



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh W. White Award Report

Project Proposal Title	Throwing You For a Loop
Name of School	University of the Sciences
SPS Chapter Number	5619
Project Lead (name then email address)	Gopal Goberdhan, ggoberdhan@mail.usciences.edu
Total Amount Received from SPS	\$500.00
Total Amount Expended from SPS	\$500.00

Summary of Award Activities

The University of the Sciences' SPS chapter participated in The Philadelphia Science Festival as an exhibitor for the science carnival. At our booth, we used hands-on demonstrations to exhibit mechanical physics. We successfully engaged over 500 visitors in physics and helped eliminate the stigma surrounding the difficulty of physics.

Statement of Activity

Overview of Award Activity

This project consisted of 7 main demonstrations which includes the Newton's Cradle, Bicycle Wheel Gyroscope, Pail of Water, Ring and Discs Demonstration, Loop-the-Loop track, Centripetal Force Demonstration, Coin and Feather falling in a vacuum and a Sand Pendulum. The focus of this project was to have interactive and hands-on demonstrations of mechanical physics and to explain the demonstrations in simple but compelling ways. Our target audience for this project was children of all ages. The Newton's Cradle and Pail of Water demonstrations attracted the attention of younger kids while the older children tend to enjoy the Loop-the-Loop track and the space-filling patterns created by the Sand Pendulum. The manner of our explanations of the demonstrations also changed from age group to age group. For example, we would explain the Pail of Water demonstration in term of taking a hard turn in a car for the younger children while we explained it in terms of centripetal motion for the teens and youth.

For this project, we highlighted the physics of motion and practical applications of mechanics. We also educated the community on Newton's laws, conservation of energy and momentum, rotational motion, oscillators and moment of inertia. The use of the demonstration purchased with this grant helped to spark an interest in physics within the community.

Our SPS chapter is very involved with outreach projects especially through the last four years. We plan on continuing our outreach events into the future because it has become a fundamental part of our chapter. Our department also supports us in our outreach endeavors. Our SPS Advisor and other physics faculty tend to take an active part and make sure we are on track with planning outreach events. Overall, our department supports our chapter outreach events because it allows us to use our theoretical knowledge and apply it to projects.

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

To assess whether or not we meet these goals, we gave our surveys for some of the participants to fill out, and we used the feedback we got from the facility supporting us. On the survey, we asked the following questions:

Rate on a scale of 1-5, with 1 being the least and 10 being the most

- 1.) What was your overall enjoyment from our demonstrations?
- 2.) How much did you learn?
- 3.) Did we pique your interest in Physics?

Answer the following question

- 4.) What was your favorite demonstration?

The results from questions 1-3 were mostly 4 and 5, therefore we interpret this to mean we successfully met all our goals mentioned above. We have successfully demonstrated and explained our demonstration

and have also promoted an interest in physics. The question about the favorite demonstration was mostly capture by either the sand pendulum or the Newton's cradle.

This project also had an influence on the SPS members and physics majors as well. We worked together as a team and spent a lot of time together planning and assembling the demonstrations needed for this event. We learned a lot of teamwork, communication and time management skills getting this project together and running the event.

Key Metrics and Reflection

Who was the target audience of your project?	Anyone ages 5+
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "25 families").	About 400 kids with their parents, and about 60 college students
How many students from your SPS chapter were involved in the activity, and in what capacity?	8-9 involved, 5 very involved
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 and how would the additional funding have augmented your activity?	The amount of money was perfect for this project but if we had more money we could have came up with some bigger projects.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	Yes, some of these demonstrations will most likely be used in future outreach events and will be used in classrooms to demonstrate some of these principles to students.
What new relationships did you build through this project?	Strengthened relationships between peers and between members and advisor
If you were to do your project again, what would you do differently?	Brought a more complex demonstration to appeal to those who already understand all of the basic concepts.

Press Coverage

For this project we received Social Media coverage from our school.

Twitter: <https://twitter.com/USciences/status/1125852813567959041>

Instagram: <https://www.instagram.com/p/BxDGpV3BHfj/>

and from our SPS Facebook page: <https://www.facebook.com/USciencesSPS/>

Expenditures

Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
Greek Waiter's Tray Super Value Laboratory Kit	Demonstrate Newton's First Law	\$29.93
Ring and Discs' Demonstration Kit	Demonstrate the concept of inertia	\$17.96
Inclined Plane, Economy Choice	Used in the Ring and Discs' Demonstration	\$47.21
Loop-de-Loop Track	Demonstrate the conservation of energy	\$46.85
Curve Ahead, Reduce Speed! Centripetal Force Demonstration Kit	Demonstrate centripetal force	\$40.70
Free Fall – Coin and Feather	Demonstrate free fall, acceleration and air resistance	\$52.97
Giant Newton's Cradle – Eisco Labs	Demonstrate the conservation of momentum and energy	\$130.49
Limitless Colorful Confetti	Used in the Greek Waiter's Tray Demonstration	\$6.50
Large 24" Slate Pendulum Swing	Demonstrates harmonic motion	\$134.71
Total of Expenses		\$507.32

Usciences SPS will absorb the excess over the approved budget

Activity Photos



Five USciences SPS members posing after setting up our SPS Physics Booth for the 2019 Philadelphia Science Carnival on the Franklin Parkway



SPS member Karla Miletic demonstrates a Newton's Cradle to a future scientist.



USciences SPS President Gopal Goberdhan and SPS Member Karla Miletic communicate the physics of the Sand Pendulum and Newton's Cradle to booth visitors.