



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Future Faces of Physics Award Report

Project Proposal Title	Promoting Physics in Mississippi
Name of School	University of Southern Mississippi
SPS Chapter Number	6266
Project Lead (name and email address)	Swapnil Bhatta, Bhatta.swapnil@usm.edu
Total Amount Received from SPS	\$250
Total Amount Expended from SPS	\$178

Summary of Award Activity

The University of Southern Mississippi chapter of SPS conducted a mentorship project at the Hattiesburg High School through the received Future Faces of Physics grant. Through the course of a whole semester, members from the chapter visited the high school to perform various demonstrations to supplement the content they were being taught, in addition to teaching the students various fundamental principles in physics ranging from kinematics to optics.

Statement of Activity

Overview of Award Activity

Through the course of the Fall 2018 semester, SPS members from the University of Southern Mississippi visited Hattiesburg High School. We selected this specific high school because of a high concentration of underrepresented students and students with a minority status. Through continuous visits to the school we developed a mentor program by giving lectures that included demonstrations relevant to the content we covered.

We started off our first visit with demonstrations of sound waves, their propagation and the terminology associated with their properties. This was followed by another lecture in waves, more specifically electromagnetic waves. The next trip included a session with liquid nitrogen demonstrations, we explained some thermodynamic properties using the liquid nitrogen to freeze flowers and racquetballs. Since the instructor for the class had requested that we consider doing a lab activity session relevant to the class curriculum at the end of our visits, we did two labs relevant to momentum and energy at the end.

We were successful in exposing the high school class to a full range of physics topics to which they may not have been exposed beforehand. By providing this underprivileged high school with opportunities to engage in fun, hands-on physics experiments, we expanded the number of potential physics majors and contributed to our project's main goal: promotion of gender and racial diversity in the scientific field.

The SPS chapter at Southern Miss is actively involved in outreach activities that include a healthy mix of educational and fun demonstrations. We visit Hattiesburg High School once every year, the project itself was more focused on imparting a sense of curiosity while simultaneously following the school's curriculum for the year and thus the multiple visits through a semester were beneficial.

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

As mentioned in the proposal, Hattiesburg High school has 97% minority enrollment for students and many of those students come from an economically disadvantaged background. Of the students present in the physics classes, with the exception of one, were African American. Through our mentorship program we were able to demonstrate physics as an impactful and interesting career choice. We were also able to give them new insights regarding the subject and interact with lab equipment which was helpful given the underdeveloped science program in the school.

We assessed the success of our project through the feedback from the students on their interest both at the beginning and ending of trips with them along with the quizzes and lab activity sheets the students turned in. The feedback in general was highly positive, most of the students along with their instructor asked if we could continue with our project for the upcoming semester as well.

The statistics from the quizzes and lab activity sheets are given below:

Quiz 1: 72%

Quiz 2: 70%

Quiz 3: 82%

Lab 1: 59%

Lab 2: 71%

The lowest averaged score for in total was for the first Lab, this was mostly due to the fact that this was the first official lab setting the students had ever experienced. Once they were used to getting data and doing the calculations on their own they improved as seen in the second lab average.

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

The mentorship project gave us a valuable opportunity to give something back to our community. The interactions we had with the students at Hattiesburg High gave us better insight to the educational system in our state and also made us aware of the challenges facing minorities in the sciences. Through the course of our visits, we were able to build better rapport with the students and the instructor, and were able to experience first-hand what giving a lecture in a classroom setting feels like. We were able to coordinate ourselves better for planning out the visits, coming up with materials for the lecture and also writing down directions and questions for the demonstrations we regularly do. Our chapter had a host of new members this semester and they got good exposure to being a part of outreach, something they enjoyed and learned. This project allowed us to brainstorm new ideas regarding our outreach module and also brought us closer together as a group, it helped us learn new things about our community and ourselves.

Key Metrics and Reflection

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

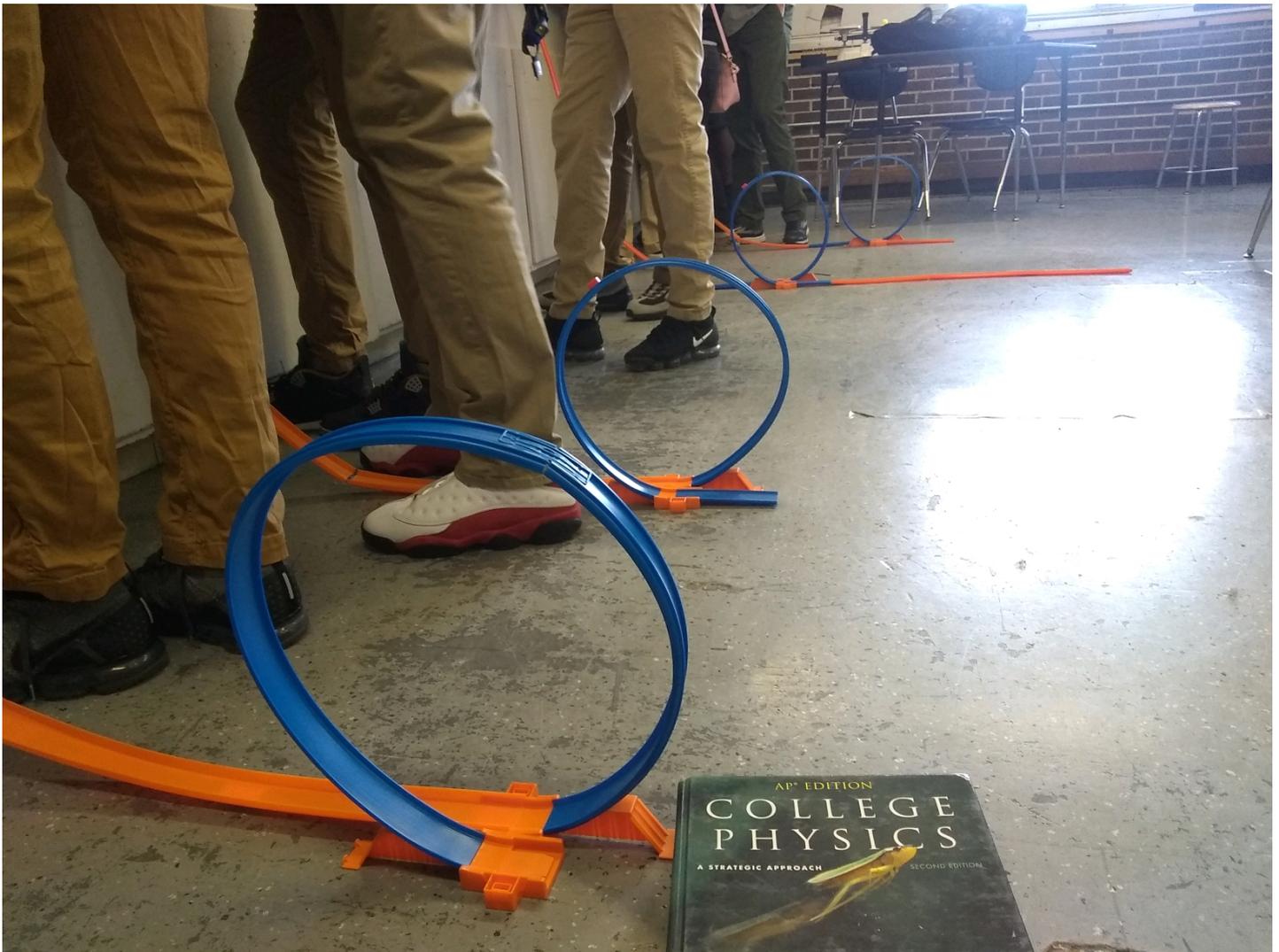
<p>The Future Faces of Physics Award is designed to promote projects that cross cultures. What cultures did your project attempt to bring together? (Please be as specific as possible.)</p>	<p>Our target audience were high school kids, focusing mostly on minorities and underprivileged students.</p>
<p>How many attendees/participants were directly impacted by your project? Please describe them (for example “50 third grade students” or “10 high school volunteers”).</p>	<p>Around 24 high school students</p>
<p>How many students from your SPS chapter were involved in the activity, and in what capacity?</p>	<p>A total of 7 students, with 3 more students partially involved.</p>
<p>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?</p>	<p>Yes, the amount 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>Not at the moment.</p>
<p>What new relationships did you build through this project?</p>	<p>We developed a progressive relationship with the instructor for the class and the school administration, along with a good relationship with the students themselves.</p>
<p>If you were to do your project again, what would you do differently?</p>	<p>We would plan it a lot more thoroughly and have written material ready before we start with our visits.</p>

Expenditures

Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
Marshmallows	Used to show how liquid nitrogen cools objects instantaneously.	6.00
Liquid Nitrogen	We use it to cool different things like flowers and marshmallows. (Provided by the department)	0.00
Race tracks and cars	We used race tracks and cars to let the students do a lab activity on kinetic and potential energy.	60.00
Refreshments	We had refreshments for members that took part in the demo meetings for the write ups.	60.00
Balloons	We use balloons for about three categories of demos, balloons are placed in liquid nitrogen to demonstrate what happens to a gas when it is cooled. We also use lasers to pop the balloons and a balloon to demonstrate the effects of pressure using a small bed of nails.	14.00
Flowers	The flowers are dipped in the liquid nitrogen and crushed.	10.00
Batteries	The lasers we use to pop the balloons are powered by batteries, other equipment we use.	4.00
Racquet Balls	We cool racquet balls in liquid nitrogen and smash them on the floor	24.00
Total of Expenses		178

Activity Photos



1) Students building their race tracks with enough height to pass a loop-de-loop.
Credit: Sophia Turner



2) Our faculty advisor Dr. Vera discussing momentum.
Credit: Swapnil Bhatta



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