



## **Water is life!**

**Age: 4th graders**

**The teacher introduced the didactic unit through questions in order to activate previous knowledge:**

- Have you ever realized how important water is for us? When?
- What do we need water for?
- Do you know how water gets to your houses? And where does it come from?
- Do you think we have always had water in our houses?
- Is all the water around us safe for drinking? Why?
- What can we do to make contaminated water, safe to drink?
- Where does all the dirty water, from our houses and factories go? What do we do with it?
- What would happen if water would disappeared from Earth?

Teacher presented these pictures and then they commented on them.



(2017 World Vision /  
photograph, John  
Warren)



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

- What are they doing?
- Do you think the water in the picture is safe to drink?
- Would you drink that water? Why?
- What could happen if you drink dirty water?
- What do you think they will use water for?
- Do you think they will have enough water to wash their clothes, to have a shower, to cook, to drink, to water the crops.....?

**FACTS:** Worldwide 844 million people live without access to safe Water. Dirty water and lack of access to sanitation kills over 5000 children every day.

Carrying water takes time! Women and children can walk kilometres every day to retrieve water. The average distance that women and children walk for water in Africa and Asia is **six kilometers a day**. Women carry heavy loads of water (about 20 litres) on their heads and children may carry 3 to 5 litres. This hard work takes time that they might otherwise spend at school or earning additional income.

Water saving solutions are necessary to keep kids in school, and women from having to spend all of their time walking to get water just for **hand washing**. One of the simplest solutions is the **tippy tap**. The **tippy tap is a hand washing station** that allows people to use small amounts of flowing water (40 ml instead of 500ml+) and soap instead of contaminating a whole bowl of water. **Hand washing can cut down on diarrhea** rates by more than 40%. Further, the simple design of the tippy tap is vital to its success for three reasons.

1. Children can be taught how to build and operate it. This also means that they can teach their parents.
2. The hands free design means that no germs are transferred between users.
3. The water is not wasted but used by plants directly around the tap.

<http://www.tippytap.org/>

How to make one: <https://www.youtube.com/watch?v=t6bP7JYPOzM>

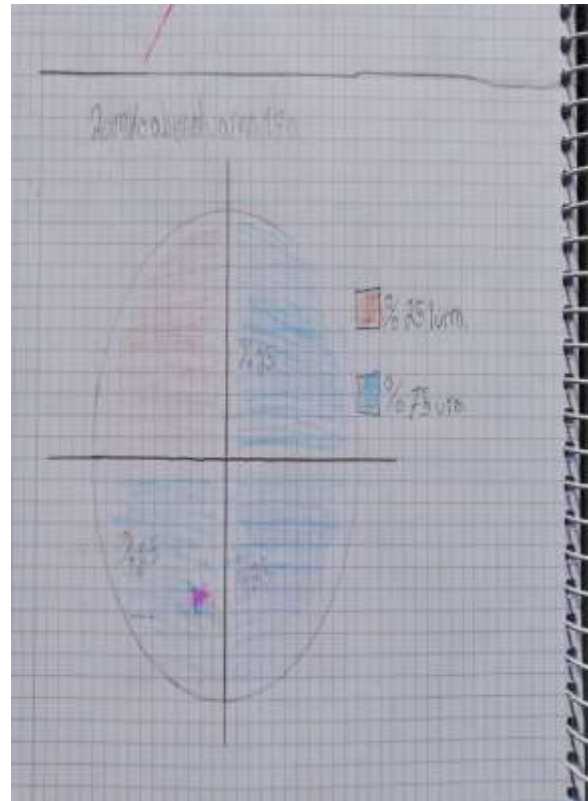
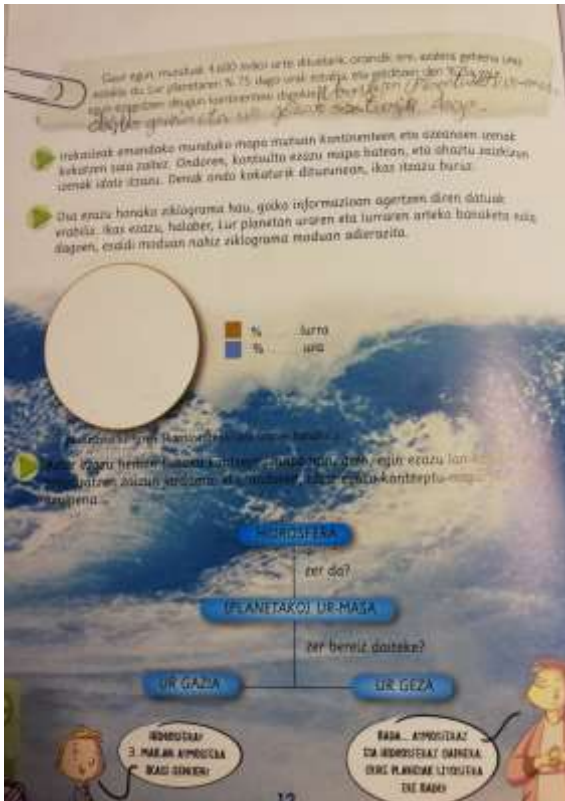


**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**

## Drinkable water on Earth.

It is said that Earth is a water planet because water covers around 75% of the Earth's surface. While about 25% is land.

Pupils completed a pie chart with the percentages.



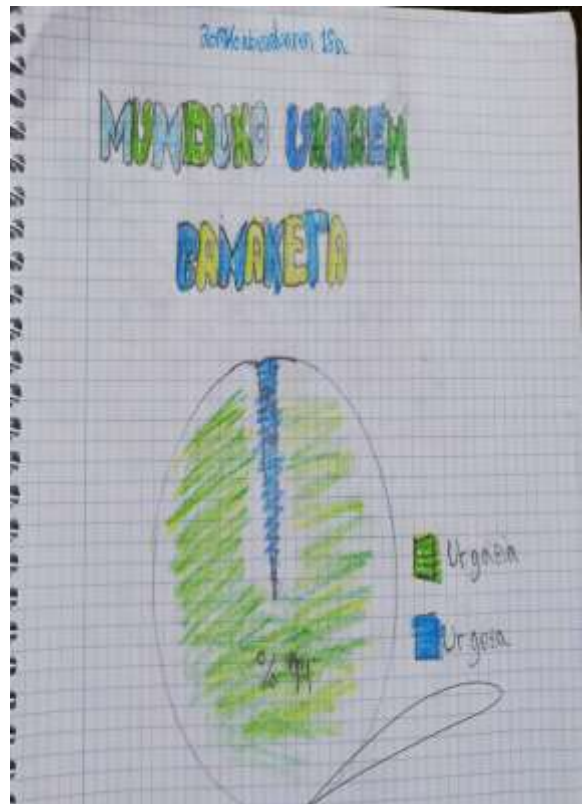
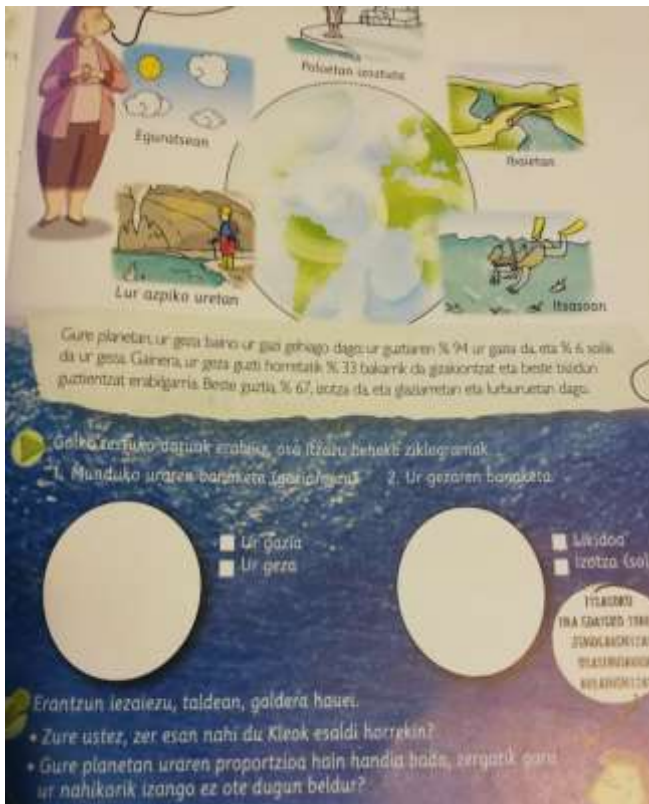
### ➤ **Where can we find water on Earth?**

Interesting video: <https://ed.ted.com/lessons/where-we-get-our-fresh-water-christiana-z-peppard>

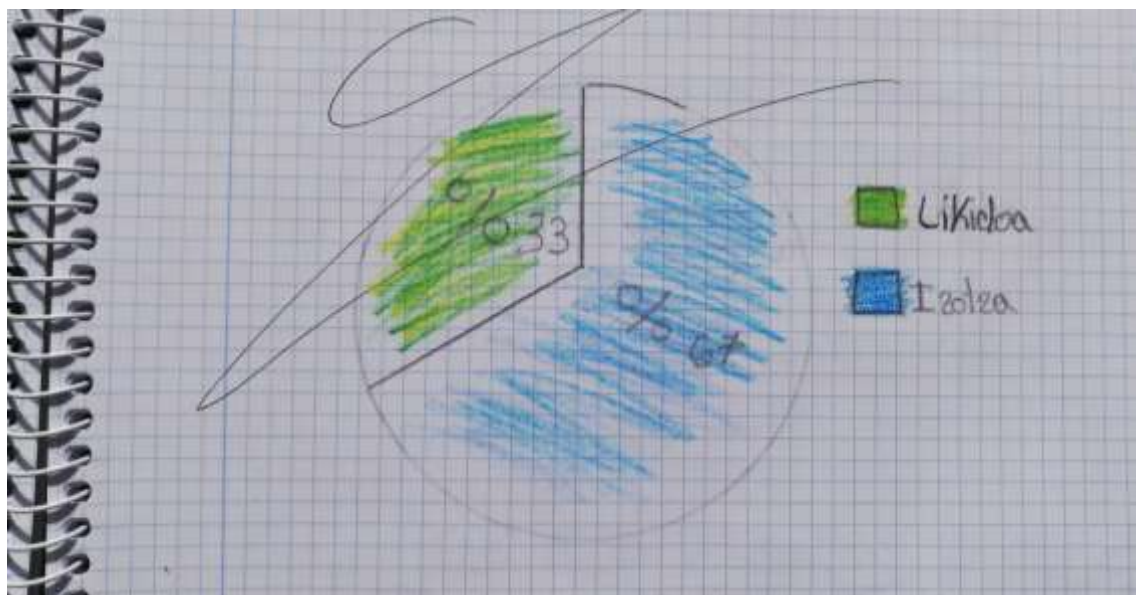
We can find water in the air and clouds, rivers, oceans, underground, glaciers and ice caps, lakes and living things.

The majority of water on the Earth's surface, over 94 percent, is saline water in the oceans. Only 6 percent of the water is fresh water.

**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**



But not all of it is accesible for humans and other living things. Less than 1 percent is available, the rest, percent is frozen in glaciers in places like the Antarctic and Greenland ice sheets.



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

Pupils completed the pie charts with the data available and tried to answer the question:

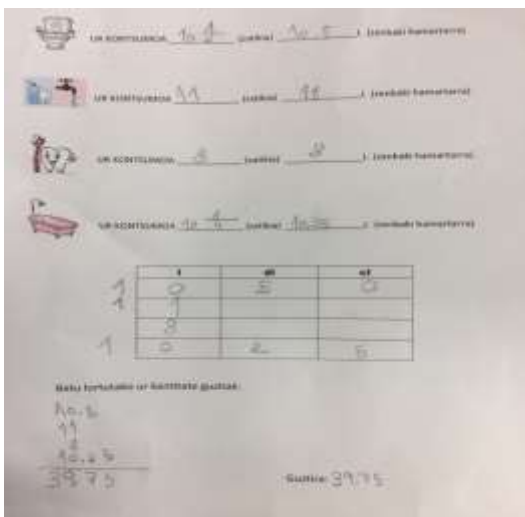
- **If there is so much water on Earth why do we worry about water? Do you think we could run out of water?**

**Facts:** The amount of freshwater which is available to us stays relatively constant over time but there is no new water. The water we drink is the same the dinosaurs drank which is recycled once and again.

Although the amount of freshwater is staying constant, the population of planet Earth is growing rapidly. We need it to survive. The NHS recommends that we should drink between 6 and 8 glasses of water a day to stay healthy (that's just under 2 litres). But we don't just need water to drink, we also need access to water for growing and processing food, for manufacturing clothing and equipment, for our waste management and sanitation systems and leisure activities such as swimming and watering the garden!

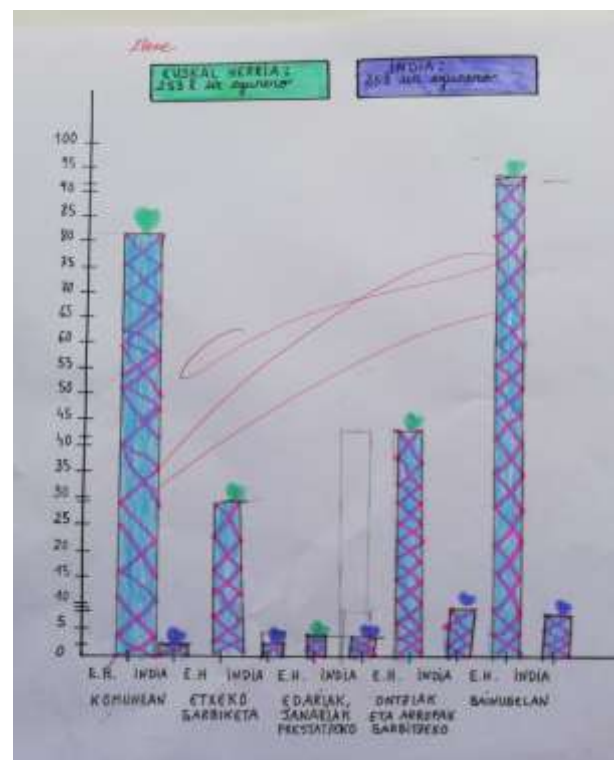
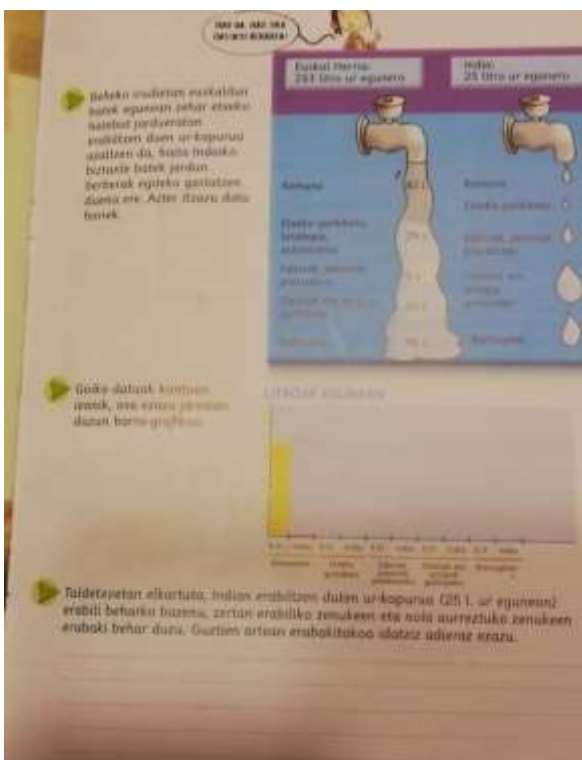
**Water conservation. How can we prevent water scarcity / water shortages?**

- What is water conservation? It means using less water or recycling used water so that it can be used again.
- Why do you think water conservation will be important?
- **Pupils measured** how much water they use at home: flushing the toilet, cleaning the house, to drink, cooking, washing the dishes, washing the clothes, in the bathroom (having a shower, hand washing, brushing teeth) **and compared it with the water an average Indian family uses.**



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

- **The average Indian family uses 25 l a day. If you had access to only 25 l a day, what would you use it for? And what would you do to use less water in your everyday life? (we can have a shower instead of a bath, close the tap while you are cleaning your teeth, check for water leaks, run the dishwasher and the washing machine only when they are full....)**



- **Movie: the animals save the planet.**  
<https://www.youtube.com/watch?v=ITuu7A4NgT4>

**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**



## How is water contaminated?



Teacher and pupils looked at the pictures and talked about them: ways water gets contaminated and ways we can act to prevent water pollution.

- Where does all the dirty water, from our houses and factories go? What do we do with it? Water leaving our homes generally is sent to a **wastewater-treatment plant** through a sewer system.

### **VISIT TO “ZABALERA”, WASTEWATER-TREATMENT PLANT**

The monitor explained all the process. (Our material is in Basque there is an interesting video in English explaining it: <https://www.youtube.com/watch?v=wAcZrC1wnss> )



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



**How does water get to our taps?**

VISIT TO “KILIMON”: DRINKING WATER TREATMENT PLANT.



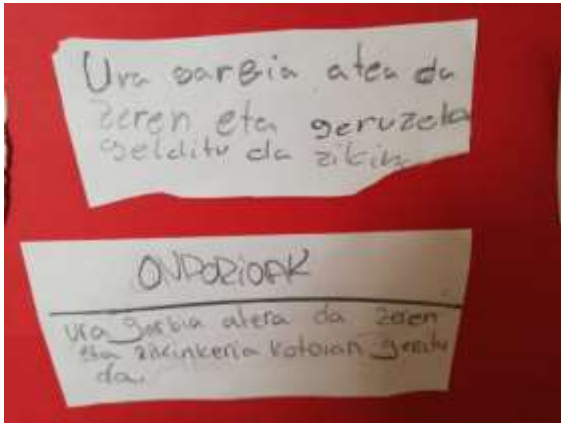
**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**



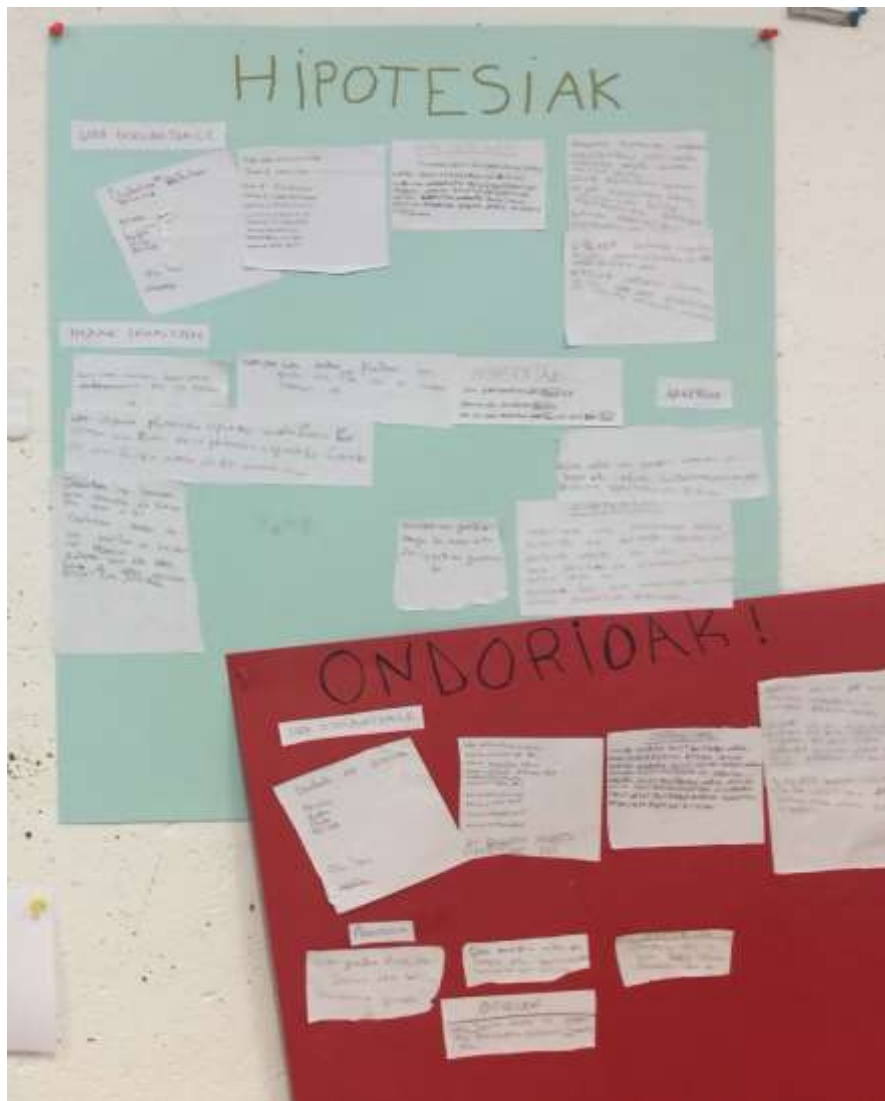
**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



- **Conclusion**



The filtered water is cleaner now because the different layers removed the dirt.



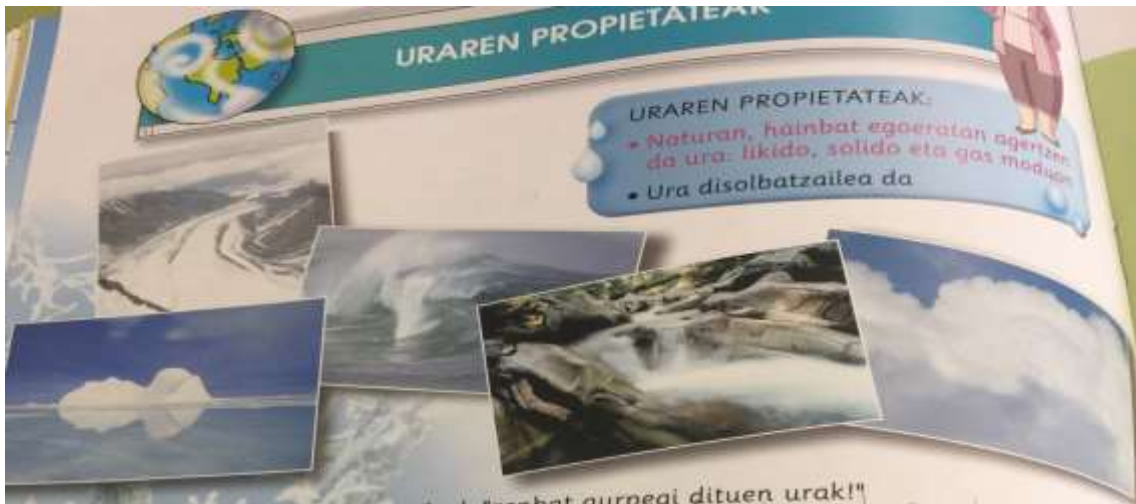
**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**

## States of water

Water can occur in three states: solid (ice), liquid, or gas (vapor). The **state** water is in is determined by its **temperature**. At low temperatures (below **0°C**), it is a solid. When at “normal” temperatures (between **0°C** and **100°C**), it is a liquid. While at temperatures above **100°C**, water is a gas (vapor).



Pupils carried on the next experiences to work on the states of water and answered the questions:

- **Materials needed:** a bottle, a saucepan and water.
  - 1st experience: Fill the bottle with water and leave it in the freezer all night.

What happened to water?

How do we call that state?

When and where does water appear in that state in Nature?
  - 2nd experience: Take the bottle out of the freezer and leave it outside.

What happened?

How do we call that state?

Where can we find water in that state in Nature?
  - 3rd experience: pour the water you have got inside the bottle into the saucepan and warm it up.

**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



What's going on? Can you see anything leaving the saucepan?  
What is it?

Can we see water in that state in Nature? Where?

Cover the saucepan with the lid for a while. Then remove the lid and observe it. What happened? Can you see anything below the lid?

Why did it happen?

Egin itzazu hemen beheko eta hurrengo orrialdeko hiru esperientziak, ipinitako urratsei jarraituz.

**Materiaia**

- Plastikozko botila
- Lapikoa eta estalkia
- Ura

**Nola egin**  
1. saiakuntza  
Lehenik, jarri ura plastikozko botilan, sartu izozkailuan eta utzi hozten denbora luzez.

Zer gertatu zaio urari? *izotza egingo...*  
*...litzatekeela...*

Ura zer egoeratan dago orain? *solidoan...*  
*dago... orain...*

Idatz ezazu naturan ura noiz eta non agertzen den egoera horretan. *adibidez...*  
*...leber:*

2. saiakuntza  
Atera botila izozkailutik eta utzi kanpoan; behatu zer gertatzen zaion.

Zer gertatzen ari zaio izotzari?  
*brizten egingo... zela...*

Ura zer egoeratan dago orain? *hi. nido... eskeran... dago...*

Naturan, non egoten da ura egoera horretan? *itsasoan... egoten... ala...*

tarako erabiltzen duguzko izotza gizakiok?

Il dakizu, izozkailurik ez zegoenean, etxeetan iparraldera ten zuen leihoan, kutxa moduko batean, gordetzen zituztela? Eta kutxa horiei toki askotan "freskera" esaten zieten? Baina, izotz-fabrikarik ez zenean, mendian elurra bildu eta "era" edo "elurzulo" izeneko zulo sakon batzuetan pilatzen zuten, eta elur hori zapalduaz izotza egiten zuten. Behar zuten, izotz hori atera eta gurdiz jaisten zuten herrietara.

**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

3. saiakuntza  
Aurreko esperientzia bukatzeko,  
isuri botilan duzun ura lapikora  
eta jarri berotzen. Aztertu zer  
gertatzen den.



Zerbait ateratzen al da lapikotik? Bai...

Zer da? Lurruna ateratzen da.

Naturan agertzen al da urik egoera horretan? Non? Bai... eguzkiak

...lurraren gainean denean ura lurrundu egiten da.

Lapikoaren gainean estalki hotza jartzen baduzu, zer gertatzen da?

...Ez da egiten dela.

Zer azaltzen da estalkian? Ura azaltzen da.

Zergatik gertatzen da hori? ...tapato egiten dvelako... eta... lurrullu...  
dela.

TEMPERATURA KONTUA DA EGOERA  
ALDAKETArena/ 0 GRADU ZENTRIGRADUTAN URA  
IZOZTU EGITEN DA ETA 100 GRADU  
ZENTRIGRADUTAN LURRUNDU/ LURRUNA HOZTEN  
DENEAN, BERRIZ, URA KONDENTSATU EGITEN  
DA; HAU DA, LIKIDO BIHURTZEN DA/

ETA ZER GERTATUKO ZEN  
EGUZKIAK URA BEROTUKO  
EZ BAZUEN?

MEI LI, HORI AL DA  
EUSKARA? LITZATEKE ETA  
BALU, MEI LI,  
BALDINTZA!

○ Aurrerago uraren zikloa deskribatzen duen diagrama hau duzueguz, bertan adierazi beharko dituzun hitz jakin batzuen esan-hia aldeaz aurretik argi izatea komeniko litzaizuke. Horretarako, hitz horien definizioak idatziko dituzu.

▶ Hemen beheko ereduari behatuz idatz ezazu hitz bakoitzaren definizioa eta hitz hori erabiliz asmatutako esaldi bat.

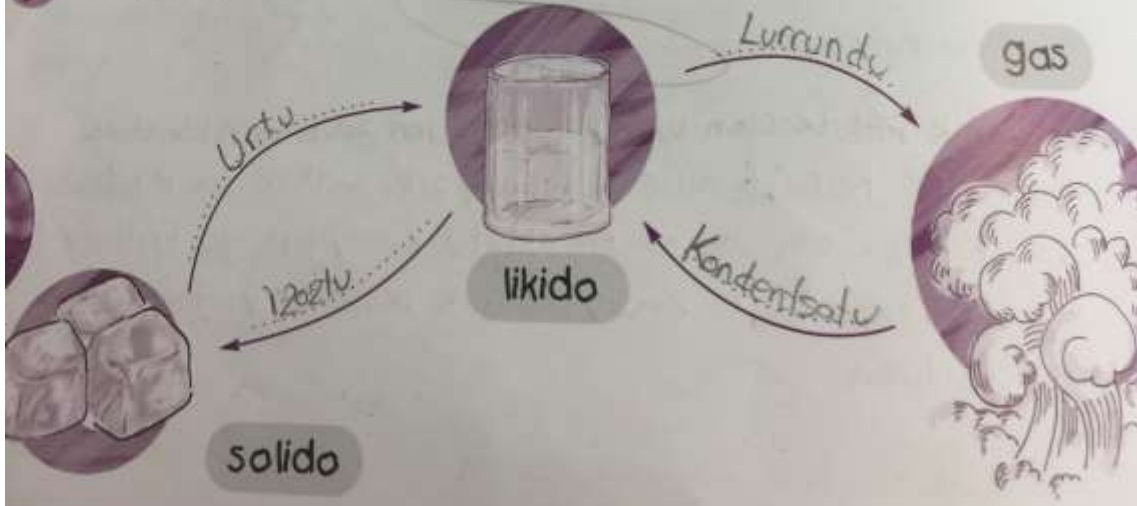
• **Urtu:** Beroaren eraginez gorputz solido bat likido bihurtu.  
 Adibidea: Atzo egin genuen elur-panpina urtu egin da.

• **Lurrundu:** Ura beroa dagoenean lurrundu egiten da.  
 Adibidea: Lapiketan urberatzen baduzu, lurruna ateratzen da.

• **Solidotu:** Ura hotza dagoenean solidotu egiten da.  
 Adibidea: Ura isozgai luan sartzen baduzu, solidotu egiten da.

• **Kondentsatu:** Lurrun artean hotza sumatzen denean kondentsatu egiten da.  
 Adibidea: Dutek gauden ur-beroarekin espiloa kondentsatu egiten da.

▶ Osa ezazu hemen beheko eskema, uraren egoera-aldaketen izenak bertan idatziz.



BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY

## What can dissolve in water?

**Water** is capable of **dissolving** a variety of different substances, which is why it is such a good solvent. And, **water** is called the "**universal solvent**" because it **dissolves** more substances than any other liquid.

A **solution** is made when one **substance** called the **solute** "**dissolves**" into another **substance** called the **solvent**.

Pupils carried out the next experience:

- **Materials used:** coffee, sugar, cocoa, stones, oil, rice, water

Egin ezazu honako esperientzia hau ipinitako urratsei jarraituz.  
Nola egin

1  
2  
3

**Materiaia**

- Plastikozko botila
- Kollaratza
- Ur
- Azukrea
- Olio
- Harri-kezkorrak
- Arroza
- Kafe-hautsa

Zer substantzia disolbatu dira? *Azukrea, kafe-hautsa, oila*  
Eta zein ez dira disolbatu? *Olio, arroza, harri-kezkorrak*  
Disolbatu ez diren substantziak non gelditu dira? *behera eta behera*

Ikusi duzue, substantzia batzuk disolbatu egiten dira uretan; era horretako substantziak uretan disolbagarriak direla esaten dugu. Baina badira uretan disolbatzen ez diren substantziak ere. Halakoak ur gainean edo flotatzen geldi daitezke, edo ur azpira joan daitezke, hau da, hondoratu.

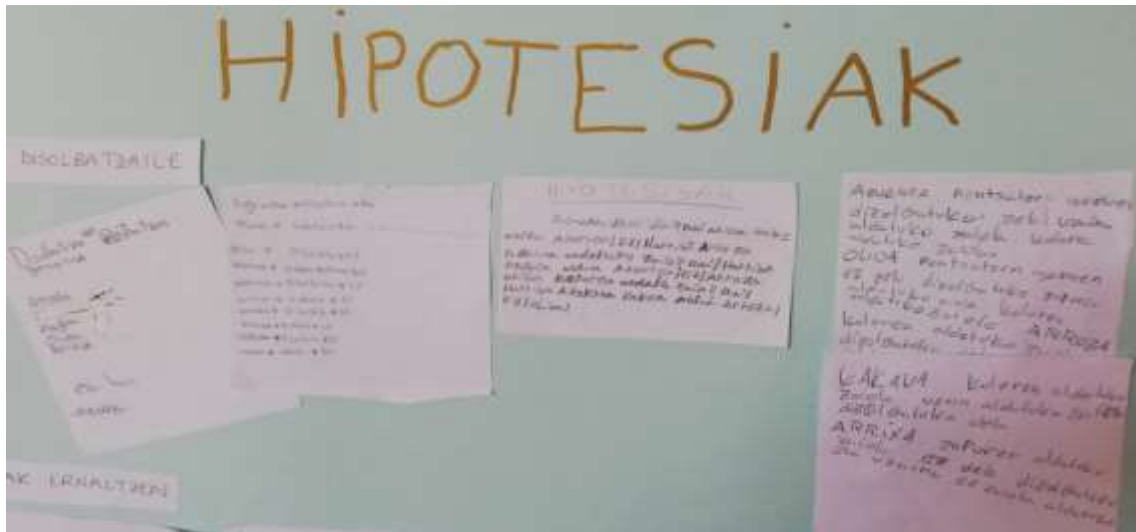
Jar ezazu esperientzia horren adierazpena laborategian, argibideen eta ondorioen panela inguruan duela.

Hainbat elementu uretan disolbatzeak garrantzi handia du bizidunentzat:

- Urak gatz mineralak eta ongarniak disolbatzen ditu. Horrela, landareek horiek guztiak xurgatu ahal dituzte eta indar handiagoz haz daitezke. Urak ongarniak disolbatuko ez balitu, landareek ezingo lituzkete xurgatu.
- Arrainek ezingo lukete arnasarik hartu ibai, itsaso eta aintziretako urak oxigenoa disolbatunik ez balu.

**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**

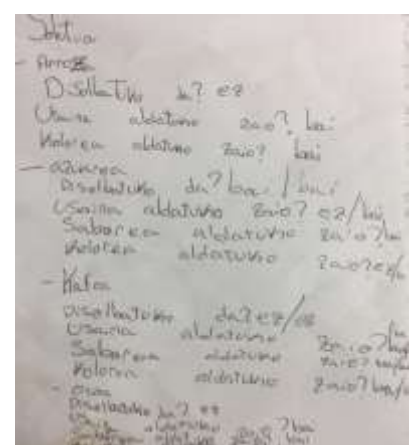
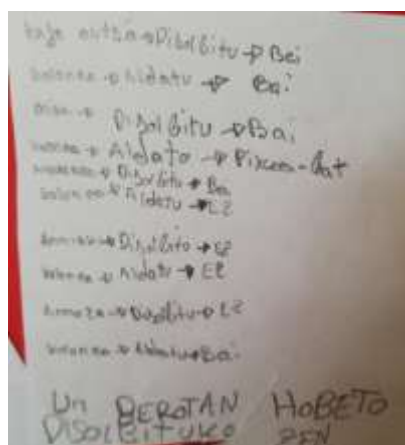
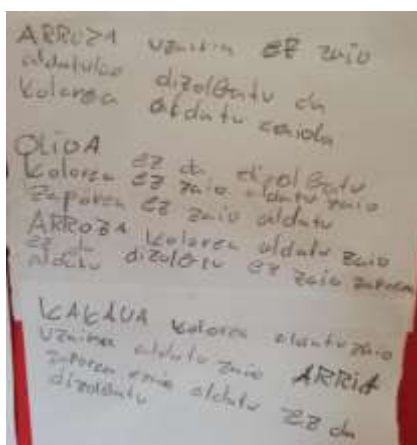
- Students made their **hypothesis**:



- **Questions:**

- Will it dissolve? We think ..... wil dissolve in water. .... will not dissolve.
- Will water smell different?
- Will water colour change?
- Will water flavour change?

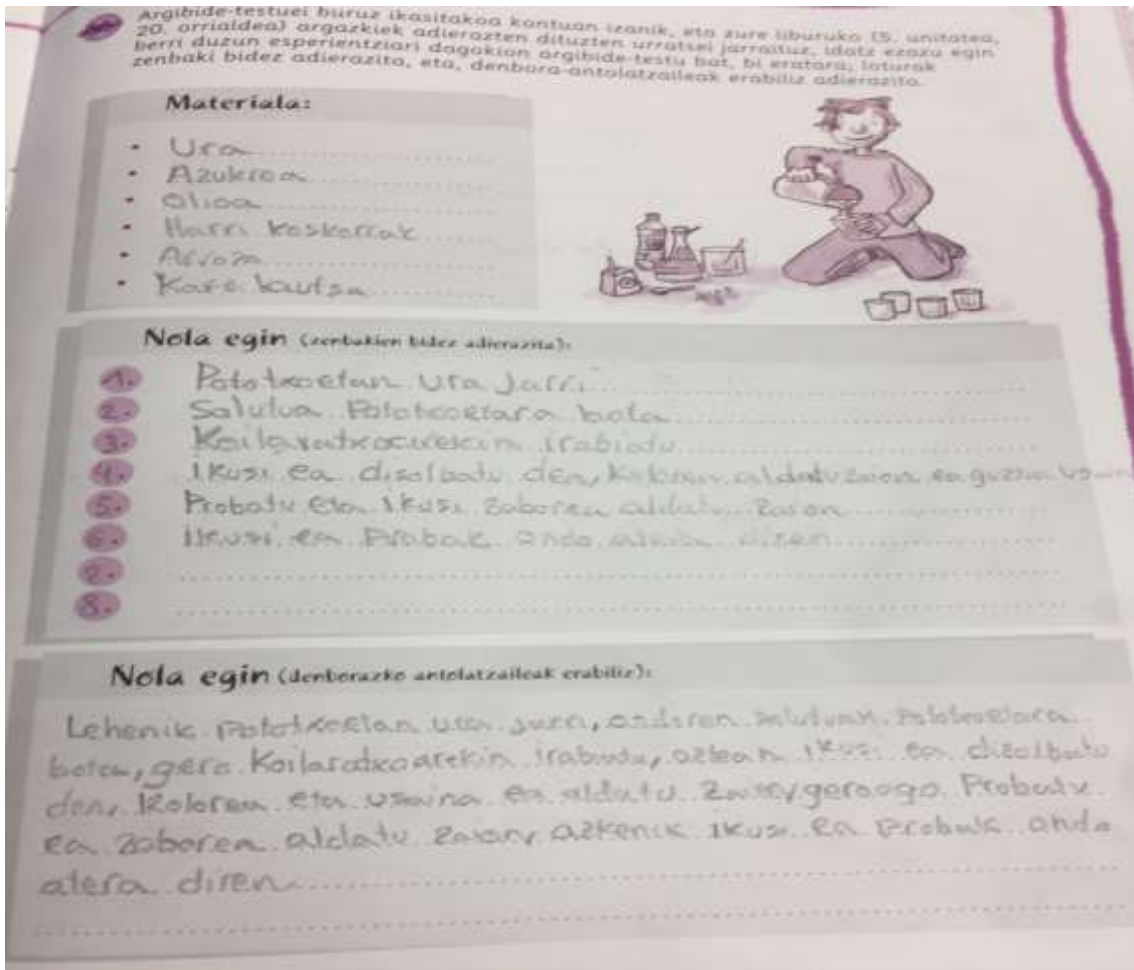
- **Conclusion:**



- **Question:** Do you think temperature could affect dissolving?

**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**

- Pupils wrote an **instructive text** explaining how they carried out the experiment. First using numbers to describe the process and then using time connectors.





**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



### Make your Rain Stick.

Water can be used to make sculptures, paint pictures and even make music. The “rain stick” is a musical instrument that makes a sound like the rain.

Pupils made their own “rain stick”.



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

## All living things need water to survive.

- **Experience:** Germinate seeds on a sponge.
  - **Materials:** plates, sponges, seeds.

- **Procedure:**
  - 1- Fill half of a plate with water.
  - 2- Place a sponge in each of the plates and place some seeds on top of each sponge. (Remember to keep the sponge in the plate with water wet the next days. It's important not to let the seeds dry out)
  - 3- Observe what's happening and answer the questions:
  - 4-
    - What has happened after three days?
    - And after a week?
    - And the next days?
    - What has happened in each of the plates? Is there any difference?
    - Why do you think happened that?
    - What conclusion do you get?
    - You already know that human beings also need water. Why is water important to human beings?

**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

- Sure you have already heard about “**dehydration**”.
  - What is dehydration?
  - What are the symptoms?
  - What should you do if you are dehydrated?
  - What should you do to avoid dehydration?



➤ **Experience:** How do plants drink water?

We did this experiment to show pupils how plants absorb water and nutrients up through their stems.

- **Materials:** glasses, jars, or cups, paper towels, food colouring, collard leaves (the lighter ones), white flowers (carnation flowers, margarita flowers...)
- What do you think it will happen?  
Observe what happens.
- Why do you think the colours are changing?
- Why might the water be able to move up against gravity like that?

**Facts:** The water moves up the paper towels through a process called **capillary action**. The paper towel is made from fibers and the water is able to travel through the gaps in the fibers. The gaps in the paper towel act like capillary tubes and pull the water upward. This is what helps water climb from a plant’s roots to the leaves at the top of the plant or tree.

**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**

The water is able to move upward against gravity because of the attractive forces between the water and the fibers in the paper towel.



**BELGIUM, FINLAND,GREECE,ITALY,SPAIN AND TURKEY**



**Facts:** Plants have tiny tubes, called **xylem tubes**, throughout their body that help carry water up through the stem (plants have “veins” like we have), and to the leaves. The water molecules are attracted to the molecules in the tubes, helping to pull the water upward. This is called capillary action. We can see these pathways with our experiment!

**BELGIUM, FINLAND, GREECE, ITALY, SPAIN AND TURKEY**