

Watershed Connections

TEACHER INSTRUCTIONS

Program Purpose: Students will learn about the watersheds in which they live, connections between land use and water quality, and “green” alternatives to reduce pollution from storm water runoff. Students will review the hydrological cycle with particular attention to runoff, infiltration, and surface water.

Length of Program: 90 minutes. Can be broken into multiple sessions.

Grades: 5-12

Other: This activity could be a first step in developing student conservation activities at the school that meet prerequisites for becoming a Maryland Association for Environmental and Outdoor Education Green School.

Maryland Environmental Literacy Education Standards Met:

- B(2) – Advance knowledge to make decisions and take actions to preserve resources.
- C(1a) – Investigate environmental issue from local perspective.
- C(3a iii) – Analyze and explain movement of matter and energy through interactions with hydrosphere.
- C(8a) – Sustainability. Make decisions demonstrating understanding of ecological and human communities.
- C(8b) – Examine personal and collective actions that affect sustainability of these interrelated systems.

Setting: Classroom; an additional outdoor component can be included.

Maximum Number of Participants: 30

Objectives: Students will be able to:

- Discuss why a watershed perspective is needed to restore or protect water quality in Maryland’s waterways.
- Describe how different land uses affect parts of the hydrological cycle.
- Describe four ways impervious surfaces affect stream ecosystems.
- List best-management conservation practices students and citizens can undertake to reduce storm water runoff.

Note:

This program and the following instructions were developed using 5 watershed models to allow for small hands-on group activities. If only 1 model is available, the exercises can be demonstrated either by the teacher or by teams of students. Students also can create smaller watershed models to explore the concepts.

Materials:

- Power point presentation
- Watershed models (1 model to 5 or 6 students)
- Student Activity Sheet (1/group)
- The land-use pieces
- 1000 ml measuring device (2/model)
- Pollutants – enough for 5 groups

Outline (details in following section):

- 1) Interactive PowerPoint Presentation (20-25 minutes)
- 2) Watershed Activity Part 1 (15-20 minutes)
- 3) Watershed Activity Part 2 (15-20 minutes)
- 4) Wrap-up discussion/Clean-up (15 minutes)

Program Instructions/Details

Interactive PowerPoint Presentation:

Notes are included for each slide. Pose questions throughout the presentation to elicit student discussion. The presentation describes water quality issues in Maryland; defines watersheds, including the watersheds in which the students reside; covers the hydrological cycle in detail; explores land-use and runoff; and presents conservation techniques, including rain gardens, rain barrels, and riparian buffers.

Watershed model activity - Part 1:

Before beginning this activity, instruct students on the objectives, which are to explore the relationship between land-use, the amount of runoff, and water quality.

Describe the watershed models and the supplies. The models represent Maryland in miniature with the mountains, hilly piedmont area, and the flat coastal plain.

Provide instructions on measuring water clarity and changes in runoff.

Teachers break the students into 4-5 groups (one for each watershed model) and assign a data recorder to each group. Each group receives supplies and written instructions for laying out a land-use scenario.

Using the group's supplies, they add appropriate pollutant's to land-use areas and then to make it "rain" over the land. They collect and measure and record "actual runoff," and water clarity.

Watershed Model Activity- Part 2:

Students will apply assigned changes in land use. Students will measure and record differences in runoff and pollutants, using same methods as in Part 1.

Wrap-up discussion/Clean-up

Groups discuss and compare their findings and observations and how their results compare with the other groups' results and why. They will also discuss how the activities relate to real-life scenarios.

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