Marine life in trouble

Experiment about the impacts of the sea acidification on the marine life

Type of pedagogical project, activity, action, accompanying	**Activity (scientific experiment)**  
Key words of relevant disciplines/ Pedagogical content	Ocean acidification/ pH/ Marine life/ Sea environment/ CO_2 solubility/ Biodiversity.
Problematic	**What are the consequences of CO_2 increase on marine organisms?**
Thematic	Increase of CO_2 consequences, ocean acidification, the impacts of ocean acidification on marine organisms.
Disciplines (sciences, geography)	*Sciences (Physics, Chemistry, Biology)/Geography*
Pedagogical Objectives/New targeted skills	**The students will be able to:** - Work as a team - Learn how to use scientific instruments (pH meter) - Understand the impacts of ocean acidification on marine organisms - Understand the consequences of CO2 increase on ocean acidification
Public target(s) (age, requested skills…)	12- 14 years old
Description (step by step)	The animator/teacher, gives all the needed materials for the experiments to the students, along with the scientific procedure.

	The animator/teacher asks students to begin by step 1 and finish it before going to step 2. **Description of the experiment** **Step 1)** ● Fill in the first jar with water. ● Put the Ph meter in the jar and write the measure down. ● Blow into the water (using the straw) for 1 minute to introduce CO2 ● Measure again the water ph ● Observe the evolution of the ph ● To conclude and validate this first step the animator/teacher asks the students to comment on the results of the experiment (a not so spectacular difference has to be expected) and the consequences of CO2 increase in the ocean. **Step 2)** ● Fill in the second jar with vinegar ● put a shellfish inside the second jar ● observe what happens The animator/teacher, ask to students to express the impact of ocean acidification on the marine organisms. The animator/teacher asks students to share their results with their classmates. The teacher must explain to students why they use vinegar and what is the biological/chemical process that produces bubbles
Place (meeting room, outside space, …)	Classroom
Individual and / or collective actions	Individual or in groups of 2 to 3 students.
Material needed	Step 1: 1 straw, 1 jar, 1 Ph meter, water (if it is possible, it can be sea water or the teacher may explain how to « reproduce » it, adding salt to the water) Step 2: 1 jar, vinegar, 1 shellfish
Duration of pedagogical project or activity	**10 minutes** for the experiments **10 minutes** to comment on the results in the groups

Evaluation of the new acquired skills	Students share their results with the other classmates.
Eco-citizen adaptation, knowledge enhancement and links to other topics	**Link to:** **Activity: "Experiment about CO_2 impact on Earth temperature** **Knowledge: Marine environment and Climate change** **Greek:** • https://physics4u.wordpress.com/2018/12/12/οξίνιση-των-ωκεανών-τι-πρακτικά-σημαί/ • http://www.helmepacadets.gr/files/acidification_cadets.pdf • **Italian:** • : http://www.green.it/acidificazione-degli-oceani-unallarmante-conseguenza-del-riscaldamento-globale/ • https://scienze.fanpage.it/cambiamenti-climatici-il-guscio-delle-lumache-di-mare-sciolto-dallacidificazione-dei-mari/ **French:** • https://lesjeunesfaceauxcc.wixsite.com/lesjeunesfaceauxcc
Observations	The program name in France is "Young people and climate change", it was experimented with people between 11 and 15 years old by environment educational NGOs. The program aims at defining causes and consequences of climate change on the earth and especially in the south of France. Students can analyse its impacts and suggest different means of action and adaptations: everyday life, actions at school… This program is a five-day event at school, with experiments and workshops involving all the classes of the school.