Project Number: 2021-1-ES01-K220-SCH-000034434

PR2.A – TEACHING SOURCES

Title	*pH measurement of acid, base and salt solutions*
Duration	*1 session*
Age Group	*14 – 16 YO*
Dimension of the advised group of students	*The dimension of the group can be unlimited*
Area	☐ *Area 1: Reading, writing and literature* ☐ *Area 2: Math* ☐ *Area 3: Second language learning* ☒ *Area 4: Sciences and chemistry* ☐ *Area 5: Soft skills*
Specific objectives	*At the end of the lesson, each student should know:* • *what pH is and what values it takes,* • *the pH values of acids, bases, salts,* • *how to compare the acidity of two acids or bases with different pH values* • *the pH of pure water* • *how to measure the pH of a solution*
Needed Materials	*Computers or laptops* *Internet connection (HTML5 simulations can be run on iPad, PC, Chromebook, Mac and Linux systems)*
Software	*The activities are online.*
Description	*A virtual experiment in which the user can measure the pH of various solutions he encounters in his daily life, such as battery fluids, blood, chicken soup, coffee, coffee, drain cleaner, hand soap, milk, orange juice, carbonated soft drink, water, etc. The user can also dilute each solution by adding water to see if and how the pH of the acid, base and salt solutions changes with dilution.*
Procedure on how to put in practice	*1) We will deal with the pH scale.* *The pH is a number that takes values from 0-14 and shows us the acidity of a solution.* *Acids have a pH of 0-7 at 25°C and the lower the pH of a solution, the more acidic that solution is.* *By adding water to a solution the pH approaches 7. Solutions that have pH = 7 are called neutral and have no acidic properties.* *We write down the water's dimension in hydrogen cations and hydroxyl anions and point out that pure water is a neutral solution in which it is true that hydrogen cations are equal to hydroxyl anions.* *2) Emphasize that in acid solutions, hydrogen cations outnumber hydroxyl anions and the pH is always less than 7. Point out that with dilution the pH of an acid increases but never becomes 7.* *We mention the ways in which we can measure the pH of a solution: the pH meter, an electronic instrument that gives us accurate measurements, and the*

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	pH paper with which we do not get accurate measurements but which is very easy to use ***Debriefing questions:*** ***Why does the product we wash our face with need to have a slightly acidic PH?*** ***Why PH is more important than you think and why your gel shouldn't make too much foam?***
Link	*https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html*

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