

Background Information

The foods you eat must be broken down into simpler molecules so that the nutrients can be absorbed and used by the cells of the body. **Digestion** is the process that breaks down food into these simpler molecules. The process of digestion can be divided into three parts. First, food is broken down into smaller pieces during **mechanical digestion**. Next, these smaller pieces of food are broken down into simpler molecules during **chemical digestion**. Finally, these simpler nutrient molecules are **absorbed** from the digestive tract into the bloodstream, where they are transported to individual cells.

Digestion begins in the mouth when your teeth chew the food you eat into smaller pieces and saliva from your salivary glands begins the chemical digestion of starches into simpler sugars. When you swallow, food passes through the throat, or pharynx, and enters the esophagus.

The esophagus is a long muscular tube that moves the food toward the stomach by muscular contractions called **peristalsis**. When food enters the stomach, it is mixed with gastric fluids by mechanical churning. The gastric fluids secreted by glands in the stomach begin the digestion of proteins. After several hours in the stomach, partly digested food, called **chyme**, enters the duodenum of the small intestine. With the help of bile from the liver and pancreatic fluid from the pancreas, the chemical digestion of proteins, fats, and carbohydrates is completed in the duodenum. As digested food continues into the jejunum and ileum of the small intestine, nutrient molecules are absorbed into the bloodstream through finger like projections called **villi**. Food material that cannot be digested is passed into the large intestine, or colon. In the large intestine, water is removed and undigested material, with the help of bacteria, becomes solid waste, or feces, that will be eliminated from the body through the anus.

Procedure**Building Vocabulary Skills**

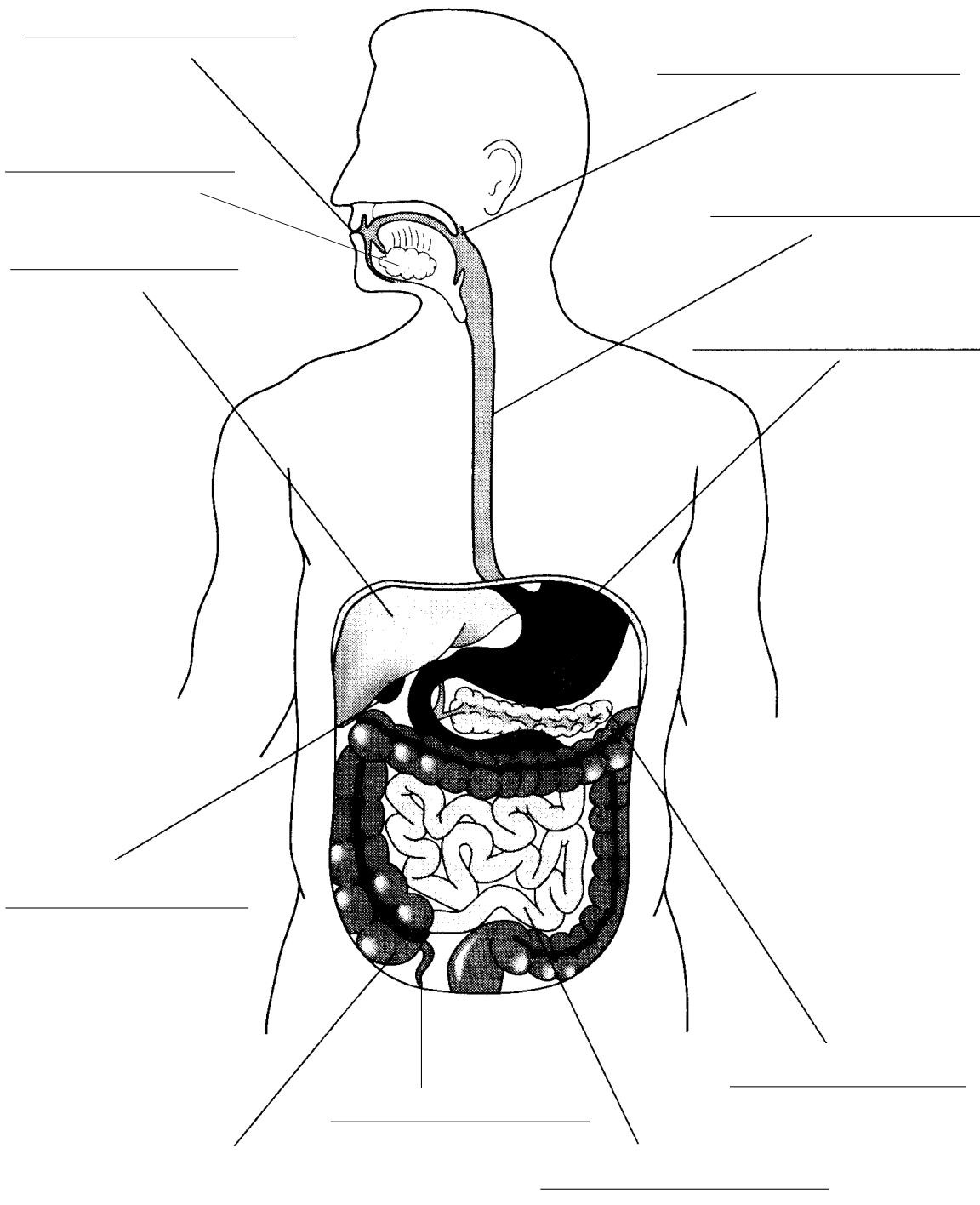
1. Replace the underlined phrase with the correct vocabulary term.
 - a. The nutrients in the food you eat are made available to the cells of your body when they are broken down into simpler molecules. _____.
 - b. The process of breaking food into smaller pieces increases the amount of food exposed to digestive chemicals. _____.
 - c. Nutrient molecules that can be used by your body's cells are produced during the process of breaking complex molecules into simpler molecules. _____.
 - d. In the small intestine, digestion is completed and the end products of digestion are transferred from the small intestine to the bloodstream. _____.
 - e. A series of muscular contractions moves food through the digestive system. _____.

2. Complete the equation:

Mechanical digestion + _____ + _____ = Digestion

The Digestive System: Identifying Structures

1. **Label** the organs of the digestive system and **circle** the five organs that food does not directly pass through.



2. Complete the following table as it relates to the functions and structures of the alimentary canal.

Organ	Type of Digestion	Digestive Secretion or Enzyme	Function
Mouth			
	None	None	Connect the Mouth to the Stomach
		Pepsin, Mucus, & HCl Acid	
Small Intestine			
Liver	None		
	None		Aids in Protein, Carbohydrate, and Lipid Digestion
Large Intestine	None	None	

3. Sequence the following events. Using the numbers 1 through 8, place the digestive events described below in the correct sequence from start to finish.

- _____ Chyme moves into the duodenum, where bile from the liver, pancreatic fluid from the pancreas, and enzymes from the intestine itself complete the chemical digestion of proteins, fats, and carbohydrates.
- _____ Peristalsis moves food down the esophagus and into the stomach.
- _____ Saliva begins the digestion of starch.
- _____ As food passes through the jejunum and ileum, nutrients are absorbed into the bloodstream through the villi.
- _____ Churning of the stomach mixes food with gastric fluids.
- _____ Water is absorbed in the colon and solid waste material is prepared for elimination.
- _____ Chewed food passes through the pharynx and into the esophagus.
- _____ Each bite of food is chewed and mixed with saliva.

4. Imagine that you have just finished eating a steak, a baked potato full of butter, hot rolls with butter, and a green salad with dressing. Identify the digestive organ in which the chemical digestion of each of these foods would begin. (**Hint.** think about the nutrients found in each of these food items.)
- a) Steak: - (protein) -
 - b) Potato: - (starch) -
 - c) Butter: - (lipid) -
 - d) Rolls: - (starch) -
 - e) Lettuce: - (cellulose) -
 - f) Salad Dressing: - (lipid and sugar) -