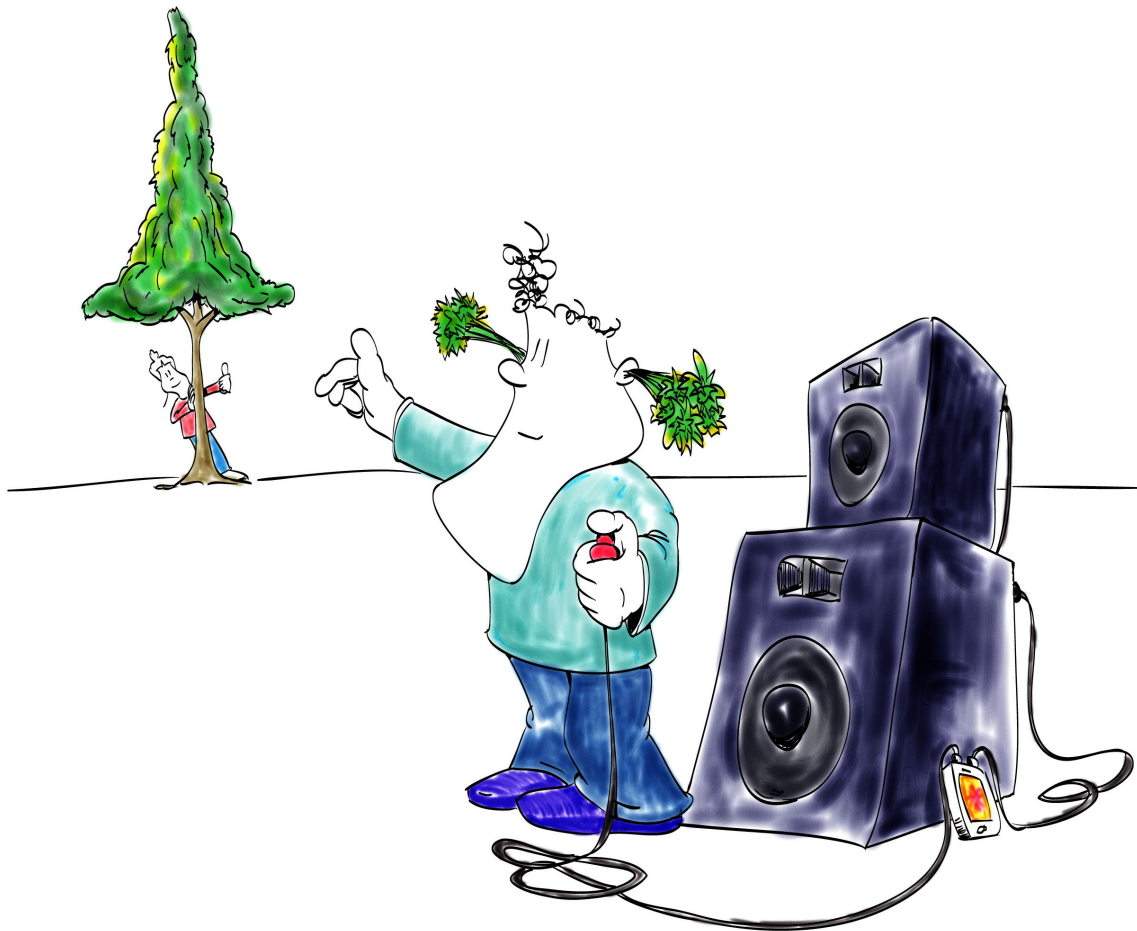


# Unit VI. Stop that noise

Key Question:

How can we protect ourselves against too loud sound?



Student name:

Class:



## Activity 1 – Dangerous decibels

1. Give examples of loud sounds to which you are exposed to in your life.

2. Your neighbour is in his room and has a radio turned on. The window in the room is opened. You are reading a book in your garden and you can hear the radio very well. What can you or your neighbour do to make the sound softer? List at least three ways.

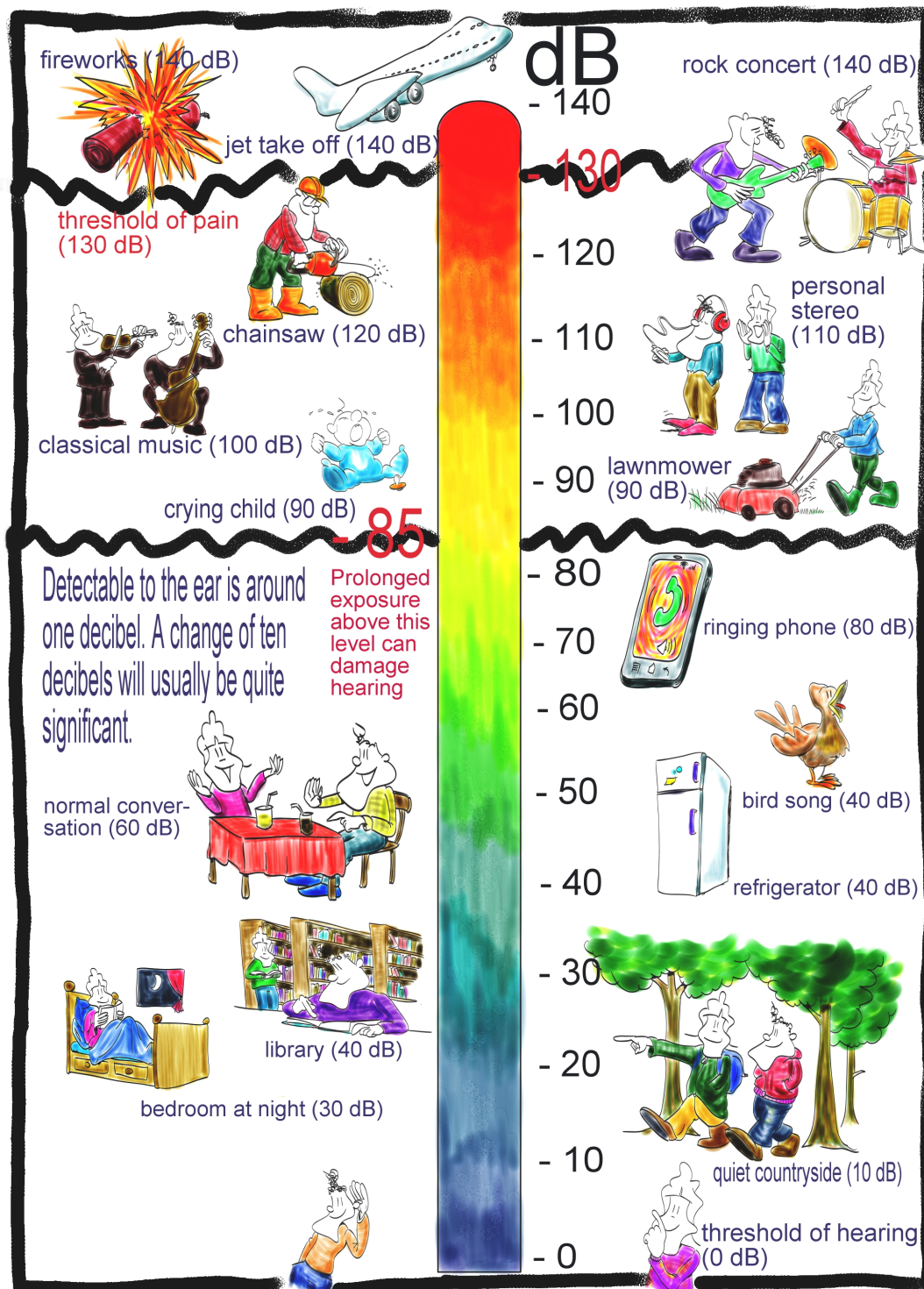
3. What do you think can sounds be dangerous to you?

☐ Yes                      ☐ No                      ☐ Sometimes

4. When do you think sound can be dangerous?

If a sound reaches 85 dB or more it becomes dangerous and can cause permanent damage to your hearing.

- Look at the decibel chart on the next page and identify sounds, which are not dangerous and sounds, which can be dangerous for your hearing.



NOT DANGEROUS SOUND	DANGEROUS SOUNDS

The amount of time you listen to the sound is also important. For example listening to music on earphones at maximum volume level, the sound generated reaches a level of over 100 dB, loud enough to begin to cause permanent damage after just 15 minutes per day! A clap of thunder from a nearby storm (120 dB) can cause immediate damage.

5. Did you experience yourself that after being near loud sound, your ears feel “full” or you hear people talking to it sounds like they talk through a pillow or underwater?

☐ Yes

☐ No

If yes, you maybe have been exposed to damaging sound levels.

6. How can you protect yourself against too loud sound? List at least 2 ways.

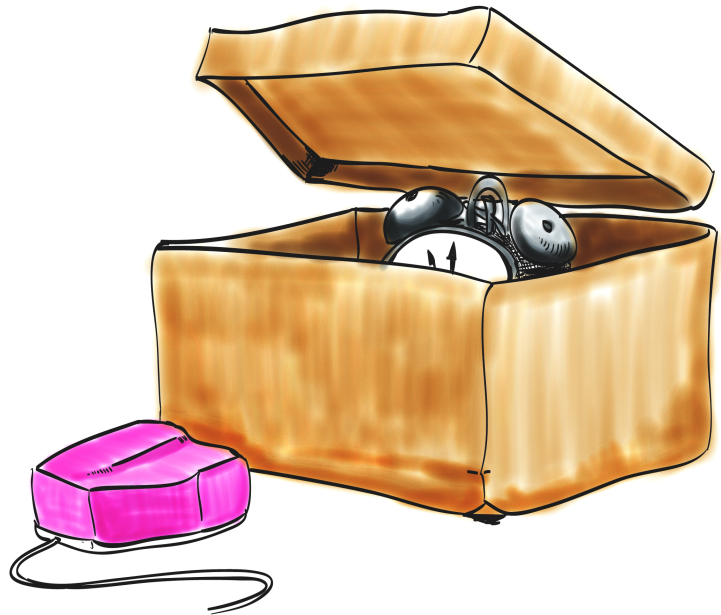


## Activity 2 – How to muffle sound?

In this activity you will use the €Sense sound sensor to find the material which is the best at muffling the sound. You will need a loud sound source.

- Design and describe below a fair experiment to test a range of materials that muffle sound.

One of possible ideas is shown on the drawing. To ensure that your experiment is a fair test, you must change only one factor at a time while keeping all other conditions the same.



My design:

7. What will you measure in your test?

8. What will you change in your test?

9. What will you keep the same in your test?

- List materials you like to test in the table below.
- Before you start, rank your materials. 1 means the best at muffling sound. Explain your reasoning.

- Ask for your plan to be approved by your teacher before you continue.
- Set up your measurement and carry it out.
- Record your measurement results in the table.

MUFFLING MATERIAL	PREDICTED RANK	MEASURED SOUND INTENSITY (DB) (APPROXIMATELY)	ACTUAL RANK
Without any material			

10. Compare your results with your prediction. Do they show what you expected?

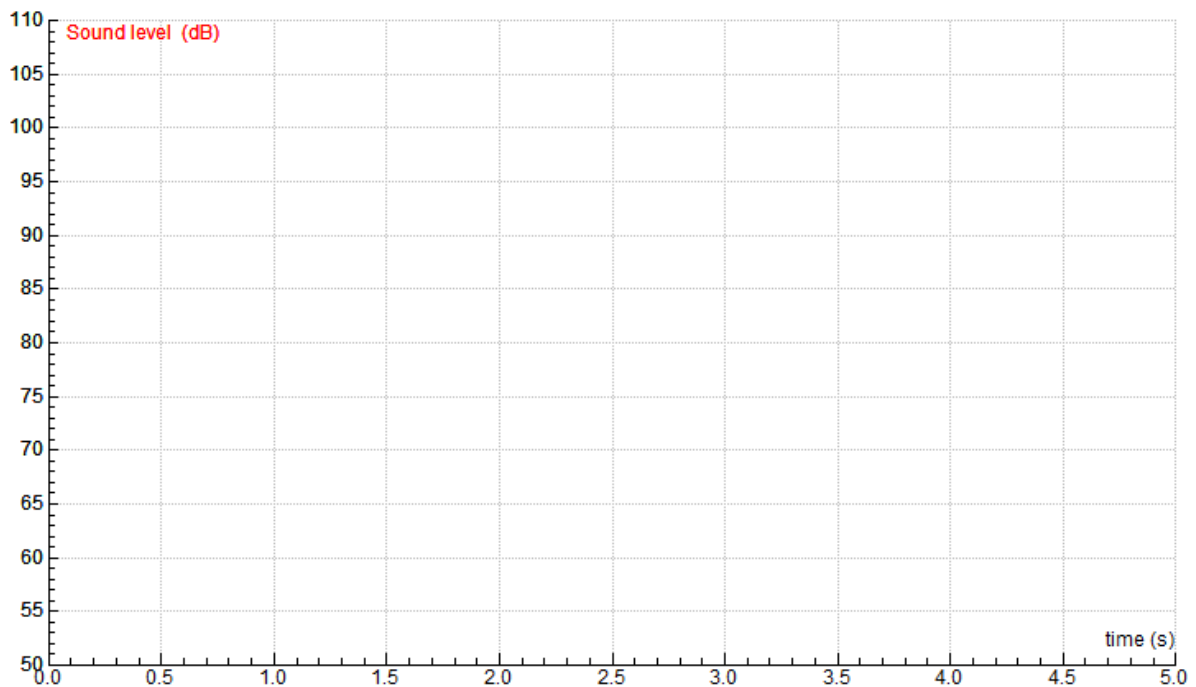
11. Which material was the best at muffling sound? Why do you think this material did work well?

12. Which material was the worst at muffling sound? Why do you think this material did not work that well?

### Activity 3 – Does sound get more quite further away?

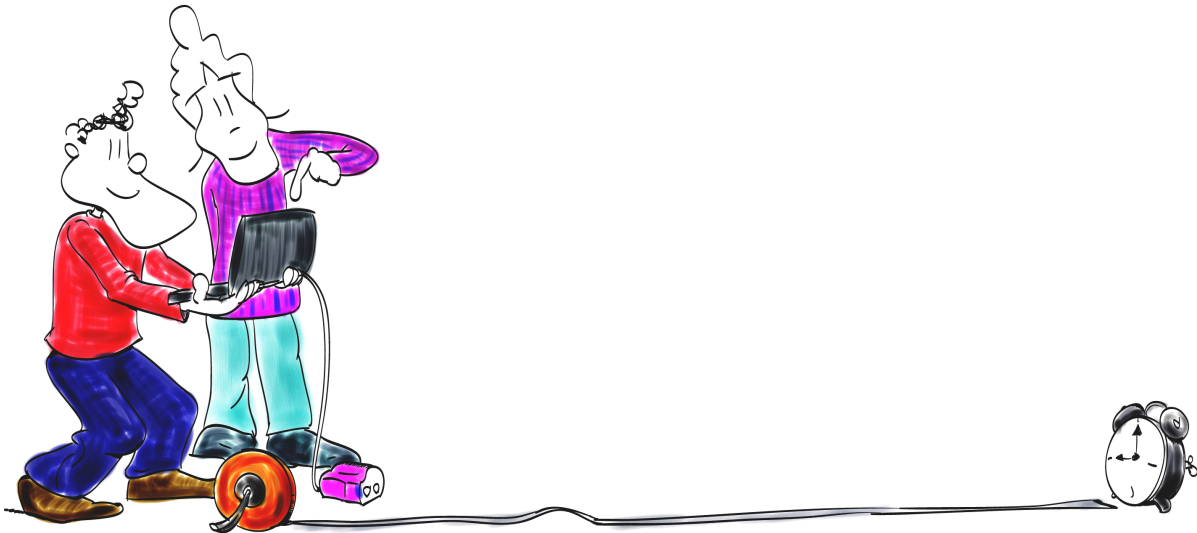
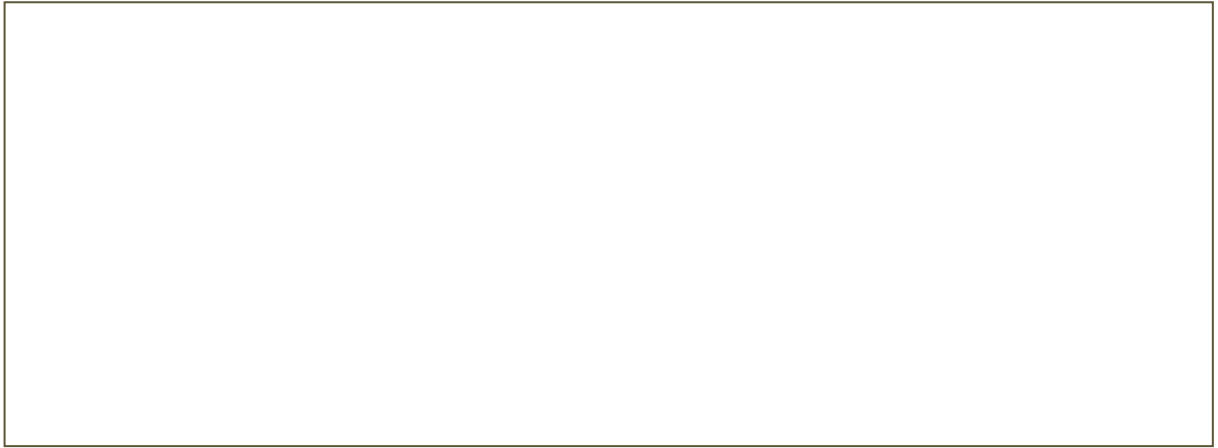
Now you are going to check what happens to the sound level as you get further and further away from the sound source or closer to the sound source.

- Place the €Sense near the sound source. You are going to move the €Sense away from the source, and then bring it back to the source.
- First predict what will happen to the sound level in such experiment. Assume that you have 5 seconds to move €Sense. With a blue pen drawn your prediction in the graph below.



- Now carry out the experiment. Start the measurement and move €Sense away from the sound source and then back toward to the sound source.
  - Draw the result of your measurement with a red pen in the graph above.
- 13.** Did the sound level change with distance as you had predicted? Was the change faster or slower than you thought?

- 14.** Describe how the sound level changes when its distance to the sound source increases.



## Questions

- A.** Why do people using large noisy drills often wear ear muffs?
- ☐ Because they think they look nice.
  - ☐ Because their ears are cold.
  - ☐ Because very loud sounds can damage your ears.
- B.** What would be a good material to lay on a floor to muffle the sound of footsteps?
- ☐ Carpet                      ☐ Metal                      ☐ Wood
- C.** Underline the correct word to complete each sentence:
- The best absorbers of sound are **hard/soft** surfaces.
- The worst absorbers of sound are **flat/bumpy** surfaces.
- D.** Which material would you use to make the best ear muffs for your teacher?

