



Lesson Plan: WATER POLLUTION

Class: 6th Class

Subject: Science

Strand: Environmental Awareness and Care

Strand Unit: Caring for my locality / environment, Environmental Awareness

Aim/ Learning Objectives:

Students will learn about what causes water pollution and how to be environmentally aware.

*Note: Students should understand the concept of the water cycle before moving onto water pollution.

(See Lesson Plan "Oceans all Around Us").

Skills:

Students will develop an understanding of the language associated with pollution and being environmentally aware. The students will also develop skills in:

- Questioning, observation, predicting
- Investigating and experimenting
- Estimating and measuring
- Analysing
- Recording and communicating

Materials:

- Dish washing liquid, soil, vegetable oil (to pollute water samples)
- Tap water
- 6 Glass jars or clear plastic cups if doing experiment in front of class, otherwise enough for 6 per group
- 1 spoon or 1 per group
- Coffee filter paper
- Worksheet: Water Pollution
- Samples of litter found on the beach. (As part of the exercise it is useful to have some samples in reserve)
- Litter Biodegradation information sheet – available on www.explorers.ie
- Stones and sand for filtration for advanced experiment

Preparation /Background:

What is Water Pollution?

Water pollution is the deterioration of the quality of water. Toxic substances or organisms changes the water's composition which can damage living things and their habitats

What causes Water Pollution?

Pollutants that affect our oceans come from many different places. One of the main causes of pollution is the water and other pollutants that flow into storm drains. Storm water is the water that comes from rain and runs off into gutters called storm drains. Urban runoff is water that comes from water used in human activities such as cleaning the car to watering the garden. Storm water and urban runoff are carried to streams, rivers and eventually to the ocean. This runoff can contain many contaminants that affect clean water.

Contaminants can include:

Dirt - is manageable in small quantities. However dirt from erosion, landslides and from the street can destroy the quality of the water in the streams, rivers, lakes and the ocean.

Leaves and Grass clippings - can block out the sun and rotting material can suffocate plants and animals in the water.

Litter - such as cigarette butts, tin cans, plastic bags, bottles and paper etc. are littered onto the streets or blown from rubbish bins can eventually end up on the seashore and in the oceans. Animals in the ocean can



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often mistake this for food or get caught in it causing sickness and death.

Soaps and Detergents - used for cleaning cars, windows and buildings can take out the oxygen in the water, which is deadly for animals and plants that live in the ocean.

Oil and air pollutants - (what goes up must come down) from cars can seep into the water supply under the ground causing damage to fresh water and eventually the ocean.

Chemicals - weed & bug killers in gardens, chlorine for swimming pools, cleaning agents for windows, paint from paint brushes and pots etc).

Pesticides and Fertilisers - from farms can seep through into the water tables under the ground or are washed off into main streams and rivers. This can then be washed out to sea.

Animal and Human Waste - contains bacteria and viruses that can cause harmful diseases.

What are the Effects of Water Pollution?

Water pollution affects our quality of life, our habitats, and our drinking water.

How can Water Pollution be controlled?

Water pollution can be prevented by undertaking even the smallest actions in the home, school and community. These can include:

- Correctly dispose of hazardous household products. Avoid letting contaminated water such as chemicals, soaps, grass clippings, paint etc run into storm drains.
- Recycle and dispose of all rubbish properly. Ensure that litter is thrown in the rubbish bin and does not get blown away. Pick up litter that has “escaped” and put it in the bin.
- Conserve water in the home and garden. Use efficient plumbing fixtures so only the necessary amount of water is used for flushing toilets and showers. Use less water when washing cars. Use a bucket with water and soap to wash the car, and then drain the dirty/soapy water down the sink or in the grass. Only use the hose when it is needed – do not let it run constantly.
- Use natural fertilizers in the garden.
- Be “green” with the maintenance of the car so it does not leak oil and release bad fumes from the exhaust.
- Volunteer for a beach clean-up, tree planting or water quality monitoring.

Activity:

WATER POLLUTION EXPERIMENT:

1. Put some tap water in 3 separate clean clear glasses or bottles and observe the water. Students should record their observations in the first section of the worksheet. Elicit answers from the students as to what they think will happen to the water once oil/washing up liquid/soil is added.
2. Add the oil to one glass of tap water to create “polluted water”, the washing up liquid to the next and the soil to the last glass. Students should complete their observations in section 2 of the worksheet. Elicit answers from the students as to what will happen once the polluted water is stirred up.
3. Stir the glasses of water with a spoon to create movement in the polluted water. Observe what happens to the water. Ask the students could this happen in nature, when and why? What do they expect to happen next? Record observations as above.
4. Continue to observe the water and see what happens after 5 minutes. Elicit from the students what they think is happening. Record observations as above.
5. Filter the polluted water through the coffee filter into a clean glass, repeat for each of the glasses. Record observation as above. Filter with other items for advanced students for section 6.

Worksheet: WATER POLLUTION

Subject: Science



Instructions for Students:

Record what happens to the water below:

Water Samples used in experiment	Observations: <ul style="list-style-type: none">• What does it look like?• What colour is it?• What does it smell like?• Are there any particles in the water?
1. Tap Water	
2. Polluted Water	
3. Polluted water after Movement	
4. Polluted water after standing for five minutes	
5. Filtered water – using a coffee filter	
6. Other items used for filtering (i.e. clean stones / sand etc)	

Worksheet: WATER POLLUTION

Subject: Science



Explain the results:

1. What happened to the clean water when items were left in it for (Number of days)?

2. What happened to the polluted water when it was moved?

3. Was the filter effective in removing the pollution from the water? Explain.

4. Explain which was the most effective filtering system - clean stones, sand, coffee filter? Compare the colour of the water samples and particles in it.

5. Could the filtered water still be contaminated – i.e. does it smell?
