|  |  |
| --- | --- |
| **Title:** | *Oil Spill!* |
| **Author:**  **Title and Organization:** | *Alex Madonik*  *Chabot Community College* |
| **Age Appropriateness:** | x 4th -- -6th grade  ☐ 7th – 9th grade  ☐ 10th – 12th grade |

**Flesh Kincaid Reading Level: 5.3**

**Safety Suggestions:** • Safety goggles required

• Protective clothing suggested

• Do not eat or drink any of the materials used in this activity

• Thoroughly wash hands after this activity

|  |
| --- |
| **Introduction of activity:** |
| *How do you clean up an oil spill at sea? In this activity, you’ll try out different methods. It’s time to act like environmental chemists and engineers and use your knowledge to try and clean up a “mini-oil spill” you create!* |
| **Materials:** |
| 1. 1 aluminum pie pan 2. 2 bird feathers 3. Water 4. 1 tbsp. vegetable oil 5. Blue food coloring 6. 1 small cup for collecting skimmed oil/water 7. 1 plastic spoon (for skimming oil from the pie pan) 8. Various types of products that might absorb oil, such as cotton balls, paper towels, oil-absorbing facial tissues, and discarded fabrics 9. 1-2 drops of “grease fighting” dishwashing detergent |
| **Procedures:** |
| 1. Fill a pie plate half-full of water. Add a few drops of blue food coloring and stir. 2. Add about 1 tablespoon of vegetable oil to the water and stir. Describe what happens to the oil. 3. Place a feather in the oily water. After 30 seconds, remove the feather and write down how the oil has affected the feather. Based on what you observe, what impact do you think an oil spill might have on birds? 4. Use the skimmer (spoon) to try to remove the oil. Put any recovered oil into the small cup. Try to take only the oil off the surface and not remove water. Rate your success at removing the oil. 5. Test the products you think will absorb the remaining oil and see which one removes the most oil. Record your results in table 1. 6. Add 1-2 drops of dishwashing detergent to the water/oil mixture. Stir it with the spoon. Describe what happens to the oil. 7. Take another feather and dip it into the pan. Compare this feather to the one that was dipped in the water/oil mixture at the start of the experiment. Describe or draw what you see in table 2. |

|  |
| --- |
| **How does it work? / Where’s the chemistry?** |
| *Oil and water don’t mix because water is a polar substance and oil is a non-polar substance. Oil will float to the surface of the water since it is less dense than water. Skimmers are machines used to remove the oil that is sitting on the surface of the water. In a real oil spill, chemists and engineers not only have to clean the water, but they also have to clean any animals that may have gotten oil on their fur or feathers. Surfactants, or soaps, are used to help break apart the oil into little droplets within the water. Then, microbes can break down the oil to clean the water in a way that scientists and engineers doing the cleanup cannot.* |
| **What did you see?** |
| **Table 1**   |  |  | | --- | --- | | **Oil-Absorbing Product** | **How Well Did It Work? (1 = worst, 5 – best)** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** | |  | **0 1 2 3 4 5** |   **Table 2**   |  |  |  | | --- | --- | --- | | **Clean Feather** | **Feather in Mixture** | **Feather in**  **Water/Oil/Dishwashing Detergent Mixture** | |  |  |  | |
| **References:** |
| *Celebrating Chemistry – Earth Day 2014 Edition “The Wonders of Water”*  [*https://www.acs.org/content/dam/acsorg/education/outreach/cced/CCED-2014-Celebrating-Chemistry-English.pdf*](https://www.acs.org/content/dam/acsorg/education/outreach/cced/CCED-2014-Celebrating-Chemistry-English.pdf)  [*https://www.acs.org/content/dam/acsorg/education/outreach/cced/cced-2014-celebrating-chemistry-en-espanol.pdf*](https://www.acs.org/content/dam/acsorg/education/outreach/cced/cced-2014-celebrating-chemistry-en-espanol.pdf) |