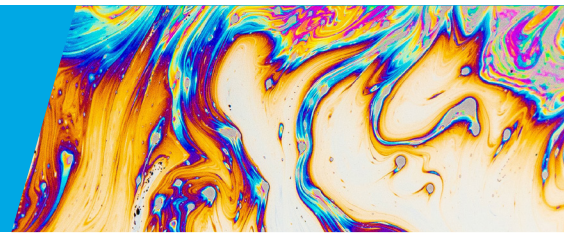


CURIOSITY AT HOME

OIL SPILL CLEAN UP



Every technology developed has an effect on the Earth from using raw materials and resources to possible mitigation of other technologies. Environmental engineers try to design techniques to minimize harm done to our environment. Engineers are consistently researching, designing, and testing new ways to help clean up oil spills.

MATERIALS

- large tub or flat container
- tape and marker, dry erase marker, or ruler
- vegetable oil
- water
- food coloring (optional)
- paper or science notebook
- pen or pencil
- oil spill cleaning materials to test such as:
 - o straws
 - o paper towels
 - o cotton balls
 - o feathers
 - o sand
 - o dish soap

DID YOU KNOW?

Oil floats on the top of the water and spreads over a large area. One pint of oil spilled on water can create a one-acre oil slick!

PROCEDURE

1. Begin by filling the tub halfway with water. You may wish to use food coloring to color the water.
2. Measure the water level using one of the following methods and record your results in the chart or your science notebook.
 - Place tape at the water line and label "Test 1" start.
 - Use a dry erase marker to record the water level on the side of a glass container and label.
 - Use a ruler to measure the water level from the bottom of the container.
3. Spill a few teaspoons of oil into the water. Record how much oil was added to the container on the chart or in your science notebook.
4. Observe the oil how it behaves in the water. Record your observations.

Problem

Oil in the water can be harmful to plant and animal life. How can you remove the oil without removing too much water?

Design

1. Decide which available materials you want to test.
2. Decide how you will use those materials to remove the oil.
3. Record your materials and methods by drawing a picture or describing your solution in the chart or in your science notebook.

Test

1. Using the materials you selected, test out your solution.
2. Using the same method you used to find the starting water level, measure and record the final water level for Test 1 in the chart or your science notebook.
3. Record the difference in the water level from the beginning of the test to the end in the chart or in your science notebook.
4. Estimate how much oil remains and record your results in the chart or in your science notebook.

Experiment continued on next page...



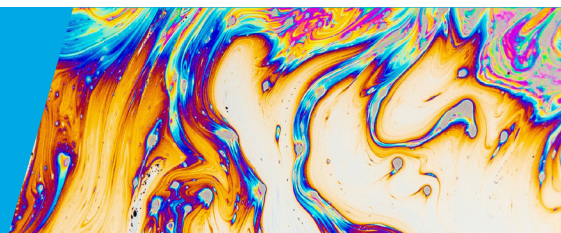
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OIL SPILL CLEAN UP



Re-Design

How can you make your design better and more effective at cleaning oil spills?

- Try a different method with the same materials.
- Try new materials using the same method.
- Are there materials that you were not thinking about testing before that might be even better?

Record your results for each additional test in the chart or in your science notebook.

Test	Materials Used	Methods Used	Prediction	Water Level	Estimate of Oil Removed	Observations
1				Start: _____ Final: _____ Change in water level: _____	Oil added: _____ Oil removed: _____	
2				Start: _____ Final: _____ Change in water level: _____	Oil added: _____ Oil removed: _____	
3				Start: _____ Final: _____ Change in water level: _____	Oil added: _____ Oil removed: _____	
4				Start: _____ Final: _____ Change in water level: _____	Oil added: _____ Oil removed: _____	

Challenge

What will you do with the oil-covered clean-up material so it won't become its own clean-up problem? Each year, oil spilled in oceans, lakes and streams harms wildlife and the environment.

Experiment continued on next page...



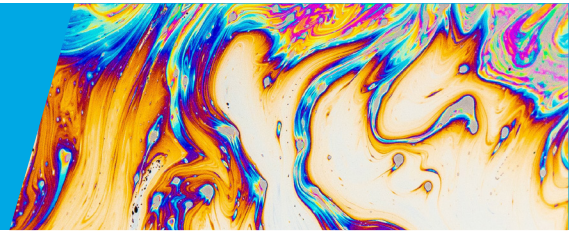
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K-2 GRADE EXPLORATION

Here are some questions you can explore together.

- Why did you choose the materials you did?
- How did you change your experiment to make it pick up more oil?
- What might you try next?
- What might cause an oil spill in the ocean, a lake, or a river?
- Why do you think it is important to clean up oil spills?



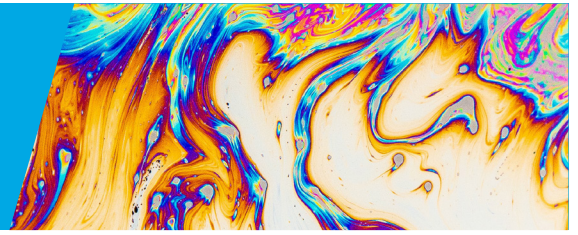
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3–5 GRADE EXPLORATION

- How do oil and water react to each other?
- Do you think it would be easier or more difficult to clean up an oil spill if oil and water mixed? Why or why not?
- How might oil spills harm the environment?
- What might be the causes of an oil spill?
- What ideas do you have to prevent oil spills?



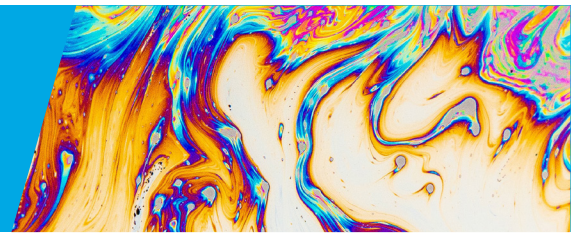
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6–8 GRADE EXPLORATION

- What are the properties of the materials that worked best to clean up the oil spill?
- What are the constraints of the materials you used to clean up the oil spill?
- How might oil spills harm the environment?
- What might be the causes of an oil spill?
- What ideas do you have to prevent oil spills so clean up is not needed?
- Research technologies that are currently being used to avoid and clean up oil spills.
- What engineering advances have been made since the Valdez oil spill in 1989?
- Write down or explain to another person the process you went through in thinking through your design and redesign.



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