Paper Watershed

Grade Level: 7

Subject Area: Life Science

Virginia Standards of Learning: LS. 11, LS. 12

Objectives:
Students will:

- Construct a simple model of a watershed
- Understand the concept of a watershed
- Understand how human activities on land are connected to waterways

Summary:
Students will use paper and a marker to construct a simple model of a watershed. They will observe what happens to materials on land when it rains within a watershed, and make conclusions about how this might affect waterways found throughout the watershed.

Vocabulary: watershed

Materials:

- Pieces of white computer paper or scratch paper (enough for each student to have one)
- Washable markers (enough for each student to have one) *Important:* These markers **must** be washable, other markers will not work
- Spray Bottle
- Water
- Map of the Chesapeake Bay watershed

Procedure:

Introduction

1. Before beginning this demonstration ask the students if they know what a watershed is. A watershed is an area of land in which all of the water (rivers, streams, rain water that falls, etc.) drains into a common body of water. Discuss the concept of a watershed with your students. You can use a map of the Chesapeake Bay watershed to refer to, and you can use the PowerPoint slide provided on the included CD to help with the discussion.

Compiled in 2010 by education staff at the Chesapeake Bay National Estuarine Research Reserve in Virginia for use in the B-WET *Chesapeake Studies in the Classroom* program. This lesson was modified from *Bay in a Beaker*, Chesapeake Bay Watershed Activity Guide. 2000. US Fish and Wildlife Service.

2. This activity goes well with a lesson on eutrophication or water quality. You can conduct this activity in an effort to help students visualize and understand how human activities on land (fertilizer use, spilling oil, clearing vegetation) can have impacts on the water quality in the Bay.

Activity

1. Have each student crumple up their piece of paper into a tight ball.

2. Students should undo the ball and slightly flatten the piece of paper. The paper should not be completely flat; there should be some ridges and valleys across the crumpled paper. This piece of paper represents a watershed. The ridges on the paper represent mountains, and the valleys between ridges represent the streams and rivers that usually occur in the valleys between mountains.

3. Students should use the washable marker to color thick lines along the tops of the ridges – only along the tops of the ridges/mountains. The marker they are putting on their watershed can represent any type of material we might put on our land: fertilizer we use on our lawns and gardens, pet waste we do not pick up, farm animal waste, oil that leaks from our car, etc.

4. Use the spray bottle to "make it rain" within the students' watershed. Spray a small amount of water over the watershed and watch the color from the marker lines run downhill and collect in the valleys of the watershed.

Wrap Up

Discuss with students what will happen to that material that ran off the land and into the valleys. What is in those valleys between mountains? (*Rivers*.) Where do those rivers lead? (*Larger bodies of water*.) If we are to imagine that our paper watershed was the Chesapeake Bay watershed, where would all of that material that washed off the land eventually end up? (*The Chesapeake Bay*.)

Ask the students to relate what they just observed to environmental issues affecting the Chesapeake Bay, such as eutrophication, poor water clarity, toxins in the water, etc. Excess nutrients run off the land and into the Bay where they contribute to eutrophication. Sediment runs off the land when we remove vegetation that would normally trap it and prevent erosion. This sediment can affect the water clarity in the Bay. Chemicals and pollutants run off the land and enter the Bay via our local waterways. Make sure the students understand that a watershed is a direct link between human activities and waterways. People that live hundreds of miles away from waterways like the Chesapeake Bay still have the ability to affect them. That is one reason why improving the condition of the Chesapeake Bay is so difficult and complex. It is not just the people that live immediately around the Bay that need to alter their actions to help restore the Bay, but everyone who lives within the Chesapeake Bay watershed – which is about 17 million people!

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