Integrating Nano and the Environment Throughout a Center Based Education and Outreach Program

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Nanoscale Science and Engineering Center
University of Wisconsin-Madison
Established in 2004 with one of the key research areas being environmental impacts of nanotechnology.

The education and outreach group wanted to integrate the environment throughout its education program.
UW-Madison NSEC
Education and Outreach

• As a center we run a varied education and outreach group that combines informal and formal education.
• We have embedded nano and the environment through all aspects of our education program.
• Informal projects that integrate the environment include:
A hands-on after school science club for Boys and Girls Clubs

Brittland DeKorver, Francisca Jofre, and Elvin Morales
Sessions
One session weekly at each Club
Fifteen sessions per semester
Includes multiple activities
From 5-6pm

Mentors
Commit for at least one semester
Undergraduate or graduate student volunteers
Receive 15 minute training before each session
Visit same site on a weekly basis
Transportation provided

Club Members
Work at their own pace and interest level
Receive no whole-group or written instructions
Earn rewards by meeting learning goals
Work as individuals or in groups
Attendance is voluntary
Goals

• Promote learning

• Encourage attention and discipline

• Reach a wide audience
## Sample Unit

### It’s Not Easy Being Green

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<td>Chlorophyll Fluorescence</td>
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SMALL SCIENCE, BIG DECISIONS

Engaging Adults Through Deliberation and Consensus

Angela Jones
Research Associate

Education and Outreach: Andrew E. Greenberg, John W. Moore
Societal Implications: Ashley A. Anderson, Sara Yeo, Dominique Brossard
Adult engagement

Small Science Big Decisions

Activity Site: http://ice.chem.wisc.edu/NanoDecisions/
YouTube Channel: http://www.youtube.com/user/UWNanotech/videos
Nanoscience Research Areas

Aerospace
- Nanotechnology and Aerospace
  - Space Travel
  - Spacecraft
  - Energy

Agriculture and food
- Nanotechnology in Agriculture and Food Technology
  - Food and Agriculture
  - Bioengineering

Electronics and computing
- Electronics and Computing
  - Electronics
  - Cell Phones

Environment, cleaning up
- Environment and Nanotechnology
  - Surfaces and Structures
  - Electronics

Manufacturing and consumer products
- Manufacturing and Consumer Products and Nanotechnology
  - Clothing
  - Personal Care Products

Energy
- Nanoscience and Energy

Military and defense
- Nanotechnology in the Military
  - National Defense
  - Homeland Security

Safety and societal implications
- Environmental, Health, Safety and Societal Concerns with Nanotechnology

Medical and healthcare
- Nanoscale Health and Healthcare

Transportation
- Nanotechnology in Transportation
  - Fabrication
  - Mechanics
  - Infrastructure
Activity

Assigned research area (30 min)

Present benefits and perceived risks (20 min)

Group ranks area priorities (30 min)

Group decides on distribution (30 min)

Time: 2 hours
Unique Attributes

• Short time commitment

• No preexisting knowledge

what? technology

• Participant presentations
Web Based Activities

Nanoparticles in the Environment
by Jeanne Nye and Andrew Greenberg
Lake Mills Area Schools and UW-Madison

THE PRINCE AND THE PARTICLES!!!
A STORY OF SMALL SCIENCE WITH BIG IMPACT ON THE ENVIRONMENT
Click Here to Read Me!!!!

NANOPARTICLES IN THE SURF
AN OIL SPILL SOLUTION
BY JEANNE NYE AND ANDREW GREENBERG,
LAKE MILLS AREA SCHOOLS AND UW-MADISON

SAVE OUR SOIL CORPORATION

HELP WANTED!!!
Nanotechnology Oil Remediation Specialist
S.O.S. seeks an experienced problem solver for the position of Nanotechnology Oil Remediation Specialist. S.O.S., a leader in its use of nanotechnology and environmental remediation, is expanding into oil spill remediation and has been hired to capture the oil quickly from a recent oil leak. The specialist will become extremely knowledgeable about the nano research that S.O.S. has conducted and develop an in-depth plan for restoring the spill site to its previous ecological balance. Your interview entails developing a plan to clean the oil utilizing our company’s patented nanomaterials and

http://ice.chem.wisc.edu/WebQuest.html
Acknowledgements

• We would like to thank the entire NSEC education and outreach group:
  – Prof. John Moore
  – Mary Beth Anzovino

• RET teachers:
  – Jeanne Nye
  – Jeanine Gelhaus