

RAFT IDEAS

Topics: Density,
Properties of Matter,
Environmental Science

Materials List per group

- ✓ Open top clear plastic container, ½ liter (~2 cups) & ~10 x 10 x 12 cm.
- ✓ Green plastic, thin, stiff but flexible
- ✓ Pebbles/sand
- ✓ Salt
- ✓ Water
- ✓ Vegetable oil
- ✓ Cotton fabric, 3-4, ~10 x 30 cm pieces
- ✓ Absorbent fillings: (wood shavings, foam pieces, cotton balls/batting, felt, paper towels)
- ✓ Rubber bands
- ✓ Dish soap
- ✓ Plastic bag
- ✓ Glue gun and glue

This activity can be used to teach:

- Water cycle (CA Science Standards: Grade 5, 3.d)
- Density and Buoyancy (CA Science Standards: Grade 8, 8.0)
- Stability in ecosystem (CA Science Standards: HS Biology, 6.0)

A Sticky Situation

Soak up learning with an oil spill exercise!



Create an “ocean” oil spill and experiment with various cleanup materials.

Assembly of model

1. Cut ~20 green plastic strips, some long enough to reach from the container’s bottom to top, others longer or shorter. Create model seaweed by gluing the strips in clumps to the bottom.
2. Dissolve 14 g (½ oz.) of salt into ½ liter (2 cups) of water.
3. Put a 1½ cm (¾”) layer of sand and pebbles at bottom of the container.
4. Fill container with salt water to within about 2.5 cm (~ 1”) of the top.

To Do and Notice

1. Add vegetable oil to container to create **up to** a 1 cm (3/8”) layer.
2. Observe how the oil floats on the water. Notice how the oil first mixes with and then separates from the water. Notice how the oil affects the plastic “seaweed”.
3. Create and test containment booms from several different materials. Roll a narrow strip of fabric around a small amount of filling material (see material list) to create a long narrow roll. Secure the roll along its length with rubber band. Determine which materials will float, allow water to pass, and block or absorb oil.
4. Which clean up materials worked the best? Why?
5. Cleanup using dish soap to emulsify the oils. Bag and dispose of boom materials.

The Science Behind the Activity

Salty sea water is generally denser than oil. Thus, the lighter oil will float, forming a layer, or sheet, on the sea water’s surface. It will continue to spread until constrained by an object (rock, boom, etc.). The sheet of oil can, over time, break into small globules that will become suspended in the cold water, making cleanup much more difficult. Containing an oil spill and physically removing the oil is one method of recovering the oil to protect the ocean’s ecology.

Taking it Further

- Add oils with different densities (e.g., mineral, motor oil) and observe how clean up is affected. **Motor oil and mineral oil will require special disposal.**
- Determine a way to measure the amount (and percentage) of recovered oil.
- Add ice to the salt water, mix vigorously - what happens to the oil?

Web Resources (Visit www.raft.net/more for how-to videos and more ideas!)

- Environmental effects of oil spills - www.itopf.com/marine-spills/effects/ and www.spaceforspecies.ca/meeting_place/news/features/oil_pollution_effects.htm
- Booms - www.boomenviro.com/containment/oilspillcontainmentbooms.htm