

Pollution Solution

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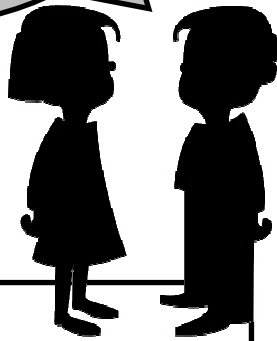
Level

Big Idea

Some liquids mix with water and some don't.

Some materials are better at absorbing oil than others.

The activity is aimed at this level but can be modified to suit other levels.



What you need to know

- Pollution is when we add things to the ground, air or water that will make it dirty or bring harm to life in and around it.
- Some liquids will mix with the water and some liquids will not.
- Liquids that do not mix with each other are **immiscible**.
- Liquids that do mix together are **miscible**.
- Oil and water do not mix – they are immiscible.
- Oil will float on top of water because water is denser than oil.
- Oil will spread out away from the spill.

Learning Intentions

- ✓ We are learning about the best materials to use to clean up an oil spill.

Success Criteria

- ✓ I can explain which material was the best to use to clean up an oil spill and justify why?

Curriculum Links

Nature of Science

Participating and contributing – Explore various aspects of an issue and make decisions about possible actions. (L3/4)

Investigating in science – Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations. (L3/4)

Material World

Properties and changes of matter – Group materials in different ways, based on the observations and measurements of the characteristic chemical and physical properties of a range of different materials. (L3/4)

Key Competencies

Participating and contributing – Explore current issues relating to our environment.

Thinking – Think creatively about how to use materials.

Other Resources

Connected

Why we have soap (Number 3, 1998)

School Journals

Oil Spill – Are we prepared (Part 4, Number 1, 1995)

Pollution Solution Cost Sheet

Equipment and Techniques	Cost	Minutes of Use Or Number Used	Cost
Dropper	\$50 per minute		
Cotton Wool Ball	\$20 per piece		
Paper Towels	\$20 per piece		
Filter Paper	\$20 per piece		
Waste Disposal – Used material	\$50 per each		
Waste water/oil disposal	\$100 per pot		
Labour	\$100 per person per minute		
Total Cost			

What you need

- A shallow pan or tote tray
- Cooking oil
- Clean up equipment (cotton wool balls, paper towels, filter paper (coffee), dropper)
- Container for waste water/oil disposal (eg – yoghurt pot)
- Container for used clean up materials (eg - ice cream container)
- Tablespoon
- Water
- Blue food colouring
- Stopwatch

What to do

Scenario

An oil tanker has sunk in the Cook Strait and is leaking oil into the ocean. Your task is to investigate the most efficient way of cleaning up the oil spill. All oil spills are costly to clean up and you will be charged for the time taken, materials used and waste disposal.

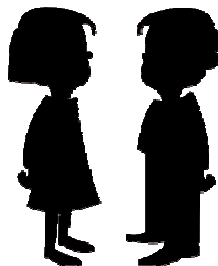
1. Show the different types of clean up equipment. **Predict** which will work the best.
2. Fill the tray halfway with water and a few drops of blue food colouring.
3. Add a tablespoon of oil to the middle of the pan to simulate a leak from a tanker. Leave for a minute to allow the oil to disperse then gently blow on the surface 3 times to simulate the wind.
4. **Investigate** – Try out each piece of clean up equipment to work out the best way of using them.

You will now need to repeat this experiment with each piece of clean up equipment.

5. Time how long each piece of equipment takes to clean up the oil spill.
6. Count how many pieces of equipment were used and record on the Pollution Solution Cost Sheet.
7. Work out the total cost for each piece of equipment used.
8. **Explain** which piece of equipment cleaned up the oil spill most effectively. Think about time taken, cost, how effectively the oil was cleaned up.

Discuss

What problems arise if an oil spill occurs in the open ocean, on a rocky coast, or near a sandy beach?



What's Next?

Investigate other materials that could be used to clean up an oil spill.

Find out about oil spills around the world.