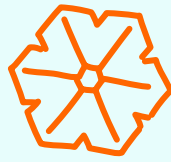


Sample collection guidelines



ORANSSI LUMI

An exploratory journey
through atmospheric events

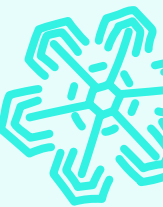
For grades 1-9



ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE



KONE FOUNDATION



Collecting samples: what for?

In the case of a dust deposition event, you can collect samples and look at them yourself, send them for analysis at the **Finnish Meteorological Institute (FMI)**, or do both! Check out [Oranssi Lumi's page](#) to see if there is any citizen science campaign happening at the moment.

What can I learn from my collected samples?

Find inspiration in the activities [In a handful of sand \(Part I\)](#) or [Orange snow cake](#). You can prepare yourself by making your own snow collector beforehand, and rehearsing how to collect samples with "fake" dusty snow (see [activity](#)). Remember, practice makes perfect!

Can I send my samples to FMI?

Your samples might be also useful for research purposes and contributing to the advancement of aerosol science! Check out [Oranssi Lumi's page](#) to see if there is any citizen science campaign happening at the moment. You will find more information about when and how to send your samples there. Follow these collection guidelines to get them ready. But remember, your samples will be useful only if there is an active campaign taking place!



How can I check if there is a dust deposition event happening?

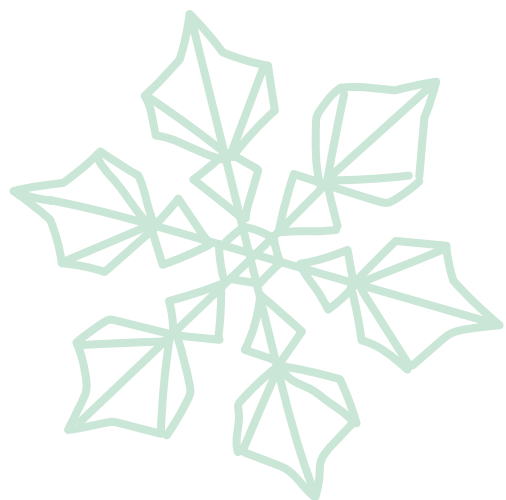
You can check this from the front webpage of FMI ([in English](#)) or from these dust forecast products websites ([CAM5](#), [AEMet](#)) and see if there are any dust plumes expected over your location.

How can I contribute if there is an ongoing citizen science campaign?

You will find in which ways you can contribute by checking [Oranssi Lumi's page](#) for an active campaign. If there is one ongoing, the samples you collect and send to FMI can be analysed by researchers.

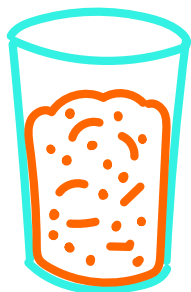
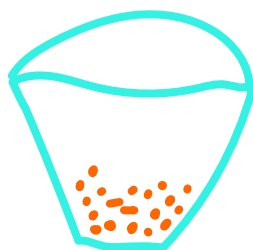
I want to collect dust-containing snow. What are the steps?

First, you can check if there are any chances that the snow will contain dust (see Resources listed at the end of the guidelines). Then, you can follow these simple guidelines for sample collection. Of course, you can always collect snow following these instructions if you are curious to see what is in it!

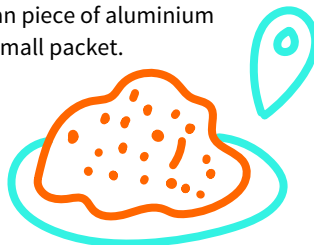


SAMPLE COLLECTION GUIDELINES

Without snow collector



- 1 Take a dusty snow sample** (dust-containing snow) by scraping the most superficial layer of recently deposited snow that visibly contains dust. Collecting 2 dL, i.e. one drinking glass, is enough. However, you can collect larger samples or combine several of them.
The closer to deposition time the snow sample is collected, the better! If the dust is deposited by itself or along with precipitation (rain) that has already evaporated, and only dry dust remains, just collect it as it is, no further processing is needed.
You can brush it off carefully and transfer it into a clean piece of aluminium foil to make a small packet.

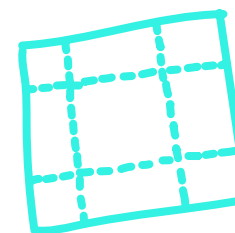
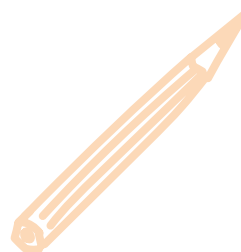


- 4 Once the sample is dry, it is ready for analysis!** Check out [Oranssi Lumi's page](#) to see if there is any citizen science campaign at the moment. Follow the instructions there to send your sample or other contributions (photographs, drawings or even poems!) in case of a citizen science campaign. You can always look at your own samples and learn from them. Find inspiration in activities [In a handful of sand \(Part I\)](#), [Orange snow cake](#) or [Practice makes perfect](#).

- 2 Write down details about the sample collection:** date and time of collection and place (address or coordinates). The amount of snow collected in volume (decilitres or litres of snow) and/or sampling area (in square centimetres) are also important information. You can fill up a container of known volume (a cup, a plastic container) to estimate the total volume of snow collected.
To estimate the sampled area, you can try to collect the snow from a patch with a rectangular shape. By measuring the sides of that rectangle you can get the area: $A(\text{cm}^2) = \text{side 1 (cm)} * \text{side 2 (cm)}$. You can also be more creative with the shape of your patch and find how the area is calculated.



- 5 Don't forget to take pictures of the deposited dust outside and the sample preparation process.** They are very valuable!



- 3 Extract the dust (the solid residue) from the snow sample.** There are 2 methods you can follow.

Method 1: Evaporation

Place the snow on a piece of aluminium foil (usually found in a kitchen) or a container (preferably glass, freshly cleaned) and let the snow melt first, and then let the water evaporate. You can speed up the process by using the sauna heat or an oven (low temperature, preferably under 70°C) for melting and evaporation.

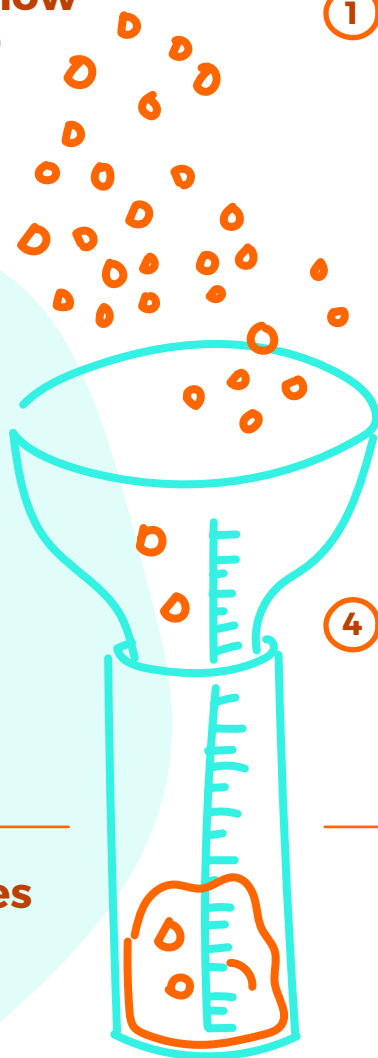
Method 2: Filtering

Let the snow melt in a container and pour the mix of water and dust through a coffee filter. Most of the dust particles should remain in the filter. It is very important to let the filter fully dry before sending the sample (in case of an active campaign, check the status [here](#)).

- When the snow samples are large, one might use the **decantation** technique before applying method 1 or 2. Start by letting the snow melt in a container. Once the dust has settled at the bottom, carefully pour most of the water away and then evaporate (*Method 1*) or filter (*Method 2*) the rest.

SAMPLE COLLECTION GUIDELINES

With a snow collector

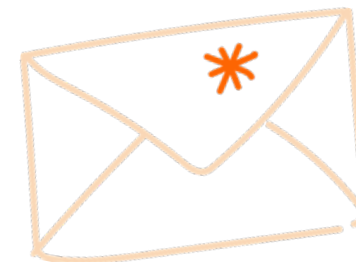


1 Place your DIY snow collector outside, in an area clear of obstacles. Mark the starting date and time of collection. Let it collect snow during a snow fall, and mark the end of the collection period (date and time).

2 Make a note of the amount of snow collected (depth). Since you know the area of your collector, you can calculate the volume of the snow sample. Write down details about the sample collection: date and time, duration (time the collector was deployed) and place (address or coordinates). Check the activity [Practice makes perfect](#) to explore how to calculate your collector's area and the volume of your sample. Take the collector inside and retrieve the snow sample. You can let it melt in the collector container and then extract the dust (solid residue) by evaporation (*Method 1*) or filtration (*Method 2*).

3 Once the sample is dry, it is ready for analysis! Check out [Oranssi Lumi's page](#) to see if there is any citizen science campaign happening at the moment. Follow the instructions given there to send your sample or other contributions (photographs, drawings or even poems!) in case there is an ongoing citizen science campaign. You can always look at your own samples and learn from them. Find inspiration in activities [In a handful of sand \(Part I\)](#), [Orange snow cake](#) or [Practice makes perfect](#).

4 Don't forget to take pictures of the deposited dust outside and the sample preparation process. They are very valuable!



Resources

Finnish Meteorological Institute website (in English).
www.en.ilmatieteenlaitos.fi

Copernicus Atmosphere Monitoring Service (CAMS) aerosol forecast.
www.atmosphere.copernicus.eu/charts/packages/cams/

Daily Dust Products.

Visualisation tool for accessing different dust forecasts and dust-related observational products.
www.dust.aemet.es/products/daily-dust-products