Making a Watershed at Home

OVERVIEW

Students create a watershed model to simulate the movement of urban runoff through watersheds.

SCIENCE QUESTION

When rain falls in a watershed, where does it go? What happens to pollution on land when it rains?

GRADE

6th

TIME

25 minutes

STANDARDS

MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Objectives

At the end of the lesson, students will be able to:

- Identify the direction that water flows in a watershed
- Describe how rain carries pollution from the land into the water

Materials

- Newspaper, paper shopping bags, or other scrap paper
- Waterproof container
- Plastic bag (reused shopping bag, unused trash bag) or aluminum foil
- Cup, watering can, or spray bottle
- Tape
- Water
- Fake “pollution” (choose 3-4: food dye, sprinkles, spices, dish soap, vegetable oil, vinegar)

Instructions

1. Prior to conducting this activity, students should watch the corresponding 6th grade video lesson.
2. Before beginning, gather materials to create the watershed models.
3. Your waterproof container will serve as your watershed. Every watershed has geographic features like mountains, valleys, canyons, and hills. To build these, crumple your newspaper or other scrap/recyclable paper into loose shapes. Use the tape to secure the crumpled paper along one side of your plastic container, creating the shape of a mountain range.
    - Reinforce the idea that a watershed has natural landforms— like hills, mountains, canyons, and valleys— which change how water flows. They also form the boundaries of the watershed, separating one watershed from another.
    - No two watersheds are alike, so students can be creative with their landforms. Just make sure that one side of the watershed is higher in elevation than the others!
    - You can also make the landforms out of crumpled aluminum foil, which will eliminate the need for a plastic bag in the next step.
4. Once your landforms are created, cover the whole container with plastic. We highly encourage using a reused or recycled piece of plastic, like an old grocery bag or packaging from the mail. Tape the plastic down to the landforms and to the bottom and edges of your container. The goal is for the plastic to form to the shape of your mountains, creating a waterproof surface.
5. Create a rain storm by carefully pouring water all over your watershed. You can use a cup with holes in the bottom, a spray bottle, or a watering can. Watch which direction the water flows.
6. After you've finished with your first rain storm, take note of any areas where the water naturally collected. What would each of these areas be in a real watershed (i.e. lakes, creeks, or the ocean)? What part of your model does your watershed drain to?
7. Now, add some fake "pollution" all over your watershed— on the mountaintops, in the valleys and canyons, etc. We recommend choosing a few items from the list to represent different types of pollution. Be sure to choose at least one solid and one liquid.
    - Liquids

    - Food dye: can represent pesticides, fertilizers, and other liquid forms of pollution
    - Vegetable oil: can represent motor oil
    - Vinegar: can represent motor oil, fertilizers, pesticides, or other chemicals
    - Dish soap: represents cleaning chemicals from washing cars
  - Solids
    - Sprinkles: can represent solid pollution, like trash
    - Spices (cinnamon, pepper, parsley, etc): can represent pet waste, dust from car brake pads, and/or trash

8. Create another rain storm by carefully pouring water all over your watershed. Observe where the water flows and what happens to the pollution.
9. After finishing the second rain storm, look at your watershed again. Take note of how the pollution moved through the watershed. Ask students:
    - How does your water look now?
    - What happened to the pollution when it rained? Where did it go?
    - Did all of the pollution move, or is there any left on the land? What will happen the next time it rains?
    - Did one type of pollution move easier than another (i.e. solids vs. liquids)?
10. Restate the science questions. Call on students to answer them and explain their reasoning.
    - *When rain falls on a watershed, where does it go?* Rain will naturally move from areas of high elevation to areas of lower elevation. Water will collect in the lowest parts of the watershed, which is how we get features like rivers, creeks, and lakes. Eventually, all the water in a watershed will drain into one body of water, like the ocean.
    - *What happens to pollution on land when it rains?* Every time it rains in San Diego, the rain picks up pollution from the land and carries it into our storm drain system, which is not cleaned before it drains into creeks, rivers, and the ocean. This process is called **urban runoff**. Urban runoff is the biggest threat to clean water in San Diego.

Visit www.sdcoastkeeper.org to check out supplemental videos, activity books, and more to extend the lesson!