SCIENCE ★ TECHNOLOGY ★ ENGINEERING ★ MATH

PRESENTED BY: girlstart

Oil Spill Clean-Up

Investigate different methods of cleaning up an oil spill! Channel your inner restoration ecologist as you simulate the renewal of an ocean ecosystem after environmental disaster.

TEKS:

8.11 A: The student is expected to investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition.
8.11 B: The student is expected to explore how short- and long-term environmental changes affect organisms and traits in subsequent populations.
8.11 C: The student is expected to recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.

Materials:

- Cocoa powder (approximately 1 tablespoon)
- Cotton ball
- Dishwashing detergent ("grease-fighting" detergent works best)
- Paper towels
- Plastic bin or container
- 2 small bowls
- Spoon
- Tablespoon measure
- Vegetable oil (approximately 4 tablespoons)
- Water

How To:

1. Fill a plastic bin or container approximately halfway with water.
2. In a small bowl, mix 4 tablespoons of vegetable oil with 1 tablespoon of cocoa powder. This mixture represents the oil, or petroleum, that might be released during an oil spill.
3. Use a tablespoon measure to add one tablespoon of the petroleum into the bin of water.

4. Take out your spoon and a small bowl. Try to clean up the oil spill using just these materials. Once you're done, clean out the plastic bin and refill it halfway with fresh water.
5. Use a tablespoon measure to add another tablespoon of petroleum into the bin of water.
6. Take out a cotton ball. Try to clean up the oil spill using just a cotton ball. Once you're done, clean out the plastic bin and refill it halfway with fresh water.
7. Use a tablespoon measure to add another tablespoon of petroleum into the bin of water.
8. Take out your dishwashing detergent. Add a few drops of detergent into the oil spill bin and watch what happens!
9. Read the STEM Explanation below to learn more about oil spills and the methods restoration ecologists use to clean them up.

STEM Explanation:

The oil that you added to the water represented an oil spill. Oil spills can happen on any body of water, but are most common in oceans, and can be very damaging to the environment. Oil floating on the water's surface blocks sunlight and can kill plankton, an important part of the ocean's food chain. Oil sticks to animals and plants, as well as sand and rocks on beaches. This harms or even kills many different species. Also, oil is a nonrenewable resource so just leaving barrels of it in the ocean is incredibly wasteful. Because of these negative effects, we must be able to clean up oil spills as quickly as possible.

You investigated three different methods of cleaning oil spills. First, you tried a method called skimming when you scooped the oil out with a spoon. **Skimmers** are devices used to recover oil from the water's surface. Next, you used a method called absorbing. **Oil absorption** works by using materials that are really good at soaking up oil, like cotton balls! Finally, you used a dispersant to clean up the spill. Adding a **dispersant** like dishwashing detergent pulls apart oil particles that are in the water into small droplets. These small droplets can be more easily broken down by bacteria in the ocean. Which method was your favorite for cleaning up an oil spill? Which one do you think would be the most environmentally friendly?

Career Connection:

Restoration ecologists save damaged ecosystems by developing tools that rebuild habitats and save organisms. They educate the public on conservation and ecology and work to restore our planet's soil, water, and air quality.

Resources:

https://www.teachengineering.org/activities/view/cub_enveng_lesson01_activity1
https://www.teachengineering.org/activities/view/cub_enveng_lesson01_activity2
https://www.epa.gov/emergency-response/skimmers
https://news.psu.edu/story/545373/2018/11/01/research/inexpensive-material-offers-solution-ocean-oil-spills
https://blog.ted.com/6-very-promising-oil-spill-clean-up-innovations/

