Overview

In this activity, students will investigate the effect they can have on the world's oceans, no matter where they live. Students will first be introduced to the concept of a watershed as they create a model landscape and simulate rain. The class will then watch a video that explains how pollution affects the Potomac River, as well as how a very special boat works to protect this waterway. Students will be encouraged to become water's eyes and ears from their own homes, and the activity will conclude as groups brainstorm ways to protect their local watershed and the oceans of the world!

Objectives

Students will be able to:

- Understand and explain the concept of a watershed
- Analyze how their own actions can affect the world's oceans
- Create a list of steps their community can take to protect their waterways

Materials

- Device with the ability to project and display video
- United States map
- Watershed Simulation Materials:
  - One large watering can with a backup water supply
  - Enough of the following for groups of four students:
    - Empty containers of various sizes: yogurt containers, water bottles, cereal boxes, etc. (Aim for at least four or five per group. (Tip: Prepare for this activity in advance by asking every student to bring in one or two materials from home!)
    - Newspaper, several sheets
    - Tape
    - One large trash bag, cut along two edges
- Watershed image
- Marine Conservation video
- Protecting our Waterways Handout

Time Period

60 minutes
Exploration Details

1. **Engage:** Project a [map](#) of the United States and begin class by asking students to consider:
   Do you think it's possible for trash or other pollution in the middle of the country to make its way to the ocean?

   After students take a moment to consider their response, instruct the class to demonstrate their answer by moving to one of the classroom's four corners. Designate one corner of the room for “Definitely,” “Maybe,” “Probably Not,” and “No.”

2. Encourage students to discuss their opinion with their like-minded peers. Then instruct students to make eye contact with a student in another corner, cross the room, and discuss their differences in opinion with this person.

   Note: If there is an uneven number of students at different stations, some groups may be larger than two.

3. Tell students that they are now going to investigate this question further! Grab the watershed simulation materials and lead students to a flat outdoor location. Divide students into groups of four and distribute each group's materials.

   Note: If an outdoor location is not available, you can conduct this simulation indoors by using large plastic bins as your base. These bins will help collect the water!

4. Tell students that they will be using their materials to create the shape of a mountainous landscape. If needed, explain the term [landscape](#) by saying: If you were a bird looking down at land from above, what would you see? All of the mountains, hills, valleys, etc. that you may see make up the landscape! A landscape is the shape of the land.

   Go on to explain that once students have created their landscape, they will cover it with a garbage bag, so it looks a little more like land. Demonstrate what this will look like so students understand their task. Explain that their landscape can be any size as long as it fits under the outstretched garbage bag.

5. Encourage groups to be creative and use each of their recycled materials to create mountains and hills of all different sizes. Then tell the class that they will have about five minutes to assemble their landscape and instruct them to begin!

6. When five minutes are up, ask each group to cover their landscape with a garbage bag. They should press the bag lightly so it takes the form of the landscape underneath.

7. Now gather the class around one group’s landscape. As you observe the land's shape together, introduce students to the word [watershed](#). Explain that a watershed is an area of land where all precipitation (rain or snow) flows into the same place. Ask students to predict where the water will flow in this first landscape.

8. Demonstrate how to use the watering can to make it rain over the landscape. Then rotate from landscape to landscape and invite groups to pour rain over each one. Be sure students pour enough water so it flows in, down, and around the landscape—and even off the sides. As the class observes the water flowing, encourage them to think about the watershed(s) in each model. Does some water stop in one area? Does other water continue flowing?
9. Once all landscapes have experienced rain, gather the class back inside. Ask:
   a. What happened when it rained on your land?
   b. Some of your water flowed off the sides of your landscapes. If this was a real watershed, where may this water go?
   c. What would have happened if the rain had continued for a long time?
   d. Based on what you observed, do you think it’s possible for trash or other pollution in the middle of the country to make its way to the ocean?

10. Take a moment to project this watershed image. Ask students to compare and contrast it to the landscape they constructed. Then explain that, like this image portrays, most watersheds are called open watersheds, which means they eventually drain downstream into the ocean. Because of this, pollution can be carried from the middle of the country all the way to an ocean.

11. Next, show the Marine Conservation video. Encourage students to think about how the Potomac River could affect the world’s oceans as they watch the video. When the video ends, emphasize its final point: It is the responsibility of every citizen, young and old, to be water’s eyes and ears!

12. Instruct students to get back into their watershed groups from the beginning of class, and distribute one Protecting our Waterways handout to each group. Read the directions together and then encourage groups to get to work!

13. Wrap up: When there are about five minutes left in class, ask every student to pick one item from their Take Action list and complete the following sentence: “I can be the eyes and ears of our waterways by…”

Differentiate & Extend
Depending on the needs of your class, you may scale this lesson by challenging students to:

- Use a map to investigate the path trash may take from your local waterway to the ocean
- Research the bodies of water in your local watershed and any pollution issues that they currently face
- Transform their brainstorming into a school-wide or community-wide campaign
National Standards

Next Generation Science Standards

- Third Grade LS4.D Biodiversity and Humans
  Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

- Fourth Grade: ESS2.A Earth Materials and Systems
  Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (4-ESS2-1)

- Fifth Grade:
  - ESS2.C The Roles of Water in Earth's Surface Processes
    Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
  - ESS3.C: Human Impacts on Earth Systems
    Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

Common Core English Language Arts Standards

- Writing:
  - CCSS.ELA-LITERACY.W.4.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

- Speaking and Listening
  - CCSS.ELA-LITERACY.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
Instructions: Follow the steps below as you figure out how to be the eyes and ears of the ocean from your own home!

Step 1: Brainstorm: Use this image to help you brainstorm how your community may affect your local watershed. Then write your ideas below.

We may affect our watershed by:

____________________________________________________________________________________________

____________________________________________________________________________________________

____________________________________________________________________________________________

____________________________________________________________________________________________

____________________________________________________________________________________________

Step 2: Take Action! Now think about what you and your community can do to protect your watershed and the oceans of the world. Make a list below!

✓ _____________________________________________________________________________________

✓ _____________________________________________________________________________________

✓ _____________________________________________________________________________________

✓ _____________________________________________________________________________________

✓ _____________________________________________________________________________________

✓ _____________________________________________________________________________________
Look at what your girl learned at school today!
Girl Scouts of the USA and Discovery Education are helping girls discover their strength in STEM. Check out the program and learn how to become a Girl Scout today at girlsleadstem.com/girlscouts.