



## Hot Air from EEOP – A Newsletter

Environmental Education Outreach Program (EEOP)  
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Web version @  
<http://www.nau.edu/eeop/newsletter>

### **The Newsletter**

This newsletter is a service of the Institute for Tribal Environmental Professionals (ITEP) Environmental Education Outreach Program (EEOP). The EEOP staff created this newsletter for K-16 students, educators, and tribal professionals that are interested in learning more about environmental issues with an emphasis on air quality.

### **Indoor Air Quality**

The EEOP staff spent half of the month of April working on Indoor Air Quality (IAQ) education and training. The EEOP staff conducted a 3-day training course for over 20 representatives of Alaskan villages and organizations. The EEOP staff also visited several schools in Alaska, conducting IAQ Building Assessments and making classroom presentations on Indoor Air Quality (IAQ).

In addition to school visits in Alaska, one of the EEOP staff visited schools in Montana to encourage increased awareness of Indoor Air Quality (IAQ). Several schools on the Ft Peck Reservation had just participated in a Chemical Clean up program, which removed hazardous chemicals from the school building. The EPA Indoor Environments Division and the organizers for the Chemical Clean up program, Rocky Mountain College - American Indian Affairs, requested assistance from the EEOP staff to increase awareness of IAQ issues.

One objective of the classroom presentations was to create empathy (identification with and understanding of another's situation, feelings, and motives) for asthmatics. The EEOP staff hoped to create empathy, leading to action. An activity using straws to simulate an asthma attack created a better understanding of the impacts of asthma. Asthmatics are part of the most vulnerable population in a school or in a public setting to air pollutants. The EEOP staff encouraged the schools to develop an IAQ management program that reduces pollutants, irritants, and triggers and that addresses ventilation issues, which can help reduce the number of asthma episodes experienced by students. Reducing air pollutants also helps everyone else; asthmatics are an early warning system for air pollution problems in a building.

The EEOP staff worked with students and teachers to take simple measurements that can help monitor air quality in the school building. The instruments in the EEOP IAQ Kit facilitate air quality measurements such as carbon dioxide, radon, carbon monoxide, relative humidity, air movement, surface temperature, moisture, and particles. With a carbon dioxide meter students could quickly determine if there was adequate ventilation in the classrooms. The students also learned about the importance of reducing or eliminating pollution sources from classrooms, as well as their homes. (After

learning about dust mites in a classroom presentation, one student reported washing the sheets on their bed for the first time this year.)

Students enjoyed measuring particles in the air and were surprised to find out that they were a source of particle pollution. After measuring particles produced by their shoes, the students understood the value of walk-off mats at the school entrances. Students also learned about the importance of using perfume and cologne in moderation. The students were also encouraged to help all smokers in the community understand their responsibilities for reducing exposure of children to Environmental Tobacco Smoke (ETS), since ETS is strongly tied to asthma and other respiratory problems.

In addition to assessments and presentations, the EEOP staff delivered copies of the USEPA IAQ Tools for Schools kit and encouraged the school staff to consider developing an IAQ management program. Improved air quality can lead to reduced sick days for both the staff and the students. Improved air quality also leads to an improved learning environment for the students.

School staff interested in addressing Indoor Air Quality (IAQ) issues in their building, including the control of asthma, are invited to contact the EEOP staff.

### **Problem Based / Community Based (Place Based) Education**

As a new high school chemistry teacher, the EEOP Senior Program Coordinator, Mansel, quickly realized that his students were not particularly interested in the models and theories of chemistry. His search for better ways to engage his students motivated him to take a summer workshop in Problem Based Learning (PBL) facilitated by Howard Barrows.

Mansel also identified a chemistry text-book that used an issues based approach, rather than models and theories based approach. The textbook, Chemistry in the Community (ChemCom), was a product of the American Chemical Society (ACS). Each of the eight units revolved around an issue, which created the need to know chemistry in order to find a solution to the issue.

Combining the ChemCom text-book with Problem Based Learning (PBL) resulted in a course that explored issues such as: "Is the water safe to drink in our community?" As the class began the investigation, students pointed out that we needed to learn more about our own community water system in order to answer the question. Mansel didn't realize it at the time, but his class was entering the world of Community Based Education (CBE).

Based on recommendations from the students, the class took field trips to learn about the community water supply and invited guest speakers from the water company to talk to the class. The students also learned the chemistry needed to understand water quality and participated in labs in the classroom. During the entire process the students wanted to know what Mansel thought about the water in our community. They even tried to catch him drinking from either a bottle of water or a drinking fountain.

As the unit came to a close, the students were surprised to find out that their opinion mattered. Mansel wasn't going to tell them whether or not the water was safe to drink. The last assignment of the unit was to write a letter to the editor of the local newspaper expressing their opinions about the water in their community. The only requirement was that students support their opinion with scientific information. Eventually all of the student letters were published, which

expanded the debate to the entire community, including the director of the local water company. (Yes, there is more to that story, but perhaps we will share the expanded story at another time.)

Through the remainder of the year the class took on a number of issues, many of them important to community members. Combining problem-based and community-based education transformed Mansel's classroom. Students were talking about the issues outside of chemistry class, including talking to their parents. Students were motivated and curious; attendance increased and tardiness decreased.

There were many ways to describe Mansel's class: Problem Based Learning; Community Based or Place Based Learning; Service Learning; Experiential Learning. As the class evolved the students became more involved in both the school and the community.

The EEOP staff would like to help other teachers to transform their classroom into a community based / place based classroom. If you are interested in learning more, contact Mansel.

### **Mathematics Education**

The National Mathematics Advisory Panel recently released its report on the status of mathematics education in the United States. Math skills are essential for success in science and engineering careers.

Quoting from the executive summary:

“The eminence, safety, and well-being of nations have been entwined for centuries with the ability of their people to deal with sophisticated quantitative ideas. Leading societies have commanded mathematical skills that have brought them advantages in medicine and health, in technology and commerce, in navigation and exploration, in defense and finance, and in the ability to understand past failures and to forecast future developments. History is full of examples. During most of the 20th century, the United States possessed peerless mathematical prowess—not just as measured by the depth and number of the mathematical specialists who practiced here but also by the scale and quality of its engineering, science, and financial leadership, and even by the extent of mathematical education in its broad population. But without substantial and sustained changes to its educational system, the United States will relinquish its leadership in the 21st century.”

Nation National Mathematics Advisory Panel Report, 2008

All tribal nations face the same challenges. In order for tribal nations to take their place as self-determinate, sovereign nations, they need more native scientists and engineers. In order to get more native scientists and engineers, we will have to address math education for native students.

Success in mathematics education is also important for individuals. Strong math skills lead to more career options and it increases prospects for future income. A strong grounding in high school mathematics has a high correlation with access to college, graduation from college, and higher lifetime earnings. The value of good math preparation promises to be even greater in the future. The National Science Board indicates that the growth of jobs in the mathematics-intensive science and engineering workforce is outpacing overall job growth by 3 to 1.

The report has many recommendations for addressing the future of mathematics education. Most of the recommendations are directed towards the formal education system. However, one recommendation is directed to parents. Building math skills prior to kindergarten is important. The mathematical knowledge that kindergartners bring to school is related to their mathematics learning for years thereafter—in elementary school, middle school, and even high school. Additionally, there is a myth that success in mathematics is related to inherent talent or ability, rather than effort.

The EEOP staff is interested in helping families and schools address mathematics education. Please contact one of the EEOP staff for more information.

### **No Child Left Behind or Inside**

The No Child Left Inside Coalition ([www.eeNCLB.org](http://www.eeNCLB.org)) would like to invite you to become a member. The Coalition represents over 280 educational, environmental, health, and business organizations across the country comprising more than 20 million people. Members of the Coalition believe the reauthorization of the Elementary and Secondary Education Act provides Congress with the opportunity to address one of the unintended consequences of the No Child Left Behind Act (NCLB) – the elimination or scaling-back of environmental education and field investigations in schools throughout the nation. To better prepare students for the 21<sup>st</sup> century economy and to improve student achievement and health, we are urging Congress to include the provisions of H.R.3036 and S.1981 – the No Child Left Inside Act – in the reauthorization bill. This measure would support the efforts of states and school systems to develop environmental literacy plans and train teachers to deliver quality environmental education programs in the classroom and outdoors.

The No Child Left Inside Act of 2007 amends the NCLB law in the following ways:

- Provides federal funding to states to train teachers in environmental education and to operate model environmental education programs, which include outdoor learning.
- Provides funding to states that create environmental literacy plans to ensure that high school graduates are environmentally literate.
- Provides funding through an environmental education grant program to build state and national capacity.

To be a member of the Coalition:

[http://www.surveymonkey.com/s.aspx?sm=jRAyPWHwIIPEBTn\\_2f\\_2bnZlBw\\_3d\\_3d](http://www.surveymonkey.com/s.aspx?sm=jRAyPWHwIIPEBTn_2f_2bnZlBw_3d_3d)

### **Future Issues**

The EEOP staff is interested in articles sharing stories from students, teachers, or tribal professionals influenced by ITEP or EEOP activities. If you would like to be published in the EEOP newsletter, send Mansel your proposed article.

### **Credits and Contacts**

The US Environmental Protection Agency (USEPA) Office of Air and Radiation provides part of the funding to make this newsletter possible. The newsletter is disseminated on various list serves, however, if you would like to join the newsletter list serve, contact Mansel.

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