

Description of the space (physical make up and materials): Swimming pool, plants, concrete and stone ground, electrical box, wooden exterior of house, lawn furniture.

Sources of sound production in the space: Insects, electrical box, animals, plants rustling, door opening and closing, pool vacuum.

Why did you choose this space?

I wanted to see how the pool would sound without anyone actively disturbing it. I wonder if the water absorbs a lot of the sound that you would otherwise hear.

6 Name: Dinner table conversation Expected Loudness (1-10): 5

Description of the space (physical make up and materials): Wooden table, ceramic plates, silverware, tile floor, windows facing backyard.

Sources of sound production in the space: Five people talking, chewing, silverware on plates, plates being passed.

Why did you choose this space?

I wonder how loud a conversation is when there are background noises like eating, which we normally filter out. Is it significantly louder than a regular conversation?

7 Name: Brother playing clarinet Expected Loudness (1-10): 9

Description of the space (physical make up and materials): Soft couches, carpet, wooden furniture, windows facing backyard, open-concept entryway connecting to lower level.

Sources of sound production in the space: Amplification from entryway, clarinet, breathing, sounds from other parts of the house.

Why did you choose this space?

I want to know how loud playing this instrument is for my brother, and whether or not it is in the dangerous zone that we have talked about.

Go to next page **ONLY** after this first part is complete.

Now that that is done, I want you to go visit the space! While there I would like you to do 2 things. First, sit quietly and observe. Take notes on each location, keeping track of the sources of sound around you, and anything notable about the structure of the environment. Second, I would like you to make 2 observations of the loudness in the space. One using the 1-10 rating as before, and another using this handy web browser based sound level meter. <https://webbrowsertools.com/sound-meter/> You may need to enable your microphone temporarily. To do this you will want to sit in the location and start the app. Let it run for 30 seconds, and write down the Sound Level (min) and Sound Level (max). Compile your observations below.

1 Experienced Loudness (1-10): 1 Sound Level (min): -24.00 Sound Level (max): approx. 12 Duration: 0:45 Average (estimated): 1 dB

Observations: The sound meter was varying a lot during this measurement, and was jumping up and down rapidly. I believe this was because there was very little sound and the sound that did occur then make the meter spike. The meter was jumping between negative and positive readings, often moving several decibels per second. Generally, the range was between -24 and 10 dB.

2 Experienced Loudness (1-10): 5 Sound Level (min): approx. 63 Sound Level (max): 65.23 Duration: 0:40 Average (estimated): 64 dB

Observations: The water is not as loud as I thought it would be, but it was just at the noise level above conversation level. The sound level was pretty consistently within 64-65 dB and did not vary a

whole lot. I think that, as expected, the tile amplified the water sounds of the shower, as I placed my phone close to the showerhead.

3 Experienced Loudness (1-10): 5 Sound Level (min): approx. 42 Sound Level (max): 65.30
Duration: 0:27 Average (estimated): 50 dB

Observations: The sound in the hardware store was very jumpy, as there were constantly things changing that made noise as people walked by, talked, and moved things around in the store. It went up and down very quickly and did not linger on a particular level for long.

4 Experienced Loudness (1-10): 4 Sound Level (min): approx. 36 Sound Level (max): approx. 57
Duration: 0:36 Average (estimated): 40 dB

Observations: The street was much quieter than I expected. There were a lot of sources of noise, and a car even passed by, but generally the street stayed pretty quiet. The loudest it got was when the car passed by, and otherwise the main thing that could be heard was the wind and the rustling of leaves.

5 Experienced Loudness (1-10): 3 Sound Level (min): approx. 39 Sound Level (max): approx. 44
Duration: 0:58 Average (estimated): 41 dB

Observations: The meter did not vary a lot outside, it generally stayed within 40-43 dB. The backyard was quieter than I expected it to be, seeing as there are so many potential sound sources. However, it was in reality pretty peaceful and quiet there.

6 Experienced Loudness (1-10): 6 Sound Level (min): approx. 37 Sound Level (max): approx. 60
Duration: 0:36 Average (estimated): 48 dB

Observations: The dinner table conversation was a little abnormal because we had three extra people with us for my brothers' birthday celebration. However, it was not as loud as it could have been, as the conversation was pretty tame at this time. The sound level varied a lot as the conversation continued.

7 Experienced Loudness (1-10): 7 Sound Level (min): approx. 20 Sound Level (max): approx. 58
Duration: 0:30 Average (estimated): 50 dB

Observations: I expected the clarinet to be much louder than it actually was. I could see the meter jumping up and down a lot in line with the pitches he was playing. The higher frequencies were higher in decibels, and the lower frequencies were quieter.

Now that this is done, I would like you to answer the following questions.

- What was your loudest observed location? What was it about the environment that made it so? How did your ranking compare to the Sound Level (max)?

The loudest location was the hardware store, with the second loudest place, the shower, being a close second. Their sound levels (max) were 65.30 dB and 65.23 dB, respectively. I had ranked the store as 6 on expected loudness, and the shower as 7 on expected loudness. I had expected other locations, in particular the road with traffic and my brother's clarinet to be louder than these locations. I believe that the hardware store was the loudest because it had the most diverse sources of sound that were present. There were at least 40 people in the store, and lots of different activities were going on. I think this made the location the loudest. No other location that I measured had quite as many sources of sound as the hardware store did, nor as many objects in the room that could influence the sound of the store. I believe that the shower had a similar sound level (max) likely because of the tile in the bathroom amplifying the noise of the running water. There were far fewer sources of noise here, but

the amplification within the small room and the reflective surfaces that were in the bathroom made the sound louder.

- What was your quietest location? What was it about the environment that made it so? How did your ranking compare to the Sound Level (min)?

My quietest location was my bedroom, which had a sound level (min) of about -24 dB. I was surprised that the sound level was so extremely low. I had anticipated that my bedroom would be the quietest location, but not quite as low as it was. There really were very few sources of sound in my room, and a lot of soft materials (bed, carpeting) that could have absorbed any small noises. The only noises that were picked up in this location were faint noises coming from my mom moving around downstairs, which isn't loud to begin with. When the sound must travel upstairs, and the door is partially closed, the sound gets diminished a great deal. As mentioned, the soft materials in my room surely dampened the sound as well.

- For each location, did your Sound Level (max) align with your expected and observed loudness ratings? Why or why not? Was anything about this surprising to you?

For most locations, I did not correctly guess what the sound level would be. For location 1, my bedroom, the max was about 12 dB, which is still very low. This is below the 20 dB leaves-rustling level. It was even quieter than I had anticipated, but my ranking that it would be the quietest location was correct. I was able to pick up an observed loudness rating of 1, although by the dB level it could be qualified as 0, since most people would not be able to hear any of these noises. For location 2, the running shower, the max was 65.23 dB. My expected sound level was 7, and my observed sound level was 5. The shower was quieter than I expected, and was not very loud in practice, but was one of the loudest locations I measured. My guess is that this is because the water sounds a lot like white noise, and so it is most likely dampened by the brain. Location 3, the post office, had a max of 65.30, which was my loudest location. I had an expected level of 6, and an experienced level of 5. The post office was quieter than I expected in my experience, but the sound meter picked up quite a lot of sound. Most likely, a lot of this sound is background noise, and so I did not mind it much. Location 4, the road I live on, had a max of about 57. My expected noise level was 8, but my experienced loudness was 4, even lower than my max. The street was much quieter than I thought it would be, even with a car going by. It was actually pretty quiet, probably because there was a lot of space for the sound to travel through, and it was not confined to a room. Location 5, my backyard, had a max of about 44 dB, which aligned well with my expected sound level of 3. I also experienced the sound level as a 3 when I was in the backyard. For location 6, the dinner table, the max was about 60 dB. I expected a sound level of about 5, and experienced a sound level of 6. I think it was a little louder because of the extra people that were present. This lined up pretty well with my max. My final location was my brother playing his clarinet, which had a max of about 58 dB. I expected the clarinet to have a sound level of 9, and experienced a sound level of 7. This is much louder than my max actually was. Perhaps because the instrument is musical, I was inclined to perceive it as louder. However, I experienced the clarinet as the loudest location, even though other locations were louder in reality. This could also be because there was a single noise source making the sound rather than multiple sources.

Finally, I would like you to write a concluding paragraph where you reflect on the overall experience. Is your world as peaceful and quiet as you thought?

I honestly expected the sound level to be louder than it was. Maybe I did not pick locations that were loud enough, but I was surprised that the loudest location I had did not go past 66 dB. Most places I go fall within the speech level range of sound. I suppose this makes sense in the sense that people hear best around this level, but I expected the sounds to compound on one another more and to

become amplified as a result. The world seems actually a lot quieter than I thought it was. Perhaps I am more sensitive to sound than some other people are, as I often felt that the noise level I experienced was louder than the decibel level measured. I feel encouraged by this information, as I found that I am not putting myself in acoustically dangerous situations often, which bodes well for my hearing.