



Taking Better Care of Your World Begins at Home

Introduction

When we talk about the environment, we usually think about the health of the planet. While it is important that we think about the earth, it is also important to consider the issues and challenges that can exist in our indoor environments.

In this lesson, students will explore the micro-environment that exists in their own homes. Through the lesson and activities, students will learn about the factors that affect indoor air quality.

National Science Standards

This lesson and its extensions address the following national science standards:

- Science as Inquiry (Content Standard A)
- Science in Personal and Social Perspective

Grade levels 2-3

Lesson Duration: Flexible. The basic lesson can be used for a single 30- to 45-minute school period. Extensions can take additional in-class time or become the basis for individual or small group assignments.

Goal: Students will discuss why they must be aware of the chemical products that are used in their homes and, through an experiment, experience an example of the impact of chemicals in household products.



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To complete this lesson, you should have:

- Student Pages, available as a separate PDF
- Water
- Rubbing alcohol
- Two spray bottles or measuring cups/spoons
- Paper towels

Lesson Description and Outline

Part 1: Read aloud

Engage students by reading a short story about a boy named Leo and his dog, Buddy. This story presents students with a problem faced by a child who is approximately their age. There are questions embedded in the story to elicit their ideas and introduce the concept of the effects of consumer products on living things.

(see “The Story of Leo and Buddy”)

In this story, Leo is painting a picture and accidentally spills paint on Buddy. He considers, and then dismisses, several possible ways to clean the dog (plain water, rug cleaner, clothes detergent) before asking his mother and, ultimately, choosing pet shampoo.

Option: Student activity sheet

Distribute an activity sheet with pictures that invite students to match the type of cleaner to the items with which they should be used. After making their matches, students should color products that are OK for them to use in green, and the products that they should avoid in red. (see “The Environment In Your Home” in the Student Pages)

Transition: Ask students why they wouldn’t want to use certain household cleaners to clean their pets—or themselves.

Discovery discussion

Ask students about products that they use in their homes:

- Do your parents ever tell you to stay away from cleaners or other products that they are using? What cleaning jobs are your parents doing when they say this?
- Do you ever see words or messages on bottles or boxes that warn you to stay away from them? Do you remember some of these words (for example “warning” or “caution”)?
- Where do your parents keep these products at home?

Part 2: Demonstration

Transition: Even with rinsing, certain products can leave chemicals on surfaces and in the air. Let’s see how that happens now.

Gather students around a desk or table.

Using two similar spray bottles, spray approximately equal amounts of water and alcohol on a desk or counter. (You can also use measuring spoons and pour about a tablespoon of each.)



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Wipe them once with the same size piece of paper towel.

Ask students what happens to each area. In most situations, they should observe that the alcohol dries much more quickly.

Explain their observations

Ask: What happened to both liquids? Did one dry up more quickly?

Explain that drying is also called “evaporation.” Certain liquids evaporate more quickly than water because of their chemical makeup. Alcohol is one kind of chemical that evaporates very quickly.

Ask students if they’ve ever felt alcohol on their skin, for example, before receiving a shot from the doctor. How did it feel?

Option: Demonstration

Use a cotton ball to dab a small amount of alcohol on each student’s hand or arm and ask how it feels. Explain that the cold feeling is a sign of rapid evaporation.

Ask: What else did you notice about the alcohol? Students will certainly mention the smell.

Explain that some spray cleaners contain chemicals that don’t help them clean—they are merely there to help the solution dry faster.

Ask: What do you think happens to these chemicals?

Explain that while they aren’t on the counter or table as a liquid, they are in the air. That’s why students can smell the alcohol.

Wrap-up discussion

Ask students: How do you think products that you use in your home might affect the Earth?

Explain that many of these chemicals go into the air, or down the drain through the sink, dishwasher, or washing machine. And while each household may only use a little, with millions of homes, the amount of chemicals in the air adds up and puts an additional burden on the earth’s atmosphere, streams, and rivers. This is an example of many microenvironments affecting the macro-environment.

Ask students for their thoughts on this, and what they might be able to do to help this situation.

Extensions

You can stretch this lesson with the following activities, or present them as ideas for students to consider independently.

- At home, with a parent or older sibling, look for products with words like Danger, Hazardous, Caution, or Warning. Explore the reasons for the warnings and discuss whether the family wants those products in the house or if they should look for safer alternatives at their local store.
- Do internet research to find household products for a specific task, such as washing floors, killing weeds, etc., that do not use harmful chemicals.
- Perform the test again with other liquids, such as vinegar, oil, or soapy water.



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The Story of Leo and Buddy

Read this story to get the class thinking about the topic. Use the questions embedded in the story to encourage discussion and allow students to share their ideas.

In school one day, Leo's teacher told him and his class all about the environment.

Ask the class: Who can tell me about the environment?

When he got home, Leo was excited to paint a picture of the environment that his mother could hang in his room.

Ask the class: If you were painting a picture of the environment, what would you put in it?

When Leo got home, he went straight up to his room to paint. He found an old newspaper and spread it on the table, took out his paints and brushes, filled a cup with water, and tore a piece of paper from his pad. Then he sat down to paint. While he was painting, his big white dog, Buddy, came into his room and lay down quietly under the table. Soon Buddy was asleep.

Leo painted three different pictures. As he began his fourth, he knocked over the jar of green paint. He gulped hard because he was sure there would be a big green spot on the floor when he looked down—but he was only half right. Sure enough, there was a big green spot, but it was not on the floor, as Leo had suspected. Instead, the paint had landed smack-dab on Buddy, leaving a big green spot in the middle of his back.

Leo took a quick breath and grabbed a paper towel. The paper towel dried the paint up a bit, but it didn't do much to make the big green spot on his back disappear.

Leo then wet the paper towel under the faucet and rubbed it on Buddy to try yet again to clean the green spot.

Ask: Do you think that worked?

No, it didn't exactly work. Believe it or not, it only helped to make the spot even bigger. Next, Leo took the hand soap off of the sink and tried to clean Buddy with that.

Ask: Do you think the soap worked?

That only worked a bit to lighten the spot. Then Leo had a new idea. He thought that since Buddy was lying on the floor so close to the rug when the paint spilled, he might try to find something that would clean a rug in order to clean the green spot off of Buddy.

Ask: Do you think that's a good idea?

After a bit more thinking, Leo remembered that his mom used a vacuum on the rug, but he knew she didn't use a vacuum on Buddy, so he decided he didn't think that that was a good idea either.

Then Leo thought that since Buddy's fur was like his clothes, maybe he should get some laundry detergent that his mom used to clean his clothes from the shelf above the washing machine. He could use that to clean Buddy.



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The Story of Leo and Buddy (continued)

Ask: Do you think that's something Leo should do?

Leo agreed. He remembered that laundry detergent went into the washing machine with his dirty clothes, but he knew that Buddy shouldn't go into the washing machine. No, clothes detergent wasn't something to use on a dog.

Ask: So what should Leo do?

Leo came to his senses. He decided he would march downstairs and tell his mom what happened, but, before he could get to the kitchen, she'd figured it out for herself when Buddy trotted in with the big green spot on his back.

She wasn't upset with Leo. After she hung his best picture on the door of his room, she asked Leo to remember what they had used to give Buddy a bath last summer. It was then that Leo remembered the special shampoo with the picture of the dog on the front that they used on Buddy. They had picked it out at the pet store when they went to buy Buddy his food.

So Leo and his mom put Buddy in the bathtub and washed him with the dog shampoo until the spot was gone.



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