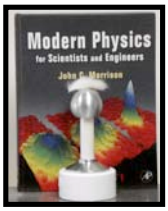
Utah State University Marsh White Outreach Award Report 2010

The USU 2010 Marsh White Award supported 23 in-class visits by the SPS outreach team to local fifth grades, a weekly meeting with capable and interested third to fifth graders (top right, SPSers in back row) attending a special science enrichment program that focused on experiential learning, and an on-campus demo show for 250 fifth graders (lower right). The activities supported by the Marsh White Award involved engaging kids in hands-on explorations of current and resistance and static electricity.

The *current and resistance exercises* employed "light bulbs" constructed from baby food jars (below left). The electrodes of the light bulbs were nails punched through the jar tops with alligator clips attached (SPSers' assembly line, below second left). Between the clips students connected various "filaments:" a piece of thread, a thin wire, a pencil lead, and so forth. Before connecting the other ends of the nails to a battery, they were asked to predict—based on a brief lesson on how current flowing through resistance produces heat—how bright the light might be and how long it might last (below second right). Incidentally, pencil leads make spectacular filaments (below right).

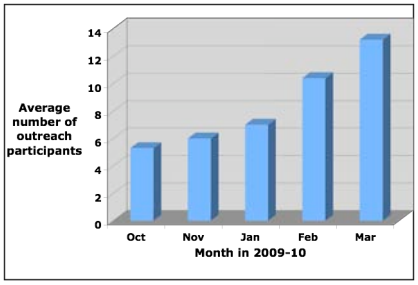
The *static electricity exercises* centered on homebuilt Van de Graaff generators. Generator construction was done in collaboration with local high school students. Generators were gifted to the fifth grades we visited. Jacob Dansie (above right), the creative genius behind both Marsh White projects, is the quintessential adapter of found parts. During the year, our group put together over 20 different size generators, at less than the cost of a single such apparatus sold by Pasco (~$600). The munchkin shown below to the right is about 15 cm tall. The dome is a doorknob, the belt a strip made from a latex surgical glove, and the power supply a double-A battery. It might be the world's smallest Van de Graaff.

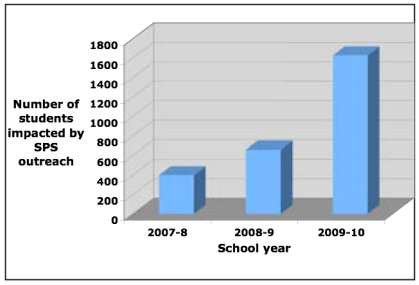


Many more pictures of our outreach effort can be found at the Facebook site

http://www.facebook.com/photo_search.php?aid=-1&view=all&oid=274280081728&s=340&hash=1cc1aecdaf438064106cdd616bf92215#!/group.php?gid=274280081728

Many of the Marsh White team members are shown to the right. The team presented a prize-winning poster describing its work and acknowledging the Marsh White Award at the Zone 15 meeting in Pocatello on April 10. The graph to the left below shows the growth of the team over the course of the year. By year's end we had about 20 total participants, 15 of whom were consistently active. The graph to the right tracks our in-class student contacts over the past three years (reaching over 1600 in 2009-10). Note that the latter does *not* include our robust LaserFest program or our involvement in Physics Day at the Lagoon Amusement Park—together impacting an additional 8,000 youngsters. Beyond Jacob, other key team members included Linsey Johnson (our Outreach VP and next year's SPS President), Robert Call (current SPS President), Brian Tracy (next year's Outreach VP), Kenneth Bennion (SPS treasurer), Cyri Dixon, and Danielle Fulmer. (Kenneth, Cyri, and Danielle are teaching majors.) At a year-end celebration, SPS members chipped in for a gift certificate (to Lowe's) for Jacob to recognize his hard work. At its annual Awards Day the Department thanked Linsey for her organization skills and energy with a special gift.





Despite our considerable frugality, costs for supplies for the light bulb kits, the Van de Graaffs, and reimbursement for transportation exceeded $600. The amount beyond the $300 provided by National SPS for this project (for which we are very grateful) came from a gift from a private donor.

"I couldn't let the wonderful Science Club at Hillcrest Elementary end without a note of thanks for the wonderful and inspiring work of the USU SPS student science "teachers." They certainly made a difference for my daughter, Molly, in her understanding and love of science. She came home with her science fire burning!" ~Julie Duersch, grateful mother of Molly Duersch, Hillcrest Elementary School 5th Grade Science Club member~

"The presentation was awesome! It got my kids so excited about science! It was very well planned with a variety of activities." ~Stacy Blauer, 3rd grade teacher~

"The SPS education and outreach program is the largest and most comprehensive effort of its kind ever mounted by students at Utah State University." ~Jan Sojka, USU Physics Department Head~

Submitted by David Peak, USU SPS adviser, May 26, 2010.