

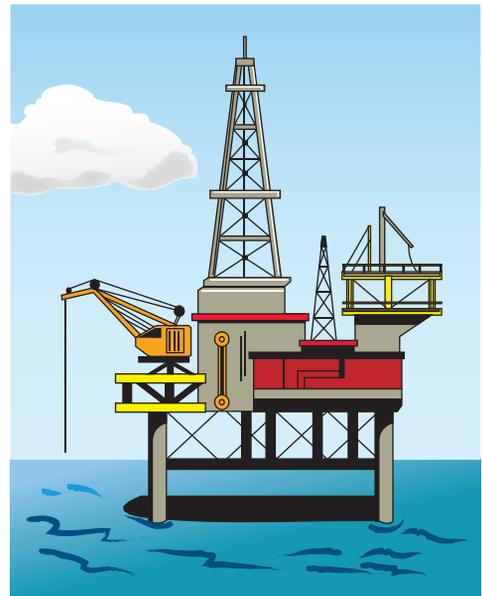
K-PREP
Sample Items
2012

Reading Grade 5

Drilling for oil can have impacts on the environment. Read the passage about one such situation with a large ecological impact. Then answer the questions that follow.

Disaster at the Deepwater Horizon

- 1 Petroleum and natural gas power much of modern civilization. Burning petroleum in cars allows them to move; burning natural gas in power plants allows them to produce the electricity you access through a wall outlet. Petroleum and natural gas are classified as fossil fuels. Found in underground deposits, fossil fuels have formed through physical and chemical changes to plant and animal remains over millions of years.
- 2 Humans obtain petroleum and natural gas by drilling into deposits and extracting them through wells. Most wells are on land, but the deposits easiest to extract have already been consumed. Drilling must now go deeper to less easily reached resources. The drilling involves greater cost than it once did.
- 3 Enormous fossil fuel deposits lay underneath the ocean floor as well as on land. In the past, no technology existed for obtaining fossil fuels from beneath the ocean floor. As technology has improved and extraction costs on land have risen, it has begun to make practical and economic sense to drill for the fossil fuel resources at sea. This has given rise to the deepwater drilling rig.
- 4 Deepwater drilling rigs are among the largest movable structures built by humans; some of them are like small floating villages. They have drills that reach to the ocean floor. The drills cut through rock to fossil fuel deposits. The deposits are brought to the surface through long pipes. Onboard the rigs, raw fossil fuels can be processed to separate them into petroleum, natural gas, and other products, which can be stored until transport ships dock at the rig. Apart from the drilling and processing equipment, the rigs often house crews numbering up to hundreds of people.
- 5 The Deepwater Horizon was a deepwater drilling rig that operated in the Gulf of Mexico, off the southeastern coast of the United States, in early 2010. The Gulf of Mexico is an area with a complex ecosystem, a community of organisms that live and function in the same environment. Ecosystems center around food webs, networks of predator-prey connections between organisms. Food webs allow



energy to flow from organism to organism. At the base of ocean food webs are plankton, tiny organisms that capture energy from sunlight and store it in chemicals. Larger organisms, like krill, shrimp, fish, and whales, consume plankton. In addition, fish prey on other fish. Where energy-bearing food is available, some organisms in an ecosystem will adapt to consume it so that the ecosystem can support as much life as possible.

- 6 In April 2010, an explosion damaged the Deepwater Horizon. The rig later sank to the ocean floor. This event left broken pipes spilling thousands of barrels of oil into the ocean each day. The flow of oil was not stopped until four months later.
- 7 The enormous oil spill had a long list of possible effects on the Gulf of Mexico ecosystem. First of all, the spill could damage the larger organisms like fish, turtles, and dolphins. Breathing or swallowing the oil allows the oil into their bodies, which can cause organ damage and endanger the lives of the animals. The oil in their environment can also disrupt the animals' feeding habits and reproduction patterns.
- 8 Possible damage was not limited to the larger organisms. Oil is poisonous, and it can eliminate large communities of plankton, cutting off the entry point of energy into the ocean ecosystem and starving the other organisms in the food web.
- 9 The explosion at the Deepwater Horizon could have destroyed the ecosystem in the Gulf of Mexico. Although the long-term effects of this disaster will not be understood for years, many efforts are underway to avoid the worst-case outcome.
- 10 Human efforts to clean up the spilled oil helped, but amazingly, microscopic organisms called bacteria were the most effective cleaners. Because oil has naturally leaked into the Gulf of Mexico for a long time, bacteria exist within the ecosystem. These bacteria are able to consume this oil as their source of energy.
- 11 Scientists discovered huge new populations of bacteria rapidly consuming spilled oil and methane (a gas mixed with the oil). Large bodies of oil would disappear within a few days. Large amounts of methane in Gulf water vanished. One of the most effective measures taken by humans to help clean up the oil turned out to be the spreading of dispersants, chemicals that break up large globs of spilled oil into smaller globs. Although it was not intentional, these dispersants helped to make the oil more accessible to oil-consuming bacteria, speeding their natural cleanup of the spill. Today, parts of the ocean ecosystem appear to be healthy, but the effects of this disaster on the Gulf of Mexico and future generations in this ecosystem will not be known for many years.
- 12 Many questions remain unanswered. How much of the spilled oil was cleaned by humans? How much was eaten by bacteria? How much is still in the ocean? How has this affected the Gulf ecosystem? What effects will this disaster have on future generations of organisms in the Gulf of Mexico? Scientists continue to research the effects of the Deepwater Horizon disaster to find the answers to these questions.

1

Using specific details from the passage, explain how an oil spill can affect the food chain in the ocean.

2

Explain how humans and bacteria worked together to clean up the oil spill. Use specific details from the passage to support your answer.

Reading

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