



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Marsh W. White Award Proposal

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Project Proposal Title	Spring Into Physics!
Name of School	Augustana College
SPS Chapter Number	0335
Total Amount Requested	\$250.00

### Abstract

*Spring Into Physics!* will be a campaign set up by Augustana College's Physics and Engineering Society that will offer hands-on physics projects for Quad Cities area students. This will ultimately instill confidence in the students, ignite a passion for physics, and allow them to express their creativity and imagination.

# Proposal Statement

## Overview of Proposed Project/Activity/Event

Our program will consist of elementary students, second through fourth grade, meeting weekly to participate in after school activities where they will be introduced to basic physics concepts through hands-on projects. The purpose of meeting weekly will be to start a project with the students that will span over a four week period. During this time, they will develop ideas and put them into action with the guidance of our club members. The students will separate into groups based on grade level, and each grade will be directed to participate in a different activity that stimulates creativity and innovation. The activities are meant to be instructive but will challenge the students to create their own unique projects. Examples of these projects would include building bridges and towers for the youngest students such as second graders. On the other hand, we will encourage more complex projects for third and fourth graders such as building roller coasters.

The mission of our club has been to spark an interest in physics among younger students through outreach and hands-on demonstrations and over the years, our chapter has successfully organized and participated in multiple physics outreach programs at schools within the Quad Cities area. We want students to be able to apply physics concepts through projects that use simple tools that are accessible as well as allow students to use their imagination to create something they can take pride in and have passion for. By working with students in second through fourth grade, we are striving to instill confidence within them at an early age so that they know they can do anything they put their mind to. As college students studying physics, we believe in the importance of the subject and would like this opportunity to be role models and mentors for the future faces of physics.

In the future, we hope to grow our program by incorporating multiple elementary schools into a competition hosted at Augustana College. By doing this, we will have accumulated a large enough amount of students to participate in a competition based on grade level to challenge students and inspire their creativity.

## How Proposed Activity Promotes Interest in Physics

By granting Augustana College the Marsh W. White award, we would use this to allow students--who would otherwise have little opportunity through school to engage in a physics-related program--to participate in physics activities that are both enjoyable and educational for elementary grade levels. These projects will encourage active engagement and use friendly competition, which kids will naturally be drawn to. Physics is also inherently a subject that often draws upon kids' curiosity and leaves them wondering how things work the way they do. Consequently, by exposing them to these hands-on projects that also appeal to their curious and competitive nature, many students will grow an interest for physics through this program by simply committing an hour of their time after school twice a week. We will encourage all students to join our program so that every second, third, and fourth grader of the school will have the opportunity to explore their interests and participate in the engaging activities we have planned.

The Marsh W. White grant money will help our club establish "Spring Into Physics!" so that we can expand this over the years into a bigger program. By starting small, we will be able to gauge exactly how well this program captures the attention of the students. We will make necessary changes that we see fit based on what works and what does not, and we will use subjective assessments of the success of our program to make proper judgements for the future.

## **Plan for Carrying Out Proposed Project/Activity/Event**

Our club will be responsible for planning all aspects of this program and will designate specific roles to members such as being in charge of gathering supplies, preparing the instructions for the students, and leading discussions based on the physics concepts being taught. The advisor of our club, Dr. Vogel, will be responsible for overseeing that we meet our deadlines and carry out our plans accordingly. We will market our program by reaching out to a specific school, such as Garfield Elementary or Bowlesburg Elementary in the Quad Cities, and proposing our idea so that they can act as our “pilot” school. Our plan is to work with one elementary school in the beginning stages of this process, and then, once we experience success from our four week trial, we will incorporate more elementary schools and assign our volunteers to lead different programs. Our long term goal is to build relationships with these students and eventually create an event hosted at Augustana for them to participate in. By inviting multiple schools to our college, the credibility of our established program will encourage students to participate in a competition amongst their peers from different schools. Overall, this will create an inclusive physics community to foster their learning and creativity as well as allow the opportunity to connect with other students.

We currently have strong relationships with Garfield Elementary and Bowlesburg Elementary and have done outreach with them in the past so we believe our relationship with them will allow our program to be put into action. As a club, we are dedicated to outreach activities and normally secure 5-10 volunteers to assist at our events. Our club treasurer, who is an SPS member, has personal experience working with students through the Golden Apple Summer Program, and she will be valuable to the planning of this event because of her background knowledge of instructional activities as well as how to dynamically work with the students.

## **Project/Activity/Event Timeline**

We will contact elementary schools in January to see which ones are willing to allow us to host an after-school program. Once we have chosen an elementary school to work with this spring, we will contact the teachers at the school and provide them with informative flyers for the students and parents. We plan to have informed the school’s teachers, students, and parents of the after-school program by early February. The program will start in March with the introduction of each grade level’s specific project. From then on, the programs will take place after school for one hour twice a week, with each grade level’s program being guided by a member of the Augustana Physics and Engineering Society. The after-school project building will take place for four weeks, preceding a final exhibit of all of the projects in mid-April. Once the program is completed, we will send surveys out to the teachers and parents so that they can evaluate our program. Since the school we are working with is considered a “pilot school”, the results of the surveys will reveal our strengths as well as indicate the improvements we can make when expanding the program in the future.

## Activity Evaluation Plan

Our chapter will evaluate the success of this program by noting the attendance of students that participate as well as the enthusiasm of the students to create their own projects. We will be able to see how engaged the students are since our members will be acting as mentors and helping to guide students in the process of building. Our members can become more interactive with the students based on which students need more assistance and can adapt by showing our own enthusiasm towards the projects the students are working on. We would also like to provide surveys for the participants, teachers, and parents to fill out so that we can receive feedback on our program and gain insight on what areas we are excelling at or need to improve on. For the students, we will focus on the aspects of the projects they liked, projects they would like to create in the future, and how helpful our members were throughout the program. For the teachers and parents, we would ask for thoughtful feedback on how we conducted the program, the level of satisfaction they believe their students had with our program, and their perspective on the instructiveness and difficulty of the activities. We can create these questions easily by using a google survey.

## Budget Justification

Here are the materials we plan to utilize to help students carry out their projects:

Roller coasters: popsicle sticks, cardboard, plastic tubing, glue, tape, paper, plastic cups,

Bridges: popsicle sticks, tape, wood glue, poster board, markers

Towers: marshmallows, toothpicks, string, tape

Egg drop: straws, eggs, cardboard, newspaper, plastic bags, construction paper

With this list of supplies, we will have the materials necessary that will provide the opportunity for students to spring their imaginative ideas into a reality. By providing these materials through funds of the Marsh W. White award, we will support the students that live in low income areas of the Quad Cities. Materials such as markers and newspapers are supplies we can use from our own previous outreach events, but the other materials are not covered by our club budget when calculated together. These projects are making it possible for students to express themselves while exploring different areas of physics and can only be done effectively by purchasing the necessary supplies listed in our budget proposal. These materials are crucial to allow students the freedom to evaluate the given project and to determine the best approach to building the project so it is efficient and an expression of their imagination.