Name _____

Observing Movement Across a Membrane

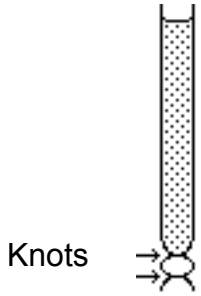
Background Information: Water particles can move through the selectively-permeable dialysis tubing. This membrane is similar to the cell membrane. In this activity you will observe the direction of the particle movement.

Materials:

10 cm dialysis tubing	Dental floss	Vinegar
Water	Indicator solution	Laptop w/ Logger Pro
LabPro data collector	pH Probe	Graduated Cylinder

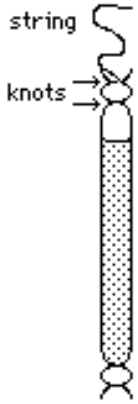
Procedure:

1. Take the dialysis tubing; rub it gently between your fingers to open it. Use a piece of dental floss to tie off the end:



2. Fill the dialysis tubing bag ½ full of Vinegar.

3. Tie off the open end of the dialysis tubing.



4. Carefully rinse off the outside of the tube to remove any vinegar that may have spilled on it. Gently pat it dry with a paper towel.
5. Put 100 ml of water in the beaker. Add 10 ml of Indicator Solution to the water.
6. Set up the computer/LabPro/sensor system.
7. Open **Logger Pro**.
8. Go to **Setup; Data Collection**; choose **Real Time Collect.**
9. At the next screen, choose **Sampling.**
10. Set the **Experiment Length** to *300 seconds*.
11. Set the number of **Samples/Second** to *1*. We will collect 300 pieces of data, one data point each second for 300 seconds.
12. Click **OK.**
13. Go to **View**, choose **Graph Options**, change the title to *pH vs Time*.
14. Check **Connecting Line.**
15. Click **OK.**
16. Put the dialysis tubing filled with vinegar and the pH probe in the beaker of water.
17. Click **Collect** to begin collecting data.

Data:
Print your graph and staple it to this lab.

Sketch the tube and **show the movement of the particles**:

Data Analysis:

Look at your graph. Describe the relationship between Time and pH:

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_____

_____

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Questions:

1. Describe the solution in the dialysis tube at the beginning of the investigation:

   _____

   _____

   _____

   _____

2. Describe the solution in the beaker at the beginning of the investigation:

_____

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_____

3. Describe the change that took place when the dialysis tube was left in the beaker:

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4. What kind of membrane does this investigation demonstrate?

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5. Why is this process important in living things?

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6. Compare the use of probes to collect information with the use of Indicator solution to collect information: -

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7. **Write a paragraph explaining osmosis and diffusion.** Use the information from this investigation as an example. Be sure to mention: *high concentration, low concentration, movement of molecules, selectively-permeable membrane*.