

Abstract  
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K-12 Engineering and Pre-College Outreach Division

**Move and Shake: A Hands-on Activity Connecting Engineering to the Everyday World for Secondary Students**

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Background

Project STEP (Science and Technology Program) is a joint effort between the Colleges of Engineering and Education at the University of Cincinnati to partner with schools in the Cincinnati Public School system. Project STEP connects engineering graduate students with middle and high school science educators to help bring authentic learning activities into the classroom. The project is funded through the NSF GK12 program to enhance science education. Over the course of the three year program, STEP has involved 16 graduate and 8 undergraduate fellows working with 33 teachers distributed throughout 7 schools in the Cincinnati area. Fellows and teachers have implemented over 20 different activities in classes covering physics, math, biology, chemistry and environmental science. These activities involve authentic, inquiry based learning and details are available at the project website. (For further information please see <http://www.eng.uc.edu/STEP/overview.>)

Description of Session

One of the main goals of Project STEP is to design, develop, and implement hands-on activities and technology-driven inquiry-based projects, which relate to the students' community issues, as vehicles to authentically teach science, mathematics, engineering and technology skills. The Movers and Shakers Lesson Plan is a three-part activity that helps students connect engineering principles to the design of buildings that resist earthquake damage. This session will describe the objectives of the lesson and how the activities related to those objectives. Pre and post assessment were completed to measure the impact of the lesson on students learning. Overall, students showed a significant improvement in their scores when tested on the specific concepts of plate tectonics. The use of a grading rubric to assess the students' projects showed that students mastered the concepts taught. Students were also surveyed about their perceptions of the lesson and its impact on their learning and attitudes towards science. 71% said the lesson

increase their interest in engineering, 86% said they learned “a lot” from the lesson and 72% reported some increase in their confidence about being able to learn math and science. Teacher and fellows reflections on the activity will also be discussed.