

OIL SPILL CLEANUP

AGES

Children 8+ years

PROGRAM DESCRIPTION

Ocean life is beautiful, but oil spills can pose a threat to these awesome ecosystems! Explain oil spills and their effects on the ecosystem, or read a picture book on the subject. For older children, you can talk about historical spills, such as Exxon Valdez (1989), Deep Water Horizon (BP) (2010). These two hands-on experiments—birds and oil spills, and oil removal—help to explain why oil spills are so damaging to the environment, and why they are so difficult to clean up. Each experiment can be done individually or as a group. Suggested runtime: 60 minutes.

ADAPTATION

These experiments can be made more rigorous by using kitchen scales to weigh each material before and after it has absorbed oil. The higher the difference between before weight and after weight the more oil has been absorbed.

MATERIALS AND PREPARATION



Image source: Shutterstock

GAME/ACTIVITY

Experiment #1: Birds and Oil Spills

Materials:

- Foil pans/pie pans (2/person or group)
- Water
- Vegetable oil (1/4 cup/person)
- Feathers
- Buckets & water (or running water)
- Dish soap
- Paper towels
- Tablespoons
- Tweezers
- Cotton balls
- Table covers
- Blue food coloring (optional)
- Black or brown food coloring (optional)
- Aprons or large old shirts (optional)

Before the program, cover each table with plastic. On each table, place pans with ½-1" of water, cups filled with 1/4" of oil, gloves, and paper towels. If possible, provide old shirts or aprons for children to wear over their clothes.

Before the experiments, discuss. Why is oil so toxic for birds and other animals that come in contact with it? Oil damages birds' feathers so birds cannot keep their bodies dry. Without the ability to repel water and insulate from the cold water, birds and mammals will die from hypothermia (when body temperature falls to dangerously low levels). Many birds and animals also swallow oil when they try to clean themselves, which can poison them.

To experiment:

- Participants slowly pour a ¼ cup of oil into their water. Ask them to notice how the oil forms a pool on top of the water.
- Have each child dip a feather into the pool of oil in the pan and take it out.
- Have them run their fingers over it to see what it feels like.

GAME/ACTIVITY

- Then wash the feather with hand soap and rinse it in the bucket of water. Did the oil come off? Repeat washing the feather. How many times must you wash the feather to get the oil to come off? Does it ever all come off?

Experiment #2: Oil Removal

Booms contain the top layer of oil on water, and skimmers remove that oil from the surface. Sorbents absorb oil. One type of sorbent boom looks like a sausage, and another is made of pads that float on the surface and absorb fine traces of oil.



Image source: Shutterstock

Boom/skimmer method: Using the same pans as above, children scoop out as much oil as they can with a tablespoon and place it in an empty cup.

Boom/sorbent method: Children pinch a cotton ball in tweezers and drag it over the water's surface to absorb the oil. Do the same thing with a piece of paper towel.

Questions to ask:

- How well does the boom and skimmer method work?
- Can you get all of the oil out of the water?
- Does the sorbent remove more oil than the boom/skimmer?
- Should there only be one method or many used?
- Can you think of any other materials that might be able to absorb oil?

UNIQUE SPACE AND/OR PERSONNEL NEEDS

This one can get messy! Consider taking it outdoors.

RESOURCES

Web

Experiment variations from Georgia Aquarium: <https://bit.ly/3vsL1lz>

“Office of Response and Restoration” from National Ocean Service: <https://bit.ly/3fVB2Pw>

Video about 14-yr-old student’s oil clean up innovation from Tech Insider: <https://bit.ly/3foOegD>

“Demonstration: Oil Spill Clean Up” from Arizona Science Center: <https://bit.ly/3vtfEaN>

Books

Non-fiction

Oil (2020) by Jonah Winter and Jeanette Winter (children’s)

Oil Spill (Let’s Read and Find Out Science) (1994) by Melvin Berger and Paul Mirocha (children’s)

Olivia’s Birds: Saving the Gulf (2011) by Olivia Boulter (children’s)

The Great Penguin Rescue: 40,000 Penguins, a Devastating Oil Spill, and the Inspiring Story of the World’s Largest Animal Rescue (2010) by Dyan Denapoli (adult)