



# Setting the Stage

**CURE**  
**BioScience**  
**EXPLORATIONS**

**Annual Report 2008-2009**

## A Word from the Director

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It has been well documented that the United States is lagging behind other nations in science education achievement. These results are mirrored in Connecticut which has some of the largest achievement gaps in the nation. These data, in combination with the increasing need for all citizens to be responsible consumers of science, highlight the important need for higher quality bioscience education in Connecticut. Cooperation and coordination among industry, scientists and educators is critical for providing educational opportunities that create a meaningful link between education and careers.

In these tough economic times, I am happy to report that our programs are continuing their success and indeed expanding thanks to the continued support from old and new sponsors from industry and academia. This year's theme "Setting the Stage" highlights the foundation we have laid over the past year to prepare our science educational outreach programs for exciting growth and expansion. There are a few key accomplishments I would like to highlight.

First, we successfully embarked on key strategic initiatives to broaden the breadth and depth of our programs. We adopted a new organizational name, BioScience Explorations, to better encompass this growth. We also secured funding and began development of new elementary science education initiatives which will roll out in the coming year.

Second, we were a key player in improving science education in Connecticut, significantly increasing student understanding of and interest in science. Our programs helped teachers meet State science education standards, and improved teacher understanding of and confidence in teaching science and technology.

Third, we achieved national recognition, perhaps most notably through hosting the Mobile Laboratory Coalition conference in New Haven this past June. We also developed key partnerships with other science education organizations regionally and nationally for curriculum growth, and presented at national conferences.

It has been a highly successful year, and I look forward working closely with our industry and academic partners to expand our horizons over the coming year.

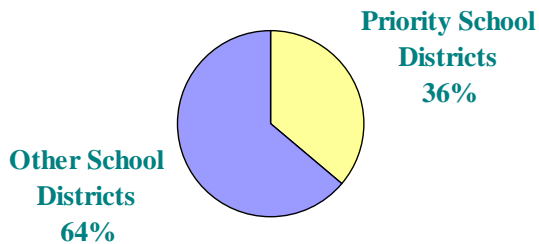
Sincerely yours,

Sarah J. Berke  
Director, BioScience Explorations

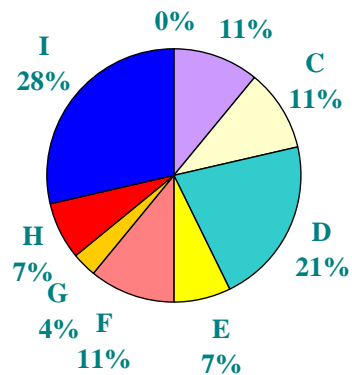
## CURE BioBus

The CURE BioBus visited twenty-eight schools across Connecticut this year, visiting 2,525 students, and training 41 teachers. Thirty-six percent of visits were to Connecticut Department of Education designated priority school districts. Twenty-nine percent of visits were to schools in district reference group I, the neediest school districts.

**Percent of CURE BioBus Visits to Priority School Districts**



**Percent of CURE BioBus Visits to Each District Reference Group**

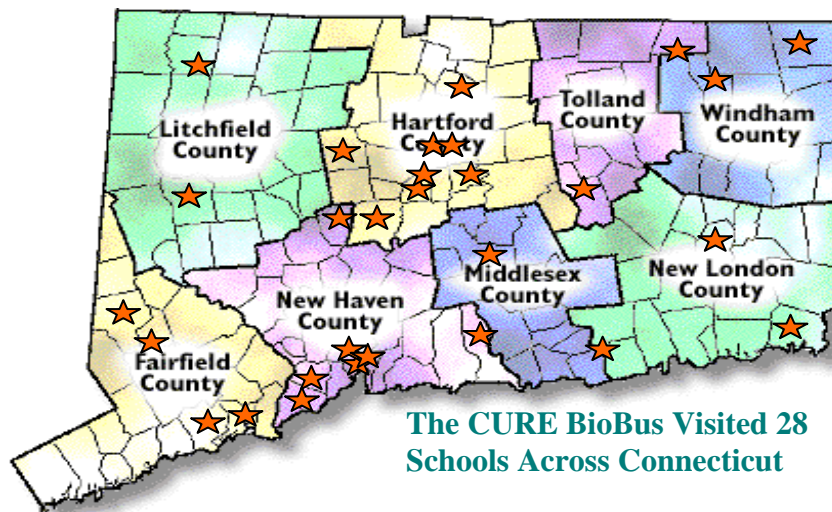


### Teacher Reported Impacts:

Following the CURE BioBus visit, teachers reported the experience (32% response rate):

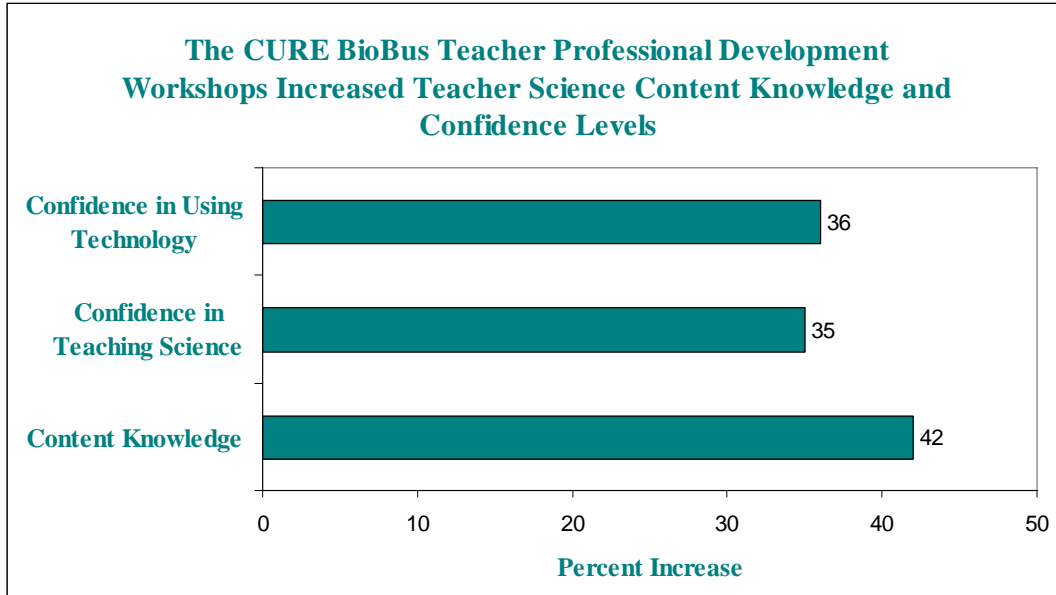
- Was worthwhile for them and their students (100%),
- Fit into their curriculum (77.8%)
- Helped them meet state science education standards (44%)
- Increased their own confidence in doing/teaching science (44%)
- Increased their own science content (11%)
- Increased student enthusiasm and interest in science (100%)
- Increased student content knowledge (100%)

100% of teachers stated they would participate in the program again.



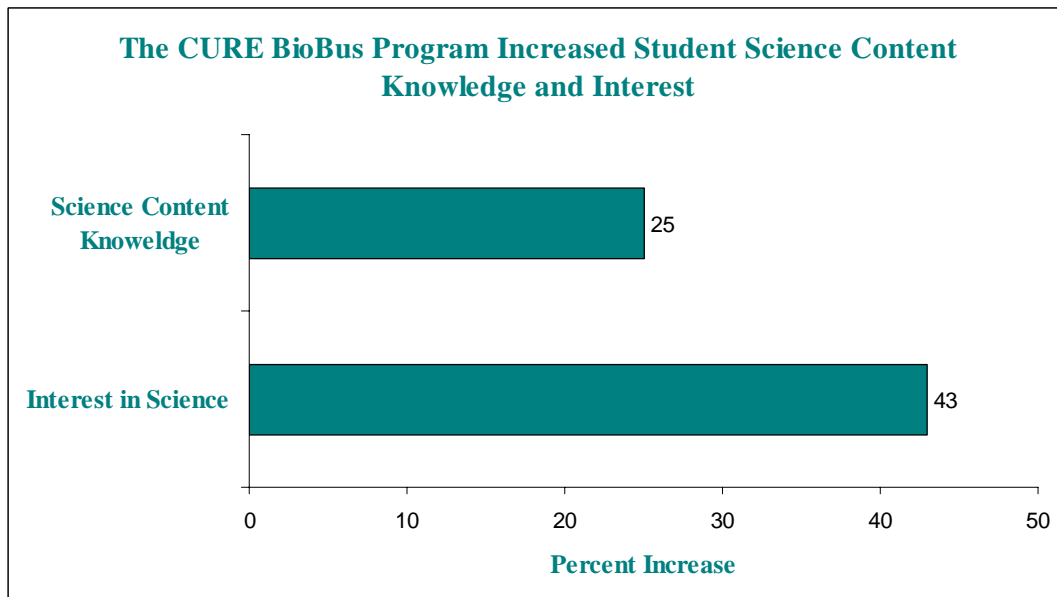
**CURE BioBus Teacher Assessment Summary:**

Pre- and post- teacher training workshop assessments indicated significant increases in teacher confidence levels in teaching science and in using biotechnology in the classroom. The tabulated results are provided below (N= 41).



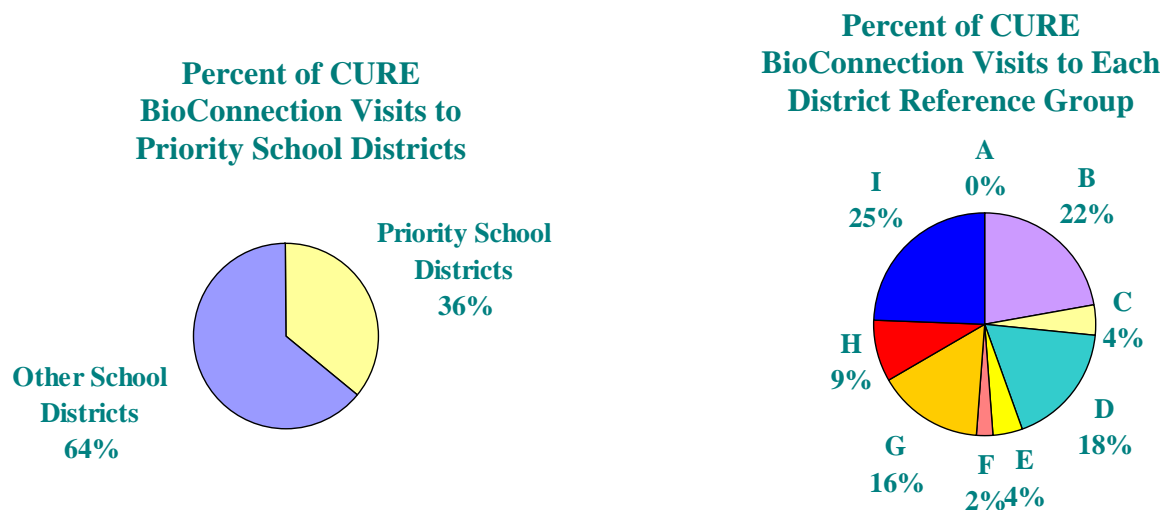
**CURE BioBus Student Assessment Summary:**

Student pre- and post- mobile lab visit assessments showed significant impacts on student interest in science and increases in student content knowledge. Survey results also showed 70% of students enjoyed the experience.



## CURE BioConnection

CURE BioConnection, our equipment loan program, visited 45 schools throughout Connecticut, reaching 6,260 students and 35 teachers. Thirty-six percent of visits were to Connecticut designated priority school districts and twenty-five percent of visits were to the neediest school districts, district reference group I.



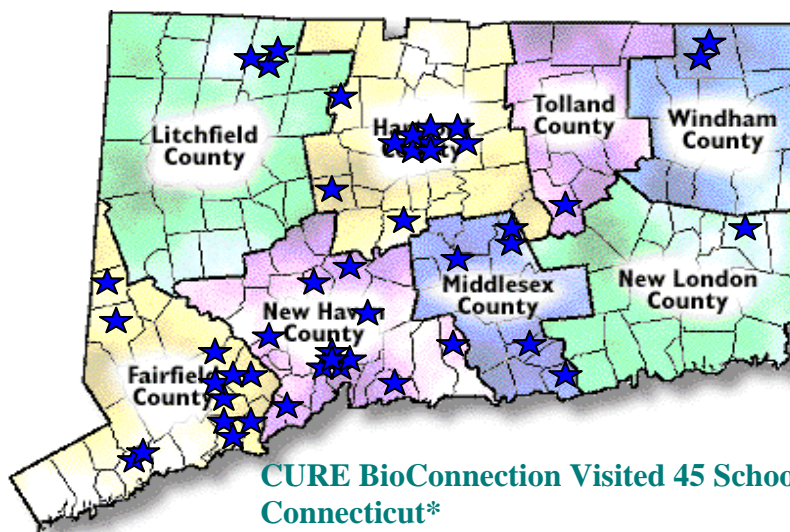
### Teacher Reported Impacts:

Following the CURE BioConnection visit, teachers reported the experience (33% response rate):

- Was worthwhile for them and their students (100%),
- Fit into their curriculum (100%)
- Helped them meet state science education standards (86.7%)
- Increased their own confidence in doing/teaching science (73%)
- Increased their own science content (77%)
- Increased student enthusiasm and interest in science (93%)
- Increased student content knowledge (100%)

100% of teachers stated they would participate in the program again.

Additionally, 93% of teachers stated they would implement the CURE BioConnection program as a regular part of their curriculum if they could receive the program at a convenient time each year.

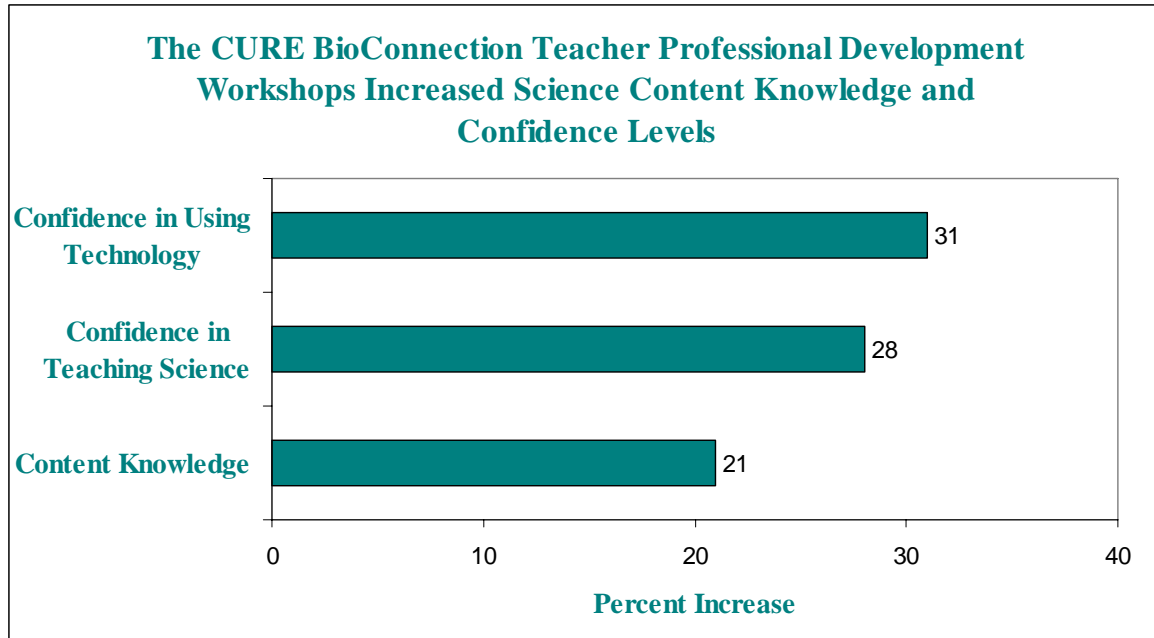


**CURE BioConnection Visited 45 Schools Across Connecticut\***

\* some stars represent more than one visit

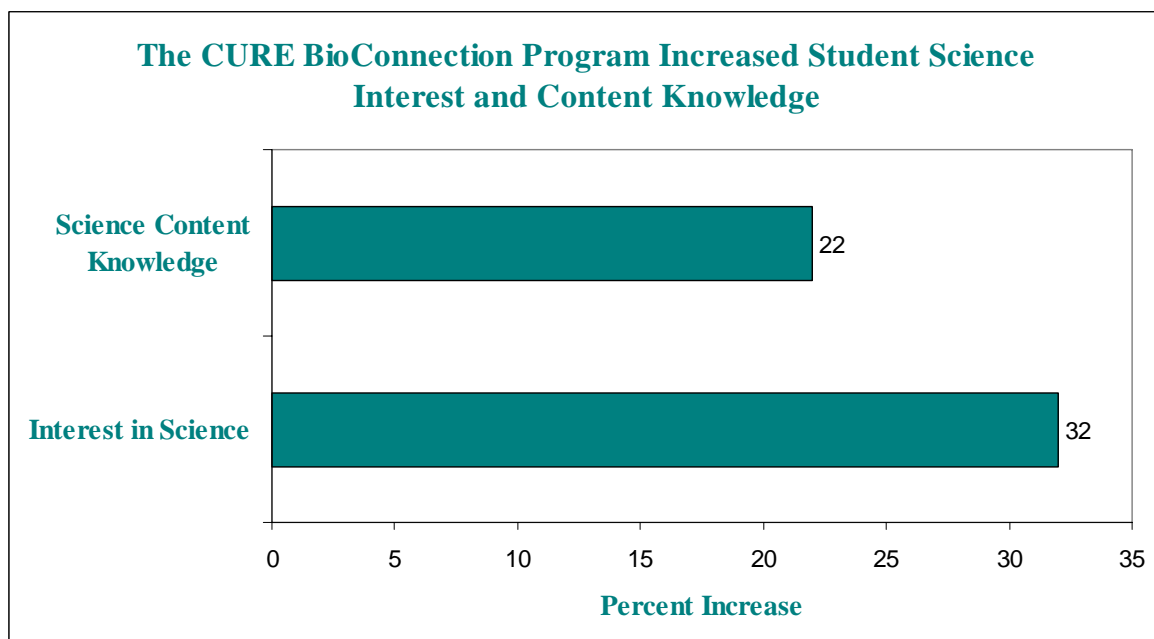
**CURE BioConnection Teacher Assessment Summary:**

Pre- and post- teacher training workshop assessments indicated significant increases in teacher confidence levels in teaching science and in using biotechnology in the classroom. The tabulated results are provided below (N= 35).



**CURE BioConnection Student Assessment Summary:**

Student pre- and post- CURE BioConnection visit assessments showed significant impacts on student interest in science and increases in student content knowledge. Survey results also showed 58% of students enjoyed the experience.



## Accomplishment Highlights

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***Mission Statement:*** *to be a key bioscience education resource in Connecticut, igniting enthusiasm, understanding, and support for science and technology*

### Goals

- Provide comprehensive, state-of-the-art and interactive bioscience experiences for students, teachers and the general public
- Serve as a nexus for knowledge transfer between formal science learning, higher education and industry
- Encourage students to pursue science careers

### Highlights

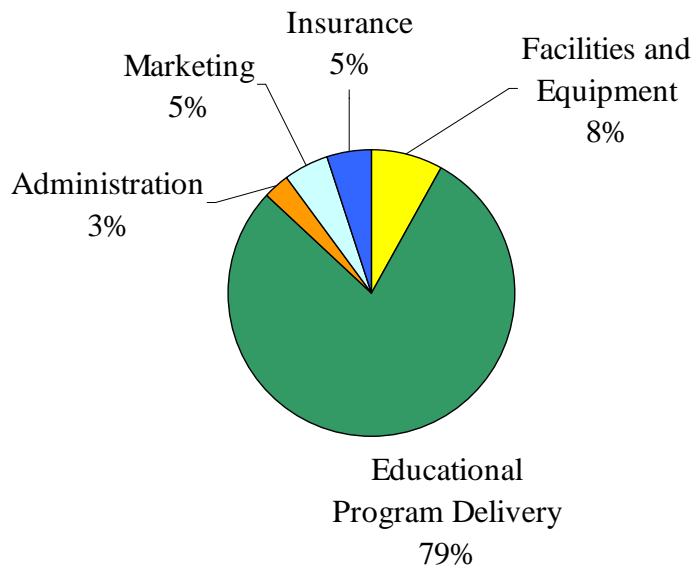
- Visits
  - Visited 73 schools, trained over 160 teachers, and reached over 8,700 students.
  - Reached 67% of Priority School Districts; 50% of those more than once
- Curriculum Development
  - Developed and piloted new middle/high school curriculum unit on DNA damage and repair entitled *The Gene Screen*.
  - Piloted new third grade elementary science task on water purification and conservation entitled *To Drink or Not to Drink*.
  - Held Stem Cell Research Symposium at StemConn '09 on bringing stem cell research into the high school classroom
  - Developed new high school cancer protein biology experiment entitled *The Proof is in the Protein*.
- Strategic Growth
  - Elementary science education program
    - Secured funding
    - Developed program scaffold
    - Started curriculum development
    - Identified builder for new elementary mobile lab
    - Designed new elementary mobile laboratory
  - Rebranding of programs
    - Adopted a new overall program name, BioScience Explorations
    - Identified outside consultant for graphic design
  - Visiting scientist program
    - Developed a new BioScience Explorations' Docent Program
    - Started development of training manual
    - Developed marketing materials and strategy

## Financial Statements and Staffing

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BioScience Explorations continued to maintain a lean and efficient budget. Approximately 87 percent of BioScience Exploration's 2008-2009 budget was directly utilized for program delivery. This was a three percent increase over the previous year.

During the period, there were no significant staffing changes. BioScience Explorations employed an intern from the University of New Haven, a female undergraduate student in Forensic Science. The intern taught onboard the CURE BioBus and in the CURE BioConnection classroom.



*“The CURE BioConnection program is a terrific program that allows us to expose our students to hands-on science technology that they wouldn’t normally be able to do because of budget constraints. My students loved the activity and made many real-world connections to their learning. The program is well designed and user friendly making it easy to implement for beginning and experienced teachers. We will definitely sign up again”.* ~ **2008-2009 CURE BioConnection Teacher**

## Partners: Expanding Our Horizons

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BioScience Explorations secured significant funding from sponsors for ongoing support and strategic growth of the programs over the past year. Significant contributions were made to develop and implement a new elementary science education initiative, Boehringer Ingelheim's Science Quest, to be rolled out in the upcoming year. This multifaceted program will include a mobile science laboratory, an equipment loan program, and relevant hands-on science curricula. Boehringer Ingelheim's Science Quest will bring an exceptional science education experience above and beyond the normal elementary classroom curriculum; focusing on Connecticut's neediest school districts. Upon completion of the program, participating students will have been actively engaged in hands-on science exploration for over six weeks. We look forward to sharing this program with you in the coming months.

### **Boehringer Ingelheim's Science Quest – Lead Sponsor**

Boehringer Ingelheim Cares Foundation

Boehringer Ingelheim Pharmaceuticals, Inc.

#### **Academic Partners**

Quinnipiac University

Manchester Community College

Yale University

Wesleyan University

University of New Haven

#### **Foundation Partners**

Boehringer Ingelheim Cares Foundation

Pfizer Community Foundation

#### **Government Partners**

State of Connecticut

Office of Workforce Competitiveness

#### **Corporate Partners**

CURE Members

Connecticut Innovations

Boehringer Ingelheim Pharmaceuticals, Inc.

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Achillion Pharmaceuticals, Inc.

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Invitrogen Corporation

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Thermo Fisher Scientific

Apple Computers

Antarus Biotech, Inc.

## A Letter from the Board of Directors

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The scientific and technological advances that have led to our nation's ability to create new industries and employment can be traced back to innovative academic and industry biotechnology research. Innovation is a key to economic competitiveness and the technological breakthroughs that improve our lives. It is critical in fostering the vitality of the U.S. science and biotechnology enterprise and the growth of a highly skilled workforce versed in science, technology, engineering and math (STEM). While the biotech industry is among the fastest-growing industries in our state, we are having difficulty finding qualified workers within Connecticut with *the* right technological and scientific skills.

Nationwide we face considerable challenges to engage our youth. As the role of science and technology in society increases, so does the need for an educated populace capable of fulfilling the industry's highly skilled jobs and making informed decisions about health and health care. As stated by President Obama, "America cannot succeed unless our students take responsibility for their own education ... and responsibility for our children's education must begin at home." Learning is a personal task and responsibility. Mathematics, science, and technology skills have become the "global languages" of the 21<sup>st</sup> Century and are driving the opportunities that await students after high school graduation. Career opportunities now require an emphasis on what people can do with knowledge rather than the individual units of knowledge they have. Students must learn to solve problems creatively, with an emphasis on how to discover, analyze, interpret and communicate information in a variety of ways to be fully equipped for the opportunities that await them.

As a recognized leader in biotechnology education, the CURE BioBus and Bioscience Explorations has moved from providing enrichment programs to developing and implementing critical hands-on inquiry in the K-12 classroom. The Bioscience Explorations program, led by Director Sarah Berke and her amazing team, have delivered hands-on learning programs to 588 schools, including 81% of Priority School Districts, reaching over 72,000 grade 4-12 students and training over 1000 teachers. With exciting programs such as *Bugs and Scrubs: Teaching Disease Concepts in the Classroom*, and *Biotech Goes Green* Sarah and her team engage grade 4-12 students, meet state science education standards, and improve teacher understanding of science and technology. But there's more!! Having successfully secured funding, Bioscience Explorations began development of new elementary science education initiatives which will roll out in 2010, providing inquiry-based science for K-5 students. The inaugural program, *To Drink or Not to Drink*, provides hands-on science for 3<sup>rd</sup> grade students highlighting water as a non-renewable resource to be conserved.

Bioscience Explorations is a successful model of cooperation and coordination between industry, state, education, and national science programs to provide Connecticut students superior science and math educational opportunities. It represents the best of Connecticut, providing an unrivaled opportunity to provide teachers, students and the general public with hands-on science, a sure way to engage inquiring minds and demonstrate that access to science is truly available to all.

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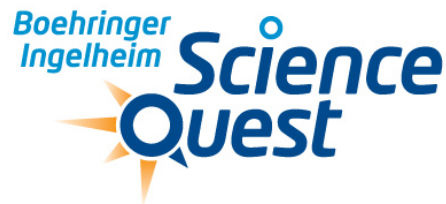
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