms to the island over the course of the term to make a functioning ecosystem. The first assignment is to draw 3 organisms on 3x5 cards. At least two must be plants. On the back students write the name, how the organism got all the way to the island, what it needs to survive, and what kind of habitat it needs.

Week 2: (100,000 years have passed). Alter the island to show that some erosion has taken place. Pull some cards out of the hat and place them on the island. Assign more cards that reflect whatever organisms you are teaching in conjunction with this (reef organisms, echinoderms, birds, mollusks, sharks, algae, etc.).

Week 3: (100,000) years have passed). Pull off any organisms from last week that did not have all the things they needed to survive. For example a seed eating bird will not survive on an island that does not yet have plants. Add more critters to the island. Assign more cards.

Continue in this fashion with each week representing 100,000 years.

Several weeks later introduce natural selection by choosing an animal or two that would surely change over time in response to different environmental pressures on the island. Suggest some variation in the traits of the offspring that might help it survive. Trace its development for a few generations and show how it would change over time until it would no longer be recognized by its relatives if it returned to its land of origin. They would no

longer mate with it and it would be considered a new species. The organism might become larger or smaller to illustrate gigantism or dwarfism. Introduce the idea of endemism. This could be done more than once during the term.

Several weeks later select an organism that has no natural predator on the island. Make it go berserk and take over the island.

Assessment

Participation in class discussions. Information on the organism cards. Take the cards down and arrange them in an energy pyramid. Have the students show which are primary producers, herbivores, carnivores, and decomposers. Decide as a group if this is a balanced ecosystem.

Follow-Up Activities

If the class has access to the shore, they can set out and monitor settlement plates.