



No Water Off a Duck's Back

This activity center is part of the **Water Protection** theme.

Purpose of this activity:

Students observe feathers to see what it's like to try to clean oil from birds. This educates them about the hazards of commercial oil spills (such as from tankers) and local problems from oil that reaches natural waterways due to household sources.

Ensure students understand the key terms **highlighted** in the activity by using them in several different contexts throughout the presentation.

Key Messages:

- The quality of water affects both plants and animals. We must ensure that we have a safe water supply (Habitats and Communities 3.1)
- Once the water is polluted, it is difficult to clean and the toxins can be ingested and bioaccumulate (Habitats and Community 3.2)
- Some of the biggest sources of pollution are individuals and their households (Habitats and Communities 1.1 and 1.2)

Materials

- 1 large tupperware container and 2 smaller ones,
- 4 magnifying glasses
- some toothbrushes
- some old rubber gloves
- Laminated pictures of wildlife affected by oil spills
- Feathers
- cooking oil
- food dye
- soap suds
- rubber gloves
- replacement toothbrushes as needed
- aprons or smocks (optional)

Set Up Instructions

Place the containers on a table with the water, the simulated oil spill and then the soapy water in a row. Place the feathers and magnifying glasses beside the water bin, the gloves next to the oil spill, and the toothbrushes beside the soapy bin.

What will I be doing?

You will be leading the discussion and supervising the kids when they use the feathers in various substances.

1. When a group comes, tell them that we are all going to act as wildlife biologists in this activity. These are scientists who study plants and animals and how they interact with **habitat**.
Q: Can anyone tell me what habitat means?
A: A habitat is the natural environment where a plant or an animal lives and grows. There are four components that define habitat: food, water, shelter and space.
In this exercise we are going to examine what happens to ducks when their habitat is disturbed. The students may want to put on the raincoats and vests as costumes to look like they are doing fieldwork (and to protect their own clothes).
2. Everybody gets one feather, large groups (5+ kids) every PAIR of students should get one feather. Have them observe the clean, dry feather with the magnifying glasses. They can hold the feathers with tweezers or with their fingers. Ask them to relay their observations about the feathers.
3. Next, they should dip the feather in the clean water.
Q: What do you observe about the feather now?
A: They are very similar when wet with clean water to when they are dry. The down is fluffy, the pattern on the rest of the feather is still symmetrical and there are air pockets between the fibers. These air pockets help ducks float and stay insulated when they are in the water. The air pockets also help when the bird is flying.
4. **Q:** what do you think will happen to the feather

when we dip it in the oil spill?

A: *just listen to their ideas and their hypotheses.

5. There is a simulated mix of petroleum oil and water. It is really just vegetable oil and food colouring. It is non-toxic and OK to get on your hands. There are rubber gloves available if they don't want to get it on their hands. PLEASE KEEP THEM at the end of the station. Do not throw them out, they will be reused. Have the students dip their feathers in the simulated petroleum and water mix.

Q: What happens to the feathers now? Is the down fluffy? Is the pattern uniform? Are there still air pockets between the fibers?

A: listen to their observations.

Q: If the feather has changed, what does this do to the duck?

A: The duck should not be able to stay warm, have a hard time floating or flying, or gathering food and migration will not be able to happen either.

Q: What will happen to the duck if it ingests the toxic oil?

A: It is possible that the duck will get poisoned and at the very worst die. It is also possible that duck will survive, accumulate these poisons and pass them on to their offspring and distribute these chemicals throughout the food chain (**bioaccumulation**). Natural processes such as migratory and feeding behaviours may also become impacted (if the students can't come up with all of these answers, provoke them to think about them).

Q: what needs to be done to the feathers now?

A: the oil needs to be removed and the feathers need to be cleaned.

Q: Can the duck clean itself? What can we do to help?

A: No. We could try to clean the duck's feathers.

6. Try cleaning the feathers in the soapy water, using the toothbrushes provided. They will quickly see that it does not work. Imagine if we had 300,000 birds to clean.

Q: What happens when a ship spills oil in the ocean? Would we be able to save many animals?

A: No, we would not have much success.

7. If we cannot clean the ducks or other animals, after the water has become polluted, what is the best way to help these animals or prevent future problems? Kids can't prevent ships from spilling oil, but as kids, what can you do? They may or may not know so help to brainstorm some ideas.
8. **Ask:** How many people here have somebody in their family who has a car?

Did you know that 1 out of every 4 people, that's 25%, change the oil in their car and many people pour it down the drain in their house or into the storm sewers. Even if people put it in the garbage and it goes in the dump it can still end up in our lakes, rivers and streams. If it

does, it can end up on the feathers of ducks preventing their ability to maintain natural functions necessary for survival. Every year 370,000L of oil is spilled in oceans from ships. Moreover, we put an additional 660,000L of oil into local waterways because of people pouring it down the drain, into the sewers and throwing it out with the regular garbage.

One drop of oil pollutes 25L of water (that is 13x2L bottles) so that it's not safe for people to drink. It also hurts animals and plants.

Q: What happens to a duck if their habitat is damaged?

A: The duck will either have to adapt to the new conditions, relocate, or in the worst case scenario, die.

Q: What can we do to stop pollution from oil and help to protect plants and animals in our lakes and rivers?

A:

- ◆ Tell our family and friends that they should NEVER throw oil in the garbage or pour it down the street sewers or in the drain
- ◆ if you have used oil, take it to a mechanics' shop where it can be recycled, or dispose of it at the hazardous waste depot
- ◆ Participate in the Yellow Fish storm drain marking program with your friends or family to educate people about the danger to the natural environment of dumping waste substances and items in the storm drains. Your local conservation authority will provide you with kits, training and literature for free.

At the end of the activity, have the kids wash their hands and use the rags for drying.

Background Information:

Two 2L pop bottles of oil (about the amount used in a regular car's oil change) can cause a 3.5 hectare oil slick. The oil will eventually be broken down by bacteria, but this takes a long time and in the mean time it will kill plants, fish birds, insects and all types of wildlife and poison their habitats. Oil is very toxic; prevention is the key!

Most places that do oil changes will accept your used motor oil for recycling free of charge. Contact your local municipality for the location of your hazardous wastes depot, or to find out when local community hazardous waste drop-off days are.

Oil spills can harm birds and other wildlife through habitat destruction, harming their feathers, or through bioaccumulation if the toxins are ingested and the animal doesn't die from that. Bioaccumulation is the storage of toxins that can be passed to offspring or predators.

Clean Up

1. Dump out all water
2. Leave oily water for the next day
3. Wipe off table
4. Tell someone with a red-shirt if more supplies are needed

