

The elements in the climate emergency

The international project Elements4life is an interdisciplinary project. Students aged 14-16 from four different schools in different countries collaborating together.

- IES Celestí Bellera (Spain)
- Escola Secundária Manuel Cargaleiro (Portugal)
- Olaus Petriskolan (Sweden)
- Taavetin Koulu (Finland)

This exhibition is about how the four elements (water, fire, air and earth) affect the climate emergency. Its been done during the school year 2020-2021.

In the exhibition you will see results of the researches made during the school year.

During this international project week we've been working virtually with virtual meetings and international teams.

One of the works that we have made is that very international team made one virtual exhibition and we've decided the winning exhibition by voting.





- Some examples of posters:

DO ALGAE HELP FIGHT CLIMATE CHANGE?

Done by: Nil Bertrams, Joan Cabrera, Laura Ejarque and Álvaro Guzmán
INS Celestí Bellera - Carrer d'Estevé Terrades, s/n. 08402 Granollers, BCN

SUMMARY

Our group is searching if algae can help reduce CO₂ and help fight climate change. To meet our objective, we will measure the pH of four different substances: seawater, sea water+algae, seawater+CO₂ and seawater+CO₂+algae

INTRODUCTION

In this research we have investigated if algae can help fight climate change. Algae activity could reverse ocean acidification by reducing CO₂ concentration in seawater. To meet our goal, we have measured the pH of seawater in the absence and presence of algae.

Seawater + CO₂

We have chosen this topic because, lately, acid levels in oceans have been increasing drastically. This happens because water absorbs part of the CO₂ in the atmosphere because of the pressure difference in the air and in water which makes CO₂ get in the water. Then, CO₂ is dissolved as its anion in water. The mixed oceans were more acid which is especially harmful for sea creatures like crustaceans and coral, because the acidity dissolves their shells and also destroys the coral.

Crustaceans are also an important part of the alimentary chain in the sea, which means that if they disappear, lots of animals that eat them will also starve. On the other side, coral reefs are very important for small fish, because they work as homes for them.

Because of that, we wanted to find out a natural way to stop that increase. However, we had to keep in mind a natural method to reduce CO₂ which led us to photosynthesis, the process that plants use to exchange CO₂ for oxygen. Algae also uses this process, so we finally decided to use this "CO₂ capturing method" to carry out our research.

HYPOTHESIS

Algae will absorb CO₂ water and will increase its pH (turn it into less acid water)

RESEARCH OBJECTIVES

1. To know in which way algae help to fight climate change.
2. To check if sea water is acid
3. To know the way algae affects water acidity

EXPERIMENTAL SETUP IMAGE

Image 1: Material used in our experiment.

CONCLUSIONS

After gathering all the results we have arrived at the following conclusion: if we analyze carefully the table with the results, we can observe that the substances with algae have less acidity.

We let the substances = algae sunbath, and after 24 hours, the pH had increased. Our hypothesis was true: the algae absorbed the acidity of water and decreased the pH level.

EXPERIMENTAL RESULTS

Image 2: QR Code of our results. Scan to see them.

With those results, we can find a solution to all of our research objectives:

1. Algae, while doing photosynthesis, absorb the CO₂ in water, helping to regulate acidity level in oceans.
2. We have measured the pH of sea water, and nowadays, sea water pH is basic, it isn't acid yet.
3. We have learned that algae absorb CO₂ levels in water, making it less acid.

In conclusion, algae help to regulate acidity levels in oceans, so if we stop acidifying water and preserve more algae, oceans will be less acid and the sea's flora and fauna will be healthier.

PROCEDURE

1. Put 300 ml of sea water in two containers.
2. Add 15 ml of vinegar and 1.5 g of salt in one of the containers.
3. Close the container and let it stand for about 24 hours.
4. Check the pH of each sample.
5. Add the algae (lava moss) in each sample, (we decided to add 4 grams of algae).
6. Let the algae a few days in the container (1 week).
7. Check the pH of the samples plus algae and compare it to the other results.

Co-funded by the European Programme of the European Union

The Fermi paradox

And why this paradox inspired us to create a song

Who was Fermi ???

Enrico Fermi was born on the 29 of september of 1901. He was an Italian physicist who did lots of things that made him a very recognised physicist, like the nuclear bomb and the fermi paradox.

The beginnings of the paradox

On those times, lots of people said that there were intelligent civilisations outside the earth, so he wanted to explain why we didn't had any signal of any other civilisation.

Manhattan project

He was working in the manhattan project (the development of the nuclear bomb) when he said "what nowadays we call "the fermi paradox"

And what did he said?

The explanation he gave to the world was that all the intelligent civilisations develop their technology until they create something capable of destroying their own civilisation. In that moment the human species were near that point, near the nuclear bomb.

Examples of that autodestruction

Some of the manifestations of this human autodestruction are wars, massive weapons (like the nuclear bomb), biological weapons, climate change and global warming...

Álvaro Guzmán, Joan Cabrera, Laura Ejarque, Nil Bertrams