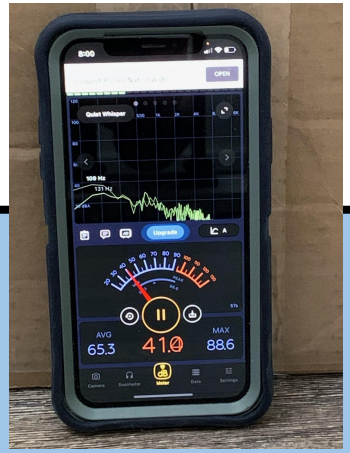
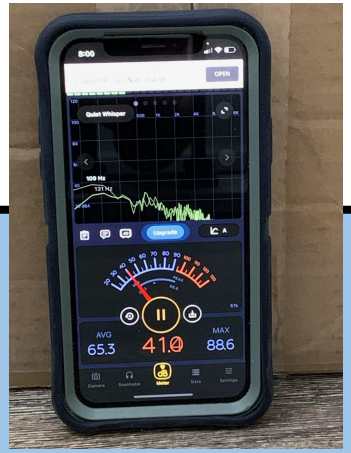
SHHHH... I CAN'T HEAR!





Purpose/Question

There are many materials that are used specifically in construction to block unwanted noise. However, what is the best material to block out unwanted noise?

The purpose of this experiment is to find out the best material to block out unwanted noise. I will compare which material has the best results to block out unwanted noise.

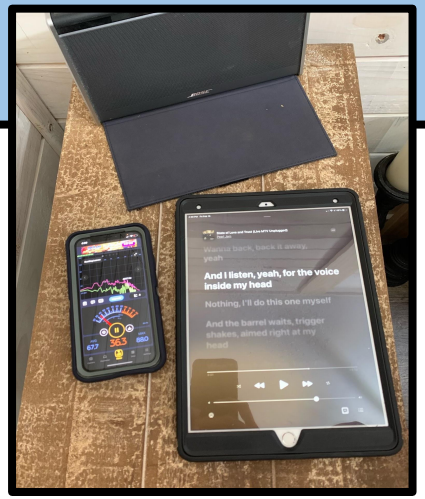
I became interested in this idea because of the location of my classroom this year. Two classes are presently sharing space in the gym and only separated by a divider. There are times that I am able to hear what is going on in the other classroom space. I designed this experiment to test some materials to find out what would be a better solution to block out the unwanted noise.

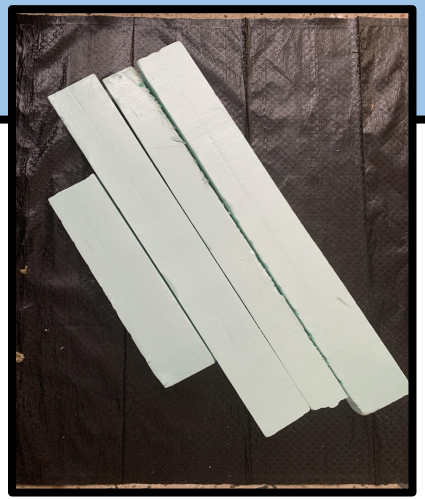
Hypothesis

My hypothesis is that I think that the silent board will block out unwanted noise because it has silent in the name. I base this hypothesis on knowing that people will be more willing to choose silent board in construction to help soundproof between rooms to block out the unwanted noise because when they see the word silent, they will think it is a better option over other materials.

Materials

- Silent Board
- Piece of Rubber
- Rigid Foam Board
- Roxul Safe and Sound
- Fiberglass Insulation
- Cinder block with foam
- Cinder block without foam
- Spray Foam
- Box
- Speaker
- iPad - with music
- iPhone
- Decibel App
- Recording Sheet
- Pencil

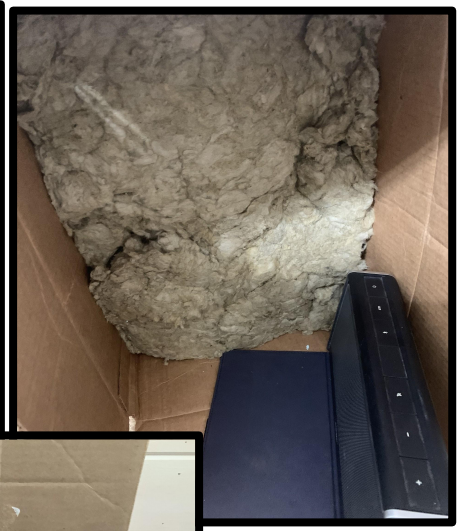


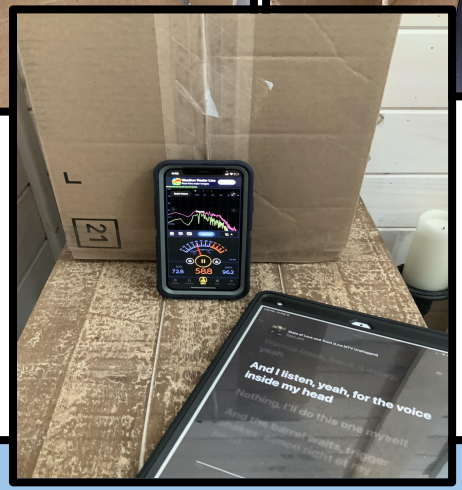


Procedure

1. Place the speaker into the enclosed box.
2. Using the enclosed box, place the test material in the center of the box in the front of the speaker. (Use one test material at a time.)
3. Close the box, and turn the speaker on a the same volume for all trials.
4. Play the music using the iPad at the same chorus of the song for all trials.
5. Use the iPhone with the decibel app to measure the decibels for each trial (3 trails for each test material.)
6. Complete the trials 3 times for each material to make sure the readings are consistent to stay in a range.
7. Complete steps 1 - 6 for all test materials three times.
8. Take a reading of the speaker in the enclosed box without any test materials, complete this three times.
9. Compare the decibels to test materials and without the test materials to determine which material is more effective to block out sound.

TRIALS





TRIALS


And I listen, yeah, for the
inside my head


8:00
OPEN
Quiet Whisper
109 Hz
Upgrade
AVG
65.3
41.0
MAX
88.6

Results

The most effective material to block out unwanted noise whas a cinder block that was filed with foam insulation. The silent board came in third and regular fiberglass insulation came in second. Surprisingly, the Roxul Safe and Sound that is made specifically to block out unwanted noise only came in fourth. Regular fiberglass insulation is most commonly used in construction.

ANALYSIS

Recording Sheet

Material	Trial #1	Trial #2	Trail #3	Average	Rank
Silent Board	77.1	74.2	76.8	76.1	3
Piece of rubber	78.4	81.3	80.0	79.9	7
Rigid Foam Board	81.0	77.4	78.6	79.0	6
Roxul Safe and Sound	78.0	77.0	75.8	76.9	4
Fiberglass insulation	74.0	75.0	75.4	74.8	2
Cinder block without foam	78.9	75.0	79.2	77.7	5
Cinder block With foam	72.6	73.4	76.2	74.1	1
No Barrier	80.7	81.6	83.9	82.1	8

Conclusion

Since the best material to block out unwanted noise was the cinder block filled with insulation foam, my hypothesis of stating the silent board would be the best material to block out unwanted noise was incorrect. It was actually ranked third overall in my trials.

I was surprised that the fiberglass insulation that is most commonly used in buildings, came in second. The Roxul Safe and Sound which is made to specifically to sound proof, only came in fourth.

Is this the reason why most buildings, like schools are built using cinder blocks? Do cinder blocks really block out so much noise? If only the classes in the gym were divided by cinder blocks. You can apply this to the real world by building structures with cinder blocks with foam to block out unwanted noise.

VARIABLES

Controlled

- The size of materials to place in the box
- The box
- The song clip used
- The amount of time to measure the decibels
- The volume of the song played

Manipulated

- The types of soundproofing materials used

Dependent

- The measurement of decibels recorded for each of the three trials for the materials used

Research

In my research for this project, I found that:

1. Soundproofing can reduce the amount of unwanted sound.
2. Soundproofing is not only used in between walls but also in ceilings and floors to reduce the amount of sound that is heard.
3. Fiberglass insulation is not only an excellent source for insulation but is an excellent source of reducing sound between rooms.
4. Spray foam that was used in between the one cinder block, is known as the best type of insulation to reduce noise.
5. Many homes are not constructed with brick or concrete walls due to it being expensive.
6. Most interior walls are constructed with insulation between the interior walls.

Acknowledgments

I would like to thank my mom and dad for helping me with my project. They helped gather the materials, cut the materials and move the items for me to test. My mom also helped with playing the music at the same point for each trial. Adult help was needed to safely complete this experiment.