

BUBBLE & FIZZ

WEEK 4: OCEAN FLOOR

EVER WONDER . . . IF THERE ARE MOUNTAINS UNDER WATER?



What we learned this week:

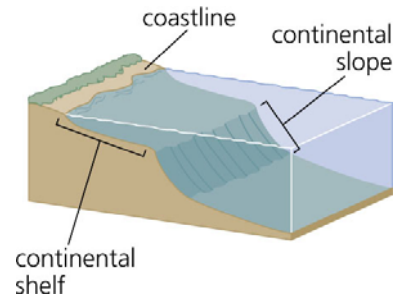
- ◆ 70% of Earth is covered by oceans, and most of it is unexplored.
- ◆ The ocean floor is very dark and cold, and some very interesting animals live there.
- ◆ Scientists use special techniques like Sonar to study and map the ocean floor.

Today's Experiments

1. Create a Map of the Ocean Floor.
2. Experiment with Depth Finders.
3. Experiment with Water Pressure.
4. Observe an Underwater Volcano.

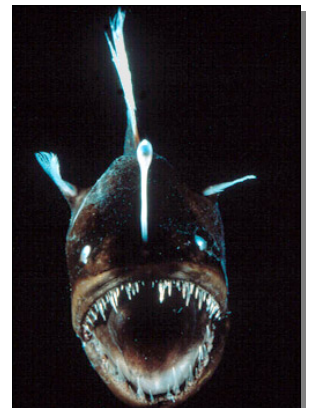
Did you know?

- ◆ The ocean floor is still largely unexplored and unmapped, though it covers almost 70% of the Earth. In fact, we know more about outer space than we do about our oceans! For example, scientists used to believe that the ocean floor was flat because of all the water pressing down on it. Now we know that the ocean floor has mountains, valleys – even volcanoes – just like the Earth's surface. The deepest place on earth is in the Mariana Trench, located in the Pacific Ocean near Japan. It is 7 times as deep as the Grand Canyon. At its bottom it is almost 7 miles below sea level.



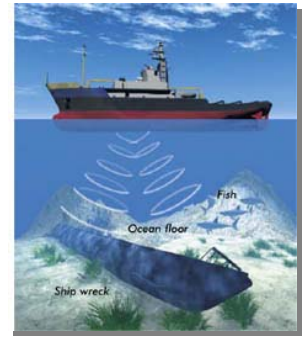
- ◆ It is difficult to study the ocean floor because it is deep, dark and cold. On average, the Arctic Ocean is 3,407 feet deep, the Atlantic Ocean is 12,254 feet deep, the Indian Ocean is 12,740 feet deep and the Pacific Ocean is 13,740 feet deep. That's why there are so many shipwrecks, for example, that no one can find. The ocean is dark because sunlight cannot reach through the water much beyond 500 feet. This means that the ocean bottom is also very cold – just a few degrees above freezing. There is also tremendous water pressure deep in the ocean -- it can be as great as 16,000 pounds per square inch. Without protection, this amount of pressure would instantly crush the people and animals that live on the earth's surface.

- ◆ The deepest part of the ocean is called the abyssal zone, and it is home to some truly strange creatures. For example, the Angler Fish (pictured at right) has a bioluminescent protrusion sticking out of its head – sort of like a spotlight – that it uses to attract prey. Many creatures in the deep sea are bioluminescent – meaning they are able to give off light through an internal chemical reaction. The only creature on land that can do this is the firefly.
- ◆ Scientists are learning much from the creatures that can survive the extremes of the ocean floor. For example, there are areas around underwater geysers and volcanoes that reach temperatures of up to 572 degrees F – and there are crabs and bacteria thriving near these hot spots. Yet on land, bacteria cannot



survive past 235 degrees F, and animals cannot survive past 122 degrees F. Similarly, many creatures swim around on the ocean floor completely unaffected by the water pressure that would crush most land species flat.

- ◆ Long ago, sailors used rope marked off at 6 foot intervals (a fathom) to measure the depth of the ocean. They would send the marked rope down tied to a heavy weight. After the weight reached the ocean floor, they would pull it back up and count how many fathoms the rope had traveled. This took a lot of time! Now scientists send down manned submersibles or remotely operated, unmanned vehicles to explore the ocean floor. Scientists also use Sonar, which sends a sound like a ping down toward the ocean floor. This sound bounces off the floor and is received back at the surface by an instrument called a transducer. A timer records how long it takes the sound to travel down to the bottom and back again. This information is then used to calculate the depth of the ocean in various spots.



Amazing Scientist

Sylvia Earle, Ph.D. (1935—). Dr. Earle is an oceanographer and explorer who studies plants and animals living on the ocean floor. She first fell in love with the ocean when she went scuba diving as a child and got to experience ocean life first-hand. Dr. Earle has led more than 60 oceanic expeditions, including one team of all women oceanographers in 1970. She has spent more than 6,000 hours underwater! Today, Dr. Earle is an explorer-in-residence for the National Geographic Society and continues to explore deep-ocean life.

Curiosity @ Home

This week at home, make a depth finder like the one we used in class. Arrange an “ocean floor” on the bottom of your bathtub and find the deepest spots. Also, use your Dive n’ Glide Sub to pretend to be on an expedition to the bottom of the ocean!

Word Search

Find the following words from class today

(look up, down, backwards, forwards & diagonally):

- Ocean
- Mariana Trench
- Fathom
- Sylvia Earle
- Sonar
- Abyssal
- Water Pressure
- Oceanographer

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