Our Changing World

An innovative approach makes teaching about global climate change less daunting for educators and 6th-grade students.

Story By Kathy Andrews
Photos Courtesy The Peggy Notebaert Nature Museum

With a roll of the dice, the carbon dioxide molecules travel around the world. Some remain in the atmosphere or move into the soil. Others move into ocean surface waters or sediments, or into a plant or animal.

In this case, the molecules are actually sixth-grade students following a pre-1700s carbon dioxide pathway and charting their movements to various stations. The exercise is repeated with a different set of dice that represent the post-1700s industrial revolution.

"I never realized…I was emitting so much carbon dioxide."

Fact: The Kyoto Protocol provides target amounts for carbon dioxide output and we must aim for a level of 2.35 tons per person if we want to slow global warming. One participant remarked: "I was shocked to learn mine was 3.06 tons."

Interest is sparked, people are connected to nature and, when charts are compared, a clear message is formulated: If humans had not discovered technologies that utilize fossil fuels, our global climate would be different today.

Oftentimes the "molecules" don't want the activity to end.

Students have, in one 50-minute classroom session, experienced the carbon dioxide cycle rather than hearing about it.

Josie Elbert, curriculum and instruction specialist with The Peggy Notebaert Nature Museum for the "sCool Globes" climate change curriculum pilot, explained that although three little words—global climate change—often confuse and mystify adults, educators using this new curriculum have found that teaching complex concepts doesn't have to be daunting.

Teaching the complex subject of global climate change is a daunting challenge made easier with an educational unit produced by The Peggy Notebaert Nature Museum.

"People have been tracking climate for a long time and a vast amount of information is available," Elbert said. "What makes the topic hugely complex is that climate is changing, and the changes are coming faster and faster, making it difficult for most people to keep up with related issues. Statistics are a little scary, and grasping scary is not something people do willingly.

"But when you provide science topics in a practical, bare-bones and hands-on manner, people can connect with the topic," Elbert explained. "That is

"I never realized…that it was so hard to get carbon dioxide out of the ocean."

Fact: Seventy-five percent of Earth's surface is water, and up to 22 million tons of carbon dioxide are stored in our ocean's surface waters, deep waters, sediments and plants.

why we made learning the difference between weather and climate a game show. The Green decision-making process became a board game, fuel efficiency becomes clear by an activity titled Cool Cars' and students got hands-on experience with test tubes and goggles in 'Graphing the Greenhouse Effect'."

The key to a successful science curriculum is not a lecture, but engaging students in the lesson.

The pilot program was a huge success with teachers and students.

"Teachers enjoyed the convenience of the pre-packaged materials and reported being more confident teaching about global climate change because they had experienced the activities during their workshop," Elbert continued. "More than a majority said they would use at least some parts of the nine-lesson curriculum next year, which we feel is a huge testament to the value of the unit."

Throughout the curriculum, students keep a Global Expressions Journal—enhancing interdisciplinary and authentic learning experiences—made of interlocking globes, similar to paper dolls. One particular journal struck Elbert.

"One student drew a picture of earth with a heart around it, and wrote a poem that says 'Earth's lover and friend, the beginning to the end, Earth's lover and friend,'" she said. "This student felt that way after only one lesson. If every student came away with a similar message then we truly will have succeeded in making a global difference."

For more information on The Peggy Notebaert Nature Museum, visit www.naturemuseum.org.

The Nature Museum will bring their educators to your region, district or school for professional development training and curriculum overview.

They also will host a group of teachers at the Peggy Notebaert Nature Museum for training. For availability and fees, call Laura Nitanda, Manager of Teacher Professional Development, to schedule a custom workshop (773/755-5100).

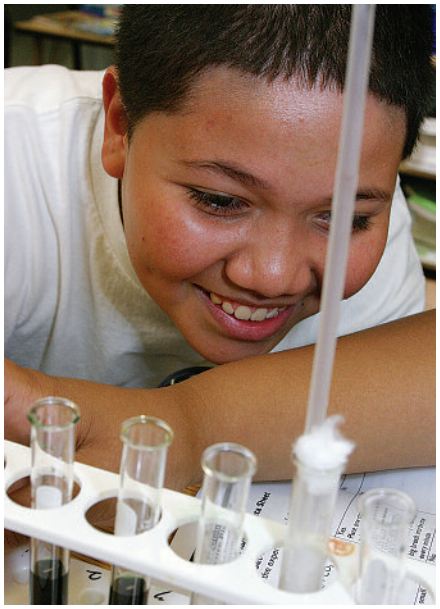
Some lessons are available at www.coolglobes.com. The Nature Museum also might be presenting this curriculum at the Midwest Environmental Education Conference and teachers should check that schedule.

Going Global

In the summer of 2007, the Chicago lakefront was dotted with 124 five-foot diameter "Cool Globes," a massive educational project conceived by Highland Park environmental activist, mother and former advertising and marketing specialist Wendy Abrams. Each of the mega-size planets featured a unique, artistic solution to global warming. Millions of people viewed the globes in Chicago, and untold millions will experience the global messages (minus the 40 globes sold in Chicago, raising $500,000 for Chicago Public Schools environmental clubs) as the exhibit travels to Washington D.C., San Francisco, San Diego and London.

Cool Globes, Inc. desired to continue the educational message and approached staff of The Peggy Notebaert Nature Museum to determine what resources were available on global climate change. Based on the museum's successful Science on the Go! model, a group of Chicago Public School Area 2 teachers met to assist the organizations in writing a usable and practical curriculum that tells the science behind global climate change.

Ten schools, 14 teachers and more than 420 students pilot tested the curriculum in the spring of 2008. Teachers attended a workshop to improve their knowledge, and nature museum educators visited each classroom to teach three of the nine lessons. Based on input from all involved, and an outside evaluator, changes will be implemented and the unit will roll back out to Chicago classrooms the second semester of the 2009-2010 school year.



Hands-on experience with test tubes helps students understand the greenhouse effect.