

# OIL MINI MUNCHERS

**Helping students understand ocean science and oil spill research**

This is the second of four specially designed lesson plans intended to help students expand their understanding of ocean science and oil spill research. This lesson focuses on teaching students how to think like a scientist by deconstructing common misconceptions about scientists. The lab in this lesson is about oil-eating microbes and includes students setting up the lab, taking long-term observations and analyzing the data they collect.



## Lesson #2: Thinking Like a Scientist

### Learning Objectives:

1. Students will be able to deconstruct stereotypes of scientists.
2. Students will be able to setup a long-term experiment and take detailed observations.
3. Students will be able to demonstrate an understanding of oil eating microbes.

**NGSS: HS-LS2-3.** Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.

### Guiding Questions:

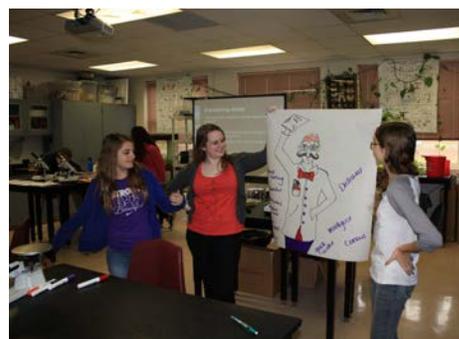
1. What characteristics make a good scientist?
2. How can we clean-up oil spills without damaging the surrounding ecosystems?
3. What are oil-eating microbes?
4. Which fertilizer and soil combination will eat away the most oil and why?

## Lesson Structure

### 1. Hook

*“What does a scientist look like?” Brainstorming Activity*

- Give students markers and chart paper.
- Ask the students to draw a picture of a scientist and list 10 characteristics of their scientist.
- Have students present their drawings to the class.
- Discuss some common themes and stereotypes they drew in their scientists.



### 2. Introduction to Mini-Munchers Lab

*Students will read a pre-lab article to prepare them for the concepts presented in lab*

- Students read the article *“Responding to Oil Spills in Coastal Marshes: The Fine Line Between Help and Hindrance”* and answer questions about the article.
- What were the advantages and disadvantages of the different methods discussed in the article?

### 3. Mini-Munchers Lab Set-up

*Facilitate set up of 4 mason jars for each group*

- Students will need to measure out various masses, so have a triple beam balance or scale available.
- After the experiment is set up, turn on the aquarium pumps.



### 4. Ongoing Observations

*Students keep track of observations*

- Every 2-3 days, have students note down observations in their GOO notebooks.
- Students should pay attention to amount of oil, color, growth, decay, etc.



### 5. 30 Day Lab Wrap up

*Students will analyze which jar had the least amount of oil*

- Students will divide a square of brown paper bag into 4 squares and measure the amount of oil left over from each jar.
- Students should record their final diameters in their notebook and make a class bar graph of the average diameters for each jar.

### 6. Discussion

*Analyze the results from the lab*

- Ask the students “Why did a specific combination do a better job than others for decomposing the oil? What improvements can we make to the experiment?”



## Supplies

Mason jars, aquarium pumps, plastic tubing, nails, hammer

Fertilizers: ammonium phosphate, magnesium sulfate, potassium phosphate, non-iodinated sodium chloride

Pipettes, distilled water, brown paper bags, potting soil (sterilized soil), soil contaminated with oil

### **Additional Resources:**

**Project GOO Blog:**

<http://projectgoo.blogspot.com/>

For additional lesson plans and related activities visit

[www.Deep-C.org](http://www.Deep-C.org)



**Gulf Oil Observers (GOO)** is an education and outreach initiative of the Deep-C Consortium. Deep-C is investigating the environmental consequences of petroleum hydrocarbon (oil) on living marine resources and ecosystem health in the Gulf of Mexico. Deep-C seeks to increase understanding of the fundamental physical, chemical, and biological connections between the deep sea, continental slope, and coastal waters and their linkages to critical habitats and ecological functions. Deep-C research is made possible by a grant from BP/The Gulf of Mexico Research Initiative (GoMRI).