

# Natural Filters



## Specific Learning Outcomes

**2-4-01:** Use appropriate vocabulary related to their investigations of air and water.

**2-4-11:** Explain and appreciate the importance of clean air and water for humans, plants, and animals.

**2-4-12:** Identify substance that pollute air and water, and describe ways of reducing such pollution.

## General Learning Outcomes

**2-0-1a:** Ask questions that lead to the investigations of living things, objects, and events in the immediate environment.

**2-0-4e:** Respond to the ideas and actions of others in building their own understandings.

**2-0-4g:** Verbalize questions, ideas, and intentions during classroom activities.

**2-0-7a:** Purpose an answer to the initial question based on their observations.

**2-0-8a:** Recognize that learning can come from careful observation and investigation.

**2-0-9b:** Express enjoyment when sharing and discussing science-related experiences from daily life.

## Vocabulary

wetland, filters, pollution, pollutant, water, cleaning, litter

## Summary

Students continue their exploration of wetlands by exploring how pollutants affect water and living things, and how wetlands play a role in reducing pollution.

## Materials

- 1 large sponge
- 1 cup of olive oil
- 1 cup of soap
- 2 cups of coffee grounds
- 2 tbsp. of food colouring
- Litter, such as wrappers, soda can, straws, and hole punch paper (optional: ask students to use garbage produced from snack time)
- Smocks for students or extra pair of cloths
- Toy plastic frog
- 4 plastic bins (4.5 gallons; 17 litres) half filled with water
- 4 buckets
- 4 strainers, coffee filters

## Procedure

### *Warm Up*

Begin by reminding students about your visit to Oak Hammock Marsh, briefly reviewing the day's activities. Remind students of the word 'wetland' and ask them what they think it means now that they have visited a wetland.

Ask students what they think the words pollutant and pollution mean, asking them to give a description and examples.

**A pollutant is** the introduction of a substance or object that is harmful to the surrounding environment. Examples of pollutants can include garbage, chemicals, and even light (think of cities which no longer have a dark night sky). Soil can also become a pollutant if it runs off of fields and into water ways like wetlands, clouding the waters.

**Pollution is** the effect caused by the pollutants. For example, bright lights left on at night, especially en masse in cities (the pollutant), has negative and even deadly effects on living things that are dependent on the natural predictable rhyme of a dark night sky.

## *The Activity*

Explain that today the class will be investigating pollutants and their impact on water and living things. Have the class divided into four groups, each group beside a bin full of water and a bucket. Explain that the class will experiment with pollutants by seeing how easy it is to filter out the pollutants once its in the water. Have students put on smocks, and then 'pollute' the water with the designated materials.

*Recommended: Have the olive oil, soap, coffee grounds, and food colouring at the front of the class so you are able to facilitate their use. You could also go from group to group offering the options, while controlling how much is used.*

After students have polluted their water, introduce the toy frog, having the students give it a name. Explain that pollutants can get into the bodies of animals and harm them. Frogs have very sensitive skin and so if there are pollutants in their habitat it can negatively impacts the frog's chances of survival. Pollutants can make frogs physically slower, increase their chances of being sick or developing harmful mutations, and reduces their ability of producing healthy eggs.

Explain to students that the class will see which group can get their water the cleanest for the frog's new home. Have students try to find a means to filter out the pollutants using the suggested tools i.e. strainers, coffee filters, and their hands (if they wish), putting the 'pollutants' in the supplied buckets.

Have class go from bin to bin with the frog, and see how well students were able to clean the water. The results will most likely be that the students were able to take out the litter, but that the food coloring, coffee grounds, olive oil and soap still remain in the water. Ask the students if they would drink this water, and if they think it is safe for the frog to live in.

Take the sponge and place in one of the bins (sponge should absorb some of the pollutants). Explain that the sponge acts like a wetland, because the plants that live in a wetland absorbs the water and filters out the pollutants. However, if there is a lot of pollution, the wetland will not be able to filter it all out.

*Extension: Have a class discussion on how to reduce water pollutants.*

### *Wrap Up*

Reiterate that wetlands act as natural filters, filtering out pollutants in water, but once water is polluted it is still very difficult to filter out, and can harm living things like the frog. Have students either write a brief reflection or explain in a sharing circle the importance of clean water for living things.