The Effects of Competition on Engagement
Bruce Clark – Lewiston-Altura High School, Lewiston, MN
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Background
In the state of Minnesota every student needs to take either chemistry or physics in order to graduate. To accommodate those not inclined by science, or school in general, our high school has created a conceptual physics class. The class consists of 20 students many plan to attend a technical or community college, if they attend any post secondary institution. The class has an average GPA of 2.28. 12 or 60% of the students are on free and reduced lunch; almost twice the district rate. The goal of this study is to engage more students in the science classroom through competitive labs and assignments.

Research Questions
1. How do competitive labs impact student engagement
2. How do competitive labs influence content knowledge

Data Collection
For each unit a competition based lab was assigned after the unit test for each unit. Students took a survey and a pretest before the unit and had a posttest and survey after the competitive labs.

Student Comments
- “I really like this set-up compared to normal science labs”
- “When is our next junk box war?”

Results and Conclusions
There is significant growth in the test scores of students. Surveys and interviews suggests that students greatly prefer competitive labs vs. traditional physics labs. The most notable growth in the survey responses is that students, like school and feel that they do better in science class as a result of the competitive labs. Students seem to really love the labs, the hands on aspect as well as the competition.

Treatment
Each unit was conducted as normal. At the end of unit content instruction, students were given a pretest and pre survey. Then students were given the parameters for the competition lab. After the competition had been conducted students were then given the posttest and the post survey.

Survey Results

Figure 1 – Results from the first unit pre and posttest. Students are identified by number and the average scores are included.

Figure 2 – Significant changes in survey responses from the first unit.

Figure 3 – Students test their paper airplane designs before the competition.

Image 1 – Students testing their egg parachute before the competition.

Image 2 – Students watching other competitors in the naked egg drop competition.

Image 3 – Students testing their egg parachute before the competition.