

Ocean secret (Geography)

Grade: 5-7

Materials

- Pencil
- Ruler/straight edge
- Optional: world map, globe
- Coloring pages of islands around the world

Topics

- Identify some of the features of the ocean, including a continental shelf, a deep ocean plain, a trench, and a mid-ocean ridge.
- Infer the conditions of some undersea locations.

Description

1. Spin a globe and have students observe the four oceans: Pacific, Atlantic, Indian, and Arctic Oceans.
2. Ask students to name the highest and lowest places on Earth's crust. They may name Mt. Everest and the Grand Canyon, respectively. Tell them that the tallest mountains and deepest canyons are found in the ocean. The Hawaiian Islands would dwarf Mt. Everest. These islands are merely the tops of huge mountains that have their base on the deep floor of the Pacific. Also in the Pacific is the deepest trench on the Earth, the Mariana Trench. It measures eleven kilometers below the sea's surface-seven times the depth of the Grand Canyon.
3. Ask students to speculate on how people have learned about the ocean. Introduce the HMS Challenger, and humans' first exploration of the ocean world in 1872. They measured depth use ropes; but, researchers now use sonar-sound waves and robotic submersibles to study the marine world.
4. Ask student to think about how the ocean is formed.
5. Many interesting islands around the world will be introduced.

References

Ocean Secret (2007). Retrieved Feb 11th 2007. from:
http://www.smithsonianeducation.org/educators/lesson_plans/ocean/secrets/proced.html

Ocean Secret
Student Sheet

Part 1 Do you know the name of the four oceans in the world? Point them on a world map. _____

Part 2 Do you know where is the highest and lowest places on Earth's crust? _____

Part 3 How people have learned about the ocean? _____

Part 4 How the ocean is formed? _____

Ocean Secret

Answer key for teachers

Part 1 Do you know the name of the four oceans in the world? Point them on a world map? Pacific, Atlantic, Indian, and Arctic Oceans

Part 2 Do you know where is the highest and lowest places on Earth's crust?

They may name Mt. Everest and the Grand Canyon, respectively. Tell them that the tallest mountains and deepest canyons are found in the ocean. The Hawaiian Islands would dwarf Mt. Everest. These islands are merely the tops of huge mountains that have their base on the deep floor of the Pacific. Also in the Pacific is the deepest trench on the Earth, the Mariana Trench. It measures eleven kilometers below the sea's surface—seven times the depth of the Grand Canyon.

Part 3 How people have learned about the ocean?

Introduce the HMS Challenger, and humans' first exploration of the ocean world in 1872. They measured depth use ropes; but, researchers now use sonar—sound waves robotic submersibles to invest the marine world.

Part 4 How the ocean is formed?

Earth's crust is both younger and thinner beneath the ocean than it is under the continents. That is because new ocean floor is continually forming at the mid-ocean ridges. These ridges wrap around Earth like the seams on a baseball. Coming off the sides of the ridges are "rift valleys," from which molten rock from within Earth pours out like lava from a volcano. When it cools, it forms new ocean floor. As the rock cools, magnetic particles in the lava are frozen, pointing in the direction of the North Pole. Scientists have matched these particles with periods of pole shifts in the geologic record. They have also matched the particles on both sides of the ridge, showing that they have spread apart. The discovery of these matching "magnetic stripes" in the rocks surrounding the mid-ocean ridges propelled the theory of plate tectonics into the forefront of geology.

The deep, flat portions of the ocean floor are referred to as the abyss or the abyssal plain. Trenches occur where one of Earth's crust plates is sliding under another. The continental slope is the area of ascent that leads to the continental shelf, the underwater edge of a continent.

One interesting connection between biology and plate tectonics involves the life cycle of green sea turtles. The fact that South American green sea turtles swim to tiny Ascension Island in the middle of the Atlantic to lay eggs may help prove the theory of plate tectonics. Some scientists hypothesize that the ancestors of these animals made this journey before the continents were so far apart. The turtles have continued this behavior over many generations as the distance across the Atlantic has gradually increased by several centimeters each year.