

## Smart Moves Lesson 3

### H<sub>2</sub>O and Cars

#### Overview:

Students discover the connection between cars and water quality. They discuss how they can prevent water pollution, and then create illustrated fact sheets to distribute to drivers in the community.

#### Objectives:

Students will be able to:

- Understand how cars impact water quality.
- Identify specific practices involving cars that increase water pollution.
- Use a drawing to illustrate a fact.
- Consider audience when presenting information.
- Design an illustrated fact sheet to inform the public about cars and water pollution.

**Time:** 2 class periods

#### Materials:

- Water in a transparent drinking glass
- Student Handout: *The Water Cycle*
- Student Handout: *Cars and Water Fact Sheet*
- Drawing paper and crayons or markers
- Teacher's Resource: *Numbers* (photocopy, cut on dotted lines, put into a container to use in Step 3)

#### Procedure:

1. Take a big swallow of water from the drinking glass. Tell the students that you just shared a drink with a dinosaur. Ask students how that could be.
2. Pass out the *The Water Cycle* handout and tell students to consult the handout to explain why you actually could be drinking the same water as a dinosaur. Point out that the dinosaurs' drinking water was not affected by as many pollutants as our water is. Tell the students that they will explore the connection between one source of pollution – the car – and the quality of their drinking water.
3. Ask the class what possible connections there could be between cars and water quality. Record their responses on the board.
4. Assign or have students choose partners. Have each team draw a number from the container, taking care not to reveal the number to the class. Distribute the *Car and Water Fact Sheet*, drawing paper, and markers. Tell the teams to match their numbers to the corresponding numbers on the *Fact Sheet* and then draw a picture that illustrates that fact.
5. Now have the teams take turns displaying their drawings. Have the class consult the *Fact Sheet* and identify which fact each team illustrated. For each fact, have the class discuss: 1) why the information is important, and/or 2) how they might help prevent the pollution described in the fact. If the students do not suggest it, point out that one way to reduce water pollution is to walk or ride a bicycle instead of driving a car.
6. Return to the list on the board that the class generated in Step 2. Ask the students to make additional connections between cars and water pollution.
7. Tell the students that they will now create an illustrated fact sheet to distribute to their parents and other car owners. With the class, determine which facts are the most critical and relevant to car owners.
8. Discuss how these facts can be conveyed clearly in a drawing. Students can use their original sketches to guide them, but students should also consider the size of the drawings for the fact sheet, the level of complexity (the simpler the better),

and even the types of pens they will use. Students should realize that a public information piece requires different considerations than one they create for the class.

9. Working with your class, sketch on the blackboard a general layout for the fact sheet. How will it look with all the facts and illustrations together? Who will create a title for the sheet? Who will write a line that identifies the authors of the sheet? What other information should go on a public handout?
10. Have the students form teams to illustrate the facts they have chosen for the handout. Assign a team to collect the completed drawings and do a mock-up of the handout. If possible, have students complete the fact sheet on a computer. Let the class comment on the mock-up before you finalize its design.
11. Print and distribute the illustrated fact sheet to your students to take home. Ask your students to show the fact sheets to their parents and other drivers. Encourage your class to find out which facts are new information to these drivers.

### **Assessment Opportunities:**

- Drawings and discussion generated by drawings
- Additional connections between cars and water quality
- Willingness to share their illustrated fact sheets with car owners

### **Extensions:**

#### *An Internet Project*

Have students find out what Fort Collins is doing to prevent water pollution, especially pollution caused by motor vehicles. Find another city that is working on water pollution. Compare and contrast the solutions of the two cities.

#### *A School Project*

Have students build terrariums to help them understand the water cycle and the fact that water is a limited resource on earth.

### *Another School Project*

Have students create a bulletin board that illustrates the relationship between cars and water quality. Students could include colorful pictures and large, catchy text. The best location for this display would be near the main office of the school where parents might see it, or near the drinking fountain.

### *A Field Trip*

Have the students wash a car, keeping careful count of how many gallons of water they use by filling buckets instead of using a hose. Then have them take a field trip to a car wash where they can learn about technology that limits the use of water and recycles it.

## **Benchmarks:**

### **Arts**

#### *Create, Present, Perform*

Apply artistic elements and technical skills to create, present, and/or perform works of art for a variety of audiences and purposes.

- Create, present, and/or perform a work of art, selecting and applying artistic elements and technical skills to achieve desired effect.

### **English**

#### *Reading*

Locate information and clarify meaning by skimming, scanning, close reading, and other reading strategies.

- Locate information and clarify meaning by using tables of contents, glossaries, indexes, headings, graphs, charts, diagrams, and/or tables.

Demonstrate literal comprehension of a variety of printed materials.

- Identify sequence of events, main ideas, facts, supporting details, and opinions in literary, informative, and practical selections

### *Writing*

Communicate knowledge of the topic, including relevant examples, facts, anecdotes, and details.

- Convey clear, focused main ideas supported by details and examples in ways appropriate to topic, audience, and purpose.

Use correct spelling, grammar, punctuation, capitalization, paragraphing, and citations.

Use a variety of modes and written forms to express ideas.

- Write in a variety of modes (e.g. narrative, imaginative, expository, and persuasive) and forms (e.g., essays, stories, letters, research papers, reports) appropriate to audience and purpose.

## **Social Science**

### *Social Science Analysis*

Identify and analyze characteristics, causes, and consequences of an event, issue, problem, or phenomenon.

- Examine the various characteristics, causes, and effects of an event, issue, problem, or phenomenon.

## **Science**

### *Unifying Concepts and Processes*

Use concepts and processes of change, constancy, and measurement.

- Identify and explain patterns of change as cycles and trends.

Use concepts and processes of systems, order, and organization.

- Identify a system's inputs and outputs. Explain the effects of changing the system's components.

**HANDOUTS:**

*Handout 1 - Water Cycle*

## **Handout 2 - *Cars and Water Fact Sheet***

1. Last year, 180 million gallons of used motor oil were sent to a landfill or poured down the storm drains by do-it-yourself oil changers.
2. One gallon of gasoline can contaminate 750,000 gallons of water.
3. On calm water, one pint (two cups) of oil can spread out and cause an oil slick the size of two football fields. Think what an oil tanker of spilt oil could do!
4. It takes 39,090 gallons of water to manufacture an automobile, tires included.
5. Roads and parking lots generate runoff of oil, radiator fluid, brake fluids, and other chemicals that degrade our water.
6. Pavement for vehicles now covers over 60,000 square miles in the USA—2% of the total surface area and 10% of all arable land.
7. Exhaust from diesel-fueled vehicles is the primary source of lead in surface water.
8. When a car needs new brakes, metal filings (tiny pieces of metal) fall onto the street and can end up in our water supply.
9. Rubber from skid marks on the street gets washed into storm drains and can find its way into our water supply.
10. Hand washing a car can take up to 143 gallons of water. The suds run into the storm sewer and contaminate streams and rivers. Many commercial car washes use about 35 gallons per car and recycle the water.
11. Although 75% of the Earth's surface is water, most of it is frozen or salty. About 1% is available for human use. Water is precious stuff!

12. About 75% of your brain is water. You can use your "brain water" to keep your drinking water clean.

Many facts about water pollution can be found on the Internet. Many of these facts came from <http://www.nps.gov/rivers>, Web site for National Wild and Scenic Rivers Systems.