

Connecting Classrooms and Community with the Health Sciences

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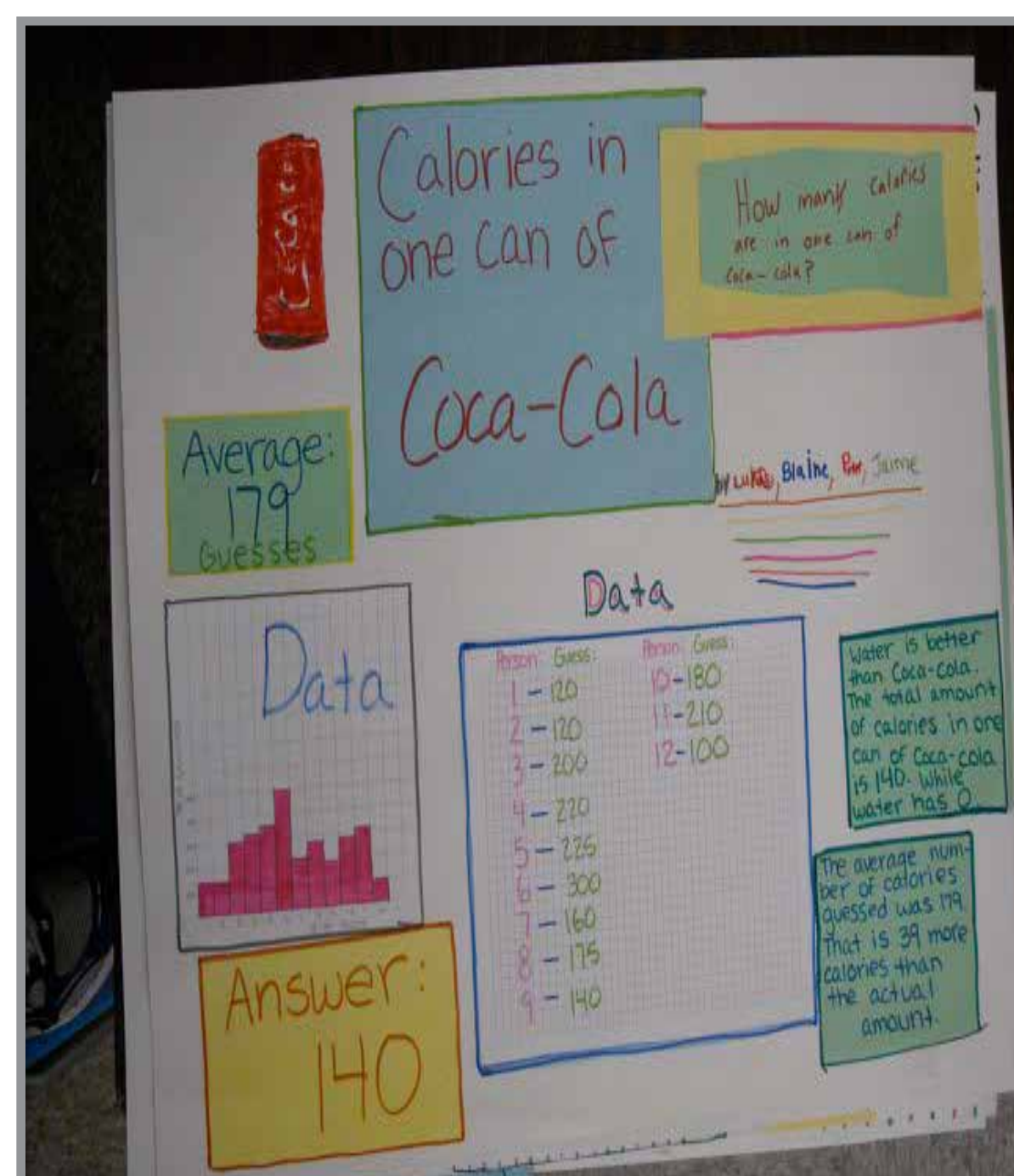
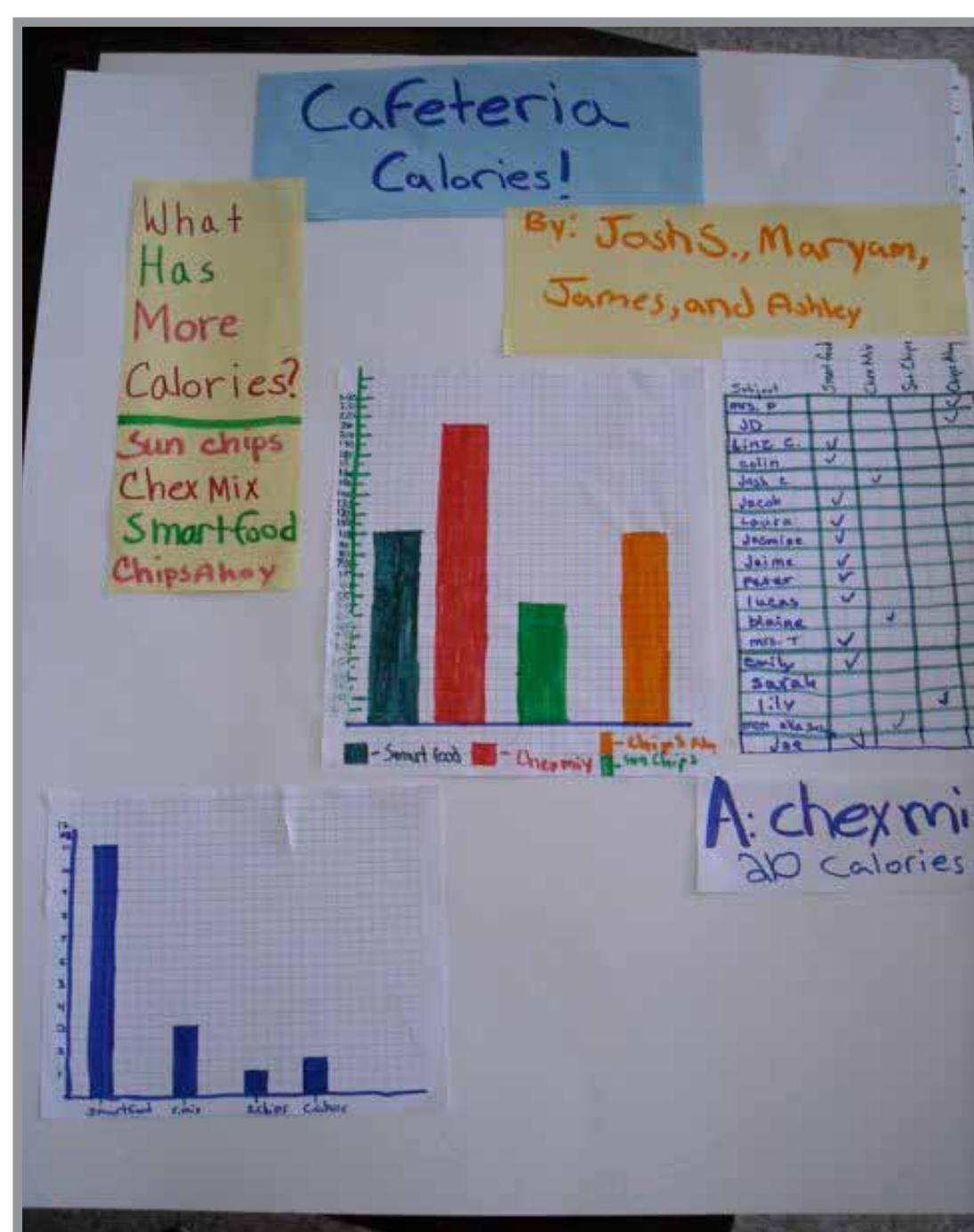
Montshire Museum of Science • Norwich • Vermont
Science Education Partnership Award • National Center for Research Resources

How do we help students and teachers engage in the health sciences through student-designed research experiences which build awareness and understanding of adolescent health issues?



Year 1 Focus: During the first year, the project is developing curriculum materials and piloting lesson plans that engage young adolescents in the topic of nutrition and diet. Research questions students develop for their group research projects are modeled after Dalton/Longacre research group at Dartmouth Medical School investigating cultural, family, and environmental influences on child dietary preferences, activity levels, and obesity. Student research projects include investigating exterior store advertising at their local corner markets, the amount of calories and other nutritional information in different fast food meals, and the nutritional information of sodas and sports drinks available at vending machines. Students research groups have also investigated the availability of different food types in their neighborhoods and schools, including sugared drinks and fresh fruit in convenience stores, and the amount of fried foods available in their school cafeteria. Photo credits, left to right: Taber Andrew Bain, David Berkowitz, and Karen Bloomberg.

Year 1: Investigating Nutrition, Energy Balance, Activity, and the Built Environment



Winter/Spring 2010 Pilots: Montshire project staff are currently piloting a nutrition unit in five different classrooms. The materials are designed to be flexible for classroom teachers to implement in a variety of ways, ranging from a complete four week unit on nutrition, energy balance, and student research on the built environment, to a short two week supplemental unit on nutrition and diet.

Students from a small K-8 school in central Vermont completed their unit with a variety of student-designed investigations on nutrition, diet, and food choices. Two posters from the 'student research symposium' illustrate their work on surveying children's understanding of calories in different beverages and snack foods. These posters were then displayed in the school cafeteria for all members of the school community to see while waiting in the lunch line.

Project Goals

- ❖ Provide participants with information about current health science research and advances that will assist in making personal health decisions;
- ❖ Raise participants' awareness of the ways culture and media affect their choices;
- ❖ Expose participants to the interesting and relevant research taking place locally, increasing their understanding of the diversity of health science careers and research processes;
- ❖ Provide middle school students with opportunities to participate in their own health science related research projects through inquiry-based science investigations; and
- ❖ Provide teachers of under resourced rural schools the instructional materials and support needed to meet the science and health education standards of Vermont and New Hampshire.

Four Areas of Focus

Each year a new health science curriculum module will be developed, piloted, and evaluated in schools. Each module has a specific area of focus which is aligned with the research interests of our partner scientists at Dartmouth Medical School. The four curriculum modules are:

- ❖ Nutrition, Activity, and the Built Environment
- ❖ Alcohol, tobacco, and other risk behaviors seen in movies, television, and other media and their impact on adolescents' choices.
- ❖ Being sun-safe: tanning Salons, tanning, body image and health.
- ❖ Nature of impact injuries and protective gear in sports.

Program Components

- ❖ Four health science curriculum modules.
- ❖ One classroom table-top exhibit for each module developed.
- ❖ Teacher and classroom support.
- ❖ Public lecture series by partner health researchers.
- ❖ School visits by health researchers.
- ❖ Summer teacher institute.

This project was made possible by a Science Education Partnership Award (SEPA) grant from the National Center for Research Resources (NCRR), a component of the National Institute of Health (NIH).

SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
Supported by the National Center for Research Resources, a part of the National Institutes of Health

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Background

The Montshire Museum of Science is a regional science center serving schools, families, and adult learners in Vermont and New Hampshire. The Montshire Museum carries out its mission by engaging children and families in hands-on, inquiry-based science. We address society's need for education by inspiring and supporting a life-long love of learning. The Museum's levels of public participation are extraordinarily high given its rural setting. Last year, over 150,000 people visited the Museum or participated in Montshire's educational programs and outreach activities.



Montshire is nationally known for its hands-on exhibits that engage visitors in exploring the natural and physical sciences. In addition, we offer an array of education programs serving schools, teachers and students. In these programs, Montshire's professional educators help teachers implement inquiry learning in their classrooms, and provide hands-on learning opportunities for students.

The Museum is located along the banks of the Connecticut River in Norwich, Vermont. Located one mile from Hanover, New Hampshire, Montshire's proximity to Dartmouth College and Dartmouth Medical School allows for many successful science education collaborations between the three institutions.

Staff and Resources

Montshire maintains a professional staff of science educators whose expertise lies in designing inquiry-based science learning experiences for teachers, students, families, and children. The Education staff is actively engaged in research in teaching and learning, and developing new models for school-museum partnerships that meet the special needs of under resourced small rural schools in Vermont and New Hampshire.



The Museum's exhibit department has extensive experience in developing and prototyping exhibits in both biological and physical sciences.

The Museum has invested heavily in recent years in providing the infrastructure for unique learning experiences. These include a classroom specifically designed for K-8 science education programs and teacher workshops, and a new Science Discovery Lab in the main exhibit hall.



Connecting Classrooms with the Health Science Project Staff, Year 1

- ❖ Greg DeFrancis, Director of Education, PI
- ❖ Mike Fenzel, Curriculum Developer
- ❖ Bob Raiselis, Director of Exhibits
- ❖ Emily Fiskin, exhibits and graphics
- ❖ Inverness Research Associates, Project Evaluator
- ❖ Meghan Longacre, Investigator, Hood Center for Children and Families, Dartmouth Medical School
- ❖ Gail Langeloh, Nutritionist, Hood Center, DMS
- ❖ Keith Drake, MPH Intern and graduate student, DMS

Year 1 Evaluation Activities

- ❖ Develop and administer pre-unit evaluation instrument on knowledge and attitudes.
- ❖ Site visits to schools during field testing of materials, include classroom observations, student interviews, and teacher interviews.
- ❖ Site visit during teacher institute, interviews on-site with participants and follow-up telephone interviews.
- ❖ Interviews with project staff and Dartmouth researchers.
- ❖ Meeting with project staff to share finding of pilot and inform improvements for Year 2.

Year 1 Project Activities

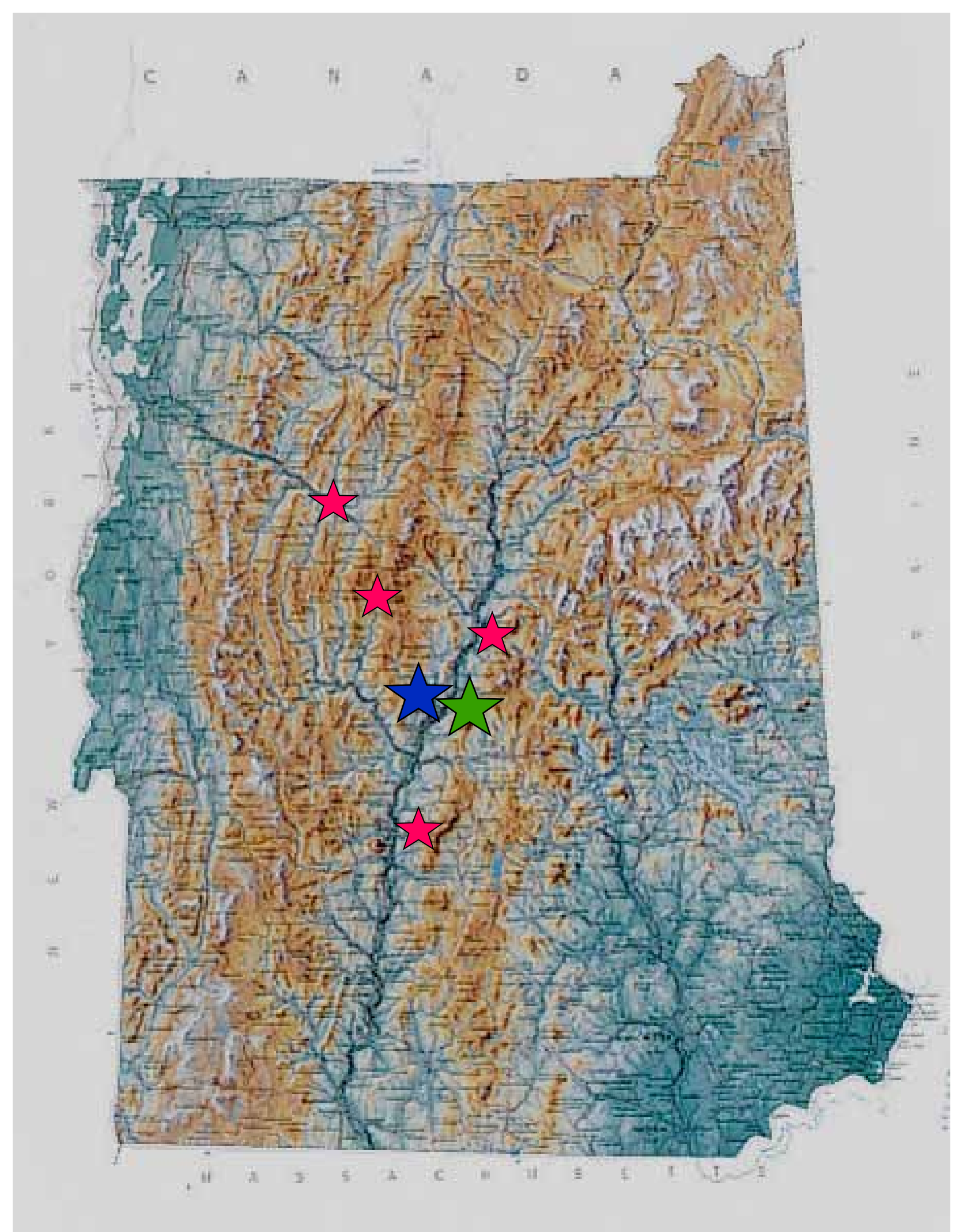
- ❖ Project planning and meeting with DMS researchers.
- ❖ Recruit schools for Year 1 and Year 2 pilots.
- ❖ Research and develop first module for classroom pilots, aligned with state and national health and science standards.
- ❖ Develop prototype of table top exhibit for use in spring 2010 pilots.
- ❖ Pilot first curriculum module in five classrooms.
- ❖ Hold public lecture on health science research.
- ❖ Create video tape interview of health science researcher.
- ❖ Recruit teachers for first summer teacher institute.
- ❖ Implement first summer teacher institute.

Connecting Classrooms with the Health Sciences will rely on a strategic partnership with four different research groups at Dartmouth Medical Schools. Each group's research is focussed on a different adolescent health issue and where chosen for their relevance to students in grades 5-8. The research teams will work under a sub-award agreement between Montshire and Dartmouth College, and provide a lead researcher for a videotape interview, and junior faculty and graduate students to assist with school visits and curriculum development. Research teams include:




- ❖ Drs. Madeline Dalton, and Meghan Longacre. Community Health Research Program, Hood Center for Children and Families, Dartmouth Medical School. Current research: individual, family, community, and built environment factors on adolescent dietary practices and physical activity and relationship to childhood obesity. Funded by NIEHS.
- ❖ Dr. Ardis Olson. Community and Family Medicine, Dartmouth Medical School. Current research includes how to change adolescent behavior and attitudes towards skin cancer and sun tanning.
- ❖ Drs. James Sargent and Keilah Worth. Community Health Research Program, Dartmouth Medical School. Research interests include adolescent drinking, smoking, and influence of popular culture on teen risky behavior.
- ❖ Drs. Ann-Christine Duhaime and Beth Costine. Pediatric Neuroscience at Dartmouth Medical School. Research interests include brain injury in children and pediatric epilepsy.

Pilot Schools for Year 1 Four schools will be involved in field testing the curriculum modules during Year 1. Additional schools will be recruited in Spring of 2010 to join the project in Year 2. All schools serve small, rural populations or are in small towns. Three of the schools have only one class per grade, the fourth school has two classes per grade. The schools are listed below, and the map shows their approximate locations.

- ❖ St. Monica's Catholic School (K-8), Barre, Vermont.
- ❖ Tunbridge Central School (K-8), Tunbridge, Vermont.
- ❖ Rivendell Academy Middle School (6-8), Orford, New Hampshire.
- ❖ Cornish Elementary School (K-8), Cornish, New Hampshire.



Project Sites Year 1

-  Montshire Museum of Science
-  Dartmouth Medical School
-  Pilot Schools