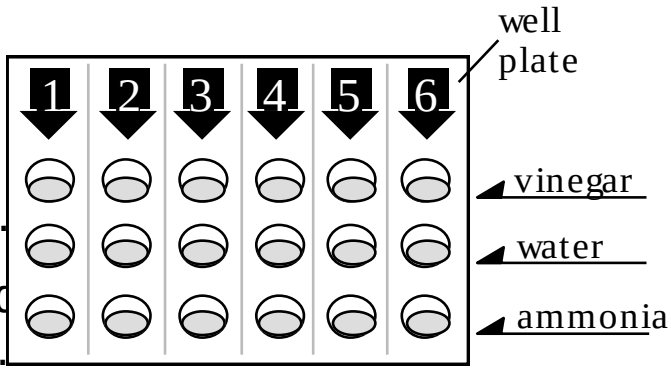
Natural Indicators

Procedure:



1. Always wear safety goggles.
2. Rinse the well plate in the sink.
3. Add 8 drops of vinegar (an acid) to each well in the vinegar row.
4. Add 8 drops of water (H_2O) to each well in the water row.
5. Add 8 drops of ammonia (a base) to each well in the ammonia row.
6. Add 5 drops of cabbage juice to each of the 3 wells in column 1.
7. Pick two other plant solutions.
   - Add 5 drops of one plant solution to each well in column 2.
   - Add 5 drops of the other plant solution to each well in column 3.
8. Closely observe the colors in all the wells. What colors do you see in the ammonia (base) and in the vinegar (acid) for each plant solution?
9. What colors do you predict other plant solutions will turn? Test your predictions by adding 5 drops of a plant solution to each of the 3 wells in column 4, 5, or 6 (as in step 7).
10. Rinse the well plate in the sink.

Why did the plant solutions change color?

A Closer Look:

Maintaining an acid/base (pH) balance is important for the survival of living things. Living organisms have complex chemical structures that help them keep acids and bases in balance. Because color often depends on the acid/base balance, you've probably never seen a blue radish or a green cherry!

Many molecules change their structure slightly, depending on whether they are in an acid or a base solution. This change in their structure changes their color. Molecules that change color when they are in different solutions may be used as indicators. All the plants in this experiment are natural indicators.

Many other plants are also natural indicators and produce flowers of different colors depending on the acidity of the soil. For example, hydrangea flowers are red in basic (or alkaline) soil and blue in acidic soil.