



Curriculum for the Bioregion¹

Your Environmental Impact

A series of homework assignments for an introductory course on local environmental issues for non-science majors.

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Summary

A series of homework modules designed to be part of a 10-week course in local environmental issues for non-science majors in an introductory level course. Each assignment is a set of questions that requires the students to find out about their personal environmental impact.

Short Description

The following homework assignments are designed to build understanding of personal water use, sewage, waste generation and disposal, pollution sources and impacts, and energy use and costs.

Learning Goals and Big Ideas

These assignments are designed to:

1. Help students discover their own environmental impact and its costs; and,
2. Help students develop their basic mathematics fluency by providing a number of personally relevant and important problems.

The individual assignments build understanding of personal water use, sewage, waste generation and disposal, pollution sources and impacts, and energy use and costs.

Keywords: water use; energy use; pollution; embedded costs.

¹ *The Curriculum for the Bioregion is an initiative of the Washington Center for Improving the Quality of Undergraduate Education at The Evergreen State College. This “teaching and learning activity” is one of several developed by a faculty learning community in math in February, 2010.*

Context for Use

These modules are designed to be part of a 10-week introductory course in environmental issues for non-science majors. They are used throughout the course as individual homework assignments. Ideally, the results would be pulled together into a single portfolio or paper that would attempt to integrate this information. Although the assignments are mostly stand-alone, some do rely on other information from other assignments.

Description and Teaching Materials

Section 1

- **1.1 “Where Does Your Water Come From?”** Students will need to use a word processor and the Internet.

Reference noted on homework sheet:

<http://dnr.metrokc.gov/wlr/wq/groundwater-data.htm>

Students will need to find out where their supply comes from: public water, well, water district, community water systems.

- **1.2 “Water Use At Your Home and Beyond.”** Students will use a word processor, water bill, calculator, and a bucket; and, the use of a ruler and the Internet in some situations.
- **1.3 “Where Does Your Household Waste Water Go?”** Students will use a word processor and the Internet.

Reference noted on homework sheet:

<http://dnr.metrokc.gov/WTDMWPAAC/index.htm>

Link is to Washington State, King County’s website for the count’s treatment facility. Students will learn if their household is supported by a public sewer system, district, company, or septic system.

Section 2

- **2.1 “Your Household Solid Waste (HSW)”** Students will use a word processor, Internet, and possibly a bathroom scale and a telephone.
- **2.2 “Local Waste Management Issues”** Students will use a word processor, Internet, and perhaps a telephone.

Reference noted on homework sheet:

<http://www.ecy.wa.gov/programs/swfa/county/Profiles.htm>

Select your county and get information on its solid waste disposal. This link is for Washington State.

Section 3

- **3.1 “Toxic Emissions in Your Neighborhood”** Students will use a word processor and the Internet.

Reference noted on homework sheet:

<http://www.planethazard.com/>

Teaching Note: This site has a list of the top 10 polluters in your city ranked by pounds of emissions. At first this might seem like an unreliable source. However, in this case all the website has done is make data from the Environmental Protection Agency available in an easy to find format, so we will go ahead and use it.

www.scorecard.org click on chemical profiles.

- **3.2 “Fine Particle Air Pollution”** Students will use a word processor and the Internet.

Reference noted on homework sheet:

<http://trendgraphing.pscleanair.org/TrendGraphing.aspx>

This lists the most important and problematic air pollution in the Puget Sound area. The site offers graphs of pollutants over time from any Puget Sound area monitoring station.

Section 4

- **4.1 “Where Does Your Electricity Come From?”** Students will use a word processor and the Internet.

Reference noted on homework sheet: <http://www.cted.wa.gov/>

Energy policy fuel mix disclosure for Washington State based on actual electricity production data.

- **4.2 “How Much Gas Do You Use?”**
- **4.3 “The True Cost of Your Car”**
- **4.4 “Your Car vs. Public Transport.”**
- **4.5 “You’re in Hot Water!”**
- **4.6 “There’s a Light Bulb on Over Your Head.”**
- **4.7 “Conserving Power.”**
- **4.8 “Your Home Heating Energy Use and Costs”** Students will need to access electricity or gas bills. If using wood or space heaters, they will need to consult with instructor.

Reference noted on homework sheet: www.zillow.com to find square feet of your home.

www.pse.com To find last year's electrical use if you are a customer of Puget Sound Energy.

- **4.9 “Your Energy Use”**
- **4.10A “Home Electricity Use”**
- **4.10B “Home Electricity Use”**

Section 5

- **5.1 “Local Population Growth”** Students will use a calculator.
- **5.2 “Local Population Growth”** Students will use the Internet and a word processor.

Reference noted on homework sheet:

<http://www.census.gov/opulation/cencounts/wa190090.txt>

For historical population data.

- **5.3 “Land Use Issues in your Neighborhood and City”** Students will use the Internet and a word processor.

Reference noted on homework sheet:

<http://www.kingcounty.gov/property/permits/codes/growth/CompPlan/2008.aspx>

This site contains your county or cities' comprehensive plan for locations within King County.

<http://www.co.pierce.wa.us/xml/abtus/ourorg/council/code/title%2019a%20pcc.pdf>

This is the site to go to for Pierce County.

Attachments

These attachments are all PDF's:

Section 1 - Contains worksheets:

- “Where Does Your Water Come From?” (2 pages).
- 1.2 “Water Use At Your Home and Beyond.” (4 pages).

- 1.3 *"Where Does Your Household Waste Water Go?"* (2 pages).

Section 2 – Contains worksheets:

- *"Your Household Solid Waste (HSW)"* (2 pages).
- *"Local Waste Management Issues"* (2 pages).

Section 3 – Contains worksheets:

- 3.1 *"Toxic Emissions in Your Neighborhood"* (1 page).
- 3.2 *"Fine Particle Air Pollution"* (3 pages).

Section 4 – Contains worksheets:

- 4.1 *"Where Does Your Electricity Come From?"* (2 pages).
- 4.2 *"How Much Gas Do You Use?"* (1 page).
- 4.3 *"The True Cost of Your Car"* (3 pages).
- 4.4 *"Your Car vs. Public Transport."* (2 pages).
- 4.5 *"You're in Hot Water!"* (2 pages).
- 4.6 *"There's a Light Bulb on Over Your Head."* (2 pages).
- 4.7 *"Conserving Power."* (2 pages).
- 4.8 *"Your Home Heating Energy Use and Costs"* (2 pages).
- 4.9 *"Your Energy Use"* (1 page).
- 4.10A *"Home Electricity Use"* (1 page).
- 4.10B *"Home Electricity Use"* (3 different pages of data recording charts).

Section 5 – Contains worksheets:

- 5.1 *"Local Population Growth"* (3 pages).
- 5.2 *"Local Population Growth"* (3 pages).
- 5.3 *"Land Use Issues in your Neighborhood and City"* (3 pages).

Assessment

Assessment is made by grading a student's worksheets.

References and Resources

Students use their textbooks along with internet resources mentioned as part of the assignment in the “**Description and Teaching Materials**” section.