1. **Title of your project:**

Household Objects to Soundproof your Room.

2. **Question**: What is the effect of different materials on the volume of noise?

3. **Variables**:

- ☐ **Independent variables**: Four different materials to soundproof | Wood, Aluminum Foil, Foam, Fabric
- ☐ **Dependent variables**: The amount of decibels each material scores.
- ☐ **Control**: The volume and type of sound played in each experiment. The same cardboard box that the sound will be placed in.

- ☐ **4. Hypothesis:** If I test 4 different materials for sound proofing (Wood, Aluminum Foil, Foam, Fabric) then the foam will provide the most sound proofing because it is thick and not as porous as the other materials.

5. **Purpose of my Experiment:** The purpose of my experiment is to inform others about soundproofing ideas and what household materials would be able to soundproof your home.

6. Materials used:

1 Cardboard box

1 yard of fabric

1 sheet of plywood

1 ½ inch project foam

4 aluminium foil sheets

1 Bluetooth Speaker

1 Decibel Meter

7. Procedures:

1. Acquire Materials
2. Set up a workstation (table)
3. Set up your cardboard box 1ft. X 8in.
4. Inside the card board box set up a speaker and connect it to bluetooth. Dog Speaker Mini Subwoofer to connect it to bluetooth get your mobile device and scroll down The Control Center and press the button that looks like a weir d S then look for your speaker
5. First we will use the yard of fabric and add it all around the area space of the box.
6. Then grab your decibel meter
7. Then you will play a noise Clock Alarm which is about 85.5 Decibels without any sound-proofing materials
8. Then you will point the decibel meter microphone in the direction of the box
9. You will record your trial 1 on a sheet of paper.
10. Finally you will repeat these directions for each material.

Closing:

In my experiment I measured the decibels of a mini subwoofer speaker by insulating the box that it was placed in. The insulators I used were wood, aluminum foil, fabric, and foam. Without using the subwoofer the natural sound registered at 30 decibels.

2. What was your hypothesis?

My hypothesis was that the foam would be the most effective soundproofing material to use. My hypothesis was completely wrong, surprisingly the fabric was the most effective. I thought the foam would work the best because it was the thickest material used.

3. What do your data and observations tell you?

My observations tells me that the fabric was the most effective soundproofing material to soundproof a box/room. The data showed that in each trial the fabric was consistently the most effective material to soundproof. The second most effective material was the aluminum foil followed by foam and then wood. In my hypothesis I said that the foam would soundproof a room/box the best, but I proved myself wrong.

4. Was your hypothesis valid or invalid?

My hypothesis was invalid because I believed that the foam would do the best but in reality the best was the fabric and surprisingly the foam was the 2nd least effective thing. My hypothesis was invalid and the reason I thought that the foam would be the best is because it is thick, porous and hard and so I thought that the foam met all the requirements for the most effective soundproofing materials.

5. What did you learn from this project?

I learned that to soundproof a room using household material, you need to make sure that the room is covered in fabric. I also learned that even though the human ear does not hear any sound the decibel reader captured some noise which was consistent in each test.

6. After doing this experiment what are the questions or changes that you would like to explore related to your experiment?

I would have liked to have a better quality speaker to see if that changed any of my conclusions. I would have liked to have different soundproofing objects and more room to test out my experiment. I would've liked to have researched a little bit more on soundproofing.

Summary:

In my experiment, I measured the decibels of a mini subwoofer speaker by insulating a box with several different materials. The insulators I used were wood, aluminum foil, fabric, and foam. The natural sound registered at 30 decibels without any insulation. My hypothesis was that the foam would be the most effective soundproofing material. I thought the foam would work the best because it was the thickest material however, my hypothesis was wrong. Fabric was the most effective in soundproofing the speaker. I also learned that even though the human ear does not register any sound the decibel reader captured some noise while everything was still.

10. **Reflection**:

1. What are your thoughts about how your experiment turned out?

I think my experiment went really well except for the fact that my hypothesis is invalid, but overall I think I did a cool experiment. I think that the foam should have been the most effective because of its hardness and its porousness. The experiment took over a month span and lots of tending to the speaker and all the objects that were used to soundproof. Looking back, I am glad the experiment provided a challenge for me.

2. What do you think went right and wrong with how you did your experiment or the results?

The only thing that went wrong was my hypothesis. I used the most common materials I could find around the house with varying textures. During the experiment, I was able to calculate the results immediately.

3. Including if you did this experiment again, what would you change and why.

I would change the materials and change them to things like paper,metal, and styrofoam. I would also change the speaker. I picked the most common materials but it would be fun to do it again with different materials.

4. How does your experiment benefit the world?

My experiment could benefit the world by making it quieter and peaceful. So your neighbors don't move out when you move in. Help me make our world more peaceful with fabric. You can also do it for fun to show your friends and family.

Summary:

I think my experiment went really well except for the fact that my hypothesis was invalid. Overall, I think I did a cool experiment that I enjoyed completing. Looking back, I am glad the experiment provided a challenge for me and I think I learned more since my hypothesis was incorrect. I used the most common materials I could find around the house with varying textures. I was able to calculate the results immediately and it would be fun to continue the experiment with different materials. My experiment could benefit the world by making it quieter and peaceful. So your neighbors don't move out when you move in. Help me make our world more peaceful with fabric!