

Name _____ Period _____ Date _____



STEM Sims

Lesson 1: Water Testing

One definition of an acid is a substance that forms the hydronium ion when placed in water. A base is often defined as a substance that forms the hydroxide ion in water. In this investigation, you will test what happens to the pH of water when an acid or base is added to the system.

Doing the Science

1. Open the Buffers simulation.
2. Select the magnifier and move it to the beaker of water on the tabletop. Note the number and type of particles in the beaker.
3. Note the pH of the pure water on the tabletop. Record this value in Table 1.

Part I: Adding an acid

4. Select a pipette and move the pipette to the beaker containing acid on the shelf.
5. Move the pipette to the beaker of water on the tabletop to dispense the acid.
6. Select the magnifier and move it to the beaker of water and acid on the tabletop.
7. Note and record in Table 1 the number of particles in the solution and the solution's pH.
8. Move the same pipette back to the beaker with acid on the shelf to reload the pipette with acid.
9. Move the pipette back to the beaker on the tabletop to dispense the acid. Repeat this process three more times, then move the pipette to the waste area. Make sure to use the magnifier to view the particles present in the solution and to record in Table 1 this number of particles and the system's pH.

Part II: Adding a base

10. Move the pure water beaker on the shelf to the center of the tabletop.
11. Note the pH of the pure water on the tabletop. Record this value in Table 2.
12. Select a pipette and move the pipette to the beaker containing base on the shelf.
13. Move the pipette to the beaker of water on the tabletop to dispense the base.
14. Select the magnifier and move it to the beaker of water and base on the tabletop.
15. Note and record in Table 2 the number of particles in the solution and the solution's pH.
16. Move the same pipette back to the beaker with base on the shelf to reload the pipette with base.
17. Move the pipette back to the beaker on the tabletop to dispense the base. Repeat this process three more times, then move the pipette to the waste area. Make sure to use the magnifier to view the particles present in the solution and to record in Table 2 this number of particles and the system's pH.

Table 1. Adding an acid to water

System	Particles present	pH
Pure water		
Pure water + 4 drops acid		
Pure water + 8 drops acid		
Pure water + 12 drops acid		
Pure water + 16 drops acid		

Table 2. Adding a base to water

System	Particles present	pH
Pure water		
Pure water + 4 drops base		
Pure water + 8 drops base		
Pure water + 12 drops base		
Pure water + 16 drops base		

Do You Understand?

1. What happens to the value of the pH as an acid is added to a system?

2. What happens to the value of the pH as a base is added to a system?

3. What are some possible implications for a living organism exposed to an acidic or basic environment?