



# Search for micrometeorites

Classroom activity

## Material List:

A plastic bottle (cut in two)

A small shovel or scrape

Small plastic bags

A magnet

Two sieves:

- with a fine mesh (approx. 0,2mm)
- with a course mesh (approx. 0.4mm)

## Outline

Every day, several tons of cosmic dust falls down onto our planet, and roof tops have proven to be the ideal place to look for micrometeorites, even in busy city environments. You can join the hunt, and if you're lucky you might find your own micrometeorite on the roof of your school or a local warehouse. Follow the steps in this document and join the hunt!

## Procedure



### Collect the material

Find a large building (school, storage facility, etc.) with a large roof. Ask the landlord/janitor kindly if you can gain access to the roof together with your teacher. The roof surface should be "clean" (e.g. metal or plastics), i.e. not made of bricks or other materials that produce lots of small grains in hard weather.

Look for the drains or gutters on the roof and see if you can find piles of sand and dust. Use a shovel, a bottle cut in two (for round gutters) or other tools to pick up as much of the loose material as you can.

Of the micrometeorites we are looking for (diameter of approx. 0,3mm), we expect 1 micrometeorite to have landed every year per 50 square metres.





## Wash the material

Start by washing the material you've gathered in a bowl or bucket of water. Remove everything that floats. Repeat this procedure until you only have heavy elements in the bottom of your bowl. When you are happy with your washing, try to pour out all the water without losing any dust grains. Dry the remaining dust on a clean tray in room temperature or on a plate in a microwave oven (be careful not to use too much power on the oven, the "defrost" program will usually hold).



*a) Pour the material into a tray or bowl and fill it with water. Let the water run, so that the top layers of water that run out of the tray, carry the floating particles out of bowl/tray.*



*b) Use a magnet to catch all dust grains with some metal in them (described in the next step).*



*c) The material after rinsing away all non-magnetic and floating particles.*



*d) Dry the material (be careful to use low power if you use a microwave oven).*



*e) Gather you dried materials on a plate.*



*f) Filter the material (by following the instructions below).*



## Filter the material

Pull a plastic bag around the magnet and drag the plastic-covered magnet over your dry dust. Since most micrometeorites have some metal in them, we will only keep dust grains that are magnetic.

Find the sieve with the coarse mesh and filter the material through it. Keep what falls through, throw away what stays back in the sieve. Filter the material through the fine meshed sieve, keep what's left in the sieve and throw away everything that falls through.



## Study the dust in a microscope

Distribute portions of your remaining dust on a small tray and study the dust through a microscope. Micrometeorites are usually smaller than you think, so focus on the smallest portion of particles on your tray. Remember to have sufficient lighting, if your microscope does not come with top-lighting, you can use a hand held flash light.

Look for round shapes! Before the micrometeorites enter our atmosphere, they can have any odd shape, but as they are heated by friction falling through our atmosphere, they melt and later cool down to form little droplets. Before they land, they will most likely have become little *spherules*.

Hint: Use a wet toothpick to pick up the dust grains you are investigating and put your best candidates aside on a separate tray.





## Report your findings

Once you've narrowed down your findings to some candidates, you can report your findings to "[Project Stardust - Jon Larsen](#)" on Facebook. Take pictures of your best candidates by hold your mobile phone camera in front of the eyepiece of your microscope. It requires some exercise, a sturdy hand and a friend to "pull the trigger" on your camera to get nice images.

## Further Resources/Activities:

To extend on this activity, and maybe even a tool you can use to investigate several of the questions raised here, see our activity: [Make your own Orrery on onlineobservatory.eu](#).

### Assessment:

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