



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh White Award Report

Instructions: Please complete each section after reading the purple text describing what should be in that section. Then delete the purple text.

Project Proposal Title	Sucking the Life Back Into Physics Demo
Name of School	Utah State University
SPS Chapter Number	7579
Project Lead (name and email address)	Vanessa Chambers vanessa.chambers@usu.edu
Total Amount Received from SPS	\$500
Total Amount Expended from SPS	\$461.88

Summary of Award Activity

The Marsh White Award was given to Utah State University to purchase a Bell Jar Vacuum Chamber demonstration. This demonstration was used to show that sound travels through the medium of air and how air creates friction. When the vacuum bell jar is pumped free of air, the sound stops traveling through the jar and the noise making device inside becomes quiet. It was also used to show that in a vacuum coins and feathers drop at the same rate with no air friction. This demonstration is used at a monthly science night where members of the community come and do one on one activities with our club.

Statement of Activity

Overview of Award Activity

Our chapter was given the Marsh White Award with the intent to purchase a vacuum bell jar. The vacuum bell jar consists of a rectangular sealed acrylic box with a small hole designed for a hose. This hose connects to an air pump that sucks the air out of the jar. On the jar, there is an acrylic lid that can be placed on and is sealed through pressure. This project allowed our chapter to have one-on-one demonstrations with members of the community reaching children from pre-school age to adults. This vacuum bell jar allowed us to demonstrate that sound travels through the medium of air as well as that objects all fall at the same rate with no air friction, including feathers. Our chapter used this demonstration at monthly "STEM" nights put on by the college as well as at local "STEM" fairs put on by local elementary schools and middle schools. Kids are fascinated by the idea that a feather and a coin fall at the same rate in the bell jar. We have the students drop coins and feathers outside the jar and they watch them fall at different rates due to air friction. We put the same objects in the bell jar and they fall at the same rate. Kids find the idea that air has friction fascinating.

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

This project is used at monthly "STEM" nights with children of all ages and cultures. Using members of our chapter we taught the children about air friction and sound waves. These students gained a better understanding of pressure, air friction, and sound. The goal of our project was to use this demonstration in monthly "STEM" nights that promote physics learning. We have used this demonstration several times with small children and they love it. It gives us an opportunity to explain physics principals to them, regardless of their age. This demonstration allowed us to teach many students from different cultures and different ages about air resistance and pressure. So far, we have reached approximately 150 students from pre-school age to college age with this demonstration. We will continue to use it in the future.

Impact Assessment: How the Project/Activity/Event Influenced your Chapter

When our chapter first received the vacuum chamber, we all had to learn how to use it. We had a group meeting one night where each of us had the opportunity to use the chamber to do a demonstration. It was a great experience as members in our chapter thought of new activities that we could use in the vacuum chamber. It strengthened the relationships of the members in our chapter and gave us the skills of how to work the pump and set up demonstrations inside the chamber. Now all of the members are capable of taking this demonstration to STEM nights in our region.

Key Metrics and Reflection

Please answer the questions below. Please indicate if a question is not applicable to your project.

The Marsh White Award is designed to promote projects that cross cultures. What cultures did your project attempt to bring together? (Please be as specific as possible.)	This project reached students who were Latin, African American, Caucasian, and Asian.
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "10 high school volunteers").	About 150 students ranging from pre-school age to college age. About 100 first through sixth grade and about 50 middle school through college age.
How many students from your SPS chapter were involved in the activity, and in what capacity?	10 members from our chapter currently know how to use the demonstration
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?	We could have used additional funding of \$50. The vacuum chamber and pump were slightly more expensive than anticipated, and we couldn't afford a cart to carry the demonstration on.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	We will repeat this demonstration at monthly "STEM" nights and at outreach events in the community.
What new relationships did you build through this project?	The members of our chapter are closer to each other through learning how to use the chamber.
If you were to do your project again, what would you do differently?	We would buy a slightly better pump that removes the air more quickly so we can repeat the demonstration more often.

Expenditures

The expenses were to purchase each piece of the vacuum chamber including a pump, hose, and bell jar. Each of these items is necessary to create the vacuum chamber. We also required a small coin and feather demonstration to show the students how air friction works.

Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
2-Stage Vacuum Pump	The pump is used to pump all the air from the bell jar.	\$141.98
2.25 Gallon Acrylic Wall Vacuum Chamber	This is the bell jar (rectangular) that is used for vacuum demonstrations. We chose acrylic for safety purposes. It also came equipped with tubing.	255.00
Coin and Feather Free Fall Tube	This equipment is used to show that coins and feathers fall at the same rate with no air friction.	54.95+ 9.95 (shipping)
Total of Expenses		461.88



If you have any questions, please contact the SPS National Office Staff
 Tel: (301) 209-3007; Fax: (301) 209-0839; E-mail: sps-programs@aip.org