

<b>CHAPTER 6</b>	<b>Investigation 6.B: Optimum pH for Two Protease Enzymes Answer Key</b>	<b>BLM 6.2.9A</b>
<b>ANSWER KEY</b>		

### Answers to Analysis Questions

1. The only difference between the control test tubes and the contents of P-2/P-8 is the control tubes only contain distilled water while the other tubes have pepsin (enzyme).
2. a) Pepsin was more active in a pH of 2.  
b) Trypsin was more active in a pH of 8.

### Answers to Conclusion Questions

3. The small intestine normally has a pH of 8. Trypsin was more active in the solution with a pH of 8. Therefore, trypsin would be the enzyme that breaks down protein in the small intestine.
4. The stomach normally has a pH of 2. Pepsin was more active in the solution with a pH of 2. Therefore, pepsin would be the enzyme that breaks down protein in the stomach.

### Answers to Extension Questions

5. a) Enzymes are proteins. These molecules are very temperature-sensitive. Maintaining the temperature between 35 °C and 39 °C mimics the optimum temperature range for these enzymes.  
b) There was a fairly low degree of certainty in this Investigation because it was qualitative rather than quantitative. For example, you did not do any quantitative measures, such as determining the mass of the egg cubes before and after the Investigation. There were also potential sources of error. For example, the “cubes” of egg white were not exactly the same size. Another source of error could be the use of a hot water bath instead of an incubator—it would be difficult to maintain a constant temperature if the hot water bath was used.
6. The temperature or the concentration of enzyme solution could be manipulated in subsequent investigations. The procedure should be similar to the one provided in the student textbook and should include all safety precautions. If temperature is being manipulated, the procedure should indicate that the enzyme solutions have to have the same pH and be of the same concentration. Enzyme activity would be reduced at temperatures above or below the optimum temperature. If the concentration of enzyme solution was being manipulated, you would have to control the pH of each solution and provide the optimum temperature for enzyme action. You should predict that enzyme activity would be greater at higher concentrations.