



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh W. White Award Proposal

Bridge the Gap Initiative

Rensselaer Polytechnic Institute

SPS Chapter Number: 5922

Amount Requested: \$500

Abstract

Bridge the Gap Initiative (BGI) is a program originating from Rensselaer Polytechnic Institute that will provide stability, opportunity, and mentorship to inner-city students that do not have the availability to do so themselves. Ultimately BGI will offer assistance across the nation to minimize the achievement gap in STEM in America.

1. Introduction

1.1 What is Bridge the Gap Initiative?

As a chapter of the Society of Physics Students (SPS), Rensselaer Polytechnic Institute does multiple outreach events. The club collects a few volunteers every month and goes to K-12 schools in the local suburban and rural areas to do demonstrations explaining the science behind the magic and it is easy to see that these students are excited and engaged. However, after the program is finished, the club leaves and with it much of the enthusiastic support. While this is not an overly large problem for the surrounding local suburban schools who already benefit from multiple STEM outreaches a discontinuity elsewhere begins to come to light. We would like to extend SPS's reach further to address what we believe to be a more obviously pressing issue.

In America today there is a great divide between the educations adolescents are receiving district by district and this goes on to diminish prospects later in life for certain careers, higher education and future happiness and success. The problem is especially evident in the STEM related subjects. For those schools with the lowest funding, primarily inner-city schools, there is an overwhelmingly large failure to meet basic proficiency set about by the Common Core in that region. Often times this leads to even less funding the next cycle, and thus the problem becomes self-perpetuating.

What the RPI chapter is proposing, and have begun to formulate, is a possible solution to help assist in bridging the gap that can be implemented across the nation via SPS's 700+ chapters. This would operate in tandem with normal SPS outreaches as this is not meant to replace the pre-existing local outreach, but simply add a new separate program designed to focus solely on struggling inner cities rather than simply its suburban and rural counterparts.

1.2 Who Will BGI Target Specifically?

By the time high school rolls around, the fissure between districts is already woefully evident by the overwhelming failure to meet proficiency on the Common Core in fields such as Physics, Chemistry and Mathematics especially. This coupled with the increase in extracurricular activities and prolonged exposure to the achievement gap has lead the RPI chapter to choose to start with middle school students. While ultimately BGI will be extended to high school, it is felt that by beginning and continuing on with those not yet in high school the chances of long term success will increase.

1.3 Why Bother?

The opportunity to move forward in this world and advance our society in a positive way should not be dependent on where you live. Currently however there does not exist wholly equal opportunity. BGI lends a helping hand because the future of America depends on it, this Nation needs to invest in its future and the children and adolescents currently not meeting proficiency are its future. The Science, Technology, Engineering, and Mathematics fields pride themselves on objectivity and diversity of thought. Through countering ideas many discoveries have been made, and presently there is a large subsection of the population whose ideas and thoughts are not being heard.

1.4 Bridge the Gap Initiative Mission Statement

In inner cities near Universities with SPS chapters our mission statement is to:

1. *Excite* students about science and mathematics
2. *Assist* in increasing proficiency in STEM as set about by the Common Core Curriculum
3. *Inspire* success and foster curiosity
4. *Create* and maintain a continual supplemental support system that encourages diversity, STEM, and positivity.

2. Logistics Proposal

1. *Volunteers* involved will undergo awareness, sensitivity, disability, and self-defense training so that they are properly prepared on how to handle situations that may arise.
 - a. Already someone who is a certified self-defense instructor willing to put together a program and we have pre-existing Rensselaer training for mentors that we will pull basic ideas from.
2. *Create* problem packets with solutions to go over in sessions along with easy cheap demos.
 - a. Currently 29 students are breaking off into teams by subject (starting with middle school grades 6-8) to start creating those.
3. *Communicate* with the local school to make sure they will be interested/receptive
 - a. It appears this would be easiest to do if it was during school hours so that a teacher pre-agreed upon would be present; currently RPI chapter is looking into ties with Albany High School.
4. *Extend* the reach
 - a. A rotation of people so that we have people at the school every week multiple times a week as consistency is key and with rotation, it would just be an hour of someone's time they are donating
 - b. Starting with middle school and hoping to extend the program later to include High Schools as well

5. *Expand*

- a. We don't want this to be an RPI organization. There are over 700 SPS chapters across the country. If the pre-made problem/solution sets and training can be delivered to them via the web then other Universities could very easily get involved. We would have done all the legwork for them; all they need to do is get willing eager volunteers

3. Timeline

December:

- Established contact with local Albany middle school, exchange ideas with teachers
- Working on outline of problem sets, training, and demos

January:

- CUWIP conference present what we have so far and get more universities on board
- Continue working on problem sets, training, and demos

February:

- Finalize problem sets training and demos and set up a rotation of students for local Albany Middle school to begin the mentor sessions
 - Ideally would want a couple other universities that expressed enthusiasm operating in tandem across the country

March-May:

- Adapt problem templates, training, demos, and approaches based off of feedback
 - Ideally this should be a package deal that we are offering other schools, therefore it should account for different scenarios and the curriculum should be more general so that it can be tailored to fit specific school needs as need be

4. Activity Evaluation Plan

Evaluation of success for the first year will be based on middle school student attendance and feedback from the chapters of SPS participating. Drastic results are not expected to be observed during the first semester, however given a couple years the overall performance on the STEM common core evaluations, graduation rates, and continuation onto higher education in participating schools are expected to increase. Once we are able to extend the BGI to high school this will be especially evident as a safety net will be cast that will extend through at risk student's entire secondary education.

Additional criteria to be met are the completion of the problem sets and initial training formulation. While this will be edited as the program progresses, the initial basis must be formed before anything else can move forward.

5. Budget Justification

A rough budget outline totaling \$500 is outlined in the attached budget template.

Binders and Printing: Because BGI is providing each school's mentors with problem sets and solutions, along with tips for how to run a session via the web it would also be helpful to have an organized binder filled with the material in chronological order. This will help mentors prepare easier and adapt their sessions appropriately. While students at RPI have a \$12.50 allowance for printing on campus, it cannot be expected that other universities will have the same resources.

Snacks: Since the sessions will take place during the middle of the school day snacks will be provided both as an incentive to attend and to revitalize the students to give them the energy needed to focus and maximize their productivity.

Supplies for Demos: Once every few weeks BGI will have demonstrations the students can make to illustrate a particular concept and engage students outside of the standard problem set setting. In the past with RPI's other outreaches demonstrations were a particular source of excitement. Currently we have material that we can use but we may need more, and we also cannot assume that other universities will have the same amount of spare supplies at their disposal.