

Oil and Paint Contamination Activity

Objectives:

- * Students will experience on a small scale the effect of oil on an aquatic ecosystem.
- * Students will understand that prevention is easier than clean-up when it comes to any form of water contamination.

Mini Lesson 1

Student learning: Students will see how oil reacts with water and other materials in the context of an oil spill.

Materials:

Clean motor oil	Craft stick/feather	1 clear container (pyrex works well)
Straw	Mini marshmallows	Spoon
Cinnamon	String	Paper towel or cotton balls

* Teacher Note * Be careful in your choice of feather. Some species of feather are deemed sacred in Native American cultures. Duck or chicken feathers are deemed appropriate.

* Teacher Note * Unused motor oil is safe to use in this experiment because of the very small amount needed. You could use some vegetable oil mixed with cocoa (for coloring). Vegetable and motor oil are basically the same from an environmental cleanup standpoint.

Instructional Procedures:

- 1) Show students some motor oil in a clean container. Talk about how we are going to use this oil to demonstrate the effects of oil in our ponds, sloughs, oceans, etc.
- 2) Pour a little oil, slowly from about 1 cm above the surface, into a clear container containing water. You may choose to colour the water with food colouring to help see what is going on. Observe what is happening.
 - What is happening to the oil? (floats on the water and will slowly spread across the surface)
 - What conclusion can you draw about oil and water? (Oil and water do not mix.) Thinking about what you have seen, what do you think happens when oil gets into an ocean or slough?

- 3) Use string to try to corral the oil for containment. How could this be useful? This is called containment and is important because otherwise the oil will keep spreading out, creating a thinner and thinner layer, covering more and more surface area.
- 4) Dip craft feather/craft stick into the "mixture".
What happens to the feather/craft stick? (oil adheres to the feather/stick)
- 5) Add a few mini-marshmallows to the oil, representing wildlife. Observe what happens.
- 6) Using the straw, gently blow on the oil, representing wind and waves. What happens? Blow harder; again, what happens?
- 7) Observe the sides of the bowl. Oil should be sticking to the sides.
- 8) Sprinkle some cinnamon on the surface of the oil. Using a spoon, try to scoop the cinnamon off. Is this easy to do? Would it be useful on a large scale for a spill? This is called skimming and is used in conjunction with containment if the spill can be reached in time. It uses a boat that scoops or sucks the oil from the surface of the water.
- 9) Use paper towel to try to absorb the oil. How does it work? Are you able to absorb it all? Does the paper towel absorb water as well as oil? In a real-life application this is done using large sponges called sorbents.
- 10) Discuss how this activity relates to a real oil spill (ocean or slough). In a real-life spill there are many options or approaches used in oil clean up.
- 11) One litre of used motor oil can contaminate 1 million litres of water. Talk about the magnitude of the contamination when huge amounts of oil are spilled into the environment. Show pictures of a large oil spill. Discuss with the class the amount of energy, cost, manpower, etc. needed to clean up a spill.

* Teacher note * great photos of several major oil spills

[http://response.restoration.noaa.gov/gallery_gallery.php?RECORD_KEY\(gallery_index\)=joinphotogal_id,gallery_id,photo_id&joinphotogal_id\(gallery_index\)=82&gallery_id\(gallery_index\)=3&photo_id\(gallery_index\)=31](http://response.restoration.noaa.gov/gallery_gallery.php?RECORD_KEY(gallery_index)=joinphotogal_id,gallery_id,photo_id&joinphotogal_id(gallery_index)=82&gallery_id(gallery_index)=3&photo_id(gallery_index)=31)

This lesson could be done as a lab activity individually or in small groups, or as a teacher demonstration.

Mini Lesson 2

Student Learning - Students will gain first hand experience in cleaning up an “oil spill”

Materials

Clear glass bowl	Straw	Water
“Fun” fur	Cotton balls	Cotton swabs
Cleaning supplies	Newspaper	Cleaning supplies
Motor/vegetable oil	Eye Droppers	Feathers

Acrylic paint

* Teacher Note * Cleaning materials could include dishwashing soap, laundry detergent, baking soda, mineral oil, paper towels, etc. Either choose which ones the students will use, or let them choose and rationalize their choices.

* If you want the students to choose their own cleaning supplies use Oil Spill Labf1.doc, Paint Labf1.doc, Paint Labfur1.doc and Oil Spill Labfur1.doc. If you are choosing the supplies for the students use Oil Spill Labf2.doc, Paint Labf2.doc, Paint Labfur2.doc and Oil Spill Labfur2.doc.

Instructional Procedures

- 1) Review findings from mini lesson 1.
- 2) Divide students into groups (half the groups will need feathers, the other half will need “fur”). The feathers groups will be working on cleaning up marine birds affected by an oil spill or paint contamination and the fur groups will be working on cleaning up marine animals affected by an oil spill or paint contamination. This works out to 4 groups (oil-feather, paint-feather, oil-fur, paint-fur). Pairs or threes would work well.
- 3) Students will follow handouts to complete the activity.
- 4) Students will join together in like groups (feather/fur) and share their findings as to what worked well and what didn't in the clean up.
- 5) Bring all groups together and discuss all findings. Some of these clean up options may work but what would the impact be on the animals? Example: soap
- 6) Discussion - What can **we** do to avoid all the energy and work needed to be put into clean-ups? What organizations can help us? Think about proper disposal of oil filters, used oil, leftover paint, etc.

Additional Resources

[http://response.restoration.noaa.gov/gallery_gallery.php?RECORD_KEY/gallery_index\)=joinphotogal_id,gallery_id,photo_id&joinphotogal_id/gallery_index\)=82&gallery_id/gallery_index\)=3&photo_id/gallery_index\)=31](http://response.restoration.noaa.gov/gallery_gallery.php?RECORD_KEY/gallery_index)=joinphotogal_id,gallery_id,photo_id&joinphotogal_id/gallery_index)=82&gallery_id/gallery_index)=3&photo_id/gallery_index)=31) pictures of a variety of oil spills

Oil Spills by Madeline Klein Anderson, Franklin Watts, 1990 ISBN 0-531-10872-4
-for younger students

Oil Spill Lab - Feathers Students choose cleaning supplies

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Motor/ Vegetable oil	Cotton balls	Water
2 feathers	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a feather. Describe the feather's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your feathers. Record what you observe.

Step 4: Oil has now been spilled in your ecosystem. Use an eyedropper and drop several drops of oil onto the feathers. Rub the oil gently into the feathers to simulate the bird trying to clean itself. Observe and record what you see. How have the feathers' appearance changed since Step 3?

Step 5: What method or cleaning supplies would you use to clean your feathers? Choose 2. Why did you choose these?

Step 6: Using the cleaning methods or supplies you chose, go ahead and clean your feathers. How did each work?

Paint Spill Lab - Feathers

Students choose cleaning supplies

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Acrylic paint	Cotton balls	Water
2 feathers	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a feather. Describe the feather's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your feathers. Record what you observe.

Step 4: Paint has now been spilled in your ecosystem. Drop several drops of paint onto the feathers – **Do NOT use eyedropper**. Gently rub the paint into the feather to simulate the bird trying to clean itself. Observe and record what you see. How have the feathers' appearance changed since Step 3?

Step 5: What method or cleaning supplies would you use to clean your feathers? Choose 2. Why did you choose these?

Step 6: Using the cleaning methods or supplies you chose, go ahead and clean your feathers. How did each work?

Oil Spill Lab - Fur Students choose cleaning supplies

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Motor/ Vegetable oil	Cotton balls	Water
2 fur pieces	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a piece of fur. Describe the fur's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your fur pieces. Record what you observe.

Step 4: Oil has now been spilled in your ecosystem. Use an eyedropper and drop several drops of oil onto the pieces of fur. Rub the oil gently into the fur to simulate the animal trying to clean itself. Observe and record what you see. How has the fur's appearance changed since Step 3?

Step 5: What method or cleaning supplies would you use to clean your fur? Choose 2. Why did you choose these?

Step 6: Using the cleaning methods or supplies you chose, go ahead and clean your fur. How did each work?

Paint Spill Lab - Fur

Students choose cleaning supplies

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Acrylic paint	Cotton balls	Water
2 pieces of "fur"	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a piece of fur. Describe the fur's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your pieces of fur. Record what you observe.

Step 4: Paint has now been spilled in your ecosystem. Drop several drops of paint onto the pieces of fur – **Do NOT use eyedropper.** Gently rub the paint into the fur to simulate the animal trying to clean itself. Observe and record what you see. How has the fur's appearance changed since Step 3?

Step 5: What method or cleaning supplies would you use to clean your fur? Choose 2. Why did you choose these?

Step 6: Using the cleaning methods or supplies you chose, go ahead and clean your fur. How did each work?

Oil Spill Lab - Feathers Cleaning Supplies Chosen by Teacher

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Motor/ Vegetable oil	Cotton balls	Water
2 feathers	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a feather. Describe the feather's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your feathers. Record what you observe.

Step 4: Oil has now been spilled in your ecosystem. Use an eyedropper and drop several drops of oil onto the feathers. Rub the oil gently into the feathers to simulate the bird trying to clean itself. Observe and record what you see. How have the feathers' appearance changed since Step 3?

Step 5: Using the cleaning methods or supplies that you have been given, go ahead and clean your feathers. How did each work?

Oil Spill Lab - Fur Cleaning Supplies Chosen by Teacher

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Motor/ Vegetable oil	Cotton balls	Water
2 pieces of fur	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a piece of fur. Describe the fur's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your pieces of fur. Record what you observe.

Step 4: Oil has now been spilled in your ecosystem. Use an eyedropper and drop several drops of oil onto the pieces of fur. Rub the oil gently into the fur to simulate the animal trying to clean itself. Observe and record what you see. How has the fur's appearance changed since Step 3?

Step 5: Using the cleaning methods or supplies that you have been given, go ahead and clean your pieces of fur. How did each work?

Paint Spill Lab - Feathers Cleaning Supplies Chosen by Teacher

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Acrylic paint	Cotton balls	Water
2 feathers	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a feather. Describe the feather's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your feathers. Record what you observe.

Step 4: Paint has now been spilled in your ecosystem. Drop several drops of paint onto the feathers – **Do NOT use eyedropper**. Gently rub the paint into the feather to simulate the bird trying to clean itself. Observe and record what you see. How have the feathers' appearance changed since Step 3?

Step 5: Using the cleaning methods or supplies you were given, go ahead and clean your feathers. How did each work?

Paint Spill Lab - Fur Cleaning Supplies Chosen by Teacher

Follow the instructions to complete the lab activity.

Step 1: Assemble all needed materials:

Acrylic paint	Cotton balls	Water
2 pieces of "fur"	Eye dropper	Cotton swabs
Cleaning supplies		

Step 2: Examine a piece of fur. Describe the fur's shape, color, texture and over-all condition.

Step 3: Use an eye dropper and drop several drops of water onto your pieces of fur. Record what you observe.

Step 4: Paint has now been spilled in your ecosystem. Drop several drops of paint onto the fur – **Do NOT use eyedropper**. Gently rub the paint into the fur to simulate the animal trying to clean itself. Observe and record what you see. How has the fur's appearance changed since Step 3?

Step 5: Using the cleaning methods or supplies you were given, go ahead and clean your fur. How did each work?

Oil Spill Wordfind

o s f q v u q t e j x b q e e i g r j y
 k r p e j t c n n y g r r t h i i e p y
 a p x i r j i i t e i f v a o d c l f g
 z k p j l l a i v t m u w n r l j n m x
 m a s j e l e h h q j n v i x r a w r s
 t f k r m e b w q u h z i m l o c g o d
 q x o e v q s a n s j c d a w d e y a z
 l h i d z p r v i k u j h t t p l e r v
 s t o o o o e e t i d h q n y n r i t n
 z i r n i m k s g v o s e o c p o u f g
 l k g y y v n t u a k o b c s a d c v e
 u e y b c c a d q z p r b o a t s g n y
 s b a b h s t n m l e b e s m t m g v i
 m j g p u n a e l c b e l c f u f s l f
 x z v q b n l n p s t n x q a h v m b i
 b b p x a n p c z g v t o o t f v h k k
 l p c t j j m r u s x g r n f l r b q k
 m m c a z b n p u h d g u p m t c u u x
 p i y a q j n k p g n r g g g t i f s b
 k f i n x p z n d h w d s k i m m i n g

Word Bank

wildlife	waves	boats
tanker	surface	cleanup
spread	sponges	containment
spill	sorbent	contaminate
skimming	shoreline	oil