

Marsh W. White Award Report

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The Coolidge Science Club was born of a desire to expose 3rd, 4th, and 5th graders to some of the wonders of science outside of their everyday classroom experience. It is important to make clear that the goal was a qualitative exploration, and that quantitative measurements were introduced slowly during the course of the eight weeks that the Club met each semester. As such, the activities described in this manual could often be performed with a few everyday items, and the mission for every activity was to excite the students about hand-on work and experimentation.

The Club met for eight weeks, every Monday night, from 6:45 pm to 7:30 pm. Aside from a few introductory remarks by Prof. Affatigato, the activities were complemented with a few exciting demonstrations. Highly popular ones include the marshmallow/vacuum demo, the green laser pointer that reaches the stars, singing rods, laser balloon popping, and NdFeB magnets “floating” on a copper plate. Each activity was organized so that 2-3 elementary age students sat a table with an adult guide. The guide’s job was to keep the students on task, explore different ideas, and ensure safety. The guides came from different backgrounds, but many had previous experience with science or engineering. Parents, relatives, Coe College physics students, and two teachers formed the core of volunteers. On any given night we had 6-10 volunteers, allowing us to keep the student groups small and interactive.

For the most part the activities were liked and were very successful. If anyone attempts to recreate the Club, some suggestions might include: a) have the students keep a lab binder/notebook to organize their worksheets and take notes; b) add additional labs on chemistry, a weak point in the current assortment; c) extend the time to a full one hour, though for some activities this may require adding things to do; d) add more engineering activities, with building/construction skills; and/or e) add some multimedia at the beginning introduction every week, perhaps including some videos of hard-to-do demonstrations.

In general, it is hoped that these activities, organized and prepared to save time, will spur outreach efforts to elementary schools by folks with an interest in science, engineering, and technology. The school parents loved the Club and an article about it was written in the Coolidge Elementary Newsletter. It read:

“The Coolidge Science Club finished a very successful year, with over 50 students participating in once-a-week activities in the Fall and the Spring. Coolidge students from the 3rd, 4th, and 5th grades performed experiments on magnetism and electromagnets, optics and lasers, air pressure, sound, electricity, elasticity and rubber balls, energy, DNA of strawberries, and even a contest for an original golf-ball catcher. The Club was run by Mario Affatigato (a

physics professor at Coe College), Louisa Affatigato (research assistant, Univ. of Iowa), and a large number of Coe student volunteers and Coolidge adult parent volunteers. Coolidge teachers Mrs. Fenton and Mrs. Christoffersen were also instrumental in the success of the Club. Many thanks are owed to all the volunteers!

The students were also treated to some demonstrations every week. Among the most popular was the “Star Wars” green laser, able to point at the stars, and the incredibly-shrunken marshmallows, almost as tasty as when they started. Science skills were practiced when the students filled out their weekly worksheets, and made notes of their results. Did the size of the rubber balls affect how high they bounced? Did the number of turns of wire make stronger electromagnets? But perhaps the most amazing events were those in which the students made original observations: some noticed that making a drawing with two crayons in one hand, and then looking at it with different color filters resulted in a 3-D picture!

It is possible that the Coolidge Science Club will be repeated in a couple of years. In the meantime, discussions are going on about a possible Math Exploration Club for next year...”

We are attaching a copy of the lab manual we developed for the Club.