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

Marsh White Award Report Template

Project Proposal Title	Electrifying Interest in Physics
Name of School	University of Central Florida
SPS Chapter Number	1076
Project Lead (name then email address)	Max Daughtry maxdaughtry@knights.ucf.edu
Total Amount Received from SPS	$500
Total Amount Expended from SPS	$207.25

Summary of Award Activities

SPS UCF used circuit kits designed for young kids to provide a hands-on experience to the fifth-grade class of Lake Whitney Elementary school. Our goal was to inspire kids to pursue a career in physics or STEM through a fun and interactive learning experience. We incorporated a mixture of Powerpoint slides and circuit "stations" at which the students could learn about various circuit components as well as try their hand at building their own circuits.

Statement of Activity

Overview of Award Activity

Brief Description:

After a brief lecture on electricity, each class of elementary students were divided into groups and given hands-on experience with a variety of circuit construction stations. This opportunity allowed students to develop understanding of the applications of physics. Three of the circuit stations were pre-built, and in a single station, students were provided with three kits to create their own circuits. At each of the stations an SPS member was there to guide the students during the activity. Station 1 involved cups of tap water and salted tap water to demonstrate the effect ions have on conductivity; station 2 involved a circuit that demonstrated the difference between conductors and insulators; station 3 showed the application of a photoresistor; and station 4 was the DIY circuit station where the students got to look through the pamphlets that came with the kits and work on building their own circuits.

This was a bit of a change from the original plan. While purchasing the kits online, we ran into a problem relating to limits on purchase quantity. The supplier had a limit of 3 per customer so we resorted to purchasing 3 on the SPS UCF account and 3 from the project leader's account. In the original proposal, the plan was for each student to have their own kits to work with. However, we believe it was better it worked out this way as it kept the students engaged with us instead of focusing on the kits that would have been directly in front of them. This is also why our expended fund is so much less than the proposed budget.

Outcomes:

This project helped foster an interest in physics among elementary students. Our goal was to bridge the gap between the comprehension and application of physics. The brief talk on electricity followed by the circuit activity allowed students to use a kinesthetic approach to understanding the material with greater depth. SPS members encouraged students to use their critical thinking skills. This project provided an educational experience that helped fifth grade students learn about the various careers related to physics and STEM overall.

Audience:

The target audience for this activity were fifth grade students attending Lake Whitney Elementary School. In total, we were able to provide 108 students with a circuit-building experience.

Context of the Project:

Our chapter's aim was to bring our passion for physics to the youths in our community. Analogous to the mission of other SPS events, we sought to inspire greater interest in STEM. The project leader, Max Daughtry, is very interested in electronics and circuits and wanted to bring that to the students.

Highlights & Stories:

The station I was in charge of was a circuit that was built to explain how a photoresistor worked. In more specificities, there was a light bulb and a speaker that played sounds and music in my circuit. Due to the position of the speaker in the circuit, the lightbulb did not receive enough power to light up. I explained that the position of a resistor in a circuit can cause the current to behave differently. I had one student that then put this new knowledge to the test and asked, "Would we be able to make them both work at the same time if we changed the position?", and proceeded to point at a potential location in the circuit. After testing her hypothesis, it worked! This was a highlight to me, because it showcased the student's working knowledge as she learned, as well as curiosity. - Caden Z.

The whole day the kids were pretty engaged, but it took some work on our end to keep it that way. However, the first class of the day seemed to be so much more excited. They asked so many questions, mostly related, right at the start and seemed genuinely interested in the topics at hand. It was so amazing seeing all the students be so thrilled to learn about what we were talking about because it showed they really were interested and wanted to learn more.

Additionally, the best part of the day for me was seeing all these kids finding ways to work together at the DIY station, which I was in charge of. Out of the 108 students there were only two students I remember having any kind of

bicker (and it was settled quickly) which was astonishing to me. The fact that so many kids could work together so easily makes me hopeful about the future. - Max D.

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

Goals:

- Have a positive impact on students - We met this goal by having a more relaxed and conversational assembly that allowed the students to ask more questions and seek help if needed. They also seemed to feel more of a part of the event and not just a component of it. No one was left out and everyone had the opportunity to experience physics for themselves. Considering this, we definitely had a very positive and lasting impact on these students.

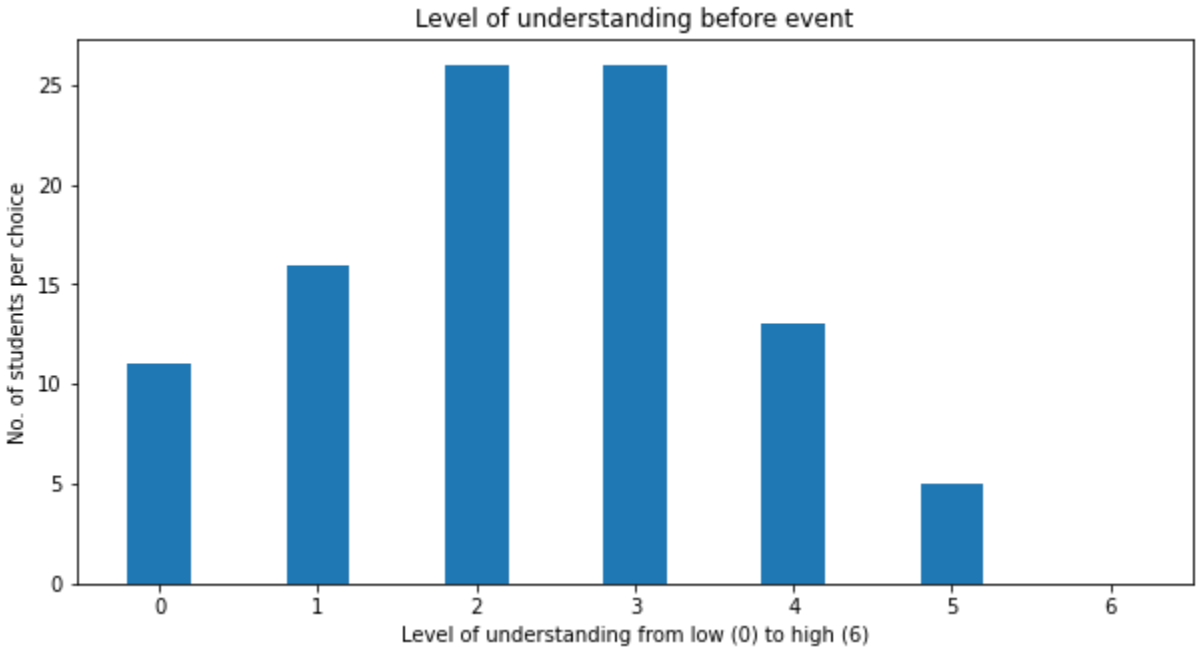
- Get kids interested in physics and/or STEM - The volunteers worked hard to get each student excited about the station they were in charge of and engage the students to make them think about the phenomena at hand. The students were extremely engaged and asked many good questions about the implications of what they were learning. With this in mind, we definitely met the goal of getting kids interested in physics and STEM.

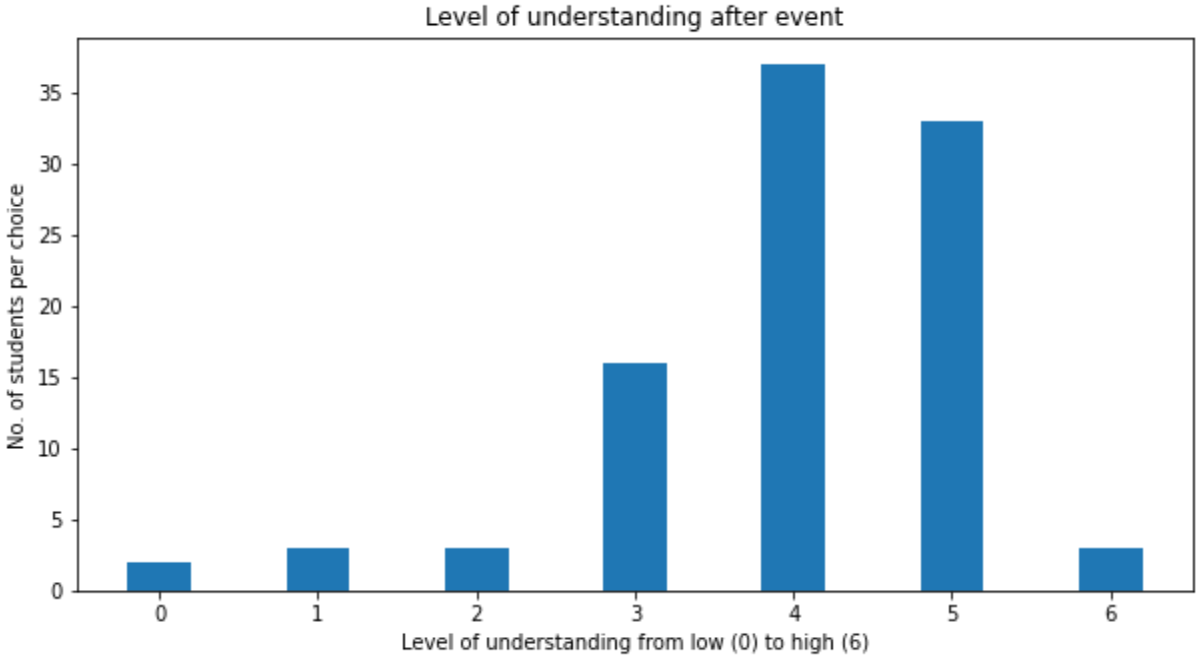
Assessment Procedure:

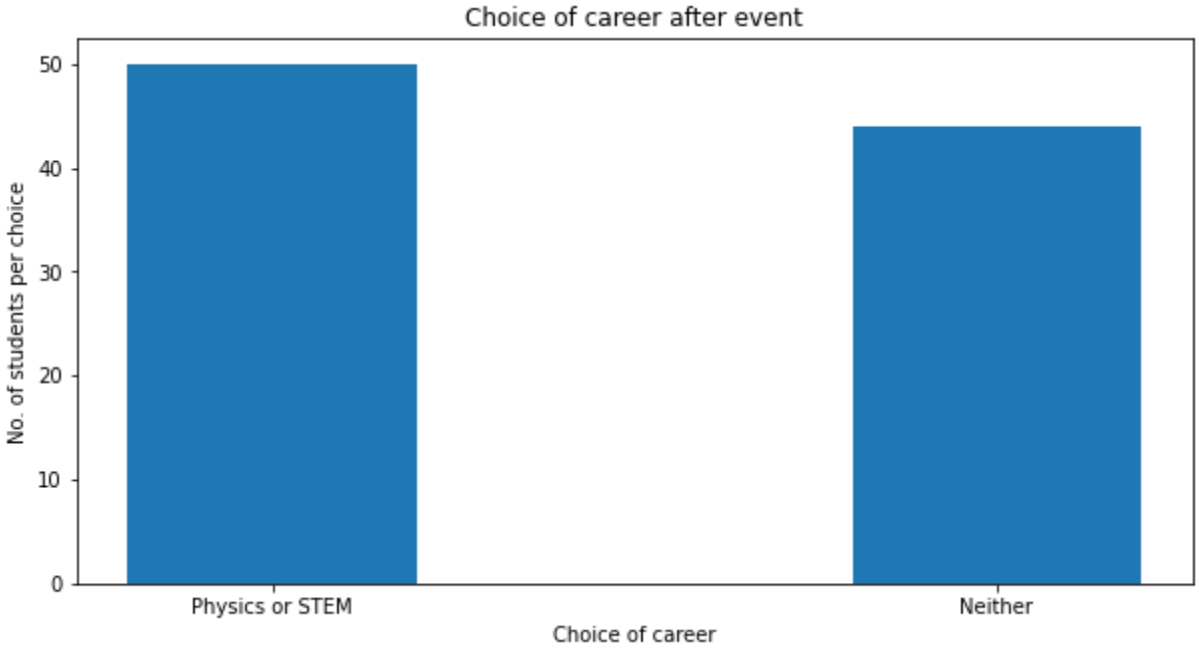
We assessed our impact by handing out paper surveys to each of the students. The survey consisted of 5 questions: Level of understanding of electricity and physics before the event, level of understanding after the event, whether they are interested in a career in the sciences, which activity they enjoyed the most, and lastly a free response section for them to write what they liked or didn't like about the event and what we could have done better. Included below are the charts showing the data collected, minus the free response answers as that would have been difficult to include.

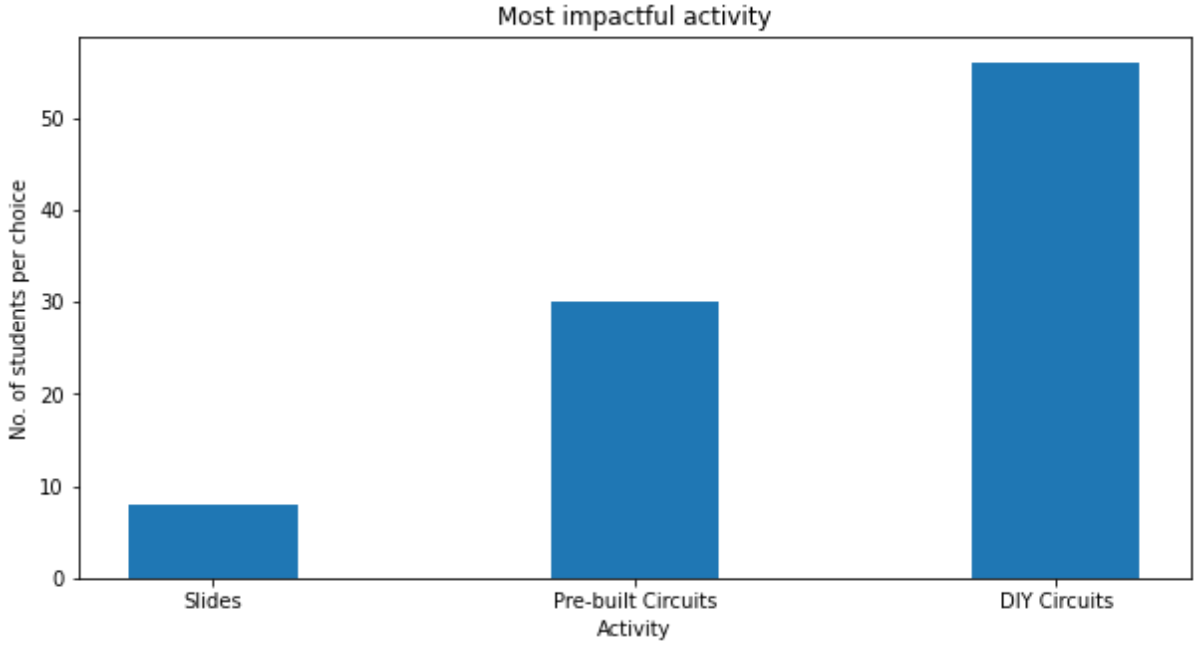
Results:

Based on the below data, it is clear that the average level of understanding of the material shifted greatly due to our event. The results show that approximately fifty-four percent of the students had a level two or three understanding of electricity and circuits before the event; however, after the activities, the majority of students, about seventy-two percent, had a level four or five understanding. Our collected data reinforces the concept that hands-on education is by far the most impactful mode of learning, especially for young minds. The results of our career choice survey was somewhat disappointing, as physics/STEM won by a relatively small margin; though, it is our belief that given more time to discuss the benefits and opportunities involved with physics we could have had a larger percentage go with physics or STEM. Keeping this in mind we would have liked to have more time to have open discussion and conversation with the students because keeping kids engaged is a very important aspect of education.


Level of understanding before event
No. of students per choice
0
5
10
15
20
25
0
1
2
3
4
5
6
Level of understanding from low (0) to high (6)


Level of understanding after event
No. of students per choice
0
5
10
15
20
25
30
35
0
1
2
3
4
5
6
Level of understanding from low (0) to high (6)


Choice of career after event
No. of students per choice
0
10
20
30
40
50
Physics or STEM
Neither
Choice of career


Most impactful activity
No. of students per choice
0
10
20
30
40
50
Slides
Pre-built Circuits
DIY Circuits
Activity

Key Metrics and Reflection

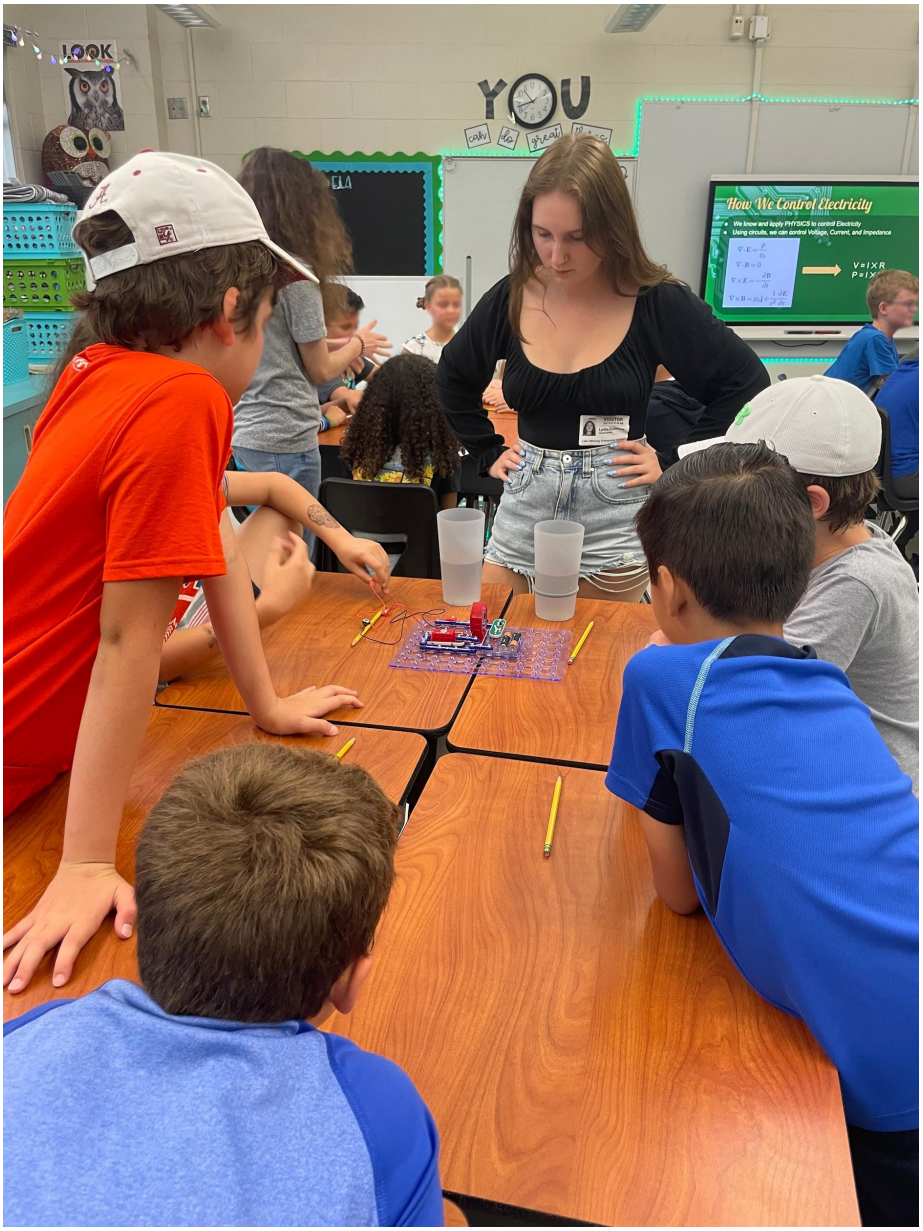
Who was the target audience of your project?	Fifth Graders
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "25 families").	108 Fifth Grade Students
How many students from your SPS chapter were involved in the activity, and in what capacity?	Max Daughtry, Caden Zaccardi, Lydia Emmons, Matthew Hernandez, Laura Eugene, Michael Lynch, Olivia Bitcon, George Minor
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 funding was sufficient, though getting it all up front would have been helpful.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	I am going to encourage the future SPS body to continue with this event, whether at the same school or another (or multiple) because I feel it impacted a lot of students.
What new relationships did you build through this project?	Within SPS we became a much closer cohort and got to know each other and our goals better. Outside of SPS, we now have an elementary school we can easily contact for future outreach related events.
If you were to do your project again, what would you do differently?	I would have liked to work with more schools and allowed more time for discussion with the students.

Expenditures

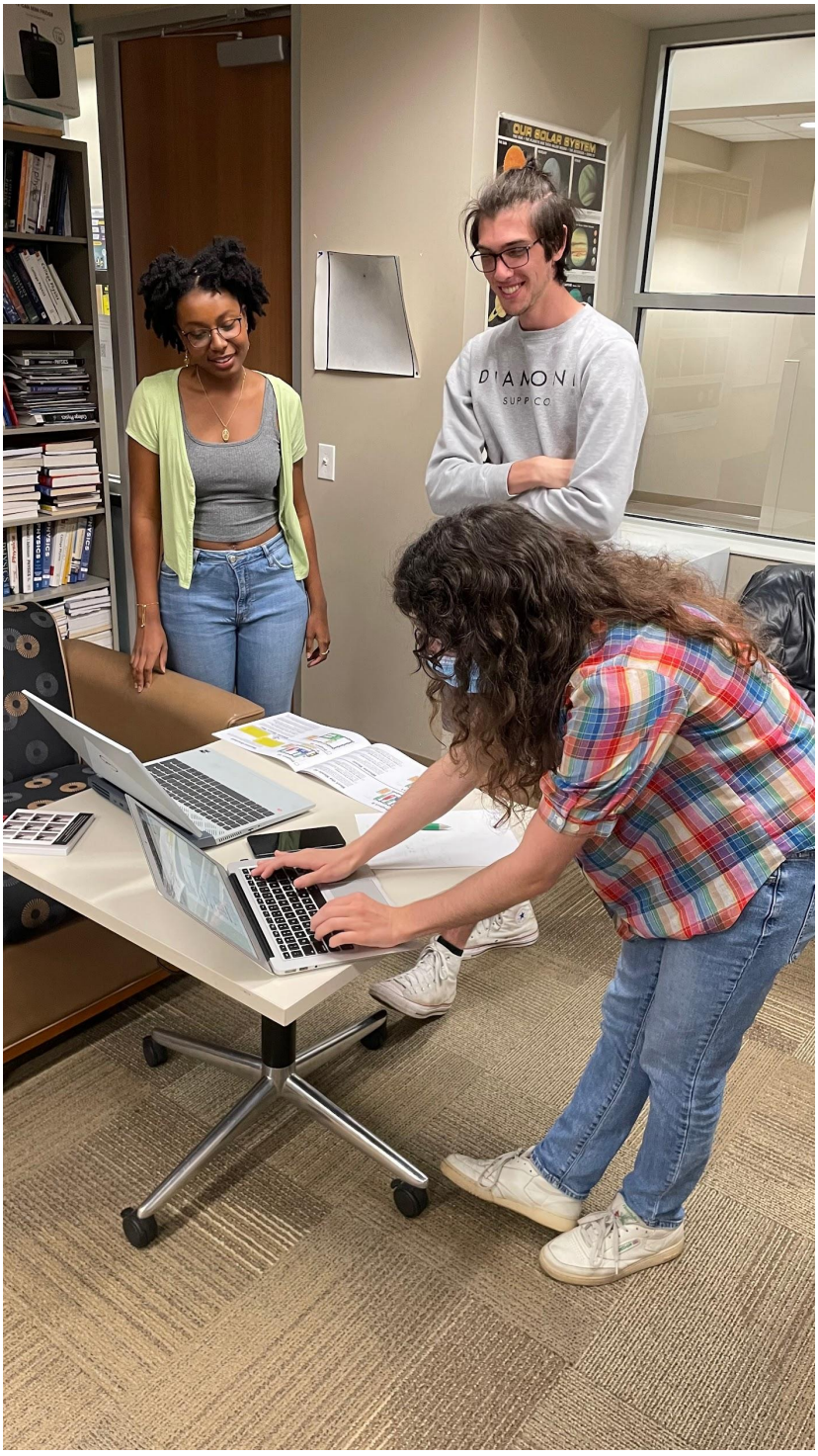
Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
Lunch	4 Subway sandwiches were provided for the 4 people that attended the event	$45.02
Batteries	24 Duracell double A batteries from Walgreens to power the circuits	$26.61
Transportation reimbursement	54 mile round trip at about 21 mpg with gas prices at $3.95/gal	$10.16
Circuits	3 Circuits from Amazon, we needed to source them from two different vendors because there was an order limit of 3 per customer	$62.88
Circuits	3 Circuits from Amazon, other vendor	$62.58
	Total of Expenses	$207.25

Activity Photos


LOOK
YOU
How We Control Electricity
We know and apply PHYSICS to control Electricity
Using circuits, we can control Voltage, Current, and Impedance
V=IXR
P=IX


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