



STEM Sound Investigation Design A Sound Proof Box Student Inquiry Sheet



Name _____ Class _____ Date _____

Engineering and Design Challenge

Sound control is a big issue for science and a big business in society. Making movies takes extraordinary sound control. Unwanted noise can ruin an important scene. Traffic noise on freeways keeps property values down because of the constant roar of cars and trucks. Aeronautical engineers and airport staff are always trying to reduce noise from airplane engines. People in some apartment buildings can hear casual conversations in adjoining apartments that make peace and quiet seem impossible. Sometimes people have secrets that they want to keep from others. They are faced with how to talk so only specific individuals hear the conversation. And, while many are engaged in trying to eliminate unwanted sounds, some spies are busy trying to hear those seemingly hidden sounds.

Getting rid of unwanted sounds is the primary business of the "Silence Is Golden" sound proof company. They are looking for engineers to invent new ways to eliminate unwanted sounds. In this design challenge, you are invited to design a box that can "hide" the sounds of a cell phone. Can you build a box or container no larger than 30x30x30 cm that is so soundproof that you can't hear a cell phone ring even when it is on the loudest ring setting? The box that wins this competition will be the one that weighs the least and contains sound so that it cannot be heard from 6 meters feet away.

Use the engineering and design process in building this box. Create a plan. Try some ideas that you predict have promise for blocking sound energy. Build and test a prototype. Exchange your findings with other groups that are working on the same problem. Redesign your box based upon your data and information gathered from other groups.

At the conclusion, issue a report about "Principles of Sound Abatement" that you can defend based upon your designs and testing results.

