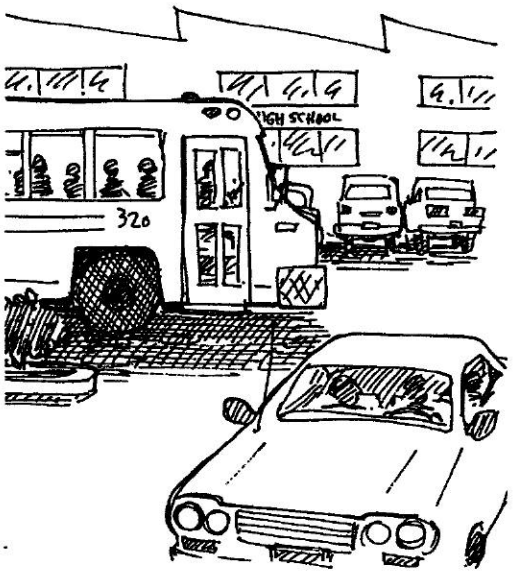
# Who Me?



## Key Concepts

1. Oil pollution can have an adverse effect on natural systems.
2. Everyday activities can permit oil to enter the environment.
3. Personal action can decrease the amount of oil that reaches Hood Canal and other bodies of water.

In the activity "Mini-spills", your students looked for signs of oil spillage in the Seal Rock Campground parking lots, then traced the flow of that oil into Hood Canal. In "Who me?", students examine vehicle use in their school community.

The mini-oil spills that happen when our vehicles leak oil, when we spill fuel, and the like introduce more oil into our waters by volume than do major spills.

Oil, however, is not the only thing cars leave behind on the roads. A car's tires wear on the road and leave cadmium and zinc to be picked up by the next rain. Chromium and zinc wear off the car's body. Copper and lead come from the engine. Once on the driveway or road, all of these metals along with the oil ends up in ditches, storm sewers, and eventually the Hood Canal and Puget Sound.

While the impact of these mini-spills of oil and other materials is less obvious and less immediately severe than that of major oil spills, there are long-term, chronic effects on wildlife. As a result, it is important that students be aware of how oil enters the environment and what they may do to minimize that entry and the harm it can cause.

## Materials

- notebook with a firm back (including "Follow that Drop" map made earlier)
- pencil

## Teaching Hints

In "Who me?", students examine vehicle use in their school community by conducting a series of surveys. While much is to be gained by having each student conduct all four surveys, you may wish to divide the class into four groups, one for each survey, and pool the results. Regardless of the approach you choose, allow time for a class discussion of results and to brainstorm ways in which we might decrease the impact of our transportation choices.

Caution your students to be aware of moving vehicles as they survey the student and faculty parking lots. Alert the faculty and student body that your students may be asking them questions about the distance they drive from home to school, their gas mileage, etc.

"Part IV - the Pavement" is most easily accomplished if you can provide your students with a scale map of the school which shows the location and "footprint" of the buildings and the parking areas.

"Who me?" may be logically followed by an oil spill simulation activity. The FOR SEA Grades 9-12 curriculum, The World of Water, is a good source and is available from FOR SEA Institute of Marine Science (forsea.org).

## Essential Academic Learning Requirements in Science

1. The student understands and uses scientific concepts and principles. (1.3)
2. The student knows and applies the skills and processes of science and technology (2.1, 2.2)
3. The student understands the nature and contexts of science and technology. (3.2)

## Answer Key

Part 1 - The Student Parking Lot

Thinking about the results...

1. - 4. Answers depend upon survey results.

Part II - The Faculty Parking Lot

1. - 4. Answers depend upon survey results.

Part III - The Buses

1. Answers depend upon survey results.

Part IV - The Pavement

1. - 2. Answer depends upon the school site.

3. Installing separation basins or other mechanical devices to catch and hold oil in the runoff is something that can be done to decrease the likelihood that oil from parking areas will reach Hood Canal and Puget Sound. Students may have other ideas, as well.

4. Answers will vary. The point of this question is to reinforce the notion of personal action as an effective way to decrease the amount of oil that reaches Hood Canal and Puget Sound.

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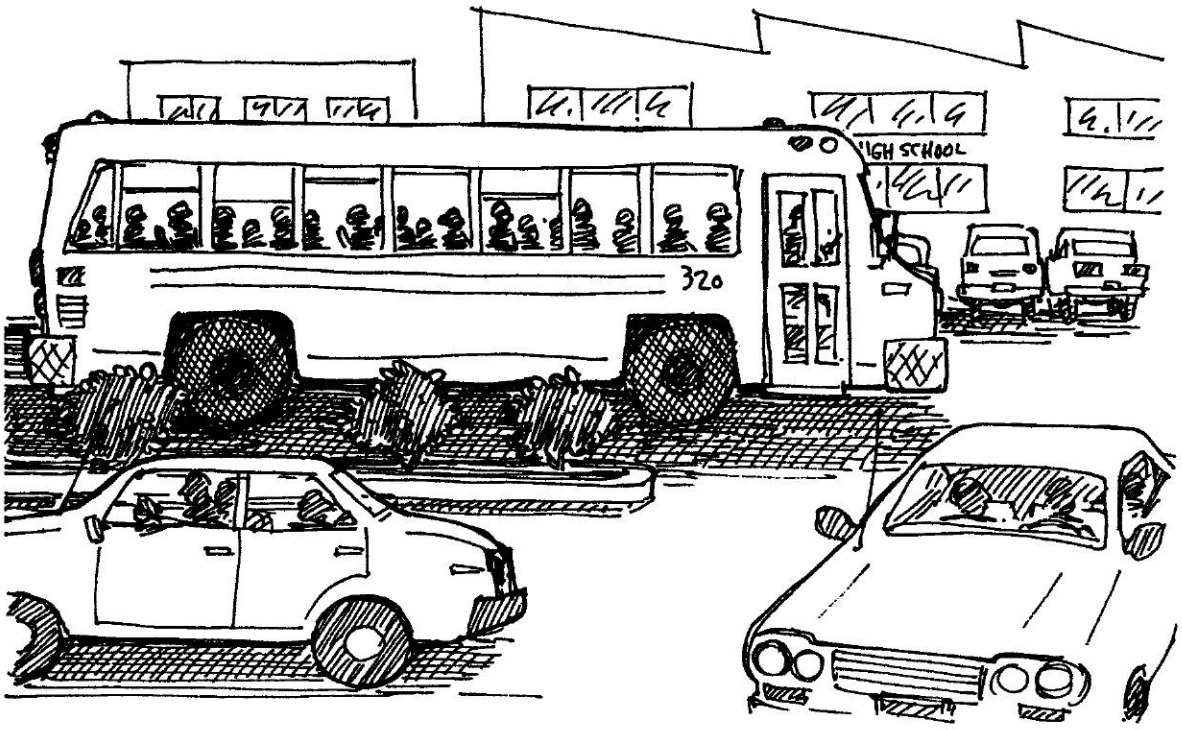


In the activity "Mini-spills", you looked for signs of oil spillage in the Seal Rock Campground parking lots, then traced the flow of that oil into Hood Canal. The oil you followed came from the vehicles of people that visited the campground.

Just look around your school. Students, teachers, bus drivers - it seems like everyone is behind the wheel. How great is our use of cars? In this activity you'll have a chance to look at the potential of our personal contribution to oil in Hood Canal.

## Here's what you'll need:

- notebook with a firm back (including "Follow that Drop" map made earlier)
- pencil

## Here's what to do:

Part I - The Student Parking Lot

Surveys are a good way to get information. Let's begin by looking at the student parking lot.

1. Count the number of cars in the student parking lot. Pick a time when most of the cars are parked. Be aware and courteous. Record your count.

2. Counting a car doesn't tell us how many people use that car. So let's see what we can find out about use. Find a spot near an exit from the student parking lot. After school, count the number of cars and the number of people in each of those cars leaving the parking lot. Record your count.

3. Ask the following questions to 10 student drivers:

   a. How many times do you drive to school each week?

   b. How many people do you usually give rides to each time you drive?

   c. How many miles is a round trip from your home to your school and back?

   d. What is the gas mileage of the vehicle you drive?

   e. Why don't you take the school bus?

Thinking about the results:

1. a. How many cars were in the student parking lot?

   b. How many students attend your school?

   c. What percentage of students at your school drives a car to school?

2. a. How many cars did you count leaving the school parking lot?

   b. How many occupants were in those cars?

   c. What is the average number of occupants per vehicle?

   d. How many vehicles had only the driver?

Let's assume that all ten of the students you interviewed drove to school on the same day.

   a. How many students were transported to and from school in their 10 cars?

   b. How many miles would those 10 students drive to and from school?

   c. How many gallons of gas does each of these vehicles use driving to and from school?

d. What is the total number of gallons of gas used by these 10 students for one day of driving to and from school?

e. Which answer to the questions "Why don't you take the school bus?" seems to make the **most** sense to you?

f. Which answer to the questions "Why don't you take the school bus?" seems to make the **least** sense to you?

## Part II - The Faculty Parking Lot

Let's continue by looking at the faculty parking lot.

1. Count the number of cars in the faculty parking lot. Pick a time when most of the cars are parked. Be extra aware and courteous!

2. Let's see how many faculty are carpooling. Find a spot near an exit from the faculty parking lot. After school, count the number of cars and the number of people in each of those cars leaving the parking lot. Record your count.

3. Ask the following questions to 5 faculty drivers:

   a. How many times do you drive to school each week?

   b. How many people usually ride with you each time you drive?

   c. How many miles is a round trip from your home to school and back?

   d. What is the gas mileage of the vehicle you drive?

   e. If public transportation is available, why don't you take the bus?

Thinking about the results:

1. a. How many cars were in the faculty parking lot?

   b. How large is the faculty of your school?

c. What percentage of faculty at your school drives a car to school?

2. a. How many cars did you count leaving the faculty parking lot?

   b. How many occupants were in those cars?

   c. What is the average number of occupants per vehicle?

   d. How many vehicles had only the driver?

3. Let's assume that all five of the faculty members you interviewed drove to school on the same day.

   a. How many faculty members were transported to and from school in their five cars?

   b. How many miles would those five faculty members drive to and from school?

   c. How many gallons of gas does each of these vehicles use driving to and from school?

   d. What is the total number of gallons of gas used by these five faculty members for one day of driving to and from school?

4. Compare the results from the faculty parking lot with those from the student parking lot.

   a. Which group had the highest average number of occupants per vehicle?

   b. What is the **average** number of gallons of gas used by the 10 students for one day of driving to and from school?

   c. What is the **average** number of gallons of gas used by the five faculty members for one day of driving to and from school?

   d. Which group used the greater average number of gallons of gas for one day of driving to and from school?

## Part III - The Buses

We know that not everyone gets to school by car. Some get to school by bus. Let's talk to some of the bus drivers.

1. Ask the following questions to five bus drivers:

   a. How many miles do you drive each day on the high school route?

   b. How many students do you carry on an average trip to or from school?

   c. What is the maximum number of students you can transport?

   d. What is the fuel mileage of the bus you drive?

   e. Why do you think more students don't take the bus?

Thinking about the results:

1. a. Look at the data for student drivers. How many gallons of gas does this group use per person per day? (Hint: You know the gallons for each vehicle and the number of occupants per vehicle.)

   b. Look at the data for faculty drivers. How many gallons of gas does this group use per person per day? *(Hint: You know the gallons for each vehicle and the number of occupants per vehicle.)*

   c. Look at the data for bus drivers. How many gallons of fuel does this group use per person per day? *(Hint: You know the gallons for each vehicle and the number of occupants per vehicle.)*

   d. Which manner of traveling to and from school is most fuel efficient? Which is least?

## Part IV - The Pavement

Not all of your school grounds are occupied with buildings. Some areas are landscaped. Others are paved for vehicles. Let's look at the paved area.

1. How much of your school property is paved for vehicles? (How can you figure this out? Sometimes the maps that the office gives to visitors show the buildings and parking lots. You can also estimate by pacing off the areas. If your school is on a hill, you may be able to look down on the buildings and parking areas. Use your imagination to find a creative solution.) Describe your solution and give your estimate in the space below.

2. Examine the parking areas, looking for signs of oil pollution. Signs will include fresh oil, dark oil stains, and iridescent ("rainbow-colored") slicks floating on water flowing across the pavement. Imagine that the oil you see is picked up by rain falling on the parking lot. On foot, or on your map, trace the path of the oil/water mixture from its start to its finish.

   a. Where is its "finish"?

   b. If the finish is a storm drain or ditch, where does the water go from there?

   c. How can you find out where it goes?

3. What is something that can be done to decrease the likelihood that oil from parking areas will reach Hood Canal and Puget Sound?

4. What is something that you can do to decrease the amount of oil that reaches Hood Canal and Puget Sound?

As much as we might hate to admit it, driving less is good for an estuary (and good for lots of other parts of our environment, too). Driving less may seem impossible --especially to high school students -- but if we want water that's clean, air that we can breathe, and some land that's not paved over, this society is going to have to change its ways.