



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh White Proposal

| | |
|-------------------------------|----------------------------|
| Project Proposal Title | Science Olympics |
| Name of School | Henderson State University |
| SPS Chapter Number | 2798 |
| Total Amount Requested | \$500 |

Abstract

We would like to host a Science Olympics to create an unforgettable scientific experience for high school students in the primarily rural schools surrounding our area. This experience will incorporate the fun of hands-on science with the stimulation of competition engaging students in lessons they will remember for a lifetime.

Proposal Statement

Overview of Proposed Project/Activity/Event

The Society of Physics Students at Henderson State University and its dedicated members have decided to host a Science Olympics along with our partners in the biology and chemistry clubs at our university along with our interdepartmental friends from ASEE and Robotics Club. The purpose of this event rouse interest primarily in physics, but also in the other sciences, among High School Students.

We chose our target group to be high school students because it is a very opportune time for them to be exposed to ‘outside the box’ physics. Our objective is to provide them with a fun and educational one day experience, and encourage them to pursue the study of physics or other STEM fields, since they are on the verge of starting college, and deciding majors.

The event will include a variety of competitive activities. There will be seven different events hosted by 5 different clubs (physics, engineering, robotics, chemistry, and biology). School teams can choose to participate in as many different events as desired. In the area of physics, one event we will hold is a mouse trap propelled vehicle event. Teams will be given a budget to work with when designing their vehicle and a heavy set of restrictions that prevent cheating. We will also help our new engineering club develop an event in which students are given materials on the spot to build a thermal tile to protect an egg-stronaut.

Each school is allowed to choose how many subject areas they wish to compete in, and which areas those will be. This year, we have decided to have a Grand Champion of the HSU Science Olympics. This means that for every event that a team participates in, they are awarded points based on their success in that event. The higher they place in an event, the more points awarded to that team. Whichever team has the most points at the end of all of the events, will be awarded the title of Grand Champions of the Science Olympics.

We would combine funds from the Physics Department at Henderson, SPS funds, funds from the other science clubs, the Marsh White Outreach Award and the Student Government Association Funding Award to make this event a success. Most of the Marsh White award will be used in buying supplies for the SPS challenges and the awards. SGA Funding (\$500) will be used as the primary source of funds for lunch during the event from Sodexo – our campus food vendor, although we know that lunches will cost about \$700 from our experience this year. A more detailed Budget Plan is in the Budget Estimate Section.

The SPS chapter here at Henderson has hosted this event several times in past years with great success and we hope that this year will be no different.

How Proposed Activity Promotes Interest in Physics

This project will invigorate many of our nearby high school physics classes. It will give teachers an opportunity to have students create hands-on projects while discussing topics such as force due to gravity, stress and strain, acceleration, pressure, and thrust. The stimulus of competition will allow students to have fun while encouraging them to test their ideas and really understand the material. In addition to introducing physics topics, this activity encourages scientific exploration in all subject areas and inquiry by its very nature. By engaging students, and all of their five senses, in learning, we are creating the opportunity for an unforgettable experience.

Our university is based in a rural community. Many of the surrounding schools do not have a physics class or have very limited resources for hands-on science. By creating this event, we are giving students an opportunity for hands-on science, while holding a very visible event. The visibility will hopefully be a catalyst in the community to draw interest in science. This event could be that one experience that turns the light bulb on for some of the participants and fuels their love of science for a lifetime.

This event is an expansion of our Science Olympics held last year and Physics Olympics held the year before. The event drew in 42 students from local schools last year and over 120 the year before and made our administration aware of the interest in physics. (We learned that, although the event went well, we weren't ready to handle over 100 students yet)

Plan for Carrying Out Proposed Project/Activity/Event

- The officers of our SPS chapter will be in charge of the logistics of this event. The SPS advisor will recruit judges from Henderson science faculty.
 - The officers will work with officers in the other participating clubs to set a competition date, finalize event rules, and inform participating schools of the rules and regulations of all competitions. This should be completed by the time we go to winter break, so we will distribute the information to schools in December. That way they can begin planning in January.
 - The SPS advisor will work with our local STEM center and use the math/science state-wide listserv to send the information to all science teachers throughout the state.
 - The officers will then order certificate paper, prize ribbons, and discuss a winning team plaque with a local business to ensure that all prizes are in order. This should be completed by 3 months before the competitions (mid-February).
 - The officers will build their own projects following the rules of the competition to gain a better appreciation for the challenges they have put before the high school students. They may show their projects in an exhibition at the actual event. This will happen through the spring semester leading up to the event.
 - One month before the event, the officers will ensure that food services are lined up for the Olympics. We will make sure that lunch is planned to incorporate any dietary restrictions that participants may have.
 - The week before the event, SPS members will communicate with the participating teams to ensure that everything is in place for a fun and successful event. As teams sign up to participate, an SPS officer will be assigned as their liaison. The liaison will check in with teams monthly to make sure that they are doing well and to answer any questions that arise.
- The officers of the other science clubs will provide events and supplies for their events.

- Marketing will be done through the state-wide math/science listserv by an email from the SPS advisor to all science teachers. In addition, the university's officer of Marketing and Communication will put out a press release. All information about the competition will be on a public website, as well.
- SPS members will serve as monitors for each of the events, runners with scores, guides around the university, for set up and clean up, and as liaisons with each competing team. We expect that at least 7-10 SPS members will assist. Biology, Chemistry, Robotics, and ASEE members will fill similar roles for their events.
- Our SPS chapter has much experience with this event. Our advisor has good records of the previous event, since it was recorded by previous officers, and has evaluation forms from the previous event, so we are able to start from that information and adjust our planning.

Project/Activity/Event Timeline

- The event will occur in early April.
- One week before the event, SPS members will contact each participating team to ensure that they have been working diligently on their projects and to ensure that they have all the information necessary for a good experience.
- One month before the event, SPS officers will ensure that food arrangements are made.
- Two to three months before the event, SPS officers and the SPS advisor will contact scientific supply companies and ask for donations for the participating classrooms.
- Three months before the event, SPS officers will select an assortment of awards for individual events and teams, as well as certificates for participation. These will be ordered after we have a better idea of how many teams will participate. We will also price all awards for the various events
- Three months before the event, the SPS advisor will contact schools in person and via the state-wide math/science listserv to find interested teachers who will coach the teams at their schools.
- Four months before the event, the SPS officers and officers of other clubs will finalize all of the rules and events, and put these up on a website so that the information is easy to find.
- Throughout the time before the competition, each science club will also work on the projects they have assigned in their area, following their own rules.
- At the end of the event, we will ask participants, judges, and science club members to fill out an evaluation of the event for future reference. We will follow up with all schools involved in the weeks following the event to see if there are other ways our SPS members can serve as role models and mentors to their students.

Activity Evaluation Plan

At the end of the event, we will ask student participants, judges, and science club members to fill out an evaluation, similar to the one we have from last year's Science Olympics. This will allow us to know what went really well, what could use improvement, and what the participants enjoyed the most.

We will keep records from the event including companies contacted for donations, from whom the food was purchased and what it cost, information on prizes, survey results, judging forms, and attendance numbers. In addition, we will have people assigned to take photos.

We will consider the event successful when we are able to draw in five or more teams to compete, we have eight or more members from our SPS involved, and we see that everyone is having a great time while doing something related to physics. This should be a learning experience for everyone involved.

Budget Justification

Because we are located in a rural area, we would like to be able to invite schools to participate in this event without an entry fee. Teams would have to provide their own materials for each event, but hopefully, that would not be a prohibitive expense. We are requesting funds for awards, event supplies, and certificates of participation (\$500). After initial pricing, we estimate a total cost of all our items and lunch at around \$1200 (with \$500 covered by our Student Government Association and \$200 covered by SPS funds raised – all toward lunch costs). We realize that these prices may change slightly if we have more or less participants (hopefully more!). Additionally, each club will cover the cost of supplies for events in their own area. Since we are the founding club and managing all logistics, we would like to supply the awards. In addition, we will ask scientific supply companies to donate experiments, gift certificates, or supplies to be awarded to the classrooms of winning teams. Previously, Vernier, Pasco, and SparkFun have been generous enough to donate to our Olympics.