# No Water Off A Duck's Back

## Activity Overview
Students play the role of wildlife biologists observing feathers when they are wet, dry and soaked in oil and give oral descriptions of their observations. Students are encouraged to think about ordinary actions, such as pouring used oil or other contaminants down road sewers or household drains and how these could cause pollution.

## Objectives
The students should learn the properties of dry, wet and oil soaked feathers, the effects of oil on the environment and the best ways to clean feathers contaminated by oil. They will also discuss types of household and community oil contamination and methods of prevention.

## Materials
- Feathers
- Liquid Soap
- Magnifying Glasses (4)
- Vegetable oil
- Toothbrushes
- Pictures of oil spills and marine life
- Round bowls 4
- Water
- Squeegee
- Waterless hand cleaner

## Setup
- Please make sure all the materials listed above are present.
- Be sure to organize all the materials in an orderly manner.
- Set up the poster, and make sure you have all laminate photos and feathers out and ready (Please make sure that when passing around the items for the students to see, they return it!)
- Organize your bins. With the four bins provided (all labelled):
  - The first bin will have feathers.
  - The second bin will have water.
  - The third bin will have water and a little bit of vegetable oil.
  - The fourth bin will have water and soap.
- With the bins organized, you will set up three stations.
  **STATION 1**: Station 1 will contain the *bin with feathers*, and a *bin with water* as well as the *magnifying glasses*. This is where you will be talking about the physical properties of feathers, and how the feathers are adapted to ‘roll off’ water, you will demonstrate this to the students and then you will let them try ‘rolling’ water off their feathers.
  **STATION 2**: Station 2 will contain the *bin with water and a bit of vegetable oil*. This is where you will be discussing the properties of crude oil, and what happens to the bird's feather when it makes contact with oil spills and why it is a hazard.
  **STATION 3**: Station 3 will contain the second *bin of water, soap*, and toothbrushes; this is where the students will attempt to wash off the oil from the feathers. You will discuss here the challenges marine biologists and researchers have when cleaning birds and wildlife when affected by an oil spill.
- Throughout the day, make sure the station stays clean and tidy. Use the squeegee to wipe up the tables when need be.

**Note**: Feathers are to be re-used – We cannot give each student a new feather!

## Takedown
- At the end of the day, please make sure all the materials listed above are still present.
- Clean the surface of the tables
- Wash out the bins, be sure to dry them out before placing them into the box of materials
- Keep everything in one place (ie. Feathers stay in the feathers bin etc.)
- If there is a low supply of any of the materials, please advise your steward.

## Safety
- Make sure no one ingests any of the products. Ensure that the participants do not put the toothbrushes in their mouths.

## Vocabulary
**Oil spill** - The harmful release of oil into the environment, usually in the water, sometimes killing plants and animals. Oil spills are very difficult to clean up.
What will I be doing? (Procedure)

Remember that doing an experiment and discovering the answer is more powerful than watching and listening to someone, so try to involve as many children as possible.

Part 1:

- **Say:** “Welcome to No Water Off A Duck’s Back. Today we will be learning about how oil and water affects birds and other marine life. Keep our lakes and well water pollution-free because it can kill any plants and animals that live there, and it reduces water quality.”
- You will be assisting the elementary students as they see what happens to ducks when they are involved in an oil spill.
- **Say:** “I’m going to give you each a feather and magnifying glass. I want you to look at the feather and try describing it to me. What we are describing is called the physical properties." Give out feathers and magnifying glasses to students and encourage discussion.
- **Say:** “Now that we have looked at the physical properties of the feathers, I want you to dip your feathers in water and look at how the water rolls off the feather. You will also notice that the individual fibres of the feather do not stick together.”

Part 2:

- **Say:** “In the next part of our activity, I want you to take your feather and dip them in the bucket that contains water and oil. For this activity, we are using vegetable oil so it is safe to touch, but it has similar properties to the car and crude oil that is often spilled in oil tanker accidents." Have students dip them in.
- **Ask:** "What happened to the feathers this time?”
  - **ANSWER:** The oil forms a sticky substance on the feathers and the fibres no longer separate. In order to remove the oil, marine biologists and volunteers responding to an oil spill try to clean each bird individually using soap and brushes.
- **Say:** “Now I am going to give each of you a toothbrush and some water with liquid soap and I want you to try to remove the oil from their feather.” Give time for students to try.
- **Ask:** “How is the cleaning going? Do you find it hard to clean your feather? Now imagine a bird that has a lot of feathers and think about how long and hard it would be for a marine biologist to clean the feathers.”

Part 3: Review with the students what you have taught them in this activity

- **Ask:** “What are some of the ways that we can prevent oil from polluting water?”
  - **Answer:** Don’t dump used motor oil down storm sewers; take used oil to one of the Region of Peel’s Community Recycling Centres household hazard waste facilities, and have your car’s oil changed at garages that can contain the oil if it spills)
- **Why is oil bad for birds?**
  - **Answer:** It makes their feathers stick together and that means they cannot stay warm

Specific Reminders for Students:

- Water contamination through accidental or deliberate oil spills has serious environmental effects.
- Any amount of oil spilled into the environment reduces water quality and is harmful to wildlife.
- Individuals and communities can prevent this problem through proper containment and disposal of oil products.
- Keep our lakes and well water pollution-free because it can kill any plants and animals that live there, and it reduces water quality.
**Background Information**

- Oil spills on land, rivers, bays and the ocean usually result from accidents involving tankers (large boats that transport oil), pipelines, refineries and storage facilities.
- A spot of oil no bigger than a quarter may be enough to kill a seabird. More than 300,000 seabirds are killed by oil spills every single year off the coast of Newfoundland and Labrador.
- Oil floats on ocean water. In freshwater, it usually floats too (rivers and lakes). It spreads out rapidly across the water’s surface and forms a thin layer called an *oil slick*.
- Birds have feathers that overlap like tiles on a roof. The separate strands on each feather are bound together by rows of tiny hooks, creating a tight weave. This makes the bird’s skin stay warm and dry underneath. However, oil can clog the feathers and allow water to penetrate to the bird’s skin. Oil also can damage the insulating ability of marine mammals such as sea otters. Animals can be poisoned when they swallow the oil while trying to clean themselves.
- Common ways through which household and community oil products get into the environment are through the improper disposal of used motor oil from the family car and commercial cooking oils from restaurants.