Sound Warriors

A hearing loss prevention project for young people

Activity Sheet 1 : How to measure loudness

For more information about the project
visit our website

www.Soundwarriors.org

Topic: How to measure loudness

Materials Needed:

A Decibel meter e.g., DecibelX. This can be downloaded for free onto any smart device

Tape measure

Anything that makes a noise. Could be musical instrument, radio, human voice, the whackier the better!

Paper, pencils, crayons

The Decibel scale (attached)

Hearing Protection should be worn if you plan to measure sounds at greater than 90 dBA

Learning Objectives:

Understand how sound is measured.

Observe how the loudness is affected by how close you are to the source of the sound.

If there is a volume control, e.g. radio, observe how measurements change between full volume and 60%

Recognise that loudness doubles every 3 decibels.

Create your own decibel chart. Include 80 dBA as 8-hour safe level for under 18s. The 8-hour level for adults is 85 dBA

Activity:

Split into groups of 3 or more.

- Get the group to use different objects to make a noise. Ask them how they could tell how loud the sounds are.
- Now try a scientific experiment using a Decibel Meter. (Named in honour of Sir Alexander Graham Bell).
- One person makes a sound, another measures distance, 1 metre, 2 metres, 3 metres etc, the third measures the sound using a decibel meter. Don't forget to reset the meter after each reading!
- Record your findings on the attached chart

Extension:

Create a colourful decibel scale which shows how loud each object is at 1 metre and how long you can safely listen. You can either draw it freehand or use a free tool like Canva.com

Making sure that no one can be identified, take a photograph or video of your experiments. Show both the object and dBA reading.

Send your creations to hi@SoundWarriors.org

My Experiments

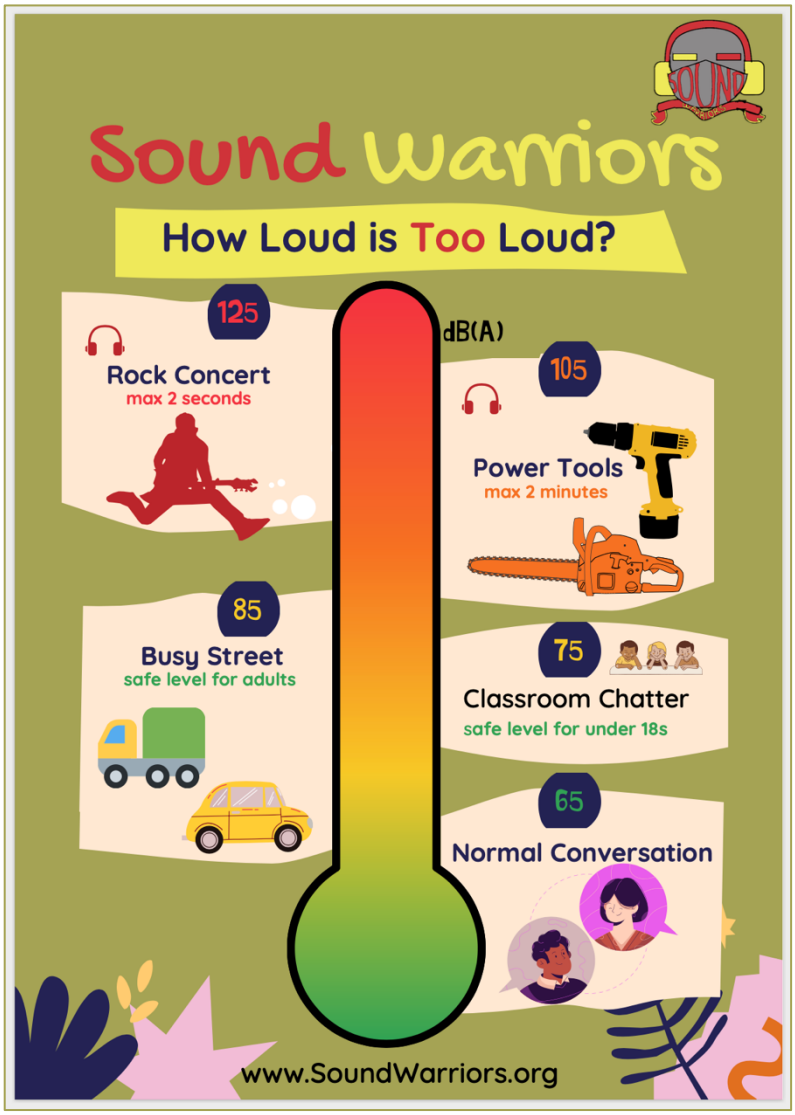
Object	Distance	dB(A)	Comments

Recommended Safe Exposure time (for adults)

Safe Time	Noise Level
8 hours	85 dB(A) 80 db(A) for under 18s
4 hours	88 dB(A)
2 hours	91 db(A)
1 hour	94 dB(A)
30 minutes	97 dB(A)
15 minutes	100 dB(A)
7.5 minutes	103 dB(A)
3.7 minutes	106 dB(A)
112 seconds	109 dB(A)
56 seconds	112 dB(A)
28 seconds	115 dB(A)
14 seconds	118 dB(A)
7 seconds	121 dB(A)
3 seconds	124 dB(A)
1 second	127 dB(A)
Less than 1 second	130-140 dB(A)
NO EXPOSURE	140 dB(A)

Did you know that the safe exposure time in any one day is cumulative, so if you listen for 1 hour to something at 94 dBA, you should keep your listening down to below 80 dBA for the rest of the day.

Are you feeling creative? Here is our Decibel chart. We used canva.com to make it. Use your experiments and other resources to create your decibel chart and share it with your friends. Don't forget to add a fun fact!



Fun Fact

Analisa Flanagan holds the Guinness world record for the loudest voice. She made an impressive

121.7 dBA

the equivalence of the average jet engine or a rock concert. Ironically she shouted the word "Quiet!"

Please send your creation to hi@SoundWarriors.org. We will feature the best ones on our website