



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh White Award Report

Project Proposal Title	Lab4Kids
Name of School	Adelphi University
SPS Chapter Number	0020
Project Lead (name than email address)	Zahin Ritee zahinritee@mail.adelphi.edu
Total Amount Received from SPS	\$500
Total Amount Expended from SPS	\$484.78

Summary of Award Activities

Here at Adelphi University, our SPS chapter takes pride, each year, in hosting Lab4Kids. Lab4Kids starts with Adelphi's physics majors receiving training in the demonstration and explanation of various physical phenomena. One such phenomenon is the conservation of angular momentum, where students have the opportunity to control the direction of their rotation on a secured plate that is free to rotate by holding and turning a spinning wheel. Adelphi's SPS chapter hosts high school physics classes, in which groups of students move from station to station to learn from our SPS members.

Statement of Activity

Overview of Award Activity

The stations that were held this year include simple DC motors, the conservation of angular momentum, the pressure of moving fluids, a simplified general relativity demo, sound, polarizers, and light and color mixing. At the DC motors station, students constructed small DC motors using a battery, copper wire, and a magnet - demonstrating Lenz's law. At the conservation of angular momentum station, students volunteered to stand on a secured plate, free to rotate. They were then given a spinning bicycle wheel and closely monitored by multiple Adelphi students. The student could then control the direction in which they rotate on the plate by turning the bicycle wheel. Additionally, students learned how rotational inertia and angular velocity play into one another, as their product is the infamously conserved angular momentum. Students once again volunteered to stand on the plate that is free to rotate and were slowly and gently spun while holding their arms down at their sides. The students were then invited to hold out their arms, which slowed them down. At the pressure of the moving fluids station, students got to hold golf balls in a stream of air from an air pump connected to the tubing. The students learned that this was because moving fluids have less pressure, which is responsible for a net force towards the center of the flowing air column with any deviation from it. At the simplified general relativity station, students were invited to roll metal balls on a large, circular sheet of fabric, first with no mass placed at the center and then with a mass placed at the center of the sheet, and were asked to compare the paths of the metal balls on the sheet. At the sound station, students learned that sound is a longitudinal compression wave through a medium. Students were then allowed to pick up a boomstick, which are tubes closed at one end that are such a length as to create particular musical notes and were allowed to come together and perform songs off-sheet music. At the polarizers station, students learned that light is modeled as a transverse wave. Using a long slink held by students at both ends and an array of vertical bars through which the slink passes through, students were able to observe how certain orientations of a transverse wave propagating through the slinky were blocked by these vertical bars. Additionally, students were gifted polarizer glasses. At the light and color mixing station, students learned about the frequency spectrum of light. Our SPS members used an overhead projector and sheets of colored, transparent plastic to demonstrate color mixing.

This project brought many exciting demonstrations of the surprising and stimulating ways in which our universe behaves in a fun and attention-grabbing way. This promotes interest in physics in high school students, which benefits the global physics community and the world as a whole, as it may influence these students to pursue physics and will grant even more students an appreciation for physics.

The audience for this project is high school students. These are students who not only may choose to pursue physics in college but will soon serve as the fabric of society. This is why instilling an appreciation for physics is so important.

Community outreach is a cornerstone of the SPS chapter at Adelphi University. Lab4Kids is our most effective and most important means to interact with our broader community.

A highlight of the event is when a teacher was encouraged to try our angular momentum demonstration, in which his students got to watch him get scared on our rotating plate (much to their amusement.) A final side note, this event is incredibly beneficial for our youngest SPS members, as it promotes their sense of responsibility and belonging in the department and chapter for which they serve.

Impact Assessment: How the Project/Activity/Event Promoted Interest in Physics

Our goal every year with Lab4Kids is to promote interest in physics in the next generation of undergraduate students. Through the eagerness to volunteer, the smiles on their faces, and the questions that they ask, we are certain that we have found success. Furthermore, student and teacher feedback has been overwhelmingly positive and encouraging. It has become an important part of the yearly schedule for the teachers we work with across many school districts.

Based on our conversation with the students and the faculty we evaluate our events' impact. Other than treating this similar to coursework, the students seem to enjoy the demonstrations. The joys on their faces, when they look through the diffraction glasses, are great. While doing the demonstrations, they get the feel of a real scientist, which promotes their interest in Physics,

Key Metrics and Reflection

Who was the target audience of your project?	High School students,
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third-grade students" or "25 families").	Over 100 students across multiple school districts.
How many students from your SPS chapter were involved in the activity, and what capacity?	10 physics majors were placed at particular stations.

<p>Was the amount of money you received from SPS sufficient to carry out the activities outlined in your proposal?</p> <p>Could you have used additional funding? If yes, how much would you have liked and how would the additional funding have augmented your activity?</p>	<p>Yes, it was sufficient.</p>
<p>Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.</p>	<p>Yes, Lab4Kids is a piece of the Adelphi SPS chapter's identity. We look forward to it every year.</p>
<p>What new relationships did you build through this project?</p>	<p>We formed relationships with many different school districts, teachers, and high school students.</p>
<p>If you were to do your project again, what would you do differently?</p>	<p>Lab4Kids ran as perfectly as ever. However, there is always room to grow. We look to increase the number of students that attend.</p>

Press Coverage (if applicable)

N/A

Expenditures

Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
<p>Diffraction glasses</p>	<p>The diffraction glasses were used at the light station as part of our demonstration.</p>	<p>\$179.94</p>

<u>Batteries for the simple motor station</u>	The batteries were used to make our mini-motors that demonstrated Lenz's law.	\$281.94
<u>Copper Wire</u>	The copper wire was used to make our mini-motors which demonstrated Lenz's law.	\$22.90
Total of Expenses		\$484.78

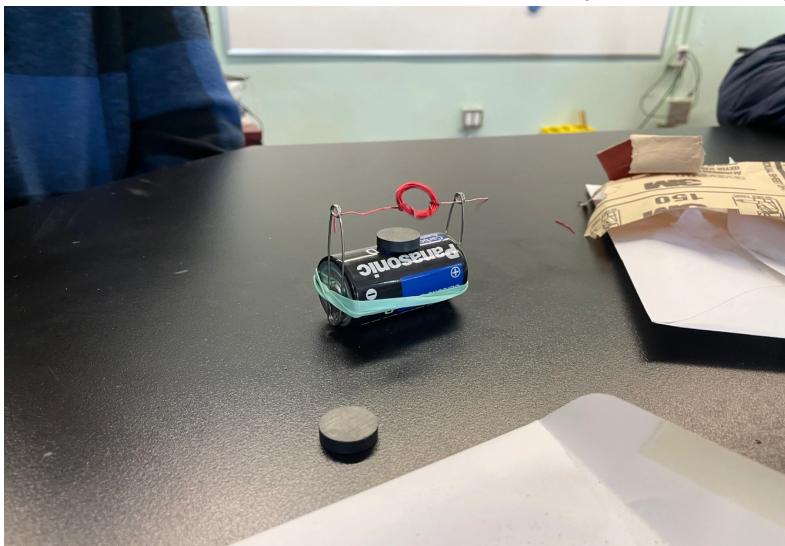
Activity Photos



Student making DC Motors



Eboard member Kylie Goldade Helping the students



Student-built DC Motor



Almost there !:)

All Photo credit: Dr. Matthew Wright



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