

ES 160
Spring 2013
Class Research Project

You will work in groups. While you can start your thinking on broad topics such as water, air, soil, food, greenspace, or energy you must define a research question that is narrow enough to actually answer. It may be helpful to know some of the questions that students in previous years have asked.

Last year students asked a range of questions pertaining to:

- Air pollution (How does air pollution vary on campus?: comparing a point near a road to a point near the lake.)
- Stream water quality (Does the presence of horse traffic in new Wilmington effect water nitrogen content and dissolved oxygen level?)
- Industrial impact (What are the pollution control mechanism in place at the Bruce Mansfield Power Station)
- Effects of herbicides on aquatic plants (How do herbicides effect aquatic plants)
- Alternative Energy (Is solar power actually viable? This drew significantly on interview with an area home owner)
- Soil quality (A comparison of soil pH at various points about campus.)

The previous year many projects revolved around an environmental audit of the college and asked the following questions:

- Does Westminster College recycle less paper than the national average?
- How much food waste do we generate and are we efficiently disposing of it in an environmentally responsible way?
- What is the difference between the heating requirements of the oldest and newest dorms on campus?
- How much of the plastic and glass bottle waste is recycled? What is done with the waste stream once it leaves Westminster?
- At Westminster College, where does water go once it is used, how much is used per day and how can this be reduced?

(Some groups were more effective at asking answerable questions than others.)

While your questions should focus on the local environment and/or the human effects on it, you need not focus on the college's impact in particular.

Paper

5-7 pages, double-spaced, hard copy only

While you will carry out your project in groups you will be writing your own paper. Your paper should present your group's research question, discuss additional information needed to understand the question and factors influencing what you found. You should address whether or not your research satisfactorily addressed your question, and what questions for further research may now be apparent. The paper should critically engage the science behind your research question, and include a reflection on how your research could impact other disciplines or areas of life. Papers will be evaluated based on their scientific merit, critical reasoning, and clear communication.

Annotated Bibliography

1-2 pages, single-spaced, hard copy only

An annotated bibliography is a list of citations/ resources used that includes a brief critical description (no more than 150 words) of the resource, focusing on its reliability and relevance to the research. For a paper of this size, you should anticipate at least 3 sources. This should be turned in at the same time as your paper.

Oral Presentation

20 minutes per group plus 5-10 minutes for Q and A and peer feedback

It goes without saying, but each member of the group must participate in the oral presentation.

Due Dates

Research Question and Outline (one per group)	<i>Due Thursday 3/21</i>
Paper and Annotated Bibliography	<i>Due last day of class</i>
Oral Presentations	<i>Last Week of class</i>

Grading

Research question and outline (group grade)	15 %
Annotated Bibliography	15 %
Paper	40 %
Group oral presentation	
Individual contribution	25%
Group grade	5 %

Appropriate sources

- Peer-reviewed scientific journals
- *Verifiable* web sources
- Reputable publications (ie: NY Times, Nature magazine, textbooks, etc)
- *Your own data collection*