“Visual guides to analyze Microplastics in salts"

María Lería, Vinyet Baqués, Elisabet Playà,
Anna Travé, Irene Cantarero

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Drawing to communicate scientific concepts

MICROPLASTICS IN TABLE SALTS?: How to easily study them

(National Geographic Society)

Addressed to society

rawpixel.com / The African Union Mission

OBJECTIVES 1/3

- To raise environmental consciousness:

Water and food contamination

Maroc Hebdo

Víctor Barro

OBJECTIVES 2/3

- To raise environmental consciousness:

Water and food contamination

- Promoting Sustainable Development Goals (SDG)

United Nations, 2030 Agenda

OBJECTIVES 3/3

- Raise environmental consciousness:

Water and food contamination

- Promoting Sustainable Development Goals (SDG)
- To promote and to consolidate collaborations between Art and Geology

METHODOLOGY 1/7

- Protocol- scientific lab

METHODOLOGY 2/7

- Protocol- scientific lab
- Drawing protocol
  - Defining iconicity

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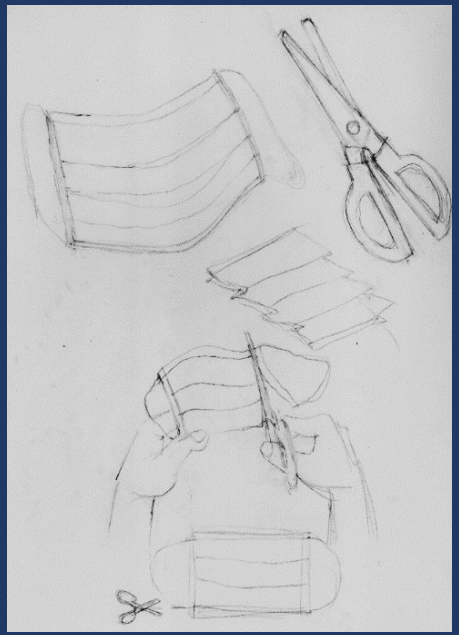
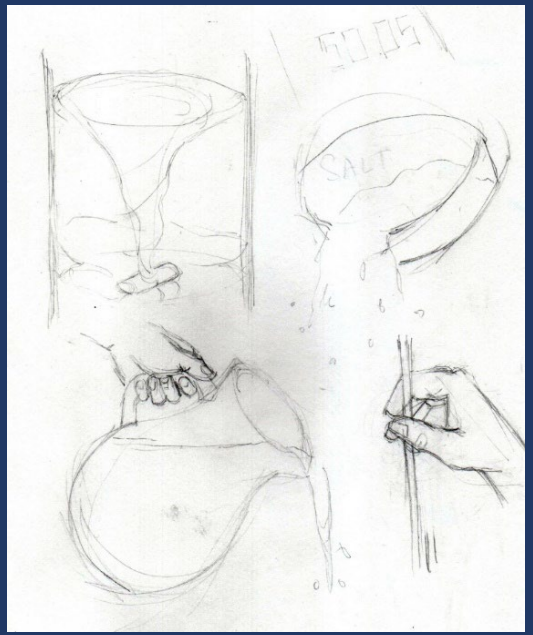
METHODOLOGY 3/7

- Protocol- scientific lab
- Drawing protocol
  - Defining iconicity
  - Pencil drawing





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METHODOLOGY 4/7

- Protocol- scientific lab
- Drawing protocol

Pencil drawing
Watercolor

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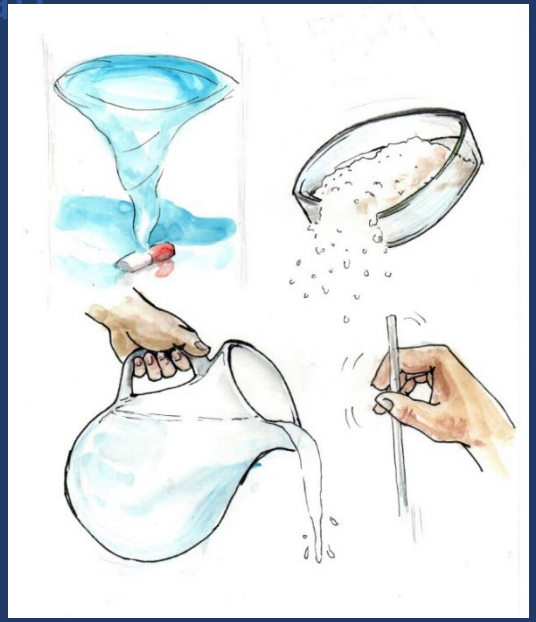
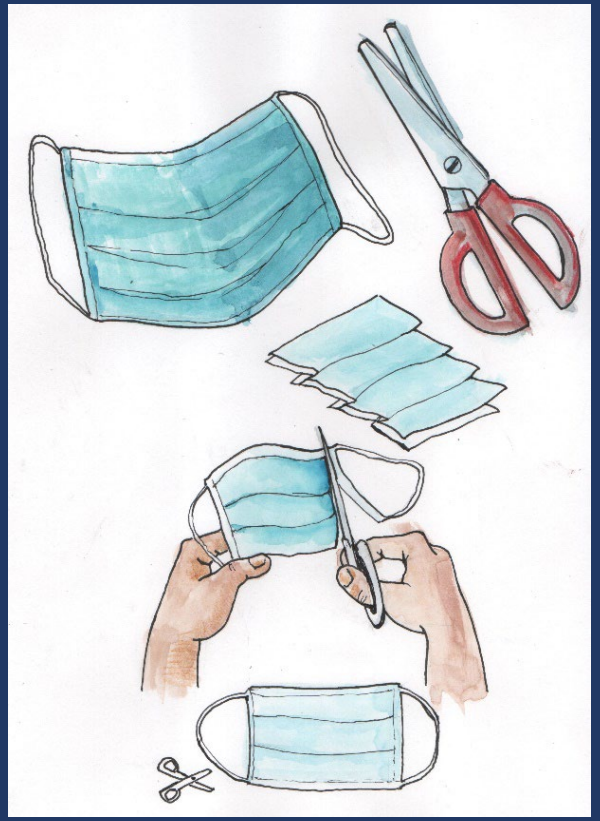
METHODOLOGY 5/7

- Protocol- scientific lab
- Drawing protocol

Watercolor

Defining contourns





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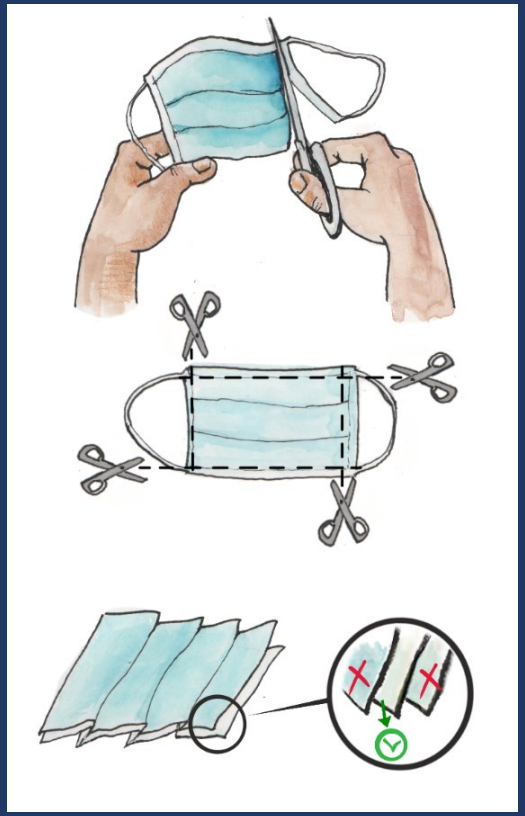
METHODOLOGY 6/7

- Protocol- scientific lab
- Drawing protocol

Defining contourns

Digitalizing



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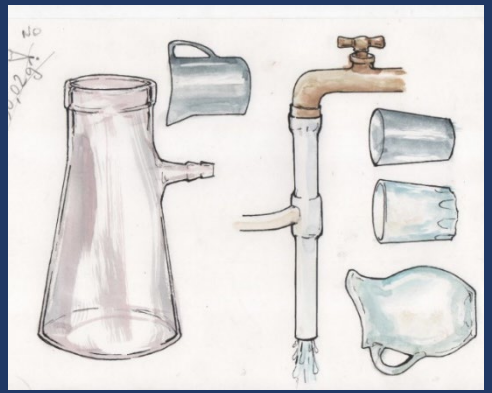
METHODOLOGY 7/7

- Protocol- scientific lab
- Drawing protocol
- Control group- test (25), identified tool and process.



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PROTOCOL (lab)

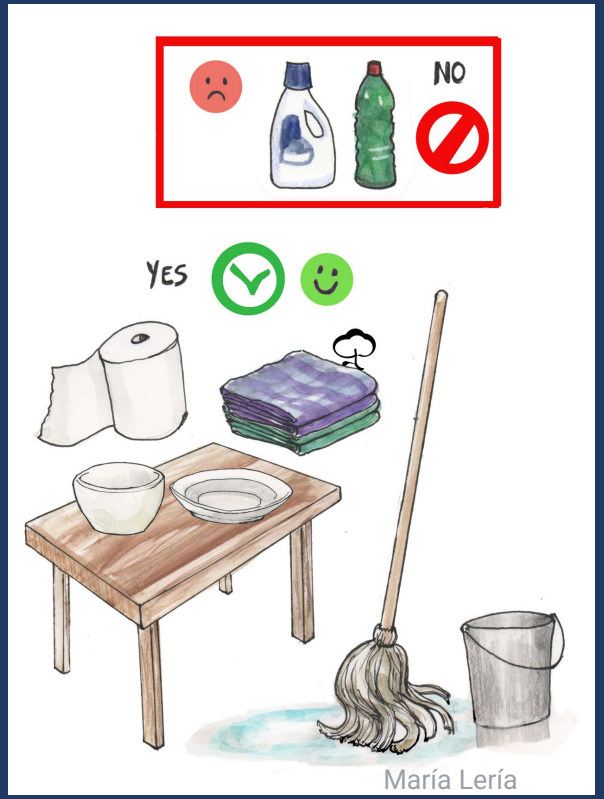
A. Analytical balance
B. Petri dishes
C. Foil
D. Glass rod
E. Surgical mask
F. Magnetic stirrer and magnet
G. Scissors
H. Spatula with spoon
I. Water
J. Table salt
K. Beaker
L. Büchner funnel
M. Filter
N. Flask clamps
O. Water suction pump
P. Magnifying binocular
Q. Tweezers
R. Notebook and pencil
S. Kitasato flask

GENERAL CONSIDERATIONS:

- Note the color of the clothes worn during the experiment.
- Write down the type of water used and filter it before hand.
- Note the type of filter used.
- Clothes can be rubbed with a filter to see how fibers come off.

Protocol 1/6

- Cleaning



Protocol 2/6

- Cleaning
- Control

Protocol 3/6

- Cleaning
- Control
- To weigh

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Protocol 4/6

- Cleaning
- Control
- To weigh
- To dissolve

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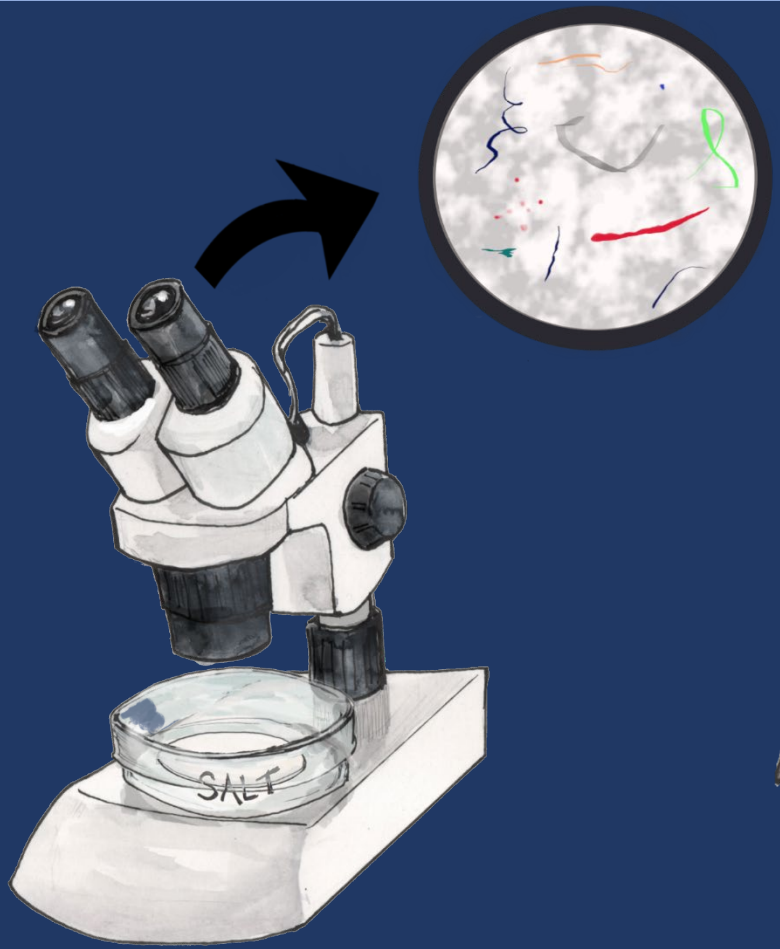
Protocol 5/6

- Filtering

Protocol 6/6

- Cleaning
- Control
- To weigh
- To dissolve
- Filtering
- Analyzing and counting



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Microplastics in Table Salts? How to easily study them

SIMPLIFIED INSTRUCTIONS MANUAL FOR CHEMICAL LABORATORY OF EDUCATIONAL CENTER

What is it for?
The aim of this instruction manual is to illustrate the procedure to separate, observe and quantify at home, or in an educational center that has a chemical laboratory, microplastics and other insoluble particles present in table salts. In addition, these activities embrace three of the Sustainable Development Goals (SDGs): 3, 4, 6 and 12.

Who is it for?
This manual is aimed at secondary school students aged 12-16 and high school and also includes a section with a slightly modified protocol, for those educational centers that have a poorly equiped chemical laboratory.

Why to use this manual?
We will use this manual as complementary material to the educational guide and the workbook for the student. In addition, with the help of the instructions we will be able to complete the observations and activities proposed in the educational guide.

How to use the manual?
The manual is structured in 4 parts, where it is illustrated how we should prepare the laboratory, the material that we will need, the procedure and finally the observations and results. To facilitate the development of the activity, additional material can be consulted at:

http://www.ub.edu/sedimentary-geology/microplastics-salt

Authors: **María LERÍA, Vinyet BAQUÉS, Irene CANTARERO, Elisabet PLAYÀ and Anna TRAVÉ**
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Geologia Sedimentària Consolidated Research Group of the Generalitat de Catalunya

Universitat de Barcelona Faculty of Earth Science University of Barcelona

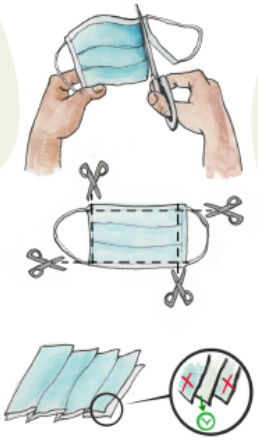
LABORATORY PREPARATION
How to avoid sample contamination?

1
- Hair tied back or with a cotton cap.
- Wear brightly colored cotton clothing.
- Wash hands with soap and water.
- Do not use hand cream or makeup.
- Do not wear plastic gloves.

2
- Clean work surfaces and material (inside and outside) with filtered or bottled water.
- Mop the laboratory floor with water.

3
- Use glass, metal or ceramic containers.
- Avoid the use of plastic.

4
Prepare filters and contamination controls:
- Separate and cut the central filter of a mask.



5
- Use a filter to control airborne contamination during laboratory work.
- Uncap and cover the control filter when running salt samples.
- Airborne microplastics will be retained and we will be able to quantify them.

REMEMBER!
Expose the control filter during the experiment and cap after completion. If the salt filter is exposed, it will control microplastic contamination during sample treatment.

HOME LABORATORY MATERIAL

A. Balance
B. Foil
C. Plasticine tablet
D. Adhesive tape
E. Domestic vacuum cleaner
F. Spoon
G. Plastic hose
H. Surgical mask
I. Bottle to collect water
J. Scissors
K. Water
L. Table salt
M. Italian coffee funnel
N. Crystal glass
O. Glass, metal or ceramic bowl
P. Glass, metal or ceramic plate
Q. Notebook and pencil
R. Glass jar with lid
S. Magnifying glass

GENERAL CONSIDERATIONS:

- Note the color of the clothes worn during the experiment.
- Write down the type of water used and filter it beforehand.
- Note the type of filter used.
- Clothes can be rubbed with a filter to see how fibers come off.

HOME PROCEDURE

PREPARATION OF MATERIALS:

- With the help of the vacuum cleaner, the flexible tube, the adhesive tape, the plasticine and the bottle, **prepare the homemade vacuum pump**.
- Put a surgical mask filter in the funnel of the Italian coffee maker.
- Pierce the bottle and tape the flexible tube so that it is well fixed.

- Choose any water and **filter 1-2L x2 times** using the home vacuum pump.

1. Place the exposed control filter near the salt. Weigh 50 g of salt and record the weight. Cover the salt and control filter.

2. Introduce the salt sample into the glass jar.

3. Dissolve the salt in 500 mL of filtered water. Stir with a spoon until the salt is well dissolved.

4. Cover the glass jar containing the solution and the control filter. If the salt does not dissolve, leave the solution for a few hours or even a day, until it dissolves completely.

5. Put a surgical mask filter in the funnel and pour the solution with the dissolved salt.

6. Cover the funnel and the control filter. Turn on the vacuum cleaner and filter the salt solution with the domestic vacuum pump.

7. Pick up the filter and cover it.
Cover the control filter.

REMEMBER!
Always cover and uncover the control filter and the experimental sample at the same time. This way you will know if the sample is being contaminated.

Conclusions

- Cheap and approachable guide
- Contribute to SDG 4
- Awareness: SDG 3, 6, 12
- Adding art is useful

Kaiwikimom: https://en.wikipedia.org/wiki/File:Students_in_lab.jpg

S M R https://pixahive.com/photo/sea-water-polluted-with-plastic-wastes/

http://www.ub.edu/sedimentary-geology/microplastics-salt

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Thank you very much!

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