

Module 8; pH Lab



Data and Procedures


Use the following link to access an online simulation. I suggest you use a split screen so that you can follow directions while running the experiment.






https://phet.colorado.edu/sims/html/acid-base-solutions/latest/acid-base-solutions_en.html

Part 1: pH values

1. Click "Introduction" to begin.

2. The lab has 2 tools that allow you to test for pH values: A probe , and pH paper . Use each one by dipping it into the solution to be tested. Try all the given types of solutions and fill in the Data Chart with the pH value 0-14.

3. The circuit with a battery and bulb as shown:  is the tool used to test for conduction of a solution. By dipping the wire leads into the solution, the bulb will either **remain unlit**, be **dimly lit**, be **somewhat bright** or **very bright**. Test each solution and record your observation for the bulb's brightness in the chart below.

Part 1: Data	pH Value from Probe	Color & pH Value from pH Paper	Observations from Circuit Tool Describe the brightness
Water (H ₂ O) 			
Strong Acid (HA) 			
Weak Acid (A) 			
Strong Base (MOH) 			
Weak Base (B) 			

Part 2: Concentration of H_3O^+

1. Choose “My Solution” on the bottom toolbar.
2. Follow the directions below and record your data in the table.

Put the pH probe in the beaker. Choose acid and toggle from “ stronger to weaker ” to find the pH value range for acids. Repeat the procedure for bases.	
Record the range for acids:	
Record the range for bases:	
Once again, chose acid and observe pH ranges as you toggle across the scale: but this time, toggle across from “ weaker to stronger ” acids.	
What happens to the amount of H_3O^+ ions:	
What happens to the pH:	
The pH of a solution is the measure of H_3O^+ ions. In the acid image, those ions are red. Watch what happens as you go from lower to higher concentration of an acid? (Toggle across the initial concentration scale and look at the red H_3O^+ ions.)	
What happens to the amount of H_3O^+ ions:	
What happens to the pH:	
Conclusion Write in your own words what will happen if you go from lower concentration to higher concentration of an acid.	
Conclusion Write a sentence relating three terms: pH, H_3O^+ ions, acidity:	

Part 3: pH calculations:

Look up in textbook, Chapter # 9, you learned how to use these formulas below.

1. $\text{pH} = -\log \text{H}_3\text{O}^+$

2. $\text{H}_3\text{O}^+ = \text{inv.log } -\text{pH}$ or $[\text{H}_3\text{O}^+] = 10^{-\text{pH}}$

Using this formula, complete the following table:

H_3O^+	pH
$9.63 \times 10^{-6} \text{ M}$ \longrightarrow	
\longleftarrow	6.01

To check your work, stay in the “my solutions” page. Make sure the pH probe is in the solution. Adjust the concentration or strength of the acid until you hit the desired pH. Select “Graph from the views. See what concentration is given for H_3O^+ ions. If your values in the table are incorrect, try recalculating.