

Marsh White Award Final Report

Yeshiva University 2006-2007

The Yeshiva University Physics and Engineering Club (YUPEC) received a Marsh White Award for 2006-2007 for physics outreach to the surrounding public school community. The money from the Society for Physics Students (SPS) was used to purchase materials for physics demonstrations and cover travel costs. Our goal was to visit public schools in the area and excite the students about physics and science.

The demonstrations we chose to show the kids were in four different categories – (1) Light Refraction (2) Lasers (3) Magnetism (4) Conservation of Energy. With light refraction, we discussed basic physics concepts such as why we can see things, why we can't see in the dark, and why the sky is blue. Then we made a Pyrex container disappear in oil due to similar indices of refraction. With lasers, we had a laser show with two vibrating mirrors which also showed the students independence of motion, horizontally and vertically. The magnetism experiment was the highest level demonstration and we tried to help the students understand the spinning of electrons and the basic principles of magnets. We also showed them how to make their own electro-magnets with coiled wire, batteries, and nails. Our last demonstration interested the students the most as we demonstrated how to achieve escape velocity with stacked balls through conservation and transfer of energy. We started with a simple Newton's Cradle which some of the students recognized from the X-men movies. Then we showed them how to stack balls and drop them together to shoot the upper

(lighter) one three times as high from where it was dropped. After attempting to show a three-fold transfer of energy we let the students perform the experiment themselves with great success.

This was the first time YUPEC had tried to set up a general working relationship with the public schools in the area. While we were successful to some degree, the size of the local public high schools made it difficult to contact and problematic for scheduling. The middle schools were much more accommodating but had limited class time. Due to their accommodating calendar, in the coming year, we hope to regularly return to the middle schools to run physics demonstrations.

The teachers and students immensely enjoyed our demonstrations. One fifth grade class was so interested that many stayed after class into their lunch break to play with the different sized balls and the electro-magnets. Surprisingly, the fifth grade classes were much more interested in the demonstrations and answered more of the questions than the sixth graders. Their enthusiasm for physics and science in general was wonderful.

Budget :

Index of refraction - \$45

Laser Show - \$35

Magnetism - \$40

Conservation of Energy - \$24

Miscellaneous - \$14

Total : \$158

Total Award: \$300

Therefore we certainly hope to use the remaining money in the coming year to hopefully build demonstrations we were not able to this year (see our proposal), return to more schools and involve as many students as we can in the planning and demonstrating stages.

We would like to thank the Society for Physics Students and the Marsh White Committee for supporting our endeavors and helping promote sciences in local public schools around our university.



