

A Unique Ecosystem

Directions: Read the following information and answer the questions below.

You have probably heard that all life depends on the sun. This is because producers such as plants and algae need the sun's light to produce their own food energy. In turn, producers provide energy for other consumers. Scientists thought this was the case everywhere on Earth until a fantastic discovery was made in 1977 off the coast of South America. Nearly 2500 meters below the surface of the sea scientists discovered an entire ecosystem which did not depend on the sun for its existence!

During the past 50 years scientists have studied many similar ecosystems deep in the oceans beyond the depths where light can penetrate. In total darkness along seafloor regions of volcanic activity, entire worlds of organisms never known before have been discovered. Strange organisms including giant clams, long tube worms, crabs, and fish are just a few of the organisms found in these deep ocean communities. All these organisms live without the presence of sunlight.

How can life exist in these deep sea communities in the absence of the sun's energy? The answer lies in superheated water which emerges in ocean floor cracks referred to as deep sea vents (also called hydrothermal vents). This very hot water is rich in a chemical compound called hydrogen sulfide which is a key component in fueling life in the hydrothermal vent ecosystem. Scientists have discovered hundreds of different kinds of bacteria capable of creating energy from hydrogen sulfide and other chemicals. These bacteria are referred to as chemosynthetic organisms. Instead of plants or plant-like organisms serving as the base of food chains in ecosystems on Earth's surface, chemosynthetic bacteria serve as the base of the food chain in deep sea vent communities. Chemosynthetic bacteria are then eaten by a wide range of other organisms, which in turn are eaten by other living things. So, as you see, life deep in the ocean can exist in the absence of sunlight.

Questions:

1. What are hydrothermal vents?
2. When and where were hydrothermal vents first discovered?
3. What is the base of the food chains in hydrothermal vent communities?
4. How are hydrothermal vent ecosystems different than the ecosystem near your house?