Measuring pH with pH Indicator Paper

pH can be measured in several ways. Probes can be used to measure pH very exactly. pH paper can also be used but is less exact. pH paper is saturated with a pH indicator. When the paper is dampened with the test solution it will change color. The color is compared to a standard color chart which indicates the solution's pH. Other indicators, both organic and inorganic liquids can be dropped into samples of a solution. Again the indicator changes to a specific color to reflect the solution's pH.

Materials

Water
Spot plate or 8 small beakers (25 mL)
Pipette
Hydrochloric acid
Lemon juice
Ammonium hydroxide
Water
Sodium bicarbonate
Ammonium nitrate
Milk
Vinegar
pH indicator paper

Write a hypothesis for your experiment. Which substances do you think are acids? Which are bases?

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Procedure

1. Pick up a spot plate from the supply table. If spot plates are not available pick up 8 small beakers. For the spot plates you will only need 2 or 3 mL of liquid. If you are using small beakers you will need to add more liquid.
2. Add water to the first depression on the spot plate (or to a small beaker). To the other depressions on the spot plate add each of the following, hydrochloric acid, lemon juice, ammonium hydroxide, sodium bicarbonate, ammonium nitrate, milk and vinegar. Keep track of where you put each test reagent.
3. If the reagent added to a depression on the spot plate is a solid (powder), use a pipette to add several drops of water to suspend the solid. Do not overfill the depressions. pH can only be determined in solutions.
4. Tear a small piece (~3 cm) of the pH indicator paper and place the tip of the paper in the depression well on the spot plate containing water. If you are using beakers instead of a spot plate, insert the pH indicator paper into the water-containing beaker for a few seconds and then remove the paper. Compare the pH paper to the color key on the side of the pH paper container. Record your results in the table provided. Dispose of the pH paper.
5. Repeat step four using a fresh strip of pH indicator paper for each substance you are testing.

Tested Compound	Color	Estimate of pH	Acid or Base	Ion in highest concentration? H^+ or OH^-
Water				
Hydrochloric acid				
Lemon juice				
Ammonium hydroxide				
Sodium Bicarbonate				
Ammonium nitrate				
Milk				
Vinegar				

Was your hypothesis supported?

Which substance was the most acidic?

Which substance was the most basic?

What was the pH of the water you tested? Was it acidic, basic or neutral? How do you explain this result?