



## Planet Ocean

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A more adequate name for Planet Earth could be Planet Ocean, seeing that ocean water covers more than seventy percent of the planet's surface and plays a fundamental role in the survival of almost all living species. Actually, oceans are aqueous solutions of extraordinary importance due to its direct implications in the current living conditions of our planet and its potential role on the continuity of life as well, as long as we know how to respect the limits of its immense but finite capacities.

We may therefore state that natural aqueous solutions are excellent contexts for the approach and further understanding of many important chemical concepts, whether they be of chemical equilibrium, acid-base reactions, solubility and oxidation-reduction reactions.

The topic of the 2014 edition of GIFT ("Our Changing Planet") will explore some of the recent complex changes of our environment, subjects that have been lately included in Chemistry teaching programs. This is particularly relevant on high school programs, with themes such as "Earth Atmosphere: radiation, matter and structure", "From Atmosphere to the Ocean: solutions on Earth and to Earth", "Spring Waters and Public Water Supply: Water acidity and alkalinity". These are the subjects that I want to develop on my school project with my pupils.

Geographically, our school is located near the sea in a region where a stream flows into the sea. Besides that, our school water comes from a borehole which shows that the quality of the water we use is of significant importance. This project will establish and implement several procedures that, supported by physical and chemical analysis, will monitor the quality of water – not only the water used in our school, but also the surrounding waters (stream and beach water).

The samples will be collected in the borehole of the school, in the stream near the school and in the beach of Carcavelos. Several physical-chemical characteristics related to the quality of the water will be taken into consideration, for instance, the value of the pH, using universal indicator paper, color, through visual evaluation and the temperature with the help of a thermometer. There will be also registered some existent chemical parameters as chloride, alkalinity, total hardness ( $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ ), nitrate, nitrite, ammonia and phosphate. Two methods will be used for analysis, the titration and the kit of semi-quantitative chemical analyses. This kit is composed by biocompatible substances, which means they are not harmful for the environment and can be disposed of by domestic sewage systems.

The results will be subsequently analyzed bearing in mind the maximum and recommended standards values for each one of the parameters. After this, the results achieved will be discussed.

I believe this project contains characteristics that will be of interest to our students, thus enabling them to participate actively and effectively develop their knowledge and enhance their scientific curiosity.