FACTivity

Time Needed

One class period

Materials

(for each student or group of students)

- Three paint roller pans
- One shovel
- 3/4 cup liquid kitchen oil, such as canola oil
- 2 gallons of water in plastic jugs
- One garden sprinkler can
- Blue or red food coloring

The questions you will answer in this FACTivity are: Which land cover surface best protects water quality and why?

Methods

Identify an area of thick grass near the edge of a grassy area. Ask an adult if the area you have chosen is a good location. Using the shovel, dig up an area of grass the size of one-half of the paint roller pan, including ½ to 1 inch of the soil underneath. Brush off the loose soil and place the grass into one of the paint roller pans. The roots of the grass should be holding the soil together. Make sure that the area of grass that you remove is away from the main lawn area.

Identify an area of bare soil. Bare soil is dirt with little or no vegetation. Dig up a shovelful of bare soil and place it into the second paint roller pan, to about 1-inch deep. If it is not possible to find the grass or bare soil in your schoolyard, your teacher will bring them to class. Leave the third paint roller pan empty. Line up the three paint pans so that you can easily compare them (**figure 15**).

During your experiment, use the graphic organizer in the next section to answer the following questions. What do think each of the paint pans represents? (Hint: Think about the different land covers studied in the research you just read.) What do the water and oil represent? (The answers are given after the graphic organizer.) Based on your reading of this article, what do you predict will happen when oil is added and water is poured across each of the paint roller pans? Write your prediction in the form of a complete sentence in the graphic organizer.

Pour 1/4 cup of oil over the contents of each pan. Wait 5 minutes.

Add food coloring to the water. Mix the water and food coloring together until it makes a bright color. Add the water to the garden sprinkler can. Using the sprinkler can, pour an equal amount of water over each of the three paint pans. As the water drains into the bottom of each pan, observe the drained water in each of the pans. What differences do you see between the water in each pan? What has happened to the water in each case? What do you think is the reason for the water's appearance in each of the pans?

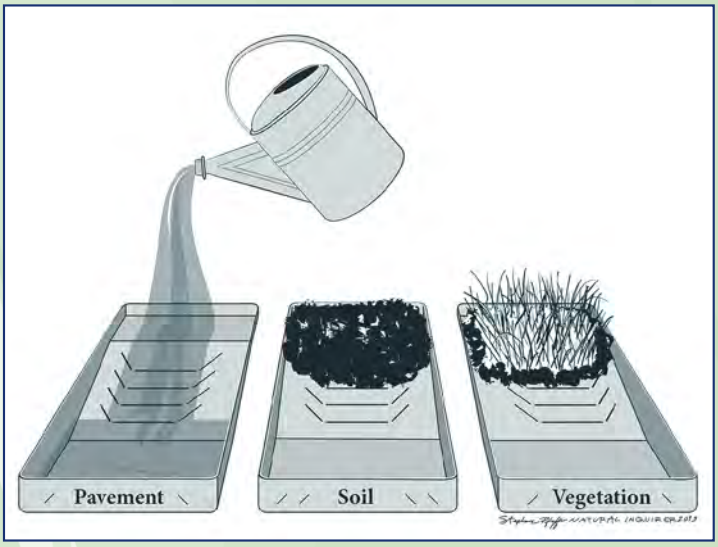


Figure 15. How to set up the paint roller pans. Illustration by Stephanie Pfeiffer.

Graphic Organizer

Note: Write using complete sentences, proper grammar, and appropriate punctuation.

The grass represents:	
The soil represents:	
The bare aluminum represents:	
Write your predictions about how the water will look after oil is added and the water drains into each pan.	Bare aluminum: Grass: Soil:
Describe your observations of the water in each pan.	Bare aluminum: Grass: Soil:
Explain why you think the water looks like it does in each pan.	Bare aluminum: Grass: Soil:
How does this experiment relate to the research you read about in the article?	
Based on what you learned, what are your conclusions about land cover and water quality?	

In this FACTivity, each paint roller pan represents a different watershed land cover. The grass represents a watershed with vegetation. The soil represents a watershed with agricultural land. The bare aluminum represents an urban watershed with pavement, such as roads and parking lots. The oil represents pollution coming from cars, industry, and agriculture. The water represents rain.

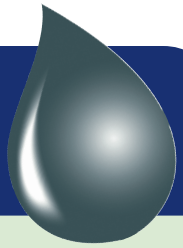
Now answer the question posed at the beginning of this FACTivity: Which land cover surface best protects water quality and why? Share your answer with your class.

FACTivity Extension

To better understand how water treatment plants clean water, do the U.S. Environmental Protection Agency water filtration activity found at http://www.epa.gov/ogwdw/kids/flash/flash_filtration.html.

If you are a trained Project Learning Tree educator, you may use "Water Wonders" as an additional resource.

Safe Drinking Water Hotline



The Safe Drinking Water Hotline provides information about drinking water and groundwater programs authorized under the Safe Drinking Water Act.

800–426–4791

http://water.epa.gov/drink/hotline/

Web Resources

U.S. Environmental Protection Agency: Learn About Water
http://www2.epa.gov/learn-issues/learn-about-water

U.S. Environmental Protection Agency: Surf Your Watershed
http://cfpub.epa.gov/surf/locate/index.cfm

U.S. Environmental Protection Agency Video: After the storm: The impact of storm water runoff on drinking water supply
http://water.epa.gov/action/weatherchannel/index.cfm

U.S. Environmental Protection Agency Water: Educator Resources
http://water.epa.gov/learn/resources/nationswaters_index.cfm

U.S. Environmental Protection Agency Water: Educator Resources: What Can I Do?
http://water.epa.gov/learn/resources/projects.cfm#projects