

Exxon Valdez Oil Spill and the Environment

Developed by: Jeff Peterson, 2004 Iditarod Teacher on the Trail™

Discipline / Subject: Science

Topic: Oils spills & the environment

Grade Level: 3-8

Resources / References / Materials Teacher Needs:

- "Oil Spills" by Laurence Pringle or "Prince William" by Gloria Rand
- Resource materials for Exxon Valdez
- 1 quart (1 liter) clear glass bowl
- Measuring cup
- Liquid oil
- Powdered washing detergent
- Measuring spoon

Lesson Summary: This lesson can easily be modified to fit the grade level you teach. The lessons focus is the Exxon Valdez oil spill and the effect it had on the environment in Alaska. Teacher will begin with a "read aloud" to provide students with some background information on the spill. Class will conduct experiment "Oily Feathers" to demonstrate the effect oil can have on bird feathers. Students will then either draw a picture to show how the spill effected the Alaskan environment, or research the spill and report back to the class their findings (depending on grade level).

Standard's Addressed: (Local, State, or National)

1. Understands relationships among organisms and their physical environment (Science National Standard).
2. Understands how human actions modify the physical environment (Geography National Standard).

Learning objectives:

1. Students will understand how pollutants effect the environment.
2. Students will gain an appreciation and respect for the environment

Assessment: Method of assessment for learning

- Work sample according to grade level assignment

Procedural Activities

- 1) This lesson should begin with a "read aloud" from a book on oil spills and their effect on the environment. I suggest "Oil Spills" or "Prince William" depending on the grade level you teach. A discussion about the effects of the oil on the environment should follow the reading (be sure to show students where the spill took place).
- 2) Conduct "Oily Feathers" experiment as a class, so students can see how the oil effects birds (and apply to other organisms).
- 3) Students in pairs will research the Exxon Valdez oil spill to learn more about the effects on the environment (could draw a picture of animals and other organisms effected.)
- 4) Students will share their research with the class.
- 5) Students and teacher discuss their role in the environment and how to avoid this type of disaster in the future. Discussion of things students could to for "Earth Day" to help the environment.

Materials Students Need:

- 1) Resource materials and/or drawing paper

Technology Utilized to Enhance Learning:

- Use of Internet as resource for researching Exxon Valdez Oil Spill

Modifications for special learners/ Enrichment Opportunities

- Peer partners
- Additional science experiments on environment

Oily Feathers Experiment

Materials

- 1 quart clear glass bowl
- Liquid oil
- Measuring cup
- Measuring spoon
- Powdered washing detergent

1. Pour 1 cup of water in the bowl.
2. Add 1 spoon of liquid oil.
3. Observe the surface of the water.
4. Sprinkle 2 spoons of powdered detergent over the surface of the liquid.
5. Gently stir the water to mix, but try not to produce bubbles.
6. Again observe the surface of the water.

Why?

Water is heavier and does not mix with oil, so the oil was able to float on the surface of the water. Detergent molecules stick to water on one side and the detergent's opposite side sticks to the oil. The large circles of oil no longer exist because there are molecules of the detergent which allows the oil and water to mix. Detergents can cause a swimming bird to sink and drown. Birds stay afloat because of the oil on their feathers. The birds are waterproof. If the birds become soaked in water containing high concentrations of detergent, the natural oil in the birds' feathers would break up into tiny droplets and allow water to penetrate the feathers. The bird would lose its waterproofing and the extra water on the feathers would increase the bird's weight and allow it to sink.

Source – "Biology" for every kid by Janice VanCleave