

A Jr. High Solution to Improving Acoustics

Purpose:

This project was developed around a true concern our school had about the acoustics of an all purpose area that was used on a daily basis for lunch/gym. Once a week it became the chapel and several times during the year it was used for parent meetings, plays, etc. The sound echoed off the outer walls and a partial dividing wall separating the room in half. This caused significant sound distortion and made it difficult to hear well in many areas.

Vocabulary:

Choice, Competition, Cost/Price, Efficiency, Human Resources, Interdependence, Marginal Thinking, Opportunity Cost, Scarcity

Project:

We challenged our Junior High students to apply both science and economic concepts to solve a real problem. We asked them to come up with ways to improve the acoustics of the common area. They were to think of their own solution using a cost/benefit approach, and then actually install their solutions in the all purpose room. They were required to observe strict spending limits (\$100 raised by each team, and a \$100 matching grant for each team). The results were judged in a science fair format.

Process:

The science teacher introduced the project and taught a unit on sound. From the beginning the students had a high level of interest and focus because they knew they were going to have an opportunity to use the information to solve a very real problem they encountered with some regularity. During this initial phase, students were given a timeline and a grading rubric for the project.

After teaching the initial science unit, the teacher divided the class into project groups. They were given guidance on ways to research their solutions and on evaluating the actual costs and benefits of their ideas. Each group developed its own research plan and bibliography. This was a multi-grade project, and the requirements varied somewhat depending on the grade level, but in general students were required to use a variety of online and offline resources and were also provided opportunities for consultation with experts in the acoustical and construction fields.

The students presented a research paper on the topic, and made a detailed design of their experiment. There was some lag time between the design and the implementation phases as students accumulated their materials.

The teams were allowed to work on the project during science class. Teachers were available to consult with each group periodically to ensure that the scientific method was being used, they the data was properly documented, and that the students met together with enough frequency to ensure they were meeting their benchmark goals.

We invited a panel of judges to our school to objectively “test” the finished products. We were thrilled with the results, as every group demonstrated their mastery of the subject at hand by the improvement they made to the acoustical quality to the room. Although we declared a winning group and awarded the prize to them, in a larger sense every student “won”. We firmly believe that adding a practical, experiential, economic approach gave all our students new insights into how greatly our lives are enhanced by a firm grasp of the sciences.