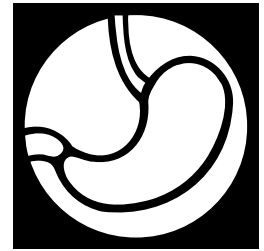




Digestive System

Name _____



Protein Digestion

Background Information:

Proteins are the building blocks of the body for repair and growth.

The digestion of proteins begins in the stomach.

The walls of the stomach are made up of strong muscles which mix the food in the stomach by contracting about three times per minute. These strong walls are covered by a lining filled with tiny glands. These glands make **gastric juices** such as water, enzymes, and acid to help in the digestive process. **Hydrochloric acid** (HCl) is one of the juices the stomach makes. It helps to soften food and kill any germs it may contain. The HCl in the stomach is so strong, in fact, that it would digest the stomach itself if it were not for another secretion: **mucus**. This thick, gooey liquid helps protect the cells in the stomach's lining and moistens food. The cells in the stomach's lining still wear out, however, and are constantly being replaced. The entire lining of the stomach is replaced every three days.

Acids, Bases & pH

Everything is made of chemicals and chemicals can be sorted into various categories.

Some chemicals are **acids**. Some chemicals are **bases**. Some chemicals are in between acids and bases and are called **neutral**.

Distilled water is a neutral. By adding an acid to a base you made your solution become more an acidic. As you add acid, your solution changes from a base to a neutral solution and finally to an acidic solution. The opposite is true, when you add a base to an acid solution.

The **pH scale** measures how acidic or basic a substance is. The ranges from 0 to 14. A pH of 7 is neutral. Values **less than 7 are acidic**, while those **greater than 7 are basic**.

Materials:

Egg white
5 Test tubes
Large cup
Goggles

Pepsin
Apron
Eye droppers
5 rubber stoppers

Hydrochloric acid (HCl)
Masking tape
Water

Procedure:

1. Label the test tubes A, B, C, D, E with masking tape. Label your cup with your names.

2. Put a small piece of egg white in each test tube. Each test tube should have approximately the same amount of egg.
3. Add the following to each test tube:
 - a. 1 small scoop of pepsin
 - b. 10 drops of HCl
 - c. 10 drops of water
 - d. $\frac{1}{2}$ scoop of pepsin + 10 drops of HCl
 - e. $\frac{1}{2}$ scoop of pepsin + 10 drops of water
4. Observe the egg whites in each test tube & record these detailed observations.
5. Put the stoppers in the test tubes and place them aside for one day.
6. After one day, observe the egg whites in the test tubes again. Record your detailed observations.

Data:

Egg White (Protein) Observations		
Test Tube	Observations Day 1	Observations Day 2
A		
B		
C		
D		
E		

Data Analysis:

1. How did adding HCl affect the digestion of the egg white?

2. Why did we set the test tubes aside for 1 day?

3. Why did we put a stopper in the test tubes?

4. Which substances / combination of substances were best at digesting the egg white? Give evidence (actual data) for your answer.

Conclusion:

What does this investigation tell you about the digestion of protein in the stomach?
Give evidence to back up your answer.
