Project: Acid Base Creative Letter

FOR THE TEACHER

Summary
In this project, students will compare and contrast the properties of acids and bases, define pH, and explain the real world connection of acid/base chemistry.

Resource Type                  Grade Level
Project                         High school

Objectives
By the end of this lesson, students should be able to
- Understand different acid base theories.

Chemistry Topics
This lesson supports students’ understanding of
- Acids & bases

Time
Teacher Preparation: 30 minutes
Lesson: 2 class periods

Materials
- Computer access

Safety
No particular safety concerns need to be observed for this project.

Teacher Notes
- This creative project acknowledges students' multiple intelligences and promotes higher-order thinking skills. Students write a letter from the perspective of a historical figure or scientist studying acid/base chemistry. Students will learn the importance and relevance of acid/base chemistry to our lives, while exploring how definitions of acids and bases changed throughout history.

FOR THE STUDENT

Student Activity Sheet: Acid-Base Chemistry Creative Letter Project

Lesson
Background
You will write a letter from the point of view of a historical person, and it should include factual details that are accurate and scientific. To make it authentic, pay attention to the font, word choice, layout, and physical appearance. It can be written to anyone. Some research about what personal letters, diary entries,
museum documents, communication among colleagues (scientist, dentist, etc.) may be necessary to produce a creative, authentic, and aesthetically pleasing document.

Look at the topics below and select one that interests you. Do some research to learn more about the specific connections to acid-base chemistry, and take notes on the following:

- Definition of acids/bases, pH, and relationship between pH and $\text{H}^+/\text{OH}^-$ concentration according to your person/topic.
- Chemical reactions involving acids/bases with explanation of reactants/products in detail that are relevant to your person/topic.
- Historical/contextual background about research topic or life of your person.
- Implications of acid-base chemistry in everyday life (so what?).

**Topics/people**

- Robert Boyle
- Antoine Lavoisier
- Humphry Davy
- Justig Liebig
- Svante Arrhenius
- Joannes Nicolaus Brønsted
- Thomas Martin Lowry
- G.N. Lewis
- scuba diver observing acidification of coral reefs ([http://www.pmel.noaa.gov/co2/story/Ocean+Acidification](http://www.pmel.noaa.gov/co2/story/Ocean+Acidification))
- museum director working to preserve limestone sculptures from acid rain ([http://www.air-quality.org.uk/12.php](http://www.air-quality.org.uk/12.php))
- dentist advising against citric acid in soda due to effect on teeth enamel (also talk about toothpaste) ([http://www.livescience.com/7198-acids-popular-sodas-erode-tooth-enamel.html](http://www.livescience.com/7198-acids-popular-sodas-erode-tooth-enamel.html))
- scientist studying effects of acid rain on aquatic or terrestrial ecosystems
- famous chef or molecular gastronomist describing acids/bases in the context of the kitchen

**Suggested resources for historical figures**

- Chemical Heritage Foundation: [www.chemheritage.org](http://www.chemheritage.org)
- BBC History [http://www.bbc.co.uk/history/historic_figures/](http://www.bbc.co.uk/history/historic_figures/)