| Name(s) | Project Number |
|---|---|
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**Project Title**

## The Effects of Building Materials Used in Sound Wall Construction

**Abstract**

**Objectives/Goals**

The objective was to see which building material is the most effective in sound wall construction. I thought that the slab of concrete would be the most effective because in my research I had read that concrete is the only material that does not produce echoes. Of the three materials I tested it was also the most dense.

**Methods/Materials**

I built two wooden boxes to keep out the outside noises. I used a laptop to generate the sounds in one box and a sound meter to measure them in the other box. I did a control with no wall between the boxes. I tested each building material between the boxes with three different sounds ten times each. I placed ivy over each building material and repeated the three sounds ten times each.

**Results**

When I averaged out the ten trials on the Urban Traffic Sound, the concrete blocks blocked out five decibels more than the 4x4 wood and one decibel more than the slab of concrete. When I averaged out the Tornado Siren Sound, the concrete blocks blocked out ten decibels more than the 4x4 wood and the slab of concrete was about the same as the blocks. When I averaged out the 522Hz Sound, the concrete blocks blocked out thirteen decibels more than the 4x4 wood and sixteen decibels more than the slab of concrete.

**Conclusions/Discussion**

If I were to build a sound wall I would build it out of concrete blocks because they proved to be the most effective. A material that is more dense might not be as effective at blocking sound as a material that is hollow inside. The sound waves reflecting off the inside of the hollow material lose energy and are absorbed by the material.

**Summary Statement**

I tested three building materials with three different sounds ten times each to see which material is the most effective in blocking sound.

**Help Received**

None. I designed, built, and performed the experiments myself.