**Vernier Labquest/Replacement Investigation**

**Grade:** 6 **Kit:**  FOSS Mixtures and Solutions Investigation # 4

**Author(s):**

Pamela Allen Tamela Anderson M. Bradley Lile

Luz Delia Ruiz-Monteso Katy Nykamp Jason Zook

**Guiding Questions:**

1. How might the pH level in a given combination affect the reaction of the solution?
2. When combined, do certain substances have a higher or lower pH level?
3. Is there a relationship between acid level in a substance and how much it fizzes when combined with water?

**Summary of Activity:**

Measure the pH conductivity as you mix two materials together.

1. Calcium Chloride + Baking Soda
2. Calcium Chloride + Citric Acid
3. Baking Soda + Citric Acid
4. Combine all three materials

**Science Standards:**

* + 1. Capturing information with tools.
    2. Organize information into simple tables & graphs

6.2.6 Read simple tables & graphs produced by others

**Math Standards**

6.6.1 Organize and display single-variable data in appropriate graph

6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing & prioritizing information, and observing patterns.

**Equipment Used:**

Per Group: Vernier Labquest and pH probe Consumable: Calcium Chloride

3 Plastic cups Baking Soda

Measuring Spoons Citric Acid

Stirring Sticks

Measuring Beaker

Water & Container to hold water

**Description of Procedures, Notes (Teacher Manual)**

1. Groups study the ph level in the two materials combined with water.
2. Use the LabQuest and probe to measure the ph level.
3. Set up the experiment as 4 stations where students can walk around in groups and do each experiment and record their findings
4. Set up experiments as directed under Investigation 4: Fizz Quiz on pages 8-14.
5. Provide students with Fizz Quiz Placemat (No. 14-Student Sheet)
6. Provide students with Fizz Quiz Observations (No. 15-Student Sheet)
7. **Extension Activity**
   1. Students put together their data in a graph
   2. Students compare their data with other groups

**Scientific Questions:**

What do we mean by “pH”?

How do we know if a given item has a pH value?

Why do you think certain combinations of mixed substances might fizz more than others?

Which combination of materials would have the highest pH level?

Which combination of materials would have the lowest pH level?

How does your data compare to other household items or materials on the pH scale?

Why might farmers want to know the pH level of their fields?

**Explain what pH means:**

What does pH mean?

The initials pH stand for "Potential Hydrogen."

The term "pH" originates from the French term 'pouvoir hydrogen' (or Hydrogen Power) and has since been expressed as "parts hydrogen". pH refers to the amount of hydrogen ions found in a substance. It's the amount of hydrogen ions present in a substance that determines the acidity or alkalinity of that substance.

It is a measure of how alkaline or acidic a substance is. Acids have a pH value under of 6 or below and bases have a pH vlaue of 8 or above. If something is 7 we say that it is neutral. This means it's not an acid or a base.

**Website Connections**

