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AMERICAN DOCUMENTARY, INC.

P.O.V.'S BORDERS | FOR EDUCATORS | LESSON PLAN 2: WATER

INTRODUCTION

Water is considered by some to be the "blue gold" of today. Though in some areas water is becoming more scarce and polluted, other communities use water as if there were no limit to its supply. Through the use of digital cameras, students will document how water is used in their local communities and explore how those uses impact the local environment.

GRADE LEVEL

These activities are written for high school level students, but can be adapted to other grade levels. (See the Extension Ideas section, below).

SUBJECT AREAS

- Science
- Social Studies
- Health

OBJECTIVES

At the end of this lesson, students will be able to:

- Identify the various ways in which water is used in their local environment,
- Identify and discuss the environmental impact of their own use of water, and
- Identify and discuss some environmental impacts of the different uses of water in their local environment.

ESTIMATED TIME

- Allowance for student representatives to take photos between home and school. The number of days/total time is dependent upon the number of digital cameras in use and the number of student photographers.
- In-Class Time = 2-3 class periods.

MATERIALS

- Digital Camera(s)
- Computer with printer and Internet access
- Map of the local area (to include all the communities that students come from) as appropriate

- Research materials (books, online access, etc.)

PROCEDURE

Teacher Preparation:

1. Assign as a homework assignment for students to write down every use of water they encounter between their home and school. They should include some water uses from inside their homes and the school as well.

2. Identify five student photographers to take ten photos each between their home and the school. Ideally, teachers should select student photographers who travel to school from a variety of directions (north, south, east and west) in order to represent as wide a geographic area as possible in the "data" (photos) and to get the most variety of land uses in the local environment.

   *Depending on each specific class structure, situation and teacher's relationship with the class, teachers may want to pre-select student photographers before introducing the activity to students. Conversely, some teachers may want to ask for student volunteers. Additionally, if the class situation/logistics prohibit the facilitation of students taking their own photographs, the teacher may want to consult with students on what they would photograph if given the chance, then the teacher may take the photos him/herself for the class. However, it should be noted that the ideal situation would allow the students to take their own photos, thus taking ownership over this study and its outcomes.

Introduction to Class Activity:

3. Introduce the lesson to students, explaining that the goals of this project/activity are to identify the different uses of water in their local community and to explore how those uses impact the environment, both locally and globally. The teacher will want to explore with the class what constitutes a use of water, as some will be more obvious than others. For example, using water to wash dishes after a meal is more obvious than water utilized by a local factory to wash machine parts or water used by local craftspeople to prepare their raw materials. Virtually everything uses water, it's just a matter of identifying how and how much, and how that water use is regulated/limited.

4. List all uses of water on the board from students' documentation between home and school.

5. As a class, choose ten uses of water to document and study. These uses should be as diverse as possible. If ten is too few, more may be chosen as the teacher sees fit.

6. Set a schedule for camera use and photo documentation according to which students live near each chosen water use to be documented. *Student photographers may be assigned by the teacher or students may be asked to volunteer.

7. Students take photos according to the schedule. Photos are uploaded to the computer and printed out for class discussion.

Day One:

8. Teacher should facilitate small group discussions of the photos as follows:

    - With all water use photos printed for the class, teacher should break the class into ten groups (or into as many groups as there are photos).
    - Each small group of students should discuss and answer the following questions regarding their photograph:

        a) How would the group classify the water use in the photograph? Name it (some will be more obvious than others).
        b) Do individual students use water in that way? If so, how? (Again, some will be more obvious here than others.) If not, do they know anybody who does use water in that way (i.e. a neighbor who works in the local factory)? If not, who does use water in that way (i.e. who works on the local farm and does the irrigation if it isn't local residents)?
        c) Does that water use have an overall positive or negative impact on the local environment? How does that water use impact global water supplies or water quality?
        d) What is the environmental impact of the water use depicted in the photograph?
        e) What is the social impact of the water use?
        f) What are some possible solutions/ways to lessen the impact (environmentally, socially or both) of that water use?* Research time may be needed in class or at home for environmental impacts of each water use. (See the Resources section below for related websites.)

Day Two (or end of Day One if time permits):

9. Have students present their photograph and overview the discussion that was held about it to their classmates.

10. As a class, compare and contrast the photos:

    - What are the differences in water use that exist among the photographs?
    - Does gender seem to affect water use at all? If so, how and why do the students think this is the case? If not, what factors do the students think contribute to this "equity?"
    - Are the students connected to the water uses in their local environment? Which ones do they participate in? Do they feel that each water use had a positive or

negative impact on the environment? Why or why not? Is change necessary? And if so, what could be done to create change?

Day Three (or Personal Study or Extension Time):

11. Have students explore their personal impact on local environments by writing an essay, short story (day in the life) or poem, preparing a presentation or somehow expressing how their own water use practices contribute to local water resources, whether positively or negatively. How does their use of water impact global water resources? For example, if students live in an environment where water is piped in from other places, how does their use of water impact other environments and communities? Which communities are they? If the water source is local, does it provide sufficient water for everybody in the community?

ASSESSMENT SUGGESTIONS

- Have students prepare a photo exhibition for other classes/the school of local water uses and ways to minimize the environmental impact of each one (i.e. sustainable alternatives).

EXTENSION IDEAS

- Teachers may choose to have each student document and research their own water use — how much water (in gallons) does each student use in a 24 hour period? What is the class average, and how does each student compare? What are some practical ways that students can reduce their water use? How can students influence others to use less water?
- Where is the source of the local water supply? Students can identify their local watershed and research how water is transported through the watershed from the source to their home/school.

RELATED NATIONAL SCIENCE EDUCATION STANDARDS, GRADES 9-12

Science as Inquiry

- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Science in Personal and Social Perspective

- Personal and community health
- Natural resources
- Environmental quality
- Natural and Human-induced hazards
- Science and technology in local, national and global challenges

INTERNET RESOURCES FOR TEACHERS AND STUDENTS

United States Geological Survey: Water Science for Schools
http://ga.water.usgs.gov/edu/index.html
Includes water use questions for students, glossary of water terms, water basics, maps and water use statistical data.

United States Environmental Protection Agency
http://www.epa.gov/ebtpages/water.html
Includes information on water pollutants, drinking water, water quality monitoring, and many other related topics. Includes an alphabetical list of all topics contained on the site.

Natural Resources Defense Council
http://www.nrdc.org/water/default.asp
Includes information and articles on drinking water, water conservation and restoration and more.

Maptech.com
http://www.maptech.com/mapserver/index.cfm
Use USGS maps to create/save/print "My Map" with your own icons. Database of maps includes entire United States.

Topozone.com
http://www.topozone.com/
Free, downloadable topographical maps for the entire U.S.