

Unit II. Making voice sounds

Key Question: How do we make sound?



Student name:

Class:



<http://www.cma-science.nl>

Activity 1 – Feeling sound

- You can also make sounds yourself. Try this. Keep your fingers against your throat as you hum. What do you feel?

- Now put earplugs in your ears and stand behind your classmate.
- Keep your fingers pressed softly against his or her throat.
- Have your classmate make different sounds for example: humming, saying aaaaaa (from the word 'are'), oooo (from word 'or'), eeeee (from 'see') or other vowels.
- Feel the sounds. Describe what do you feel.

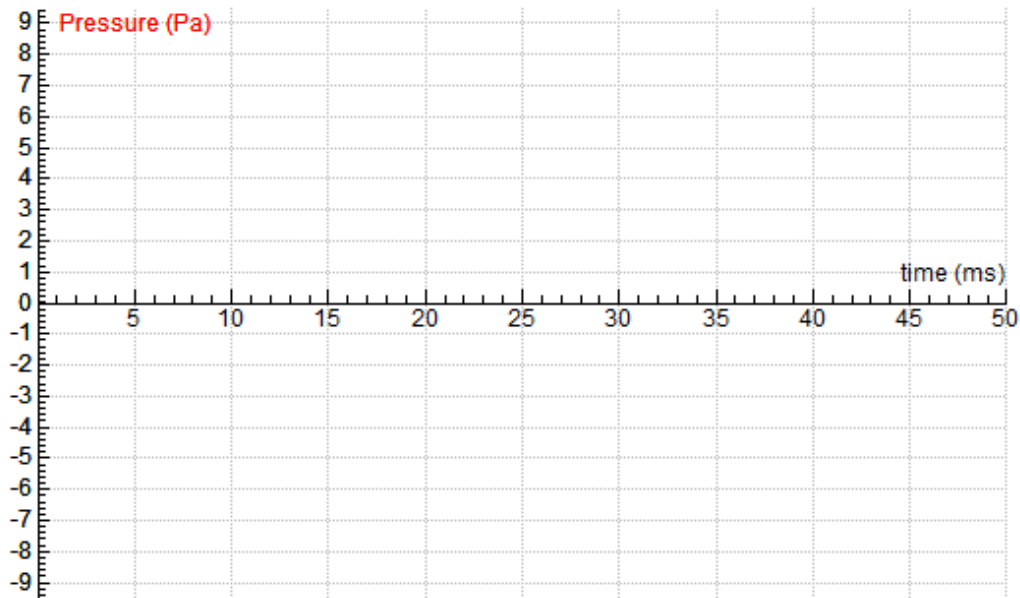


- Can you feel if the sound is loud or soft? ☐ Yes ☐ No
- Can you feel if the sound is high or low? ☐ Yes ☐ No
- Can you feel the difference between different sounds? ☐ Yes ☐ No
- How do you think are sounds made in your throat?

Activity 2 – Record your own voice

You are going to record your voice with the €Sense sound sensor and the computer.

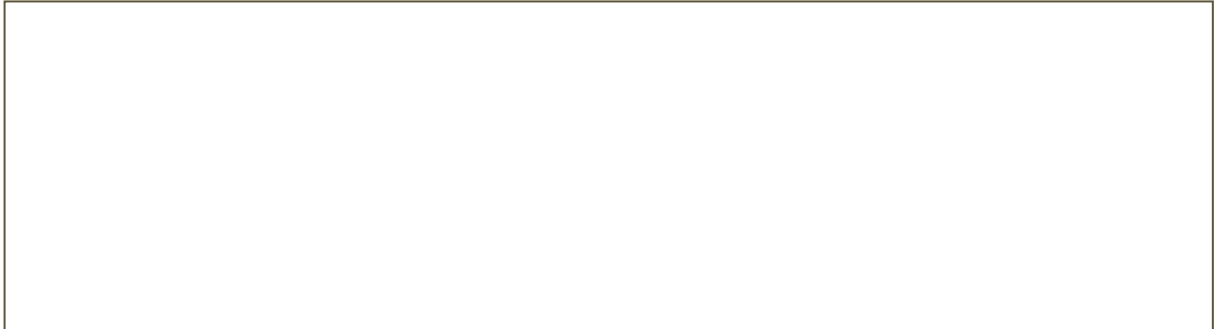
- Hum softly to the €Sense sound sensor and start your measurement while you are making the sound.
- Draw the recorded sound waveform in the graph below.



5. Compare this sound graph to the sound graph of a tuning fork. How are they the same and how are they different?

6. Look for a pattern in the graph that repeats again and again. Make a drawing that shows this pattern.

- Now repeat your measurement but try to hum louder.
- Compare sound waveforms. What feature in the sound waveform shows you how loud the sound is?



- Repeat your measurement but now make sounds of different pitch, first hum low then hum high. Try to keep the loudness the same.

- 7.** How does a high-pitched sound look different from a low-pitched sound?



- 8.** What is the number of vibrations for lower-pitched sound?



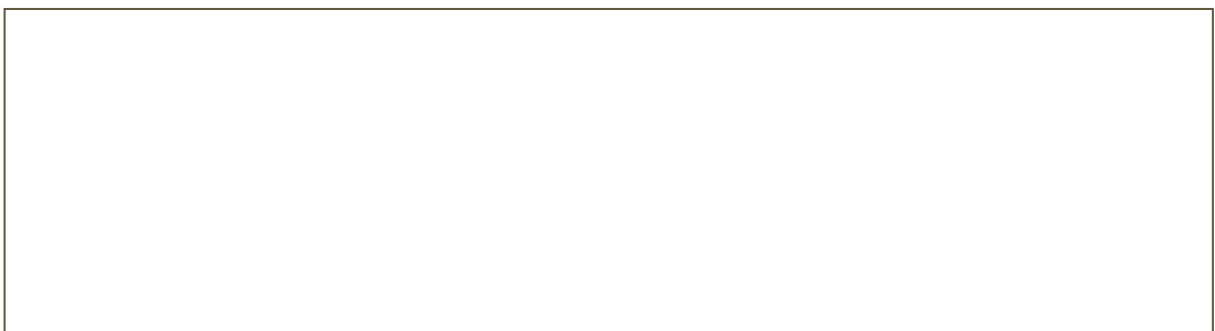
- 9.** What is the number of vibrations for higher-pitched sound?



- 10.** Which sound has more vibrations per measured time period the higher or the lower pitch?



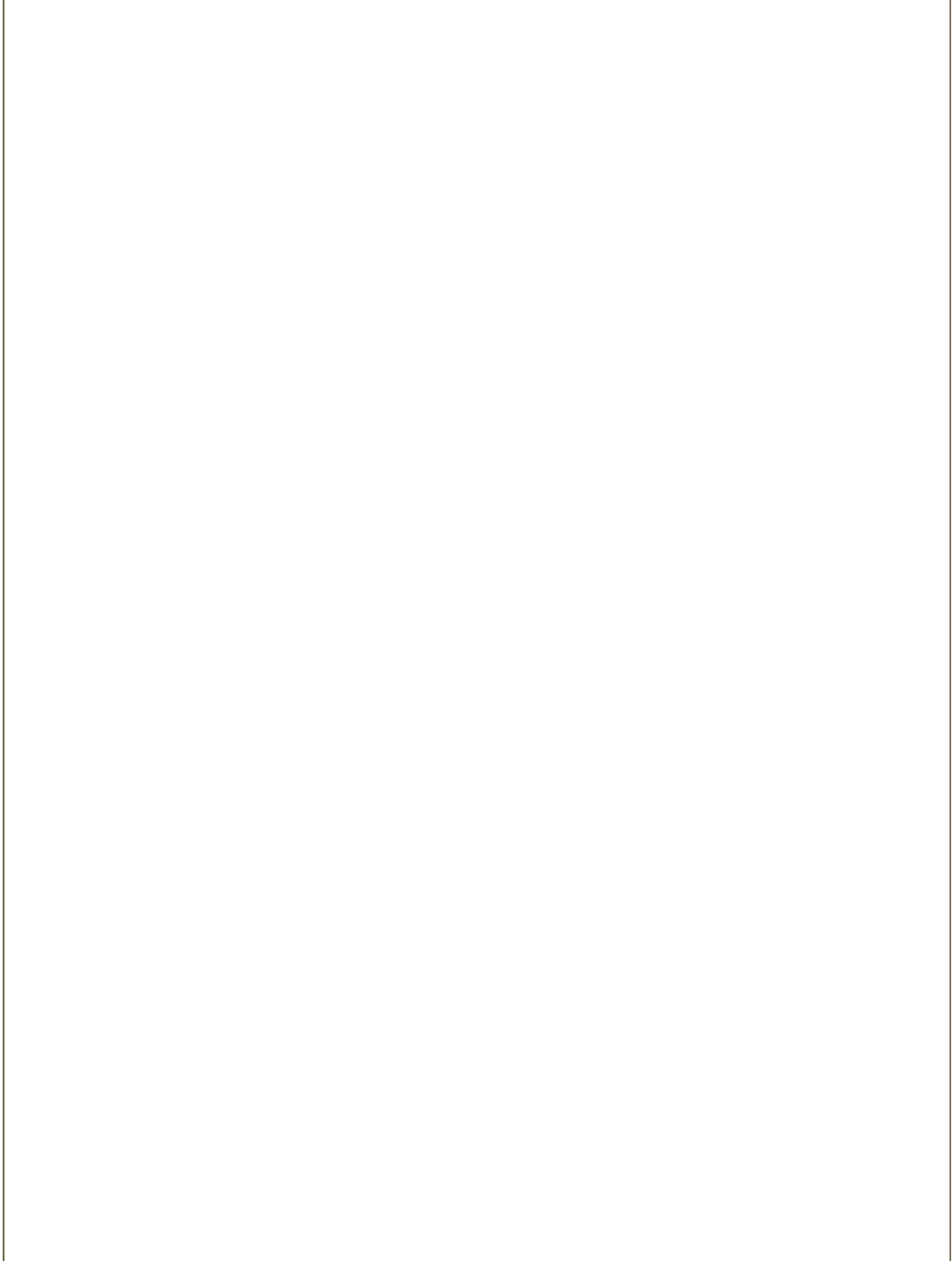
- 11.** Which vibrations are faster, the higher or the lower pitch? How do you know?



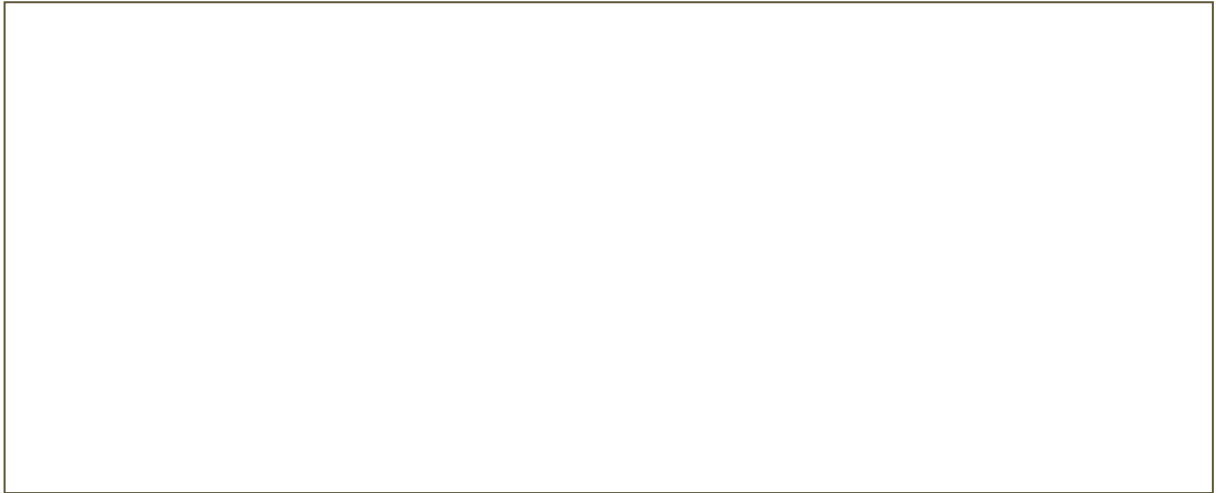
Activity 3 – Investigate vowels

Now you will investigate vibrations of different vowels. For example: say aaaaaa (from the word 'are'), or oooo (from word 'or'), or eeeee (from 'see') or other vowels.

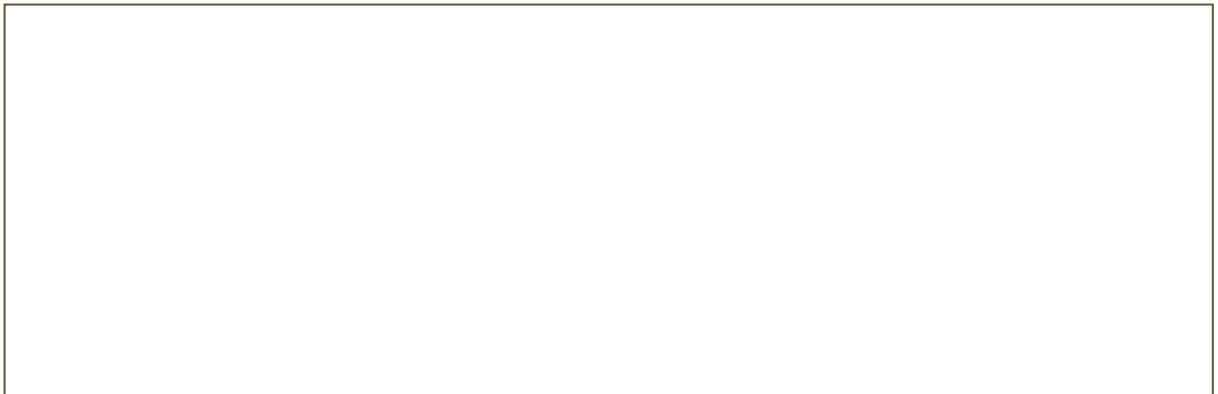
- Draw the recorded sound waveforms below.

A large, empty rectangular box with a thin black border, intended for drawing sound waveforms. It occupies the majority of the lower half of the page.

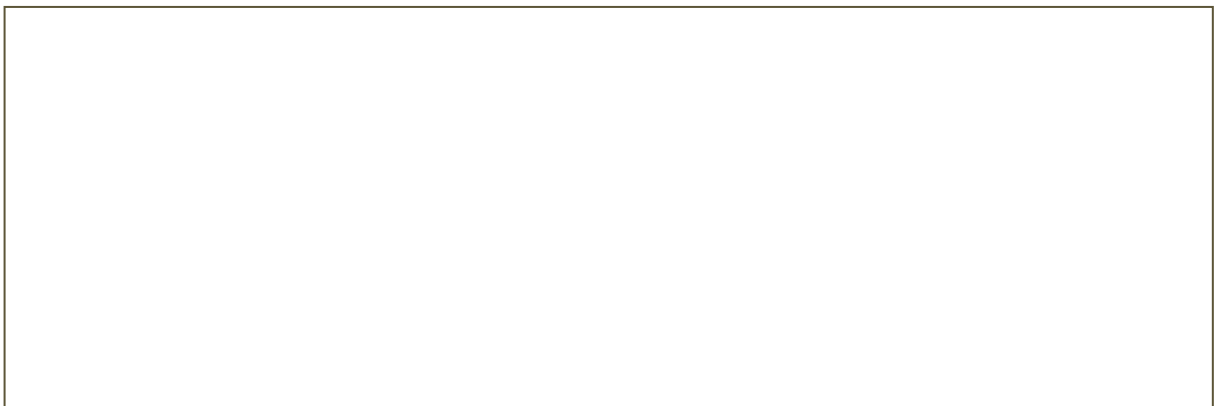
- 12.** In which way sound waveforms of different vowels are similar and in which way they are different?



- 13.** Why do you think they do not look the same?

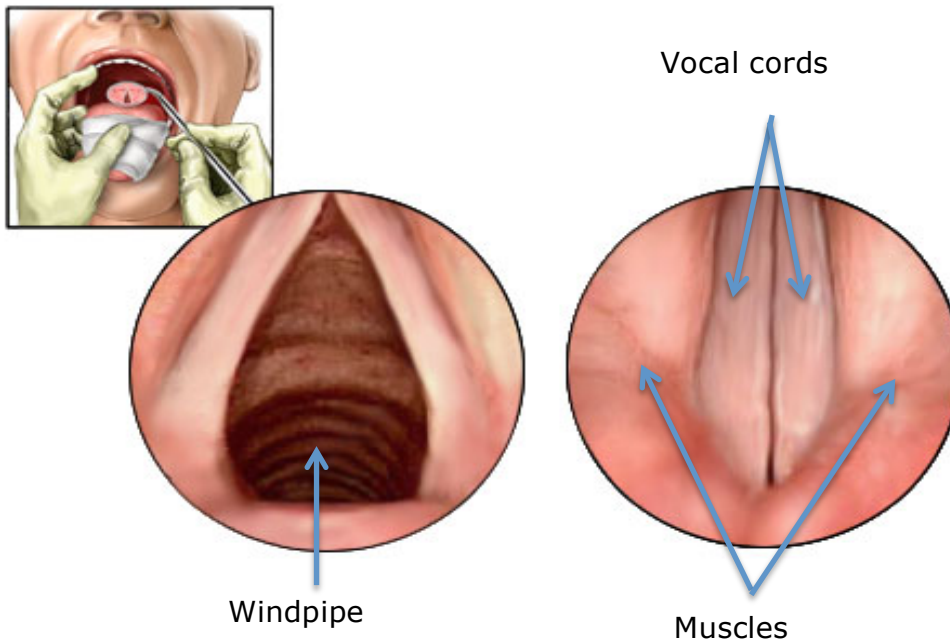


- 14.** Is there a difference between the sound waveform of the same vowel sing by a boy and a girl? Investigate this.



Explanation: How sounds are made in your throat

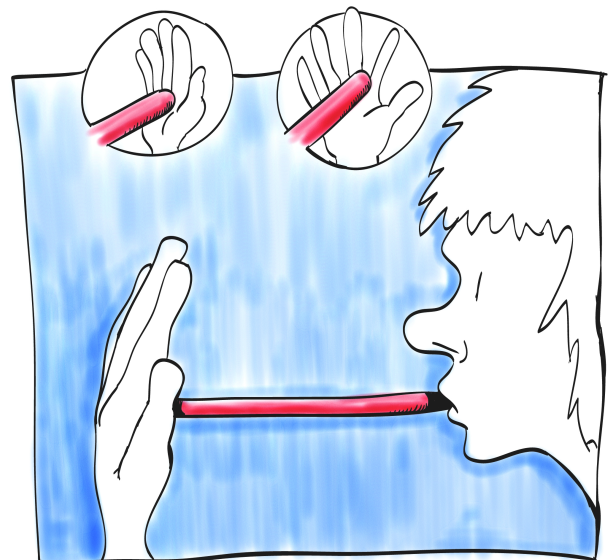
Like all other sounds, the sounds that come from your throat, are made by vibrations. You can feel these vibrations if you touch the front of your throat while talking or singing. In your throat are two thin bands called vocal cords. When you want to talk or sing, you push air through these vocal cords. The moving air makes the vocal cords vibrate. These vibrations make the sounds that come out of your mouth. Below you see the picture of vocal cords.



Your throat muscles pull on your vocal cords to open and close them. The muscles pull vocal cords less hard when you sing a low note, and pull harder when you sing a high note.

You are going to make a model of the vocal cords and demonstrate how they produce sound. You need a drinking straw or a small plastic pipe.

- Open your hand but keep fingers together.
Press the opening of the straw against the space between two fingers.
- Demonstrate that different sounds are produced when blowing in the straw.
Vary your blowing intensity and the tension of your fingers.
- Explain how this model mimics the way your vocal cords work.



Questions

- A.** Make a tube by rolling up a piece of paper. Put one end of tube near the sound sensor, hum into the other end and start to record sound. Then take away the tube and hum with exactly the same loudness. What difference does the tube make? What do you think, why?



- B.** Why do you think some people have “high” voices while other people have “low” voices?

- C.** How do vocal cords make high and low sounds?