Experiment M-8

Laud and Soft Sounds

Objectives

- To distinguish between loud and soft sounds.
- To study the sound levels of different sound sources (musical instruments, your voice, different recorded sounds).

Modules and Sensors

- PANDA-1 Panda Multi-sensor

Materials

- Musical instruments
- A CD player with different types of sounds

Introduction

Sound is a type of energy made by vibrations. Sound is produced when an object vibrates, for instance, when a drum is struck, it vibrates. The vibrations cause movement in the air particles which bump into the particles close to them. These particles vibrate, causing them to bump into more air particles. This movement is called sound waves. It keeps going until the particles run out of energy. If your ear is within range of the vibrations, you can hear the sound. Sound intensity is the amount of energy a sound has over an area. In general, we call sounds with a higher intensity louder.

Procedure

Experiment setup

1. Make sure you have some musical instruments and different types of recorded sounds.

Settings

2. When opening the Panda, the **Sound sensor** icon  should appear on the top left side of the device. If you see a different icon, press on it and choose “Sound”.

Testing and measurements

3. Change the Panda mode to Column mode or the Gauge mode .

4. Be quiet and watch the Panda screen. Do the value change? Fill the table on the next page with the value you see.

5. Point the Panda side with the small icons to your hands. Clap your hands and watch the screen. Fill the table with the value you see.

6. Take a musical instrument and produce a low/soft sound. Fill the table with the value you see.

7. Take a musical instrument and produce a high/loud sound level. Fill the table with the value you see.

8. Repeat this process with other recorded or not recorded sounds such as talking, whispering and shouting.

Type of sound	Sound level (in dB)

Summary questions

1. Which type of sound had the lowest level (soft)?
2. Which type of sound had the highest level (loud)?
3. Did you measure sounds that were close to 40 dB?
4. Did you measure sounds that were close to 100 dB?
5. Are emergency sounds load or soft? Explain why.