

## Magic Signs

### Purpose

To develop a secret message and then make the message disappear.

### Materials

white paper for sign (construction paper)                      two household spray bottles  
three water color paint brushes                                      masking tape to hang the painted sign

25 mL phenolphthalein solution (0.05 g powder in 50 mL ethyl alcohol, dilute to 100 mL with water)

50 mL of household ammonia (without soap), Windex with ammonia D

### Procedure

1. Put the basic solution and the vinegar into separate spray bottles.
2. Mark the top of the paper so you know how to position the signs when it is dry. Paint your message on the paper. Use the appropriate solution to achieve the results described below:
  - a. phenolphthalein solution gives pink writing when sprayed with basic solution.
  - b. thymolphthalein solution gives blue writing with basic solution.
3. Hang the dried paper in preparation for developing the sign.
4. Spray the paper with the basic solution. The message should appear. If the Windex or household ammonia is used, the color will fade gradually as the ammonia evaporates. The sign can be stored for future use.

### Additional Information

1. Phenolphthalein is an acid-base indicator. Phenolphthalein is colorless below pH 8 and pink in basic solution (above pH 10).
2. This activity can be used in a unit on acid-base indicators or evidence of a chemical reaction.

### Disposal

The cardboard can be thrown away, and the solutions can be saved and reused again.

### Reference

ICE Demonstration Workshop, University of Northern Colorado, 1990.