

CHAPTER 6	Investigation 6.D: Determining the pH of an Unknown Solution with Indicators Answer Key	BLM 6.3.7A
ANSWER KEY		

### Answer to Procedure Questions

3, 4.

Unknown solution	Methyl orange	Methyl red	Bromothymol blue	Phenolphthalein
Hydrochloric acid	Red	Red	Yellow	Colourless
Ethanoic acid	Orange	Red	Yellow	Colourless
Sodium carbonate	Yellow	Yellow	Blue	Colourless
Sodium hydroxide	Yellow	Yellow	Blue	Pink

### Answer to Analysis Question

1. Your answers ought to fall within the following range:

HCl(aq): 3.2 or lower

H<sub>2</sub>CO<sub>3</sub>(aq): 3.2–4.4

Na<sub>2</sub>CO<sub>3</sub>(aq): 7.6–8.2

NaOH(aq): 10.0 or higher

### Answer to Conclusion Question

2. Approximate pHs are

HCl(aq): 1.0

H<sub>2</sub>CO<sub>3</sub>(aq): 3.4

Na<sub>2</sub>CO<sub>3</sub>(aq): 7.4

NaOH(aq): 13

The pH meter is likely to be more accurate because it gives a precise measurement, whereas the indicator allows only for an estimate.

### Answer to Extension Question

3. If a pH meter is available, it is the easiest and most practical, although also the most expensive. If one is not available, then cabbage juice is the most practical since it is easy to make and provides fairly accurate coverage over a wide range of pH values.