Citizen Science activity #1: Air Quality Measurements

Every human inhales 14 kg of air each day, while drinking just 2 kg of water and eating 1.5 kg of food. With each breath, we inhale necessary oxygen, but also small amounts of potentially harmful gases and small particles. A significant proportion of Europe's urban population lives in cities where EU air quality standards for the protection of human health are regularly exceeded.

In this activity you can learn which air quality data is collected by scientists and/or collect some data yourself. We provide some suggestions on how to start your project, but feel free to adjust it to your particular interest! Be ready to present your results on April 25th.

How to participate

1. Register for this activity using our google form sign-up (https://forms.gle/CUUvNKJeahops9ye9)
2. Select one of the options to research air quality:
   A) **Investigate and find the sources of air pollution in your homeplace or nearby.** For example, an urban city near to the sea can have particulate matter consisting of sea salt, road dust and smoke from diesel engines. In contrast, a rural area near to a forest may have particulate matter consisting of soil, smoke from cookstoves and forest fires.
      1. You can start your investigation with this European Air Quality Index map. Click on the dots representing city/town close to you and click "show details" to see more information and helpful links. Mark down which particles usually have higher/lower concentration and search on the internet for the source of pollution they may be connected to.
      2. Compare the data and sources of pollutions in your homeplace with some place in another part of the world (see World Air Quality Index).
      3. Give suggestions about how to decrease air pollution and what each citizen can do for that.
   B) **Air quality in schools.** If the CO2 content rises to a high level, it affects student's alertness. That is why it's important to ventilate indoor spaces between lessons. The CO2-level also indicates how dense the amount of previously-respired air in a space is, and therefore how much potential COVID aerosols could be in the air. Typical CO2 concentration indoors is between 400-1000 ppm. To help prevent the spread of viruses the concentration of CO2 shouldn't rise above 800 ppm.
         1. Use Verinier Probware sensors or any other sensors you have in school. If you are familiar with Arduino, you can build a CO2 monitor yourself!
         2. Measure the CO2-concentration at the beginning of the lesson and 30 minutes after. Mark down you measurements. Take note of whether the windows were open before or during the measurements.
         3. How much did the level of CO2 rise? If it has risen considerably when the windows were closed, this may mean that the ventilation system in the classroom is not so good.

Having difficulties? Have a question? Then reach out to Maria and Jussi, who are part of the UNESCO BSP Citizen Science team: maria.ivanova@tartuloodusmaja.ee, jussi.tomberg@ouka.fi