



Basic Properties of Oil

Grade Level: 4-8
Duration: 30-45 minutes
www.pwsrcac.org/lessons

By Switgard Deusterloh, Kodiak Ocean Science Discovery Lab, switgard@gci.net

NGSS Standards

4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.

Crosscutting Concepts

Patterns Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Energy and Matter Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

Related Resources

Worksheet Basic Properties of Oil

Pair With Model Oil Pipeline Lesson

Overview

Oil is an important compound with unique characteristics that make it both useful to humans and dangerous.

Objectives

- Students will understand that petroleum is different from vegetable oil.
- Students will identify key properties of petroleum oil.

Materials

- Containers of cooking oil (1 per group)
- Container of motor oil or crude oil
- Water
- Pencils
- Whiteboard or Poster Board
- Disposable Gloves
- Markers
- Books/magazines about energy & fuel sources or access to internet
- Science notebooks (or back of worksheet)
- Worksheet: Basic Properties of Oil

Background

This activity introduces students to some of the basic properties of petroleum oil compared to vegetable oil. Because oil is a toxic substance, it is very important that this activity takes place in a well-ventilated area and students wear gloves when handling the oil. If students are to smell the oil, only allow them to open the cap of the

Notes

container briefly for a small whiff of the oil. Be sure to dispose of oil and oily water properly at the end of this activity.

Preparation

1. Put small amounts of the oil in a safe container for each group
2. Fill a cup of water for each group

Introducing the Lesson

Ask students to think about ways they have used oil in the past. Create a list on the board of all of the different types of oil (petroleum and not) that are used by people. Ask students what makes these oils different from each other.

Activity

1. Reveal the oil samples. Explain to students that they are going to identify some important characteristics of these compounds.
2. Have students put on rubber gloves.
3. Divide students into lab groups of 3-5 and pass out containers of each oil to students.
4. Allow them to examine the oils and begin the worksheet.
5. Once initial observations have been completed, instruct students to smell a small whiff of the oil (optional) and put some of it in water. What happens?
6. Students record these findings on their worksheets.
7. Create a Venn Diagram on the board to review some of the similarities and differences between the oils.
8. Have students make a hypothesis about which oil is more toxic based on the smell.
9. Explain to students that an important difference between the two types of oils is that most petroleum oil is toxic and vegetable oil is edible. How is this important when considering an oil spill?
10. Give students 10-20 minutes to use books, magazines, and/or approved internet resources to learn more about how petroleum oils can affect the environment.
11. Instruct them to describe at least three ways that using petroleum oil can affect the environment in their science notebooks or on the back of the worksheet.

Wrap-up

Ask students to revisit their list of oils they use. How many of those oils are petroleum-based? Could they be replaced with something that is less toxic and more renewable? Challenge students to identify at least one petroleum product that they will cut out of their “diet” for the next week.

Assessment

Review written work for complete answers to questions during the lab. Evaluate student collaboration and cooperation during the lab. Assess their written responses. Students who successfully meet the performance expectation will (1) demonstrate knowledge that petroleum fuels and energy come from natural resources and (2) be able to describe at least three ways that the use of petroleum fuels and energy sources can affect the environment.

Pair With

- Model Oil Pipeline Lesson Plan