

The Digestive System

Objectives

- Become familiar with where in the digestive system the breakdown of the various macromolecules begins.
- Be able to identify the histology of the small intestine.
- Be able to identify the major structures of the digestive system and state their function.

Introduction

To release the energy stored in food and to produce ATP, the first step is the hydrolysis of carbohydrates, proteins, lipids, and nucleic acids into their subunits. In addition to being used as an energy source, these simple organic compounds resulting from digestion can be recycled to form new tissues, proteins, or enzymes. If we take in more energy than we need, we will store it as glycogen or fat. You (like me) may have experienced this phenomenon. Digestive systems vary from species to species. Here we will focus on the structure of the human system.

To begin this exercise, within the Mammalian Systems section of the BiologyOne DVD, select the Digestive System simulation.

Activity 37.1 **Organs of the Digestive System**

From the introductory screen, click on the forward arrow in the lower right to view the structures of the digestive system. From this and your other course resources, you should be able to locate and identify the following organs:

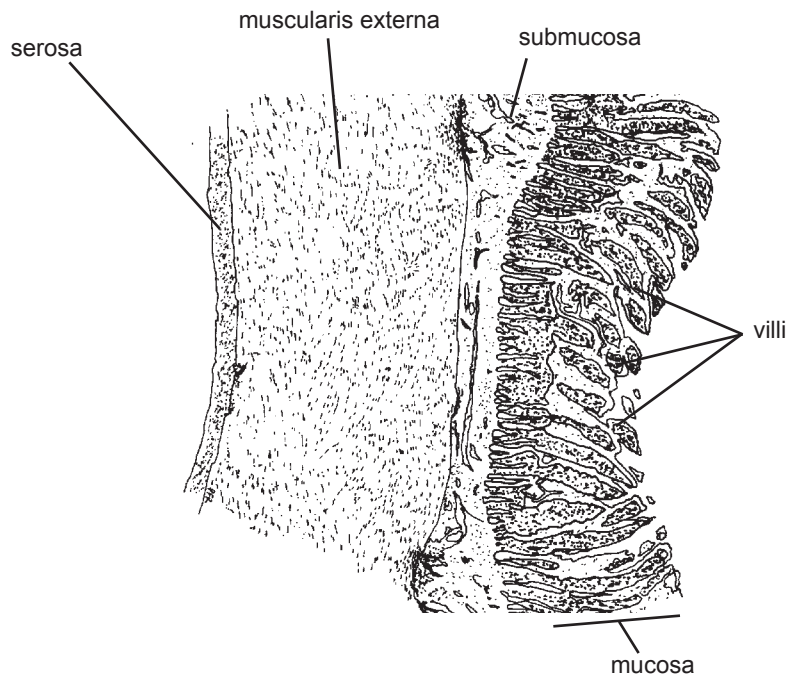
mouth accessory structures:
esophagus liver
cardiac sphincter gall bladder
stomach pancreas
pyloric sphincter
small intestine
large intestine
colon

Test your ability to identify these structures by labeling the structures indicated on the diagram in the Results Section.

Activity 37.2 **Microscopic Anatomy**

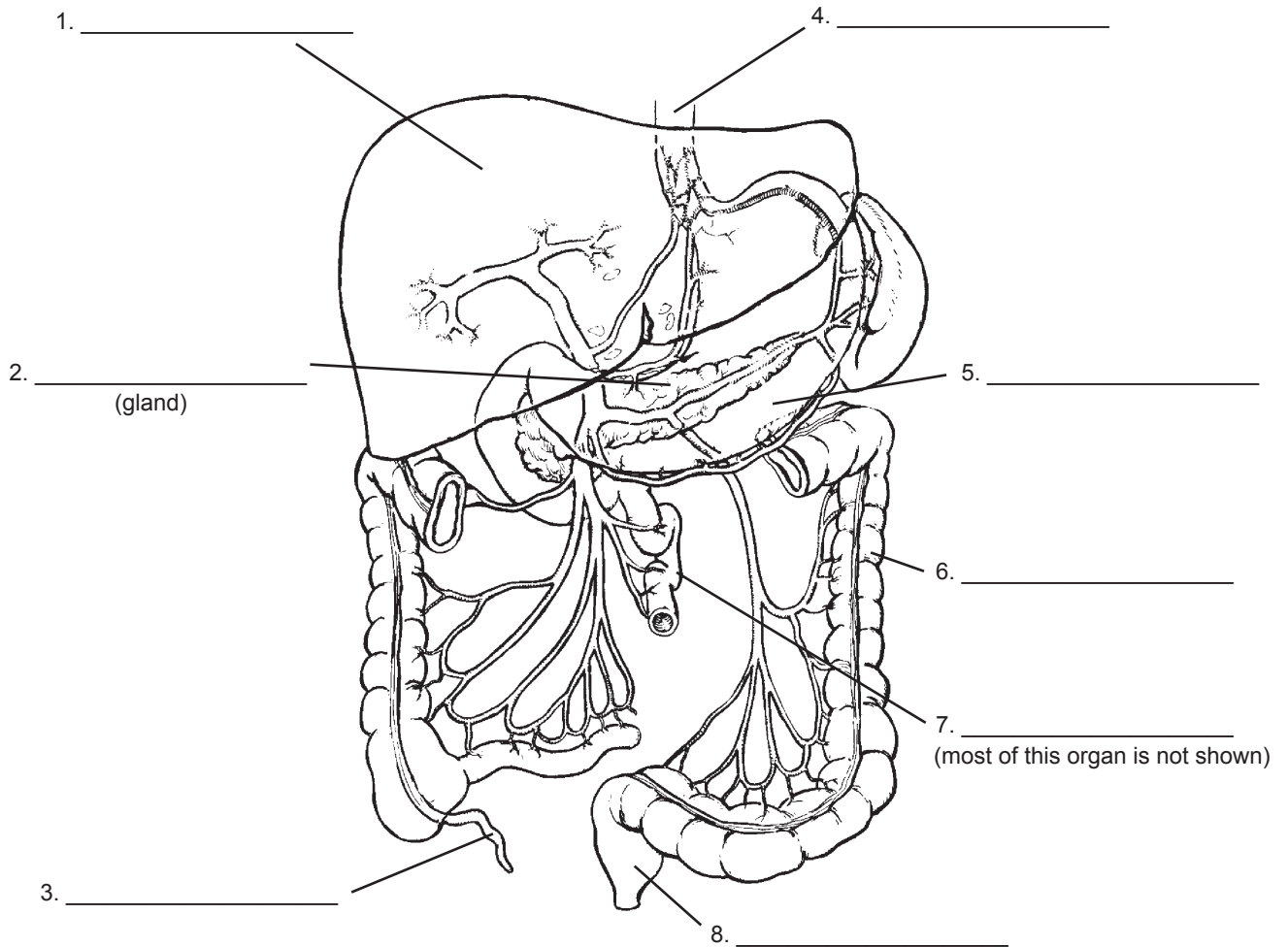
After studying the organs of the digestive system. Study the anatomical structure of the stomach and the three regions of the small intestine. Click on the forward arrow in the lower right to view these sections. When finished, you should be able to identify the gastric pits of the stomach and the villi, goblet cells, mucosa, submucosa, muscularis layers in the small intestine. Make a drawing and answer the questions in the Results Section.

Illustration of Wall of Small Intestine

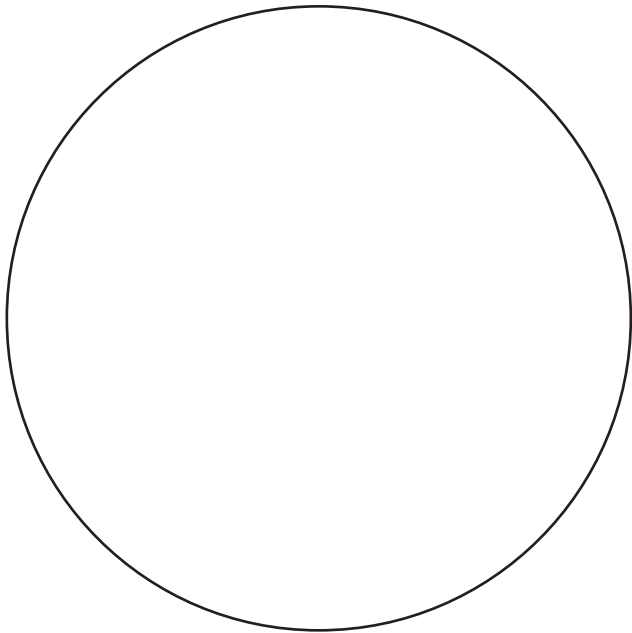


Results Section

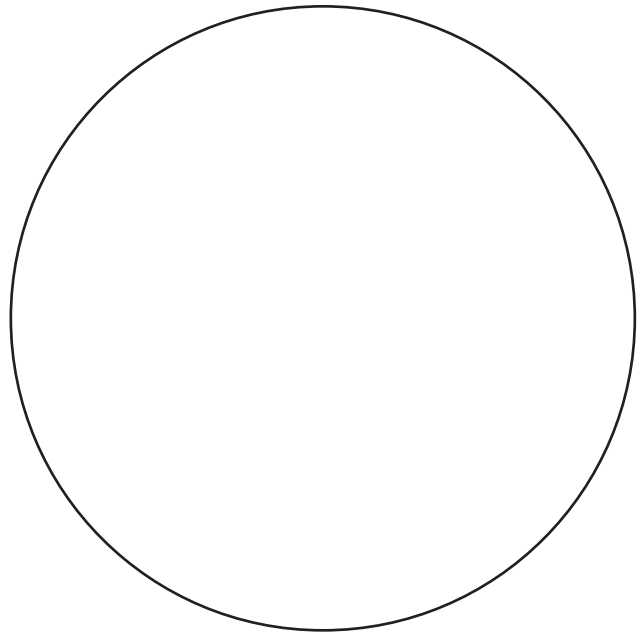
Activity 37.1
Organs of the Digestive System



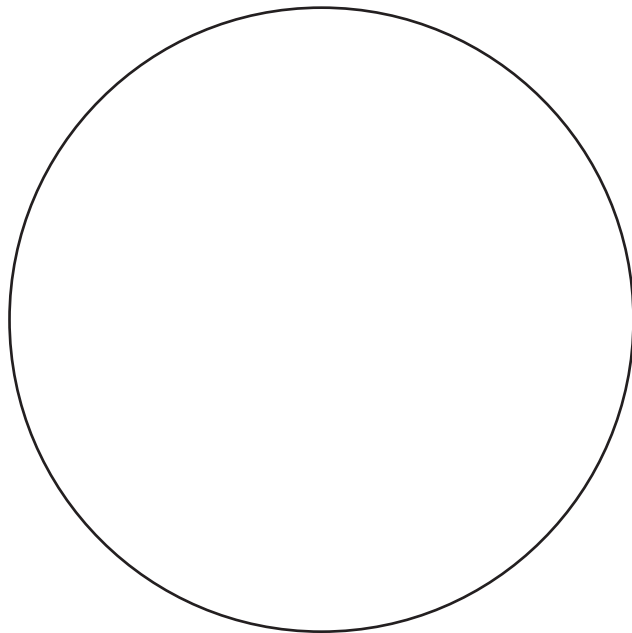
Activity 37.2
Microscopic Anatomy



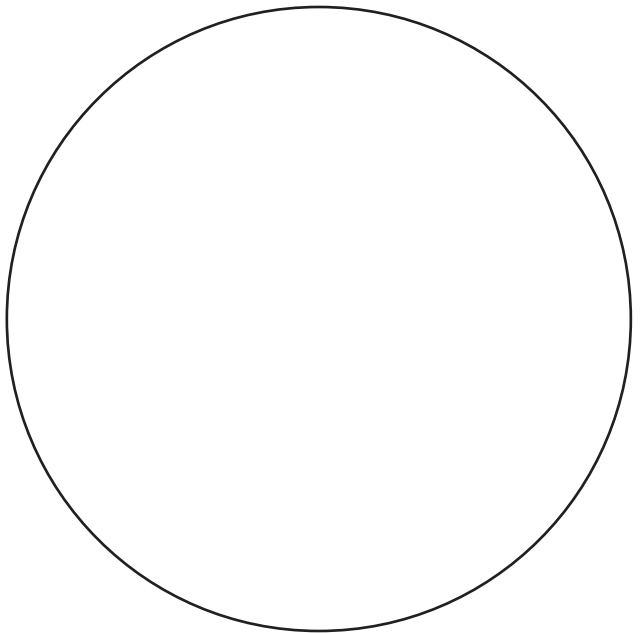
stomach tissue



duodenum



jejunum



ileum