

CHAPTER 6	Investigation 6.D: Determining the pH of an Unknown Solution with Indicators	BLM 6.3.7
HANDOUT		

In this investigation, you will determine the pH of four unknown solutions by using four acid–base indicators.

### Question



How can you use indicators to determine the pH of a solution?

### Safety Precautions



- Solutions of acids and bases can be toxic and corrosive. Wash any spills on skin or clothing with plenty of cool water. Inform your teacher immediately.
- Dispose of all materials as directed by your teacher.

### Materials

- 4 solutions of unknown pH 
- 4 indicator solutions
  - methyl orange
  - methyl red
  - bromothymol blue 
  - phenolphthalein 
- spot plates or small test tubes
- medicine droppers

### Procedure

1. Place two drops of methyl orange indicator into four wells on the spot plate (or in four small test tubes).
2. Add five drops of each of the unknown solutions to the indicator.
3. Record the colours.
4. Repeat with the other three indicators.

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### Analysis

1. Using Table 6.7 on p. 230 of the text, estimate the pH of each of the four solutions.

### Conclusion

2. Your teacher will use a pH meter to determine the pH of the solutions. How do your results, obtained using indicators, compare with the results obtained using a pH meter?

### Extension

3. With the permission of your teacher, repeat the investigation using cabbage juice indicator. Use the Internet to find a procedure for preparing an indicator by using cabbage juice. Which method, a combination of indicators, the use of a universal indicator (such as cabbage juice), or a pH meter, appears to be the most practical? **ICT**