



Acoustic rain gauge

This material is about making your own rain gauge after which it can be tested and evaluated.



Rain, technical



12-13 years



Physics, mathematics



2 hours

TEACHER GUIDELINES

The workshop can be carried out in 1 hour. In order to make it more valuable to the students, you can start a discussion about water damage throughout the world or ask the students to think of improvements and redesign this rain gauge.

MATERIALS

- Piezo electric element
- Picture frame
- Audio cable
- Soldering gear
- Superglue
- Ducttape
- Sound boxes

LEARNING OBJECTIVES/ STANDARDS

The student:

1. can make one of the weather sensors based on a detailed manual. (Reproducing)
2. understands how the weather sensors work. (Understanding)
3. can design a sensor which is able to measure one of the weather variables and make a prototype. (Creating)

BACKGROUND INFORMATION

Water Managers regulate the water. To ensure that the rain will not cause water damage, especially in the city, they need to know how much it has rained. This rain gauge works on the basis of sound. Just like in a tent, in which you can hear how much it is raining outside. The rain gauge of TU Delft is a microphone that is listening to the raindrops. It also includes a tiny computer that calculates how much rain has fallen and send that information to an online database.

CREATED BY:

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PROCEDURE

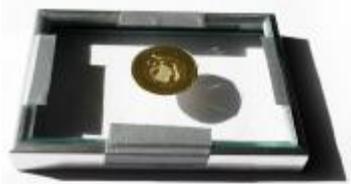
1. Superglue the piezo to the glass and wait a few seconds.



2. Place the glass pane on top of the frame with the Piezo at the bottom, as shown in the picture.



3. Duct-tape the glass to the picture frame.



4. Turn the frame and solder the plus and the minus cables of the audio cable to the piezo element (one to the white part and one to the golden part).

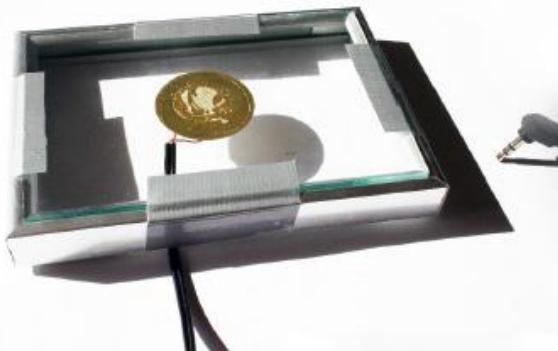


5. Use duct tape to secure the connection.



6. Now the rain gauge is ready to use. Turn the device (the piezo must be at the bottom of the glass pane) and simulate the rain. When you connect it to a sound box, you will hear the rain!

RESULT



DISCUSSION

Ready?

Now you can actually test your rain gauge. Connect it to the speakers and see what will happen. Try to answer the questions below.

1. Describe in your own words how the rain gauge work.
 2. How can you improve this prototype?

