SOCIETY OF PHYSICS STUDENTS
An organization of the American Institute of Physics

Future Faces of Physics Award Report

Project Proposal Title	Lab For Kids
Name of School	Adelphi University
SPS Chapter Number	SPS Chapter #2 Sigma Pi Sigma Chapter #124
Project Lead (name and email address)	John Dellato – johndellato@mail.adelphi.edu
Total Amount Received from SPS	$300
Total Amount Expended from SPS	$295

Summary of Award Activity

The "Lab For Kids" activity conducted by the Physics club of Adelphi University is an outreach program designed to bring an enjoyable science experience to minority children from local high schools. These students were led through various hands on experiments demonstrating a few basic principles in physics by our club officers and several other volunteer students.

Statement of Activity

Overview of Award Activity

The "Lab For Kids" event has been successfully hosted by members of the Adelphi University Physics Club for a number of years. Once again, our chapter of SPS met students from local high schools at the Cradle of Aviation for a morning full of experimental projects and . Multiple student volunteers from the Physics Club headed each station. Experimental stations for this year's event included a demonstration of the Van de Graaff generator, conservation of momentum, and spectroscopy, an optics lecture, a lesson on how to build simple circuits, and a tutorial on the construction of an electric motor. This required the most hands-on work. Students were led through the process of constructing such a motor (based on the designs from the website http://www.education.com/print/no-frills-motor/) out of a D battery, copper wire, paper clips, magnets, and electrical tape. Upon the conclusion of the event, the students were allowed to take their newly constructed motors home.

"Lab For Kids" was designed with the intent to make science (physics in particular) accessible to minority students and perhaps inspire them to pursue Physics in the future. And of course, we hope they had a lot of fun doing it! It is very easy for students to become so overwhelmed with the mathematics involved that they forget that physics describes the fascinating world around us and that playing around with nature can be so much more rewarding with some real physical understanding. Presenting this material in a more casual way lends itself to a rewarding and enjoyable laboratory experience that is so fundamental to what science is all about.

Students were comfortable with the volunteers, treating them more like friends then professors. These students were able to interact with the Physics Club volunteers (some of whom are not much older than them), to ask them questions about physics, college life, and everything else. One student in particular was curious as to how they would be able to fulfill the rigorous requirements of a program like the Physics programs while playing for a college sports team. We discussed how although it would be quite difficult to maintain both it was far from impossible. In the end it would require a great deal of dedication and hard work to pull it off.

This year, we were fortunate to have a turnout of 40 high school students, whom we hope to have made a lasting impression on and to have inspired them to continue pursuing physics and the sciences.

Impact Assement: How the Project/Activity/Event Promoted Physics across Cultures

Our event specifically targeted minority students with the hope that they would be inspired to pursue or consider Physics as a career or academic path through hands on science demonstrations. This was our primary goal. Our secondary goals were to inspire the students by presenting physics in a pleasurable way, to teach the students physics or as was often the case reaffirm their knowledge, and to test their thinking skills. Unfortunately there is no definitive way to assess the success of these goals; however, it is my opinion that we achieved each of our goals.

We attempted to make the demonstrations as enjoyable as possible. An example of an event station found at this year's Lab For Kids was the "momentum wheel" station. Students would stand on a floating platform attached to an upright wheel. Spinning this wheel caused the platform to rotate due to the wheel's angular momentum, thus illustrating conservation of momentum to the students as if it were a ride. Students were amazed at how well the platform controlled and responded to their movements. Another of the favorite stations is always the Van de Graaff generator. At this station, students have the freedom to explore the world electrostatics equipped with light bulbs, rabbit fur, conducting metals, and (for the most daring) with their hands. And, of course, students get to experience the endless joy of shocking their friends with static! One group of students with the help of the volunteers managed to create an electric chain of students across the room. Unfortunately, the charge failed to carry through so many people, but the students were happy to explore some fascinating electrostatic hairstyles!

We also managed to set up more formal experiments at the optics and analog circuit stations. Both included a short lecture of the facts behind the experiment. This year, since there are so many powerful concepts in optics, we developed a typical refraction lab (one similar to an experiment conducted at Adelphi's own freshmen physics labs). Using a tank half-filled with water, a small laser, and a protractor as a background, students can investigate Snell's Law of Refraction first-hand (see pictures on p. 7) After learning about the various circuit components the students were encouraged to design their own circuits to see what would happen given resistors, LEDs, and capacitors. Most of the students knew their circuit theory quite well, but for the first time were given the freedom to apply their knowledge creatively. Multiple groups had no problem designing several simple circuits given resistors, LEDs, and capacitors.

The main event was the electric motor construction. Students were walked through the process of building an electric motor from D batteries, copper wire, magnets, and paper clips. The goal was to have a suspended loop of copper wire perpetually rotate above the battery due to the influence of electromagnetic forces. This station tested the students forcing them to apply the physics they had been taught, and think like engineers to design a cool toy motor. By the end of the day at least half of the students had a working motor and three students had managed to build great motors that ran all day long.

As the ultimate goal of the event was to generate broad interest in the field of physics among minority students, the success of our endeavor can only be measured in the amount of enthusiasm we perceived. On that account, we believe the event was a success as many students left the event with positive feelings concerning the day's activities.

Key Metrics and Reflection

The Future Faces of Physics Award is designed to promote projects that cross cultures. What cultures did your project attempt to bring together?	Minority groups (African Americans, Hispanics, and women)
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "10 high school volunteers").	40 High School Students
How many students from your SPS chapter were involved in the activity, and in what capacity?	9 Students served as station managers for each experiment
Was the amount of money you received from SPS sufficient to carry out the activities outlined in your proposal? Could you have used additional funding? If yes, how much would you have liked? How would the additional funding have augmented your activity?	The received amount was sufficient
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	We anticipate repeating the event in much the same capacity.
What new relationships did you build through this project?	During the project we met both the physics teacher and principal of the high school. The physics teacher is actually an Adelphi alumnus who assists us oranizing this event each year. We were lucky to have her speak at a gathering of physics alumni
If you were to do your project again, what would you do differently?	Before we begin the project it would be best to test all of the supplies to make sure that everything works well.

Expenditures

We used the SPS funding to buy supplies for the electric motor experiment. The other experiments we already had supplies for but the electric motor experiment was also unique in the fact that each student was given the opportunity to create their own electric motor and then bring that motor home as a keepsake.

Expenditure Table

Item	Cost
D Batteries	$105
Insulated 22G Copper Wire	$40
Large Eyed, Long Metal Sewing Needles	$90
Modeling Clay	$10
Electric Tape	$10
Small Circular Magnets	$15
Hardware	$10
Hobby Knives	$15
Total of Expenses	$295

Activity Photos

Treasurer Brian Kaufman leading a group of students through a simple circuits demonstration.

Physics Club Secretary Dennis Mars explaining points of the electric motor construction to a group of students.

Physics Club President John Dellato leading a group discussion on optics

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Club member Kevin Teng (right) leading a circuit demonstration.

Physics Club Vice President Michael Trietsch (top left) and club member Stephen Ho (middle) leading students in the construction of electric motors.

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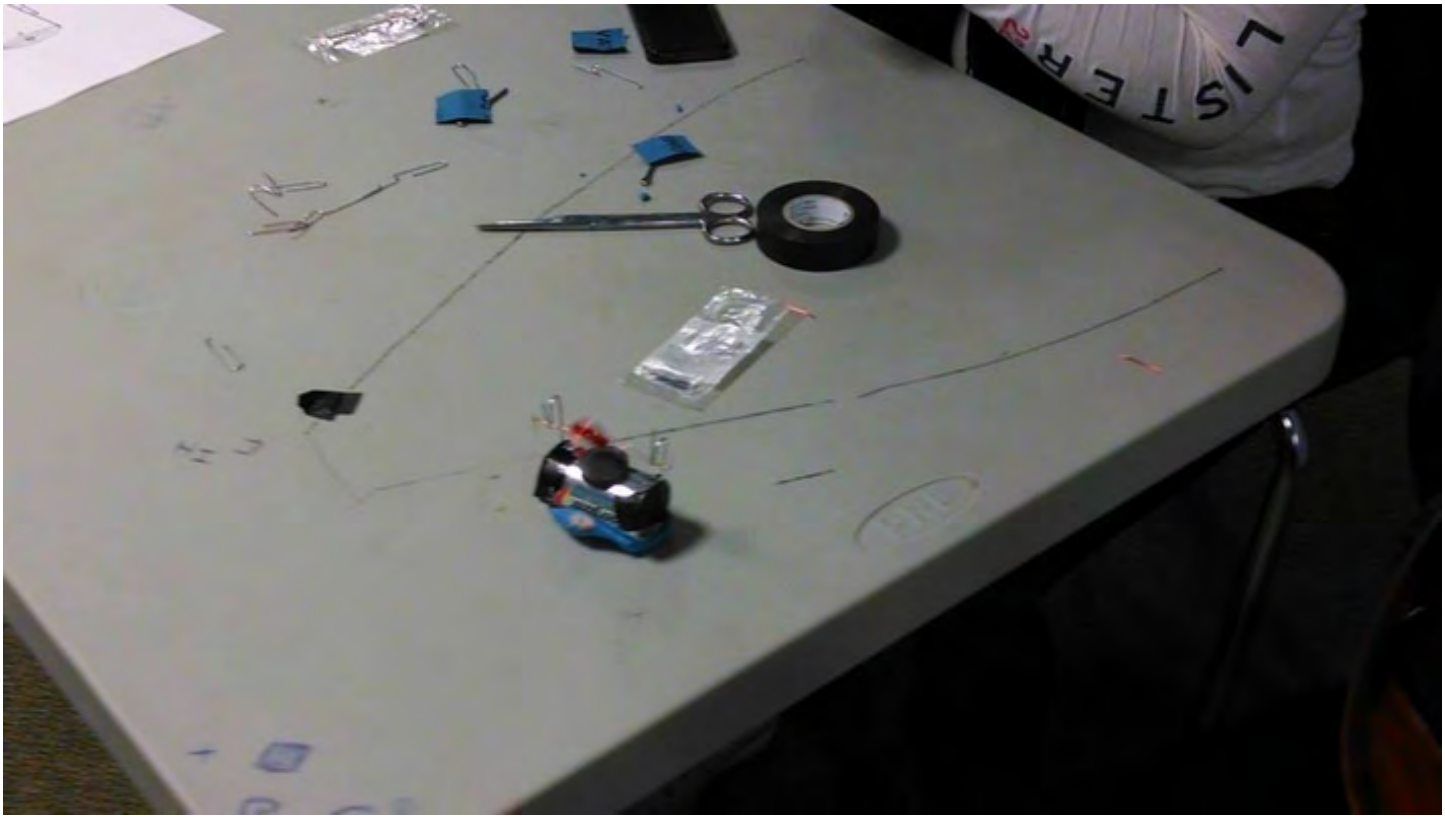

A completed electric motor. This would be the final product constructed and taken home by the students.

A group of students interacting with a Van de Graaff generator.

If you have any questions, please contact the SPS National Office Staff
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