

# Biomes: Islands & Evolution

**Grade Level:** 6-8

**Subject:** Earth Science/Ecology

**Duration:** Two class periods

## Objectives

Students will

- learn that an island is any comparatively small body of land completely surrounded by water;
- discover that islands can form in different ways and that plant and animal species travel to islands by air or water; and
- prepare a presentation that describes an island's geography and life forms.

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## Materials

- Globe or world map
- Internet access
- Relief maps of the Atlantic and Pacific Ocean floors
- Encyclopedias, textbooks, and other library references on islands

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## Procedures

1. Using a globe or world map, point out that most of Earth is covered by water.
2. Using relief maps, show students that Earth's surface has peaks, valleys, and plateaus, some of which are underwater.
3. Review the three major ways islands form: A) As sea level rises, land areas may become separated by water. B) Coral reefs emerge if the sea level drops or the land underneath rises. Sand and dust accumulating on the reef form an island. C) An underwater volcano can grow until it reaches above the water surface.
4. Explain that during the last Ice Age more of Earth's water was frozen at the poles, which were larger than they are today. About 10,000 years ago, Earth began to warm, and the ice caps began to melt. Some land areas became islands as rising waters cut them off from a mainland. New Zealand is one such location.
5. Describe how coral polyps form islands. Polyps live in underwater colonies, where they protect their soft bodies by building limestone walls around them. The colonies grow and form reefs, which may emerge if sea level drops or the land underneath rises. Accumulations of sand and dust help form an island. An example of a chain of coral reef islands: the Florida Keys.
6. Explain how volcanism forms islands. When underwater volcanoes erupt, lava flows build up. Over time, a volcano can reach above the surface of the sea, forming an island, such as those that make up Hawaii.
7. Explain that an island's formation affects the kinds of plant and animal species living on it. Cut off from a mainland by rising sea level, an island is likely to have mainland species from the start. Formed by a volcano or as a coral reef, an island will have no plants or animals to begin with. Animals can reach an island traveling on logs or other objects floating in the ocean. Plants and birds usually travel by air.
8. Next, have students work in pairs or groups to prepare a presentation on one island listed below. Presentations should include the island's location; a brief description of its geography; how and when the island

formed; a description of at least one animal species unique to that island; and an explanation of how the species has adapted to life there.

- Surtsey, located off the southern coast of Iceland, is referred to as the newest place on Earth because it was formed by a volcanic eruption in 1963. Visit this Web site: [www.gi.alaska.edu/ScienceForum/ASF11/1132.html](http://www.gi.alaska.edu/ScienceForum/ASF11/1132.html).
- The Galápagos Islands, located west of Ecuador's coast, have been isolated since they formed three or four million years ago. See "Virtual Galápagos" at this Web site: [www.doc.ic.ac.uk/~kpt/terraquest/galapagos/intro.html](http://www.doc.ic.ac.uk/~kpt/terraquest/galapagos/intro.html).
- Inaccessible Island is part of the Tristan da Cunha group in the South Atlantic Ocean. It is home to just one species of bird, the Inaccessible Island flightless rail, the smallest flightless bird in the world. See this Web site: [www.btinternet.com/~sa\\_sa/inaccessible\\_island/inaccessible\\_island\\_history.html](http://www.btinternet.com/~sa_sa/inaccessible_island/inaccessible_island_history.html).
- Madagascar, the world's fourth-largest island, is home to about 40 species of lemur. Find information at this Web site: [www.sci.mus.mn.us/greatestplaces/book\\_pages/madagascar2.htm](http://www.sci.mus.mn.us/greatestplaces/book_pages/madagascar2.htm).

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## Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

- **Three points:** Students included all required elements in the presentation; clear explanation included concrete facts; had logical organization; made few errors in grammar, usage, and mechanics.
- **Two points:** Students included at least two required elements in the presentation; clear explanation included concrete facts; had mostly logical organization; made some errors in grammar, usage, and mechanics.
- **One point:** Students included only one required element in the presentation; explanation included concrete facts; had illogical organization; made errors in grammar, usage, and mechanics.

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## Vocabulary

### continent

**Definition:** Earth's major landmasses: North America, South America, Africa, Asia, Europe, Australia, and Antarctica

**Context:** Australia is an island continent.

### coral reef

**Definition:** A mound or ridge of coral and calcium deposits that forms in warm shallow seas

**Context:** A coral reef is a complex ecosystem that shelters many kinds of marine life.

### sea level

**Definition:** The surface level of the sea used as a standard in calculating land elevations and sea depths

**Context:** A growing volcano will become an island if it rises above sea level.

### species

**Definition:** A fundamental classification of living things in biology, consisting of related organisms capable of interbreeding

**Context:** An island's isolation limits the number and variety of its animal and plant species.

### volcanism

**Definition:** The force, activity, or phenomena associated with volcanoes

**Context:** Volcanism created the Hawaiian Islands.

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## Academic Standards

The National Academy of Sciences provides guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K–12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following national standard:

- Life Science: Populations and ecosystems

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## **Credit**

Discovery School staff (based on lesson plan by Eric Kraft, freelance writer and educator and former teacher)