Green ROUTES
Redirecting Our campus Toward Environmental Sustainability

CES 301: Community-Based Research Project
BUS/CES 321: Organizations and their Environment
• Sustainability assessment
• Reducing the environmental impact
• Living within nature’s limits (IUCN)

• Decision making that integrates environmental, social, and economic opportunities across campus and within the broader community (NACUBO)
Our Vision

Redirecting Our Campus Toward Environmental Sustainability

• Creating a culture of consciousness

• Reducing environmental footprint
8 Point Work Plan

Redirecting Our Campus Toward Environmental Sustainability

• Energy
• Purchasing
• Buildings
• Grounds
• Offices
• Student Services
• Dining Services
• Recycling
• Investment Group

• Financial Analysis Group
A sampling of what we have done:

- 6 Stations, 6 minutes for each
  - College Investments
  - Water; toilets & urinals
  - Grounds and Trash Disposal
  - Paper and Printers
  - Energy; Propane & Light bulbs
  - Green Buildings & Current Initiatives
Conclusions

What should be done

• Implementing green building standards
• Reducing energy and paper consumption
• Utilizing environmental screens for college investments
• Installing low-flow bathroom fixtures
• Revising waste management
Future outlook

Redirecting Our campus Toward Environmental Sustainability

Plans for next semester

• MTVu Grant
• Survey
• Composting
• Recycling
• Dining
• Concrete plan for buildings
• Comprehensive report
Insulation Importance: Insulation is essential to efficiency in a building. Without insulation, buildings would lose heat very rapidly, and subsequently have drastically higher heating and cooling costs. Insulation efficiency and quality can be measured by comparing surface temperatures of opposite walls in the same room, as well as the inside and outside temperature of the exterior wall of the aforementioned room.

Objectives: To determine the effectiveness of the insulation in several new buildings on campus as compared to several old buildings on campus. This would indicate if the new buildings are more efficient in terms of insulation than the old buildings, as they should be. It could also pinpoint which buildings may need to have new insulation installed, so as to improve their energy efficiency; a step towards reaching campus sustainability.

Methods/Procedures: Surface temperatures were recorded with an infra-red temperature gun on three different walls in each representative room surveyed. The walls measured were the outside exterior wall, the inside exterior wall, and the interior (neutral) wall. Three measurements were taken for each wall and averaged out for the sake of accuracy. The numbers were then compared as follows: The temperature difference of the inside exterior wall to the outside exterior wall indicated the insulation quality of that one wall. The temperature difference of the inside exterior wall to the neutral wall indicated the overall insulation quality of the entire room, because the neutral wall represented the ambient temperature of the room, while the inside exterior wall indicated the effect on it from the temperature of the outside exterior wall. A greater difference between the inside exterior wall and outside exterior wall temperatures was ideal, representing minimal effect of low outside exterior wall temperatures on inside exterior wall temperatures, and thusly, more effective insulation. Conversely, a smaller difference between inside exterior wall and neutral wall temperatures was ideal because it indicated a very uniform ambient temperature, wall to wall, within the tested room, and thusly, more effective insulation.

Related items:
- Replace insulation in old buildings?
- Research and emulate LEED certified building designs.
- Research different insulation types.

Websites/Links:
- http://globalgreen.org/greenbuilding/
- http://www.cmu.edu/greenpractices/green_initiatives/leed_buildings.html
- http://www.greenbuildingsupply.com/Public/Home/index.cfm

Findings/Graphs: See page 2.

Findings/Graphs Continued: Graph 1 compares the “inside difference” average of the old buildings versus the new buildings on campus. The inside difference is the measurement of the difference in temperature between the inside exterior wall and the neutral wall. As was mentioned before, this is an effective way of measuring the overall insulation quality of the room, and that a lower value is more desirable because it indicates higher effectiveness of insulation. As you can see, the new buildings average about 1.2 degrees difference from wall to wall, whereas the old buildings average about 4.1 degrees difference. This data, when coupled with a very low p-value of 0.00012, indicates a consistently significant difference between the insulation quality of old buildings versus new buildings.

Graph 1:

Graph 2 shows the difference in old and new buildings between the inside exterior wall and outside exterior wall temperatures. As stated before, a large difference between these values would indicate effective insulation. As can be seen in graph 2, the new building average on the right side of the x-axis is more than 26 degrees, whereas the old building average on the left side of the x-axis is less than 25 degrees. This data would be conclusive, however, the p-value of 0.112 indicates minimal correlation in the data, which does not support a reliable conclusion.

Graph 2:
Please contact us with your ideas and suggestions

green ROUTES@colby-sawyer.edu