

# Introduction to the Digestive System

Have you ever heard the saying, "You are what you eat?" It's true, our bodies take in food. All our energy comes from this food, but how? Our body breaks the food down into nutrients. These nutrients are the fuel that keeps our body running. Do you know how this works? Read on to find out.

Food contains nutrients. These nutrients are needed by the cells of your body. How do they get from your sandwich to your cells? What organs and processes break down the food? How are these nutrients made available to cells? The answer is your **digestive system**. It is this system that controls the digestion and absorption of nutrients. Don't think it is that simple though. All the systems of your body work together to keep your body running at its best. The respiratory and circulatory systems work together. Together, they provide cells with the oxygen they need to operate. Cells also need glucose. Glucose is a simple sugar that comes from the food we eat. To get glucose from food, digestion must occur. Glucose is not the only thing we get from food. Our bodies also require proteins and fats. Let's learn a little about the digestive process.

## Roles of the Digestive System

The digestive system supports the body in three ways. First, it breaks down food. Second, it enables nutrients to be absorbed into the body. Finally, it is also responsible for the elimination of waste from the body.

## Parts of the Digestive System

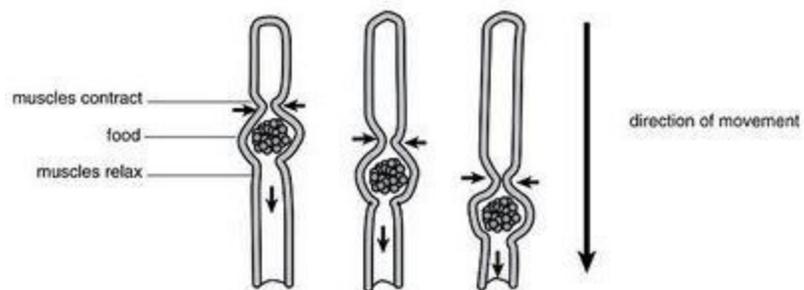
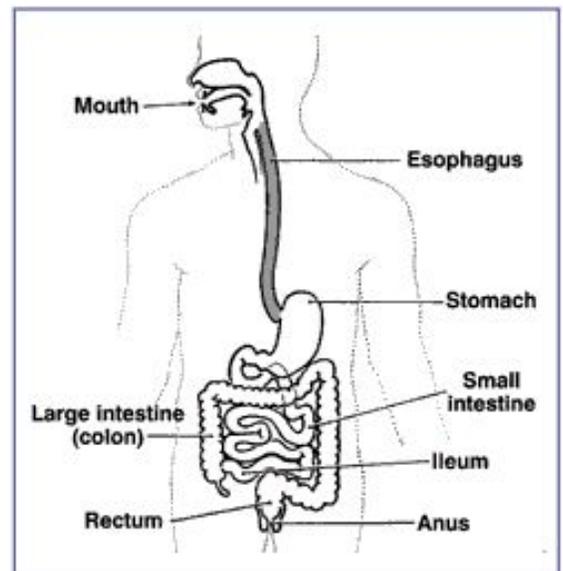
The major organs of the digestive system are shown in the figure to the right.

## The Digestive Tract

The digestive system is basically a long tube that passes through your body. Do you know how long your digestive tract is? Food enters the mouth and then travels more than 9 meters (30 feet). This distance is needed to process the food you eat. The food that is not digested is passed as waste. The organs in the digestive tract are covered by a special type of muscle. These muscles contract to help move the food along. This muscle movement is like a wave through a spring toy. Think about when you brush your teeth. You squeeze the toothpaste from the tube. The toothpaste moves out of the tube. This action is similar to how food is passed through your digestive tract. The diagram in the figure to the right shows how this process works.

## Digestion

As food is pushed along, it undergoes digestion. Digestion is the process of breaking down food into nutrients. There are two types of digestion: mechanical digestion and chemical digestion.



Peristalsis

- Mechanical digestion occurs when large chunks of food are turned into smaller chunks. Perhaps not surprisingly, this happens when you chew your food. Once you swallow the food, your stomach also does some of this work.
- Chemical digestion occurs when food is broken down into useful nutrients. This is a chemical process that begins as you start to chew your food. The saliva in your mouth starts this process. Once you swallow, the acid in your stomach further breaks down food. From the stomach, the food moves into the small intestine. In the small intestines, another set of chemicals go to work. Are you surprised? Your small intestine, and not your stomach, does most of the work!

### **Absorption**

After food is broken down into nutrients, then what? Once the food is broken down into nutrients, the nutrients can now be moved through the blood. This process is called absorption. Nutrients travel through the bloodstream to feed all your cells.

### **Elimination**

Some substances in food can't be broken down into nutrients. They remain behind after digestion has occurred. These materials cannot be absorbed. Any food that can't be digested is passed out of the body as solid waste. This process is called elimination.

### **The Start of Digestion: Mouth to Stomach**

Does the sight or smell of your favorite food make your mouth water? When this happens, you are getting ready for digestion.

### **Mouth**

The mouth is the first digestive organ that food enters. The sight, smell, or taste of food stimulates the start of the digestive process. Your body starts with the release of saliva. Saliva wets the food, which makes it easier to break up and swallow. Other special chemicals start the chemical digestive process. Your teeth help to mechanically digest food. Sharp teeth in the front of the mouth cut or tear food when you bite into it. Broad teeth in the back of the mouth grind food when you chew. Your tongue helps mix the food with saliva and helps you swallow.

### **Esophagus**

The esophagus is a long, narrow tube that carries food from the back of your mouth to the stomach. It has no other purpose. Food is pushed through the esophagus by special muscles. The muscles contract and relax, pushing the food along. The action is similar to when you squeeze your toothpaste from the tube.

### **Stomach**

The stomach is a sac-like organ at the end of the esophagus. It has thick muscular walls that contract and relax to squeeze and mix food. It's like having a washing machine inside your body tossing around food. This helps break the food into smaller pieces. It also helps mix the food with special chemicals that further aid the breaking down of food into nutrients. Water, salt, and simple sugars can be absorbed in the stomach. These nutrients absorb directly into the blood from the lining of the stomach. However, most substances must undergo further digestion. This happens in the small intestine before they can be absorbed.

## **The Small Intestine**

The small intestine is a narrow tube that starts at the stomach and ends at the large intestine. In adults, it's about 7 meters (23 feet) long. Most chemical digestion, and almost all nutrient absorption, takes place in the small intestine.

The small intestine is made up of three parts:

- The duodenum is the first part of the small intestine. It is also the shortest part. This is where most chemical digestion takes place.
- The jejunum is the second part of the small intestine. This is where most nutrients are absorbed into the blood.
- The ileum is the last part of the small intestine. A few remaining nutrients are absorbed in the ileum. From the ileum, any remaining food waste passes into the large intestine.

## **The Large Intestine**

The large intestine is the last section of the digestive tract. It is a wide tube that connects to the small intestine. The large intestine carries the remaining food out of the body as waste. In the large intestine, water is absorbed into the body. The large intestine is about 1.5 meters (5 feet) long. It is larger in width, but shorter in length, than the small intestine.

## **Summary**

- The digestive system is the body system that digests food. It digests food in two ways, mechanically and chemically. Both help in the process of turning food into nutrients. The digestive system also eliminates solid food waste.
- The major organs of the digestive system include the mouth, esophagus, stomach, and small and large intestines. These organs all work together to help you gain energy from the food you eat.
- Digestion starts in the mouth. When food is swallowed, it travels through the esophagus to the stomach. In the stomach, digestion continues and a small amount of absorption of nutrients takes place.
- Most chemical digestion and nearly all absorption of nutrients take place in the small intestine. This organ consists of three parts: duodenum, jejunum, and ileum.
- The large intestine is the last stop in the digestive system. This is where water is absorbed. The food not digested is released as waste.

## **Other Resources:**

VIDEO: <https://youtu.be/JnzwbiPJAA>

ARTICLE: <https://kidshealth.org/en/kids/digestive-system.html>