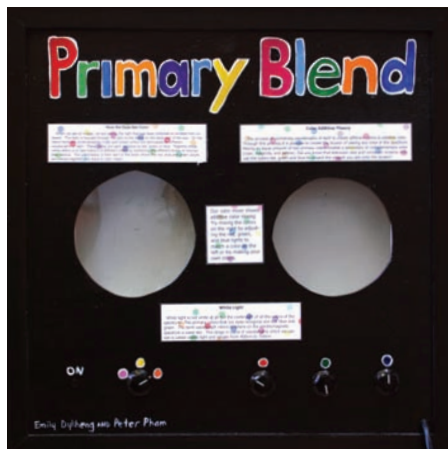




### Ferris Wheel Physics

Morgan Malone & Grace Allen

Our ferris wheel is affected by a centripetal force. The wheel must always have a force traveling towards the center or the wheel would stop spinning in a circular motion.



### Primary Blend

Emily Dykheng & Peter Pham

By switching on or off colored lights the viewer can explore additive color—the process of combining wavelengths of light to create different colors.



### String Vibrations

Derek Hubbard & Lemuel Calpito

By plucking the various strings and adjusting the tension lever at the top, the viewer can explore how mass, length and tension affect pitch.



### Pulleys—The Teachers' Example

Jeff Robin, Andrew Gloag & David Berggren

Students use pulley systems to experience mechanical advantage, applying different forces to lift the same weight. The equations show how to find the forces involved.

## Analog Flash for Windows

Jeff Robin, Art, High Tech High

David Berggren, Engineering, High Tech High

Andrew Gloag, Math/Physics, High Tech High

The assignment for this senior project was to create an interactive, museum-quality exhibit that fit in a window frame and illustrated a principle of math or physics. Analog: most of the projects were mechanical. Flash: like products created with the Adobe Flash software, the products were interactive. For Windows: the products were made not for PCs, but for the actual 24" x 24" x 5" interior windows in High Tech High.

### Timelines and Check-ins

The project took a whole semester, and the students worked on it nearly every day. We used an online calendar and weekly check-ins to make sure that no one was falling behind. We were very strict because we wanted all of the groups finished by the deadline.

### Books

Students taught each other the content behind their projects, while creating their own books that included images and explanations of the physics and math for all the windows.

### Exam

The students took a final exam on the math and physics represented in all the projects. They were allowed to bring the books they had made to the exam, and the exam comprised one fourth of their final grade.

### Teacher Reflections

At first I was a little skeptical of exactly how an art teacher, a math/physics teacher, and an engineering teacher were going to come together to create a meaningful and high quality senior project. In the end, this project turned out to be one of the best I have done in my five years of teaching since coming out of industry, and one that I am very proud of.

—David Berggren

The project worked because the three teachers on the team were interested in learning each other's perspectives. I wanted to learn the physics and engineering involved, and my colleagues wanted the displays to be artful.

—Jeff Robin

To learn more about this project and others visit

<http://staff.hightechhigh.org/~jrobin> and <http://www.hightechhigh.org/pbl>

