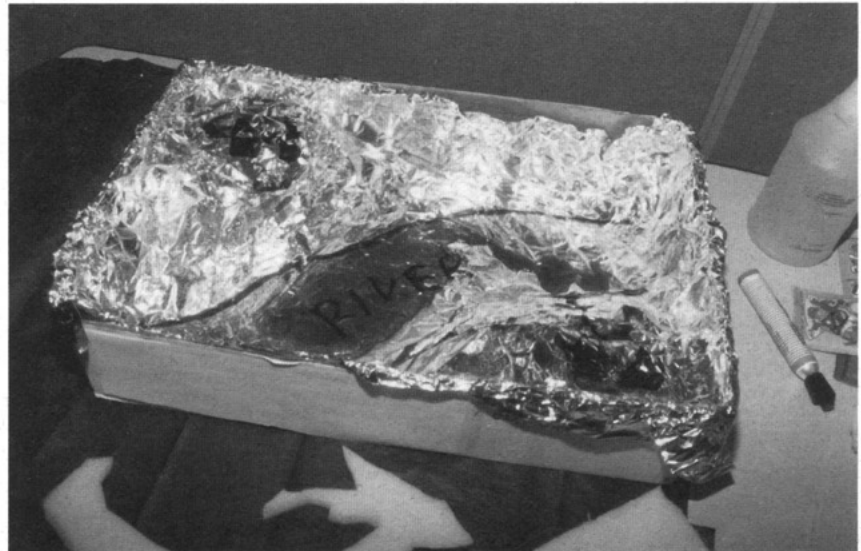


WATERSHED IN A BOX

DESCRIPTION:

You and your group will build a simple runoff model and use it to demonstrate how nonpoint source pollution can affect surface water. Whether you live in a city, town or rural area, nonpoint source pollution can be a problem.



OBJECTIVES

By building a runoff model, you and your group will:

1. Define a watershed.
2. Use powdered drink mix to represent nonpoint source pollution and demonstrate how this pollution affects surface water.
3. Design a community that will try to minimize the effects of pollution on surface water.

TIME

The runoff model is very easy to build and takes approximately 10 minutes to construct. This activity would work well at a club meeting.

AGE

This activity is appropriate for ages 8 and up.

COST

All supplies for the watershed model can be found in grocery stores, craft stores or your home.

YOU WILL NEED:

For each model:

- ◆ A box cover or other shallow box that is 12" x 12" or larger
- ◆ Foam pieces, styrofoam®, or paper
- ◆ Heavy-duty aluminum foil
- ◆ Permanent markers
- ◆ Spray bottle
- ◆ Cup of water
- ◆ Powdered, unsweetened drink mix—2 or 3 different colors
- ◆ Bucket

BACKGROUND

No matter where you live, the water quality in rivers and streams is determined by what happens on the land around them. The land around a stream or river is called a **watershed**.

One watershed is separated from another watershed by a low rise, the crest of a hill or a mountain chain. Rain or snow that falls on opposite sides of the higher land causes water to flow into different watersheds.

Not all watersheds are the same. Some watersheds are hilly, while other watersheds are flat plains. In all cases, precipitation that falls on the watershed flows over land to reach the lowest point—a lake, river or stream.

As water flows over land, it picks up soil, chemicals and other pollutants and carries them to lakes, rivers or streams. This water transportation system is called **runoff**.

In rural or agricultural areas, runoff water carries a wide variety of materials, including pesticides, soil and animal wastes, directly into waterways.

In urban areas, hard surfaces such as driveways, sidewalks, roof-tops and roadways prevent water from soaking into the ground. As a result, the runoff water, which can be contaminated with road salt, heavy metals, or automobile fluids, flushes quickly into storm drains that dump directly into streams

and rivers. These kinds of pollutants do not have a single source, so they are called **nonpoint source pollution**. This pollution originates from many different places.

Everyone lives in a watershed. We may not realize that what happens somewhere in the watershed will eventually have an impact on the lowest point in the watershed—a lake, a river, or a stream.

HOW TO MAKE THE MODEL

1. Get a box.

Use a box cover or a shallow box to contain the runoff model.

2. Create land forms.

Arrange pieces of foam or crumpled paper to represent hills and land forms in the bottom of the box. Encourage your group to be creative. Remember, the highest points should be near the box walls. Leave a gully or valley in the middle of the box to represent a stream or river.

3. Cover the land forms.

Cover the land forms with a large piece of aluminum foil, shiny side up. Start in the middle of the box and gently press the foil into all of the hills and valleys, working your way towards the box walls. Push the edges of the foil up along the walls of the box and fold the foil over the edge of the box. Be careful not to tear the foil.

4. Create a community.

With a permanent marker, draw on the foil to outline the streams or rivers in your model. Next, draw houses, roads, farm fields, feed lots, stores or anything else that you want in your community.

5. Create a waterbody.

Gently pour a little water in the river or stream valleys for special effects.



6. Add some pollution.

Sprinkle different colors of powdered drink mix onto the model. The colors represent different kinds of pollution. For example:

- ◆ Use red powder to represent yard care chemicals and sprinkle it around the houses.
- ◆ Use green powder to represent salt on the roads or automobile waste and sprinkle it along roadways or in a parking lot.
- ◆ Use brown powder to represent exposed soil at a farm field or a construction site.
- ◆ Use blue powder to represent human or animal waste and leave little piles of powder near homes and farms.

When sprinkling the powder, be careful not to contaminate your stream or river.

7. Ask what will happen.

Ask the group what they think would happen if it rained.

8. Make it rain.

Using the spray bottle to represent a rain storm, spray water on the hillsides. Watch the water flow towards the rivers and streams.

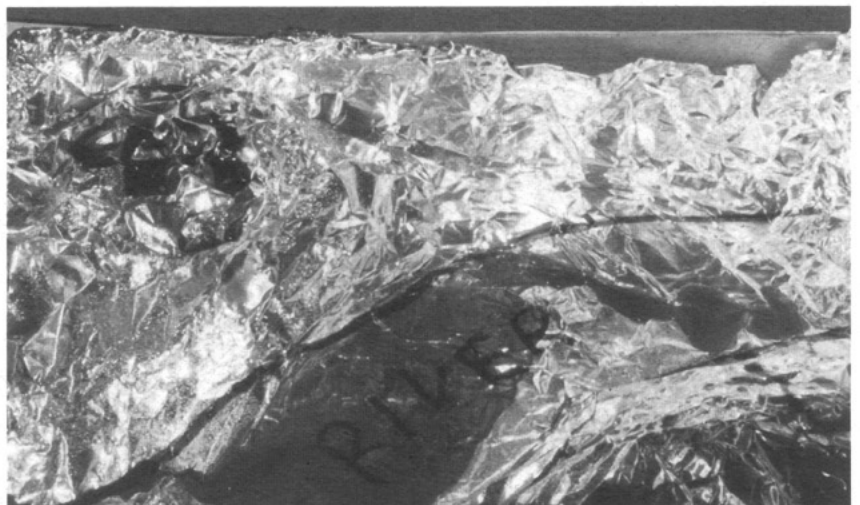
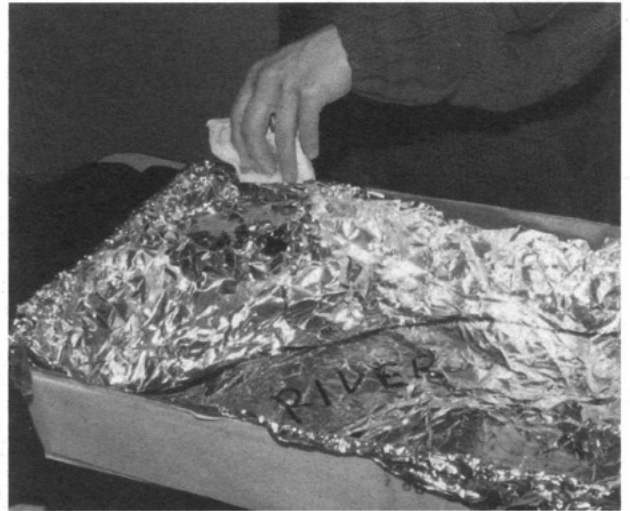
9. Follow up.

Ask the group to tell you what happened. Then ask the group how they would redesign the community to prevent water pollution.

10. Try it again.

Dump the water from the bucket into a bucket. Remove the foil from the model and set it aside. Place a new piece of foil on the watershed. Ask the group to redesign the community to prevent water pollution (for ideas, see Storm Sewers (insert).

Sprinkle powdered drink mix in the appropriate areas. Let it rain. Was there an improvement?



MORE FUN WATERSHED ACTIVITIES

Long-lasting models

Try building a more permanent runoff model made of modeling clay or paper maché (a mixture of 1 part glue, 3 parts water, and shredded office paper) covered with enamel paint. When the model is complete, use powdered drink mix to represent possible pollutants that can be washed into surface waters.

The *Enviroscape*, which is a runoff model, can be borrowed from the Environmental Resources Center in Madison. The *Enviroscape* cannot be mailed. This model can be reserved and picked up by contacting:

Suzanne Wade
Southern Wisconsin Area Water Quality Specialist
216 Agriculture Hall
1450 Linden Drive
Madison, WI 53706-1562
(608)265-3257

A demonstration

This demonstration shows common runoff pollutants that can enter our streams and rivers. The demonstration will take about 10 minutes, and it is appropriate for kindergarten to second grade.

In a container out of sight, place the following common runoff pollutants: soil, leaves, small model cow and dog (representing farm animal wastes and pet wastes), a can of oil or brake fluid, and small containers of fertilizer and pesticide.

Ask the group what kinds of pollution could be washed into a storm drain and end up in a stream or river. As the different items are mentioned, place the item in full view of the group.

Watershed survey

This project is much bigger than a stream or river survey! You can investigate an entire watershed to identify nonpoint source pollution sites that may be harmful to water resources.

Look for pollutant sources such as auto graveyards, landfills, fuel storage sites, construction sites, mining and quarry operations, animal feed lots, overgrazed pastures, places where a lot of fertilizers and insecticides are used to maintain turf, and industrial complexes.

Contest

Hold a community-wide contest that illustrates the importance of pollution prevention. Try using different categories for poetry, story writing, song writing, dance, photo essays and painting. Be creative with themes; for example, the four seasons.

RESOURCES

For more information about nonpoint source pollution, and resources specific to this unit, see the *Resources* unit.



The Water Action Volunteers program is a cooperative effort between the University of Wisconsin-Extension (UWEX) and the Wisconsin Department of Natural Resources (DNR). For more information about the program, please contact: Pam Packer, Water Action Volunteers Coordinator

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