

Ocean 11

Overview

“Ocean” in Other Languages

Portuguese	Oceano
Brazilian Portuguese	Oceano
Romanian	Ocean
Russian	Okean
Serbian	okean
Scotsho	Lewale
Slovak	Oceán
Slovenian	Ocean
Spanish	el oceano
Swahili	Bahari
Swedish	Hav

Tagalog	Dagat
Thai	ma-ha-sa-moot
Turkish	Okyanus
Ukrainian	okean
Welsh	Môr
Vietnamese	Da i du'o'o'ng
Xhosa	uWandlökazi
Yiddish	yam or okean
Zulu	uWandlë

Ocean Words and Phrases

Many of the words that we use today, have their origins in maritime cultures. Many of our ancestors traveled to Canada on ships. Thus, most early settlements were seaports.

The citizens depended on the ocean for food, trade, travel and news from their home countries.

It only makes sense that many of our words reflect this past and present ocean culture.

Some phrases seem obvious:

Don't give up the ship - which means don't give up without a fight or to fight to the end.

Like a fish out of water - this means that a person feels out of place, as would a fish in air.

Take the wind out of his sails - means to "put down" someone who is bragging, as a sailing ship without wind must slow down.

Full speed ahead - means to increase speed, hurry.

Out of commission - an officer losing rank no longer operates as such. The term means "no longer working".

Batten down the hatches - as in a storm, the hatches must be closed to prevent leakage. The term means to "take precautions".

Get the drift - means "Do you understand?" Ships travel better with the current or drift.

Keel over - a keel on the bottom of a ship maintains balance in the water. The term means to fall over as in sickness or as a drunk.

Down the hatch - means to "scoff it down". In other words, "Drink it all quickly".

Learn the ropes - in sailing ships the term referred to learning how the lines fastened the sails in a proper manner. Today it refers to learning any new skill.

Go off the deep end - means to lose control or one's mind.

First rate - a term used to evaluate British warships. Today, it refers to good performance.

Gung ho - a term used by the Chinese when a lot of work was to be done.

Jeans - term used for the cotton pants worn by French sailors (gens).

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Nausea - comes from the Greek word for ship, /nausa.

Posh - means expensive or fashionable. In the old days it referred to placing luggage in order to avoid damage from the sun, as "portside out, starboard in".

Skyscraper - referred to the topsail of ships, originally. Later, it was the term given to very tall buildings.

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A Drop in the Ocean



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Red Herring



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Schools of Fish



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Video: Ocean Overview

38 minutes

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Using the handout,
answer the questions for "Ocean Overview".

Vertical line of 20 empty boxes for student identification.

Video: Ocean Overview ... 38 minutes

Instructions: Complete the following blanks with the correct word or words.

1. Thor Heyerdahl crossed the Atlantic to show that _____.
2. Plastic ducks are sometimes used to _____.
3. The Coriolis effect refers to _____.
4. The source of an oil spill can be found by _____.
5. Ocean circulation is another term for ocean _____.
6. The ocean moves _____ from the equator.
7. _____
8. Winds are created by the _____.
9. Waves are caused by the _____.
10. The grains of sand found on a beach are different because _____.
11. The maximum free dive is 500 feet because _____.
12. The submarine, Trieste, made the deepest manned dive in the year _____.
13. At a depth of 2000 feet the pressure was _____ tons per square inch.
14. Dolphins can hold their breath for _____ minutes.
15. A giant squid's head is _____ feet across.
16. The ocean contains _____ percent of all living space on earth.
17. The ocean covers _____ percent of the earth's surface.
18. Sponges can be used to treat _____.
19. Japan agreed to the Law of the Sea before _____.
20. Humans are _____ percent water.

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Video: Ocean Overview - 30 minutes

Answers

Instructions: Complete the following blanks with the correct word or words.

1. Thor Heyerdahl crossed the Atlantic to show that it could be done by the ancients.
2. Plastic ducks are sometimes used to map ocean currents.
3. The Coriolis effect refers to the spin of the earth producing currents.
4. The source of an oil spill can be found by studying the currents.
5. Ocean circulation is another term for ocean currents.
6. The ocean moves heat from the equator.
7. Winds are created by the sun's heat.
8. Waves are caused by the wind and the earth's rotation.

9. The grains of sand found on a beach are different because they come from many different places.
10. The deepest breath-holding dive is more than 478 feet (143 metres).
11. The maximum free dive is 500 feet because deeper than that, the lungs would collapse.
12. The submersible, Trieste, made the deepest manned dive in the year 1960.
13. At a depth of 2000 feet the pressure was 3 tons per square inch.
14. Dolphins can hold their breath for 8 minutes.
15. A giant squid's head is up to two and one-half feet across.
16. The ocean contains 22 percent of all living space on earth.
17. The ocean covers 71 percent of the earth's surface.
18. Sponges can be used to treat cancer.
19. Japan agreed to the Law of the Sea before the United States.
20. Humans are 70 percent water.

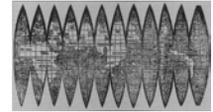
Old Ideas about the Ocean	New Ideas about the Ocean
Origin	
Rain formed as the earth cooled, filling low-lying areas.	Volcanoes released the water trapped in rock. This water filled low-lying areas.
Age	
The age of the ocean is the same age as the continents, which is 4.5 billion years.	The oldest known part of the ocean floor is only about 200 million years old.

Old Ideas about the Ocean	New Ideas about the Ocean
Nature of the Floor	
The floor of the oceans is like that of the continents, only lower. The deep floor is very flat.	The crust under the ocean is much thinner than the crust under the continents. It is made of different minerals. Earth's tallest mountains are located on the deep ocean floor.

Old Ideas about the Ocean	New Ideas about the Ocean
Stability	
Shallow seas may be formed by land rising or sinking, but the deep ocean is a permanent feature of the earth.	New ocean floor is constantly forming at the mid-ocean ridges. Old floor is disappearing at the edges of crustal plates. Trenches form where the floor is sliding between the plates.

Oceans of the World

All of the oceans of the world are part of one, vast body of water. Nearly $\frac{3}{4}$ or 75% of the earth's surface is water. There are no dividing lines between the five oceans of the world. Each ocean is connected to at least one of the others.



The Waldseemüller map, published in 1507, the first map to name America and to show the New World as separate from Asia.

The five oceans of the world arranged from largest to smallest are:

- Pacific
- Atlantic
- Indian
- Arctic
- Antarctic

The Pacific Ocean is the largest. The deepest part of this ocean is the Marianas Trench, which is 12 kilometres in depth. Its average depth is 4300 metres.

The Atlantic Ocean lies between the Americas and the continents of Europe and Africa.

The Indian Ocean is 38 million square miles in area. The average depth is 3,890 metres or 12,762 feet.

Most of the Arctic Ocean is covered by a layer of ice.

The Antarctic Ocean surrounds the South Pole and it is thought to be the southern continuation of the Indian, Atlantic and Pacific Oceans.

Canada's Ocean Act

Canada's Territorial Sea extends from Canada's low water mark along the coast out to 12 nautical miles. Within this zone, Canada may exercise full rights and responsibilities.

The Contiguous Zone extends 12 nautical miles from the outer edge of the Territorial Sea. In this zone, Canada may act to prevent the commission of offences in Canada relating to customs, sanitary, fiscal, and immigration laws and apply those laws where offences have occurred in Canadian territory.

The Exclusive Economic Zone extends 200 nautical miles from the low water mark. Canada may exercise its rights and responsibilities with respect to the exploration and exploitation of living and non-living resources of waters, subsoil and seabed. It also provides Canada with the responsibility and jurisdiction to protect the marine environment, to regulate scientific research and to control offshore installations and structures.

Background to the Oceans - Smithsonian Institute

For centuries, people have been challenged by the mysteries that lie beneath the blue depths of our ocean planet. Very little was known about the ocean until late in the nineteenth century, although nearly three-quarters of the planet is covered by ocean or seawater. Myths and misconceptions abounded. We used to think that the ocean depths were devoid of life. We thought that the seafloor was flat and that it was the same age as the continents. How different a picture we now have of the ocean as the sea has begun to yield its secrets.

In the 1870s, the HMS Challenger left England and sailed the world's oceans, throwing out weighted lines and taking soundings to measure the depths of the Atlantic, Pacific, Indian, and Arctic Oceans. For the first time, scientists had an inkling of the contours of the ocean floor, took samples of the plants and animals, and measured differences in water temperature and salinity. But the cold, dark water and extreme pressure of the depths kept scientists from knowing the secrets of the deep abyss.

Following in the footsteps of those pioneering oceanographers, today's scientists have overcome many of the challenges of the deep by using more sophisticated tools. They can send manned submersibles and sampling devices to plumb the ocean depths, taking photographs and samples of animal life and sediment to bring back to the surface for further study. Even space technology enters the picture. Satellite photos taken of the ocean provide a wide range of information, including water temperature and depth, seafloor topography, and the plankton populations. Using sonar and satellite data, scientists have been able to generate a new map of the ocean floor, thirty times more accurate than the best previous map. This map shows the ruggedness of the Mid-Ocean Ridge as it bisects the Atlantic Ocean. This contrasts to the relatively flat Pacific Ocean floor, its vast expanse broken up by more than a thousand newly discovered underwater volcanoes stretching from Hawaii to the Aleutians.

And to what does this vast treasure trove of data lead? For scientists, there is a broader understanding of how the ocean basin formed and continues to evolve. Molten magma from Earth's interior spews out at the mid-ocean ridges, spilling over to both sides and hardening to rocky basalt. As the crust pushed away from the ridges, it cools and thins, forming new seafloor and thus "widening" the ocean here. As this portion of the ocean floor widens, a section of the seafloor elsewhere is slowly sliding beneath the crust, becoming part of Earth's magma once again. Plate tectonics, the theory of Earth's crustal plates, thus helps explain ocean formation.

New observations also give scientists a greater understanding of the dynamic nature of Earth's water and oxygen cycles and how planetary winds affect ocean currents. Data allow scientists to hypothesize about global weather systems, earthquake and volcanic activity, and climatic trends of global consequence. Understanding the interactions of the ocean and marine life gives us an indication of the planet's health and the effects of human activity.

The development of new technologies for underwater exploration has led to exciting and lucrative expeditions. Photographs of the doomed Titanic taken by remote cameras from a submersible craft as it probed deep in the North Atlantic captured the imagination of the world. Recently declassified information about the locations of sunken World War II vessels has attracted adventurers and investors who would like to bring up rich cargoes. The old romantic notion of diving for Spanish pieces of eight from pirate shipwrecks in the Caribbean has been replaced by the idea of using sonar and other sensors to locate sunken submarines carrying gold. But whether in pursuit of knowledge or profit, all of these activities contribute to our understanding of the ocean.

Next Topic: The Oceans

Some people go whale watching. Some people long to swim with dolphins. Others earn their livelihood fishing for giant tuna in a vast ocean. These marine animals capture our attention and our imagination. We have a connection to all the living things of the ocean, from the microscopic floating plants that supply us with the oxygen we breathe to the huge blue whale that fills its belly with a ton of krill. Microscopic or oversized, plant or animal, from muddy shoreline to deep ocean floor, the ocean's living things attest to its endless variety, its biodiversity. Scientists say that there may be millions more species than we know swimming, floating, and crawling in the deep oceans and as yet unseen by human eyes. With the aid of submersible technology, entire new ecosystems are being discovered. Each ecosystem consists of a community of living things that interact with one another in complex relationships in unique conditions of water temperature, salinity, chemical composition, and currents.

Far below the surface of the ocean, where no sunlight reaches, hot water laced with chemicals spews out of cracks in the ocean floor. These cracks (hydrothermal vents) occur most often along the mid-ocean ridge, where Earth's crustal plates are spreading apart. Water reaching temperatures of four hundred degrees Celsius and chemical compounds such as hydrogen sulfide billow out from the vents. At certain vents, as the hot, sulfide-rich water comes in contact with cold seawater, metal sulfides precipitate out. The chemicals pile up into structures that resemble chimneys, which scientists call "black smokers." Scientists have found one black smoker that is as tall as a fifteen-story building. Can living things survive in such a place? The answer is yes.