

1: Environmental Introduction



A group of students participate in "The Incredible Journey," an activity from Project WET, to learn about the water cycle. They record their journey, construct a bar graph using a computer and write a creative story as part of the activity.

Goal:

Students will learn basic environmental water-related concepts, e.g., water cycle, watershed, pollution, ecosystem, to provide a foundation for participation in the STREAMS Environment and Ecology Program at the Huntingdon Area Middle School.

Objectives:

1. The students will define environment.
2. The students will list the parts of the water cycle (precipitation, runoff, groundwater, transpiration, evaporation, and condensation).
3. Given a chart, the students will label the parts of the water (hydrologic) cycle.
4. The students will explain why the earth is called a water planet.
5. The students will define the term "watershed".

6. Given a watershed model, the students will identify the boundaries of a watershed.
7. The students will use a watershed model to trace the flow of water in the watershed.
8. The students will define the term "pollution".
9. The students will list different types of pollution.
10. The students will categorize different types of water pollution and list examples of each.
11. The students will define the terms "point" and "nonpoint source" pollution and give examples of each.
12. The students will verbally explain how humans influence the water environment.
13. The students will define the terms:
 - Stormwater water runoff
 - Erosion
 - Nutrient enrichment
 - Groundwater
 - Acid rain.

Assessment:

Teacher-Made test of student selected vocabulary, water cycle, and watersheds. Student writings.

Procedures:

Students take a pre-test to ascertain what they currently know about the topics of study in the program. The same test is given three months to five after their study. Students receive environmental handouts prepared by the teacher pertaining to a watershed, the water cycle, characteristics of water, pollution, aquatic organisms, groundwater, acidity, etc., and a packet of environmental charts and graphs. Each section of the handouts is read by the students and discussed. Charts and graphs provide visualization of the concepts. The teacher also has an assortment of transparencies to use in the presentations. Students brainstorm and categorize environmental information throughout the introduction. All students receive a packet of environmental terms that must be defined as they go through the program. These terms are reinforced as content vocabulary words in language arts class. Students participate in activities from Project WET, Project Wild, KARE, Living in Water, and SWIMM.

Resources to Implement:

Teacher handouts:

- Introduction to Environmental Education (adaptations from Aquatic Project Wild)
- Fact Sheets (adapted from The WATER Sourcebook)
- Vocabulary Packet
- Watershed picture (from Watershed Activity Guide)
- Susquehanna River Basin
- Water Characteristics, Water Cycle, Watershed, and Aquatic Organisms (adapted from Project WET)
- Water Cycle, Water Collection Bodies, Ecosystem, Food Chains, (adaptations from KARE)
- Water Pollution (from Pennsylvania Department of Environmental Protection)
- Six Ways to the Sea (from Pennsylvania Fish and Boat Commission)
- Watersheds in Pennsylvania (from PA Department of Environmental Protection)
- Student Activities from the following resources:
 - 1) Project WET:
 - "The Incredible Journey" (pp. 161-165)
 - "Image" (pp. 157-160)
 - "Water Address" (pp. 122-126)
 - "Pass the Jug" (pp. 392-397)
 - 2) KARE:
 - "Where Have all the Shad Gone"
 - Watershed Delineation Activity
 - 3) Project Wild:
 - "How Many Bears Live In This Forest?" (pp. 134-137)
 - "Good Buddies" (pp. 104-107)
 - "Quick Frozen Critter" (pp. 122-124)-
 - 4) Living in Water: "Aquatic Habits" (pp. 18-24)

Videos:

- Water A Precious Resource

Transparencies:

- The Water Cycle (KARE Water Resources in PA)
- Sources of Water Pollution (Water Quality and Pollution, Milken Company)
- Distribution of Earth's Water (KARE Water Resources in PA)
- Distribution of Earth's Water (KARE Water Resources in PA)
- Rainfall in Pennsylvania (KARE Water Resources in PA)
- Drainage Basins in Pennsylvania (KARE Water Resources in PA)
- How Acid Rain Forms (KARE Water Resources in PA)
- Groundwater Pollution (KARE Water Resources in PA)
- Garbage Generated in USA (Water Wise Lessons in Water Resources)
- Average Family Use Chart (Water Wise Lessons in Water Resources)
- pH range that supports aquatic life (Water Wise Lessons in Water Resources)
- Biodegradable waste and the water environment (KARE Water Resources in PA)
- Muddy Run Watershed (Huntingdon Conservation Agency) Literature:
- Aquatic Project Wild (obtained at Intermediate Unit)

- Watershed Activity Guide (Chesapeake Bay Foundation, 1994)



HAMS students use a watershed model to visualize watershed delineation, stream order, the impact of stormwater runoff, and flooding and pollution.

Literature:

- The WATER Sourcebook, 1994, selected Fact Sheets from 1-61
- KARE Water Resources in PA
- Water Wise Lessons in Water Resources, 1989
- Watershed Activity Guide, Chesapeake Bay Foundation, 1994, pp. 4-5, 10
- Information Sheets, Susquehanna River Basin, 1996
- Project WET, 1996, pp. 25-27, 30, 35-37, 129-130, 186, 161-162, 210-202

Equipment:

- VCR/TV
- Overhead Projector/Screen
- Muddy Run Watershed Model

Maps:

- Muddy Run Watershed
- Huntingdon County
- Pennsylvania
- Chesapeake Bay Watershed
- Susquehanna River Basin

PA Academic Standards for Environment and Ecology:

- 4.1. Watersheds & Wetlands
 - Identify various types of water
 - Explain the difference between moving and still water
 - Explain the role of the water cycle within a watershed
 - Understand the role of the watershed
 - Describe changes that occur from a stream's origin to its final flow
 - Categorize stream order in a watershed
 - Explain the effects of water on the life of organisms in a watershed
- 4.3. Environmental Health
 - Know that plants, animals and humans are dependent on air and water
 - Identify how human actions affect environmental health, e.g., pollutants
 - Identify an environmental health issue
 - Describe how human actions affect the health of the environment, e.g., land use
- 4.6. Ecosystems and their Interactions
 - Understand that living things are dependent on nonliving things in the environment for survival
 - Explain the flow of energy and matter from organism to organism within an ecosystem
 - Understand the concept of cycles. e.g., water cycle
 - Explain the concept of cycles. e.g., water cycle
 - Identify how ecosystems change over time
 - Explain how ecosystems change over time
- 4.8. Humans and the Environment
 - Identify the biological requirement of humans
 - Know that environmental conditions influence where and how people live
 - Explain how human activities may change the environment
 - Know the importance of natural resources in daily life
 - Explain how people use natural resources
 - Explain how human activities may affect local and regional environments