Shower Curtain Watershed Lesson

Overview

What is a watershed? How do our actions affect the health of a watershed? Students explore these questions by identifying watershed features. Students then make a watershed model using a plastic shower curtain, a spray bottle of water and themselves!

Focus question

Where does rainwater go? How do humans affect the health of our watershed?

Grades

3-5

Location

Outdoors, indoors

Duration

45-60 minutes

Next Generation Science Standards

Practices

Developing and using models

Core Ideas

ESS2.A Earth materials and systems

ESS3.C Human impacts on Earth systems

Crosscutting Concepts

Cause and effect

Objectives

Students will be able to:

Identify nonliving and living features found in a watershed.
Understand how human activities can affect watersheds.
Name three actions they can take to keep a watershed healthy.

Background

No matter where people live, they are in a **watershed**. A watershed is an area where rain, snow and other water is shed from the land into a common waterway. The outer boundaries of a watershed are determined by the tallest landmasses in the area (such as mountains). Precipitation and groundwater drain down to lowerlying areas and eventually into a common waterway. Watersheds can be all shapes and sizes.

ELL tip: Let students experience the activity and see examples of real watersheds before you introduce "watershed" as a vocabulary word.

Drainage systems are a part of every watershed. A drainage system consists of a network of groundwater, streams and rivers that channel the water, sediment and other materials to a common waterway or outlet. A watershed's outlet is the mouth of a river or major stream. This is where the water flows into another stream, river, lake, estuary or ocean.

Wetlands are a part of a watershed that form a transition zone between dry land and a waterway. There are many types of wetlands, but all are areas saturated with water. This creates a specialized kind of soil and plant and animal community. Wetlands have several ecological functions. These include preventing floods by catching, storing and slowly releasing **runoff**; protecting coastal areas from storm damage by absorbing the brunt of storms as they hit the shore; recharging or replenishing aquifers by slowly releasing stored water to the underground water supply; and trapping sediments and pollutants that are washed off the land. In addition, wetland plants filter nutrients from passing water and use them for their own metabolism. Runoff is water in a watershed that flows across the surface of the ground and picks up materials, such as soil, agricultural chemicals and other transportable materials. Eventually runoff reaches a waterway.

Materials

Watershed pictures

Labels or index cards

Clear plastic shower curtain

Spray bottles with water

Sponges

Small plastic houses, animals, people (optional)

Procedure

Part 1: Watershed model

Step 1: Introduce a modified focus question to the class.

Share the question: Where does rainwater go? You may write it up on the whiteboard or have students add it to their notebooks. Give students time to write down their initial thoughts or discuss with a partner.

Step 2: Challenge students to make a model of the area that they live in.

Ask students to name some landforms and bodies of water that are in the area where they live. Create a word list with their answers. Show students the plastic shower curtain and spray bottles. Ask how they could make a model of their area using those materials. Have them work together to create it. You may need to help facilitate the process. (This activity is best done outdoors, if possible.)

Sample watershed model: Several students sit on the ground next to each other and raise their knees into the air while keeping their feet on the ground. Spread the shower curtain from the top of their knees over their legs and feet. If you want all students more active, use chairs instead of students. Students can form hills and valleys and the connections between them by shaping the shower curtain.

Teacher tip: It might be helpful to place student volunteers in chairs then lay the shower curtain over their entire bodies or use chairs to hold up the shower curtains. This way all students actively participate in adding features to the watershed.

Step 3: Students predict how water will flow in their sample watershed.

Ask the students to predict what will happen when it rains on their watershed model. You may ask guiding questions: Where will the water go? Will the water form pools? Where might the water travel faster? Slower? How do you know? Students may write their predictions in their notebooks.

Step 4: Create rain in the watershed model.

Have students spray water over the entire shower curtain, including at the top of the mountains, to simulate rain. Have the rain continue until students can see where streams, rivers and lakes form. Ask students: Where are rivers forming? Are any lakes forming? Where might wetlands form? Where might the ocean be? Where is the water going? Where does the water eventually end up?

Step 5: Label nonliving features on the watershed model.

Invite students to label different nonliving features of the model (mountains, rivers, lakes, and so on) using index cards or sticky notes.

Step 6: Demonstrate the importance of soil in a watershed.

Have students think about the function of soil. Does the plastic of the shower curtain accurately represent soil? Why or why not? (No, because plastic doesn't absorb or filter water the way soil does) Show students the rest of the materials available to construct their watershed (sponges, plastic animals, houses, food coloring, cake sprinkles). Ask them what could represent soil and why (sponges, because of absorption). Add the sponges and create more "rain." Discuss the following questions:

> What happens when water comes in contact with the soil? How is this similar to a real watershed? How is it different? (In nature, water soaks into the ground. Some of the water remains close to the surface of the soil and is used by plants while some soaks deeper into the ground and becomes groundwater.)
> Estimate how much water is stored underground. Do humans use this underground water? For what?

Step 7: Label and add living features to the watershed model.

Ask students: What living things may be found here? What human development might be found in a watershed? (houses, schools, factories, dams, farms) Where would the best places be for humans to build or live in a watershed? Have students add some small houses, animals, people, cars or factories to the model with the index card labels. How might these inhabitants affect the area? How might a dam affect the flow of water in the area?

Part 2: Introduce the concept of a watershed

Step 8: Compare the school's watershed to the shower curtain model.

Clean up the model watershed and go outside to identify the watershed of the school. Compare it to the watershed model the students created. You may choose to have a class discussion or have students record their observations in their notebooks. Discussion questions may include:

> What does our watershed look like?
> How is our watershed similar to our shower curtain watershed model? How is it different?
> What features are found in our watershed? What physical features (names of mountains, ridges and so on) form the edges of our watershed? When it rains, where does the water flow in our watershed?
> Are your homes in the same watershed as our school? Does the water you drink come from this watershed?

Step 9: As a class, explore the concept of a watershed.

Ask the class for their ideas about a watershed. Then share a definition with them: A watershed is the whole region surrounding and shedding water into a common body of water. That body of water may be a stream, river, lake, wetland or ocean. Do you live in a watershed? (yes) Is there any place NOT in a watershed? (No, all land is a watershed because rain falling on land either soaks in or runs off.)

Step 10: As a class, discuss ways to keep the watershed healthy.

Based on their model of a watershed and the information they've gathered, ask students for their ideas about keeping the watershed healthy. Come up with three actions students can take to help protect their watershed. Try to push them to think beyond not littering and picking up trash. See Background for more ideas.

Step 11: Return to the focus question.

Now that students have gone through the steps of constructing a watershed and identifying influences on one, have them revisit the question: Where does rainwater go? Then add to it and ask: What is a watershed and how do humans affect its health? Students may think on their own or discuss with a partner. Then in their science notebooks, have them draw a line of learning and under it add to their original thoughts about the question.

Extensions

> Use the zip code of their homes or school to locate the students' watershed at Surf Your Watershed on the EPA website. Have them look at a satellite image of

where they live on Google maps. Ask what they can tell about their watershed from the satellite image. Have them look at a topographical map of where they live. Ask what kind of information this type of map gives about their watershed. Discuss other kinds of maps that might show additional features of their watershed.
Research where the drinking water comes from in your community. Is it treated? If so, how?

Vocabulary

Nonpoint source pollution: Pollution that originates from multiple sources and often as a result of runoff

Point source pollution: Pollution that originates from a specific and identifiable source

Runoff: Water that flows across the surface of the ground

Watershed: An area of land that sheds water into a common stream, lake, ocean or other body of water

Standards

Next Generation Science Standards

Performance Expectation

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere and/or atmosphere interact.

Common Core State Standards

Language Arts

SL.3-5.1: Engage effectively in a range of collaborative discussions with diverse partners on grade 3-5 topics and texts, building on others' ideas and expressing their own clearly.

Modified from [Monterey Bay Aquarium Shower Curtain Watershed Lesson] 08/10/2022