Activity 5: Oil on the Beach

Overview

People all over the world depend on oil. In the United States we use more oil per person than anywhere in the world for heating our homes; driving cars, trucks, buses, boats, and airplanes; lubricating machinery including bicycles; making plastics; and growing our food (petroleum-based fertilizers). The list goes on and on.

The more oil we use, the more we need to drill wells both on land and under the ocean, the more is transported, and the greater the probability that more is leaked, spilled, and dumped into the ocean. People can help prevent oil from polluting the ocean by using less, conserving energy, keeping cars well tuned, buying organically grown produce, and buying or using fewer plastic toys, bags, and other plastic products when other materials are available.

In this activity, students learn where oil comes from, the many ways people use oil, and how and why conservation of oil is important. They get "**Into** the Activities" with Partner Parade and a class Anticipatory Chart. In Session 2, students go "**Through** the Activities" as they investigate the effects of oil on the feathers of birds. In Session 3, the students help make a model beach in a tub and observe how it is affected by simulated tidal changes as oil spilled offshore washes onto the beach. In Session 4, students work in small groups to attempt to clean up an oil spill using a variety of methods.

Through experimentation, students discover that oil spills are almost impossible to clean up—the best defense is prevention. They discuss how oil spills can be prevented by reducing the use of oil and taking measures to make oil drilling and transport safer. Also reinforced by this activity is the concept that oil spilled at sea can travel with currents, tides, and waves to the sandy beach where it can harm the animals and plants that live there. Several "Going Further" activities are suggested for going "**Beyond** the Activities."

What You Need

For the class:

- ❑ a picture for each student from magazines or newspapers showing oil-based products (e.g., plastics) or showing oil being used in cars, trucks, motorcycles, tractors, factories, refineries, power plants, farm fields, etc.
- ❑ 6–10 sheets of chart paper (approximately 27" x 34")
- ❑ markers (several colors, wide tips)
- ❑ paper for sketches and Anticipatory Charts
- ❑ 1 cup of olive oil or other heavy vegetable oil (for the oil spill)
- ❑ 1 teaspoon of dry black tempera paint powder (to color the oil)
- ❑ 1 dropper bottle or squeeze bottle (for containing oil)
- ❑ 1 plastic dishpan
- ❑ a pencil or small cork to plug the hole made in the dishpan
- ❑ a pitcher or other container filled with enough water to fill the dishpan three quarters full
- ❑ a bucket or similar container to catch water
- ❑ a fist-sized rock
- ❑ 10–12 items to represent typical beach organisms, such as small rubber or plastic beach animals (crabs, etc.); drift algae, driftwood, plastic aquarium plants; crab molts, shells, etc.
- ❑ water-resistant glue (for gluing some of the "organisms" onto the rock)
- ❑ half a bucket of sand to form a sloping beach in the dishpan
- ❑ (*optional*) an empty quart and gallon container (see bottom sidebar on page 100)
- ❑ (*optional*) marine sanctuary posters (see "Resources")
- ❑ (*optional*) oil spill videos such as "When the Spill Hit Homer" (see "Resources")

Nearly all National Marine Sanctuaries in the United States provide free educational posters to teachers. See "Resources" for a list of addresses.

For Fouled Feathers in Session 2

For each group of 4 students:

- ❑ 1 cup of water
- ❑ the dropper bottle of prepared oil (see "Getting Ready" #3)
- ❑ 1 small bowl
- ❑ 4 bird feathers
- ❑ 2 hand lenses
- ❑ 2–3 sheets of newspaper to cover desks
- ❑ (*optional*) 1 tablespoon dishwashing detergent

For Cleaning the Oil Spill in Session 4

For each group of 6 students:

- ❑ a ziplock bag with one of each of the following clean-up items:
  - __ nylon stocking square (about 2" x 2")
  - __ cotton ball
  - __ sand (or kitty litter)
  - __ hay or straw (a small handful)
  - __ feather
  - __ fake fur (about 2" x 2")
- ❑ a plastic, aluminum, or paper bowl (plastic or aluminum bowls can be reused throughout this activity; paper bowls will also work, but you will need to use a new one each time)
- ❑ 10 drops of prepared oil (see "Getting Ready" #3)
- ❑ enough water to fill bowl two thirds full 1–2 times
- ❑ several paper towels
- ❑ 3–5 sheets of newspaper to cover desks
- ❑ 6 Oil on the Beach student sheets (masters on pages 106–108)
- ❑ 6 pencils

If your groups must be larger than six students, you will need some extra clean-up items. You could add spoons or 2" x 2" cardboard squares to the bags of clean-up items.

Getting Ready

1. A week or so before you plan to start this activity, have the students conduct interviews at home with parents, guardians, grandparents, siblings, and other family members or friends about their oil use using these questions:

a. What are some ways that we use or depend on oil and oil-based products?
b. Where do you think oil comes from?
c. How do you think oil gets into the ocean?
d. Where can we find out more about oil? (encyclopedia, library, internet, other friends or family)

Many, if not most, children have no idea where oil comes from or that they use and depend on it in so many ways each day. The family interview gives them the opportunity to start thinking about the subject of oil and gives them some "prior knowledge" which they can then contribute to the class discussions.

Students should take notes during the interviews and be prepared to share their findings with the class. Information from the interviews will also help prepare them for the Partner Parade discussions.

2. Have students look with their families at home for magazine and newspaper pictures to bring to school. The pictures should be of oil-based products (e.g., plastics) or of oil being used in cars, trucks, motorcycles, factories, refineries, power plants, farm fields, etc. Start collecting any additional pictures that you can find on this subject.

The oil used in this activity is entirely biodegradable and safe for student use, yet looks and acts very much like crude oil. We must emphasize in the strongest possible terms that you should NOT use actual oil for these activities since it is a toxic substance and cannot be disposed of safely or legally through the garbage or down drains.

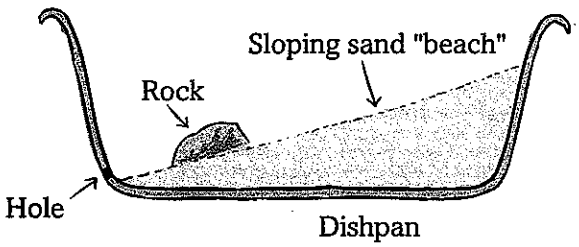
3. Prepare the "oil" using the following recipe:

Oil Recipe

- *1 cup olive oil or other vegetable oil*
- *1 very scant teaspoon black powdered tempera paint*

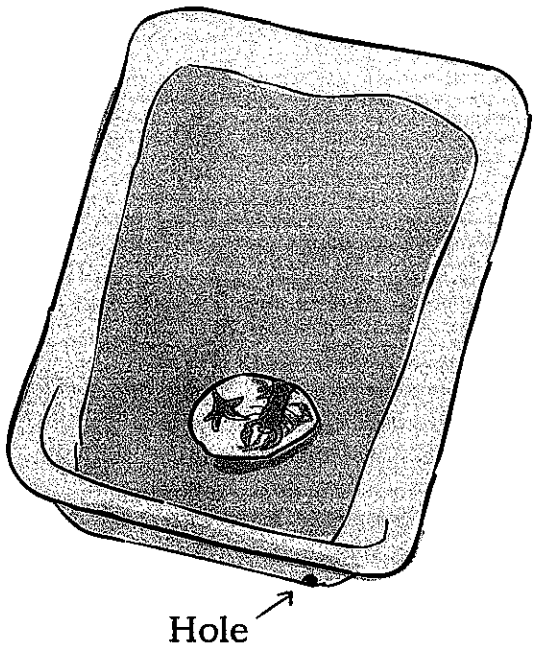
Place in a dropper bottle or squeeze bottle and shake very well. Shake it again very well before every use. This is enough oil for the whole group.

You can test the mixture by putting a few drops in a cup of water—the drops should float at the surface. If they sink, add more oil.



4. Pierce the dishpan on the side, very near the bottom corner using a nail or a drill. Small corks work the best to plug the hole, but if you use a nail to create a hole just a little smaller than a pencil, you can use a sharpened pencil to plug the hole.

5. Place enough sand in the pierced dishpan to simulate a sandy beach sloping up from the hole. Do not cover the hole with sand.



6. Glue one or two of the model beach organisms onto the rock and place it on the sand near the hole in the dishpan. Buy small, inexpensive plastic beach animals or use the beach drift from the Beach Buckets in Activity 1.

7. Start the class Anticipatory Chart. Draw a line down the middle of the chart paper to divide it in half lengthwise. At the top of one column write "What we already know about oil." At the top of the other column write "What we want to find out about oil."

8. Write out the Key Concepts for this activity in large, bold letters on separate sheets of chart paper and set aside.

- **Oil spilled at sea can travel with currents, tides, and waves to the sandy beach where it can harm the plants and animals that live there.**

- **Oil spills are almost impossible to clean up. People can help to prevent them by reducing their use of oil.**

9. (*Optional*) Obtain videos that depict oil spills and marine sanctuary posters (see the "Resources" section).

Session 1: Partner Parade

1. Have the students recall the Partner Parade activity. Remind them that just as before, they need to cooperate, follow directions, and talk quietly with each of their partners. Pass out the pictures showing oil use that you and the students collected to aid their conversations.

2. Follow the steps on pages 30–32 to conduct Partner Parade.

3. Ask students the following Partner Parade discussion questions:

- How do people use oil?
- Where do you think oil comes from?
- How does oil get into the ocean?
- What are the effects of an oil spill?
- How do you think you would clean up an oil spill?
- How can people prevent oil from polluting the ocean?

4. Move along the two lines to help partners as needed. When you call time, have several students report what they discussed with their partners.

5. At the end of the activity, ask students to sit down with their final partner and think about some of the following questions. Then lead a class discussion.

- Did it seem like the whole class was cooperating?
- Did you learn something new?
- Do you feel like you are becoming a better listener?
- Did you like having the chance to talk to classmates that you don't usually talk to?

Anticipatory Chart on Oil

1. Have students continue to work with their final Partner Parade partner. Review with them how to create a class Anticipatory Chart. Pass out the paper and have students begin their own chart by copying the class chart onto a piece of paper.

2. Tell the class that through Partner Parade they have come up with some great ideas about oil and oil spills. Now it's time to get those ideas and their questions down on paper. Ask, "How will this chart help us later?" [It documents the wealth of our collective knowledge and gives us ideas for new projects and activities.]

Having students record their ideas and questions on their own charts provides valuable practice in organizing their thoughts in writing. If this type of recording is not appropriate for some of your students, then verbal discussions followed by a whole group sharing, with the teacher recording on the class chart, is a fine alternative.

3. Have them look at their pictures showing oil use from the Partner Parade. Tell them to discuss the two questions on the chart and write notes on their own charts.

4. When the class is ready, call them back together to share their best ideas with the whole group. Record the group's ideas on the class Anticipatory Chart. You can use pictures or icons representing everything the class can think of that uses or is made from oil. Display the chart and refer back to it throughout the activity.

The responses to the Partner Parade and the Anticipatory Chart can be used to assess your students' prior knowledge. If students seem generally familiar with the topics of where oil comes from, how we use it in our everyday lives, how we can conserve it, and the problem of oil spills, you can move directly into the Fouled Feathers activity and the activities that follow. If they do not seem to have much prior knowledge of these topics, you may have to proceed more slowly and provide more directed information.

Session 2: Brief Oil Talk

1. If it has not already been brought up in Partner Parade, you may want to **very briefly** tell students some information about oil use, drilling, transport, and spills (see in particular the second paragraph in "Behind the Scenes" for this activity, on page 115).

Using graphics to illustrate this brief introduction will give all students, especially English language learners, a better opportunity to learn and remember the content.

2. Illustrate your brief comments, as possible, with graphics, simple icons, and key words written on chart paper. Depending on your time limitations and level of student interest, you may want to encourage a few questions and brief discussion to lead into the Fouled Feathers activity.

Fouled Feathers

It is quite possible that some of your students have never seen crude oil, somewhat similar to used motor oil, and are not familiar with its properties. You may want to conduct a brief discussion about the oil's thickness, stickiness, and toxicity. You could also compare it to vegetable or other cooking oils with which your students may be more familiar.

1. Ask the students to imagine that they got oil all over their skin. What would it feel like? What would it do to their skin? How would they get it off? Say, "Now imagine you are a duck and have suddenly paddled into an oil spill!"

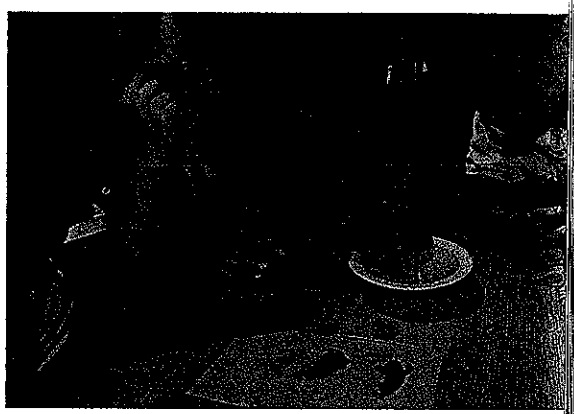
2. Tell them they are going to see what happens when birds get oil on their feathers. They will compare oiled feathers with those dipped in clean water.

3. Divide students into groups of four. Pass out the materials to each group. Have students cover their desks with newspaper. Tell them that they will each have a job to do in this investigation. Lead the students through the following steps.

Some teachers reinforce the division of labor on the student teams by numbering the students (1, 2, 3, 4) then providing instructions for Student #1, #2, etc.

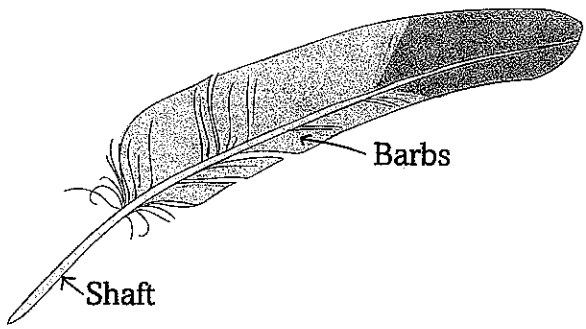
4. Have one student in each group pour water into their small bowl until it is about half full.

5. Have another student dip two bird feathers into the bowl of plain water. This represents a bird that lands in the water to rest or catch food. Caution students to dip the feathers into the water **quickly** and then remove to dry. When they remove the feathers, they should place one on top of the other, and then set them on a table top to dry. (Leaving the feathers to soak too long may prevent the feathers from drying out properly.)



6. Have a third student shake the dropper bottle well then drop a single drop of oil onto the surface of the water in the bowl. Ask students to pretend that this is an oil spill from a tanker just offshore.

7. Have the fourth student quickly dip the remaining two clean, dry feathers into the bowl through the oil. Remove them. Is the oil visible? Place one on top of the other and set alongside the feathers that were dipped in plain water to dry.



8. Have each group look closely at the feathers. They can use hand lenses for more detailed examinations. Have them sketch each of the feathers including the barbs and shaft, and describe to their group what they observe. Assign one student in each group as a recorder to write down and illustrate what the group observes. What happened to the feathers? How did the feathers dipped into plain water compare to the ones dipped into oily water? Did they differ in how they dried? [In general, the feathers dipped into clean water dry quickly and separate from one another. The oiled feathers remain matted together.] Would matted feathers help or hurt the bird?

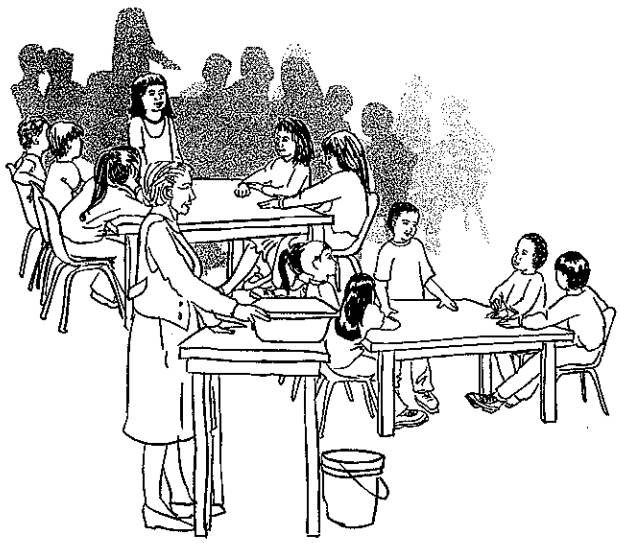
Several teachers have reported that students' interest about feathers and birds was so catalyzed by this observation they decided to do more activities related to the topic. You may want to have your students study feathers by looking at labeled diagrams, learning the names of feather parts, drawing different types of feathers, reading about their functions, etc.

9. Explain to the students that when a bird has matted feathers, the feathers do not repel water. The cold ocean water gets under the feathers to the bird's skin, the bird cannot stay warm, and will freeze to death. Many oiled birds try to "clean" their feathers through preening and die from ingesting the oil.

10. (*Optional*) Now have each group wash the oiled feathers in the dishwashing detergent. (Dawn® was used on the *Exxon Valdez* spill to clean birds and other animals.) Again have them sketch the feather after it dries. Does it still look different from the feather dipped in plain water? In what ways? Explain that a bird whose feathers have been "cleaned" with detergent still cannot survive at sea. The problem is that the detergent also removes their natural oils, so the feathers appear fuzzy and messed up with all the barbs going in different directions. The birds must be kept warm in captivity until their natural oils are replenished or until they molt and grow new feathers. Washed birds are sometimes tested for buoyancy in a pool before being released.

Session 3: Oil on the Beach (Teacher Demonstration)

High Tide



1. Tell the students that they are going to create another beach model to find out more about the effects of oil on a sandy beach. Bring out the dishpan containing a layer of sand.

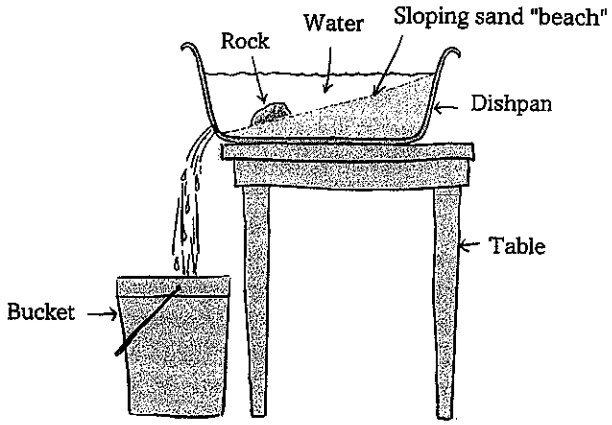
2. Divide students into groups of six and have them number off (1–6). Have Student #6 from each cooperative group come up to the front and choose one or two items from a pile of the beach debris (algae, crab molts, shells, plastic animals, etc.). Have them place the items one at a time on the beach model being created in the dishpan. Once all the items have been placed, carry the dishpan around the room so each group gets to see the beach that was created.

3. Plug the hole in the dishpan with a pencil or cork and fill it with water to the high tide line (until about three quarters of the sloping sand is covered). Call on Student #5 from each group to come up and see the high tide.

4. Ask the #5 students, "Do the organisms appear to be in the right place based on what we've learned about the sandy beach?" "Should we move some of the organisms to a different place on the shore?" Have them report back to their groups about what they saw. [The sand, debris, and organisms are now covered with water, except for those which were placed above the high tide line. Also, some

organisms, sand, and beach drift were moved by the incoming tide.]

5. Call on Student #4 from each group to watch as you remove the plug and the water drains into a bucket as the tide gradually changes from high to low. Have the students report back to their groups about what they saw. [The organisms are left strewn out on the beach as the tide recedes. Some sand is dragged out with the tide into the ocean bucket and some organisms were pulled towards the ocean.] Gently pour the water from the bucket back into the dishpan trying to disturb the sand as little as possible—it is now high tide again.



Oil Slick

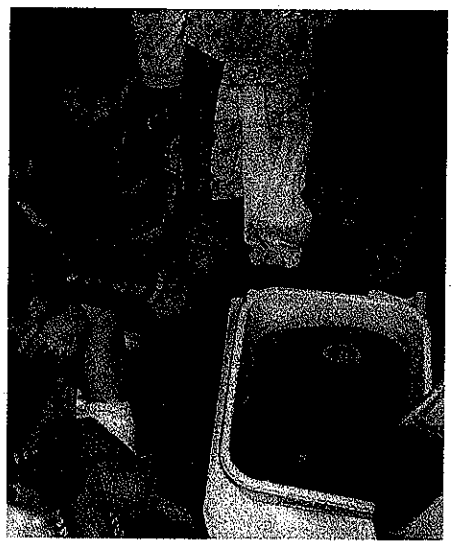
1. Remind students that this whole activity is about oil on the beach. Given that, can they predict what might happen next?

2. Tell them that something terrible has indeed happened offshore of their beach. An oil tanker has collided with an underwater reef and oil is starting to leak out of the damaged hull. Call on Student #3 from each group to watch as you add about three tablespoons of oil to the surface of the water to simulate the offshore oil spill. Let students know it is high tide now in calm weather and the oil slick has not yet reached the beach.

If you are using fine sand, it may swirl up into the water at this point and make it difficult to see the organisms. This isn't a problem, but an opportunity to talk about what happens to the beach during a storm or with rough seas. You may want to tell students that a huge storm has just hit their beach.

3. Have the #3 students describe to the class the way the oil spreads out over the surface of the water to form a slick. Have the students report back to their groups about what it looked like as the oil slick formed.

4. Have the whole class file by to see the oil slick for themselves.



5. Have Student #2 from each group come up to observe what happens next. Remove the plug and again allow the water to drain into the bucket as the tide gradually changes from high to low. [Some of the oil will drain out to sea with the outgoing tide, but most of it will remain on the surface of the beach, coating the sand and the beach organisms.] Have students report back to their groups.

6. Have Student #1 from each group come up to watch as you replace the plug and pour the water from the bucket slowly back into the dishpan so that the oiled beach again approaches high tide. What happens to the oiled beach

We have organized this powerful demonstration in this way to minimize crowd control problems around such a small viewing area. This method also emphasizes the importance of making good observations and communicating them clearly and completely to others. We encourage you to try it this way, but if you can't bear to have so few students observing each segment here are some options, suggested by teachers: video the demonstration and play it back for the whole class; do the demonstration twice, each time with half the class gathered around; have each group come up one group at a time to observe the results of each segment; gather the entire class around the demonstration area in small concentric rings, with the front row sitting, the next row kneeling and the last row standing—you could rotate students from the outer rows forward for each segment. Also, you may want to demonstrate another tidal cycle if you have time. The more times the tide changes, the more dramatic the results.

If three tablespoons of oil could cover this much water, can the students imagine how much water would be covered by the 11 million gallons of oil spilled in Prince William Sound, Alaska in 1989? Hold up empty quart and gallon containers for comparison. Then tell students these facts:

- *one quart of oil can produce a slick approximately two acres in size (an acre is almost as large as a football field)*
- *one gallon of oil can produce a slick about eight acres in size*

now? [The oil from offshore comes back in with the tide, and if the tide rises further than the first time, the mark of blackened sand also rises on the shore. This time, the oil is broken up into more, smaller globs, and is more evenly dispersed.] Have the students report back to their groups.

7. Remove the plug for a final low tide and have Student #6 from each group come up to watch how the oil covers the organisms on the beach. Have them dig down into the sand a little way to see if there is any oil below the surface. [The oil works its way deeper and deeper into the sand with each tidal cycle.] Have students look in the bucket to notice that the ocean stays polluted, and the beach looks worse and worse. Have the students report back to their groups.

8. Finally, carry the dishpan around the room so that everyone can have a look at the effects of oil on the beach.

9. Remind students that in real life on most coasts, the tide changes every six hours. The more times the tide changes, the more difficult it is to clean up the spill. The results students have before them represent a beach only 18 hours after a spill.

My Buddy Says

1. Your students by now are familiar with this activity structure. You may want to remind them about really listening to a classmate.

2. Conduct My Buddy Says, using three or four of the following prompts and questions:

- Pretend that the sandy beach organisms in our model beach were real. How do you think they would be affected by an oil spill washing up on their beach?
- Where did the oil seem to go at low tide?
- What happened to the oil at a very high tide?
- Do you think that the oil that got worked down into the sand would have any effect on the animals of the sandy beach?
- Do you think you could clean all the oil off the beach? How?

3. Spend some time discussing the last question with students. Write down their responses on chart paper or a chalkboard so they can be revisited after they actually try to clean up a spill in the next session.

Session 4: Cleaning the Oil Spill

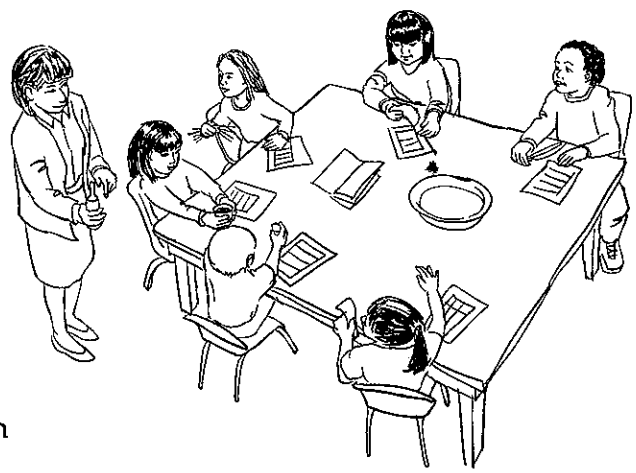
1. Ask students to pretend there has been an oil spill out at sea. They know from the demonstration that once enough time has gone by for the tides to rise and fall, the oil will be impossible to clean up. Tell them their job is to try to clean up the spill before it hits the beach.

2. Divide the students into groups of six. Each group will receive their own small ocean where an oil spill has just occurred, and several clean-up items. Each item represents a method actually used to clean up oil spills.

3. Distribute the Oil on the Beach data sheets (masters on pages 106–108) to each student. Show and describe each clean-up item in the order on the data sheet. Point out the columns for predictions. Explain what it means to predict. Model the process of making a prediction for the first item on the list and recording the prediction on the data sheet by checking the appropriate box.

4. Ask all groups to have a brief discussion in which every student in the group makes a prediction about how well each of the items will clean up the oil. (The whole group doesn't have to agree, but they should discuss their ideas and reasoning with each other.) Tell students they'll get to write down why they predicted as they did on their data sheet.

5. Introduce and model the activity as necessary. Explain that they will work in their teams with a bowl of water that has a few drops of oil in it. Each student will choose one item from the bag. The student with the first item listed on the data sheet tries to clean up the oil from the water first. Then the student with the second item listed on the data sheet tries, and so on. Students should place the oiled clean-up items on the paper towels.



6. Have the groups cover their tables with newspaper. Distribute one bag of clean-up items to each group and have the students empty them out so they can look at each item.

7. Distribute the bowls and paper towels and have each group fill their bowl two thirds full with water and place it in the center of the group. Walk around the room and place 2 or 3 drops of oil into each bowl of water, remembering to shake the dropper bottle well.

8. Have each student choose one item from the bag and proceed as you described. Circulate to be sure students understand the task and are working together. If, after a student has tried their item, the group thinks most of the oil has been cleaned up, you can add 2–3 more drops of oil to their bowl for the next student to clean up. This gives each student the same opportunity to clean up the oil.

9. As each item is tried, each student should decide how well the item cleaned up the oil and check the appropriate box on their data sheet. (Again, the entire group doesn't have to agree, but they will probably want to discuss their results and talk about why their results may not agree.) Ask students to briefly describe their results on their data sheets.

Debriefing the Results

1. After each group has completed their oil clean up and recorded the results on their data sheets, lead a class discussion based on the questions below. Record conclusions of the discussion on chart paper or the chalkboard.

2. Ask, "What worked the best and what did not work well at all?" [The students may find that feathers and fur worked the best at cleaning the oil. This graphically demonstrates why oil spills are especially dangerous for shorebirds, seabirds, and sea otters. Their fur or feathers attract and soak up oil. The barbs of the birds' feathers stick together and the sea otters' pelt becomes sticky and matted. They are then no longer able to keep themselves waterproof and are therefore at risk of hypothermia and freezing. Also, both birds and mammals depend on preening to keep themselves meticulously clean. In the process of cleaning themselves they may become sick and weak from ingesting the toxic oil.]

3. Ask, "Which group thinks their water is now clean?" If a group thinks they really cleaned it up, ask, "Is the water clean enough to drink?" [No, so what does "clean water" really mean? How clean is clean? Should it be as clean as it was before the spill, or just cleaner than it was after the spill?]

4. Now raise the question—"Would any group say they really cleaned up their oil spill?" "Was any group 100 percent successful?" [Their responses may lead the class to conclude that the phrase "oil spill clean up" contradicts itself, because it is not really possible to clean up an oil spill completely.]

5. Ask, "Then what can we do to prevent oil spills from happening in the first place?" [engage in oil conservation, encourage use of alternative energy sources, tune up cars] Remind students that although oil spills by large vessels on the ocean are major disasters, much more oil makes its way to the ocean each year by leaking out of cars onto streets or being poured in small amounts down storm drains where it eventually drains to the ocean. This emphasizes the fact that individuals also have a great deal of responsibility for reducing oil pollution. As a society, we can also propose laws that make oil drilling and transportation safer.

6. Now ask, "What should we do with all the oil-soaked clean-up items?" Explain that this is the same question people ask when actual oil spills occur and the oil-soaked material is brought ashore. Some people say that these techniques simply move the oil spill from the water to the land.

In real-life situations, often the oily clean-up material is burned, which just moves the pollution to the air. There are recycling centers which will take the used oil and oily water and materials used in a clean-up activity or the used oil from car oil changes. We can't just put motor or other industrial oil in landfills because it ultimately makes its way to the water and may also harm animals visiting the landfills in search of food. For this activity though, we don't have to worry because our oil is non-toxic and is made from biodegradable vegetable oil and tempera paint.

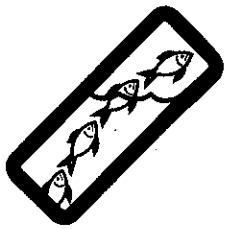
7. Explain the ways that actual clean up procedures were simulated by the items used in this activity. For example, oil is strongly attracted to oil-based materials like nylon—the nylon floats on the surface and acts as a filter or sieve, collecting the oil and letting the water pass through. Sand and/or kitty litter absorb the oil, but because they are heavier than water, as they sink they carry the oil to the bottom with them. Cotton and hay are also used to absorb the oil. Feathers and fake fur represent the unlucky animals coming in contact with the sticky oil.

8. Hold up the Key Concepts for this activity one at a time, and have one or more students read them aloud. Post them near the class charts from this activity or sanctuary posters.

- **Oil spilled at sea can travel with currents, tides, and waves to the sandy beach where it can harm the plants and animals that live there.**

- **Oil spills are almost impossible to clean up. People can help to prevent them by reducing their use of oil.**

Going Further



1. Have students work in pairs to write their own Key Concepts for this series of environmentally-related activities. Students can take charge of their own learning by deciding for themselves what they think is important. These new Key Concepts can also become part of student portfolios used for assessment.

2. Students can create a mini-book which includes drawings and descriptions about what they learned (see pages 22–25 for instructions and templates). Have students title their books, "On Sandy Shores." Chapter titles can be: Chapter 1: The Sandy Beach; Chapter 2: The Oil Spill; and Chapter 3: Who Is Responsible?

3. Have students keep a tally of every time they do or use something that uses or is made from oil. Then discuss alternatives to each oil consuming activity. They can do this first at school in pairs, then at home.

4. Have students work in groups to make posters about conservation, such as walking or riding a bicycle to school or their parents taking the bus to work.

5. Visit a bird rescue center and find out how to volunteer during an oil spill.

A good connection to Activity 5 is provided in the Raindrops and Oil Drops activity from the GEMS Teacher's Guide Liquid Explorations. *In that activity, students have the opportunity to play with drops of water and oil to investigate questions about the shapes of the drops and their "mixability." This activity was used by many teachers in Alaska following the large oil spill there, giving students direct experience to help them better understand the news reports they heard.*

6. Draw pictures of the marine sanctuaries and estuarine reserves around the United States. (See "Resources" for addresses for posters and information.)

7. Watch videos of oil spills and their aftermath such as the *Exxon Valdez* oil spill that occurred on March 24, 1989 in Prince William Sound in Alaska, or the Shetland Island spill in 1994. (See the "Resources" section.)

8. Have groups of students pick one of the following pantomime scenarios (or make up one of their own) to act out. Have the rest of the class try to guess what they are dramatizing. Alternatively, they can draw a mural depicting one of these scenarios.

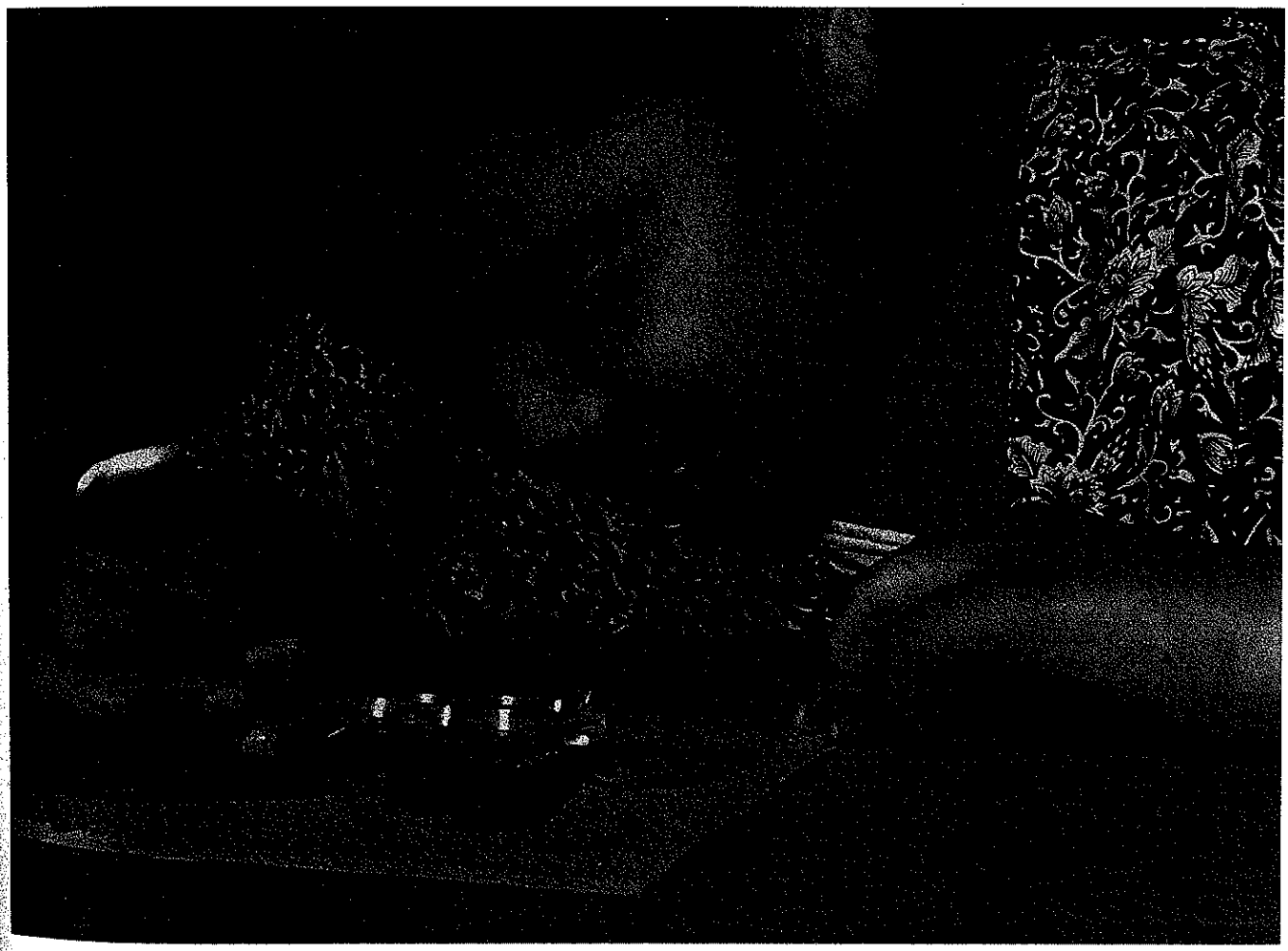
- Sand crabs live just under the surface of the sand and stick out their feathery antennae in the waves to breathe and capture food. What if their antennae are covered with oil? Can they still eat?

- Many shorebirds feed on sand crabs. What happens to the shorebirds if their sand crab food is covered with oil?

- Beach wrack is home and food for many organisms which in turn serve as food for shorebirds. What happens to this small community when it is coated with oil?

- Shorebirds feeding on the sandy beach may become covered in oil as they search for their prey and rest on the sand. What effect does the oil have on their ability to capture prey, escape predators, and stay warm?

9. Have students make posters, buttons, or bumper stickers to tell others about what they've learned about oil pollution and conservation.



Name _____

OIL ON THE BEACH

Prediction Data Sheet

Check the box which describes your prediction the best.

Name of clean-up item	PREDICT How well will it clean up the oil?		Why do you think this will happen?
	will clean up a little 	*will clean up a lot* 	
1. Nylon			
2. Cotton Ball			
3. Sand or Kitty Litter			
4. Hay			
5. Feather			
6. Fake Fur			

Name _____

OIL ON THE BEACH

Results Data Sheet

Check the box which describes your results the best.

Name of clean-up item	TRY IT! How well did it clean up the oil?		Describe your results.
	cleaned up a little oil 	*cleaned up a lot of oil* 	
1. Nylon			
2. Cotton Ball			
3. Sand or Kitty Litter			
4. Hay			
5. Feather			
6. Fake Fur			

Name _____

OIL ON THE BEACH

Data Sheet Questions

1. What worked well?

2. What did not work well?

3. Did your group clean up all the oil?

4. Think back to what you told your partner in the Partner Parade about how you would clean up an oil spill. What was your plan then?

5. Now, how would you clean up an oil spill?