

Digestion Lesson Plan

Learning Objectives: Student will understand the following:

- How our food is broken down mechanically and chemically.
- Trace a piece of food through the alimentary canal.

Idaho State Standards Met: K.S.3.1, 1.S.3.1, 2.S.3.1, 3.S.3.1, 4.S.3.1, 5.S.3.1, 6.S.3.1, 7.S.3.1, 9-10.B.3.1

Materials: Materials: A bowl (represents the mouth), a fork (represents the teeth), water (represents the saliva), paper towel tube (represents the esophagus), Ziploc® bag (represents the stomach), food (1/2 cup toast or corn flakes), vinegar (represents the stomach acid), and rolled paper towel that has been taped (represents the small intestine and colon)

Background: (Taken from ETV www.myetv.org/education/)

The digestive system is comprised of a group of organs working together to break down foods into a form usable by the human body. This system is composed of organs through which the food passes (alimentary canal) and organs such as the liver, pancreas, and gall bladder that provide chemical substances such as enzymes needed for chemical digestion. The organs that make up the alimentary canal are the mouth, esophagus, stomach, small intestine, large intestine, and anus.

Digestion begins in the mouth, where mechanical (digestion such as the tearing, cutting, and grinding of food by the teeth) and chemical (type of digestion that breaks down large molecules into molecules small enough to dissolve in water and pass through cell membranes) digestion occurs. From here the food is then moved down the esophagus by a process called peristalsis (the wavelike contraction of the walls of the esophagus that forces the food through the esophagus). Once food leaves the esophagus, it enters the stomach through the cardiac sphincter (a circular valve of muscle that works like a drawstring on a sack). The stomach, a j-shaped organ, continues the chemical and mechanical digestion of food. Digestive enzymes secreted by the gastric glands in the lining of the stomach continue the further chemical digestion of food. Once the food has been changed into a thick liquid known as chyme, it moves from the stomach through the pyloric sphincter into the small intestine. Secretions from the pancreas and liver aid in completing the chemical digestion. The capillaries located in the villi of the small intestine absorb nutrients (digestive foods). Materials not absorbed by the villi will then enter the large intestines, where reabsorption of water occurs, producing semisolid feces. Waste will then be eliminated from the body through the anus.

Focus Phase:

How Long is the Digestive System?

Have students cut a piece of yarn according to the following measurements. Allow students to use different color yarn to represent different organs. After the yarn has been cut tie the pieces together.

- Esophagus 10 inches
- Stomach 8 inches
- Small Intestine 275 inches
- Large Intestine 60 inches

- TOTAL 353 inches (almost 30 feet)

Activity: How is Food Digested?

1. Mix food in a bowl with a fork to demonstrate how teeth grind up food.
2. Create a thick paste by adding a little water to the bowl to show that the saliva mixes with the food. What does "saliva" do to the food?
3. Add 1-2 tablespoons of vinegar in a Ziploc® bag.
4. Pour the mixture from the bowl through the paper towel tube, which represents the esophagus, into the Ziploc® bag, which represents the stomach. Seal the bag.
5. Mash the food in the Ziploc® bag. What is the "stomach acid" (vinegar) doing to the food?
6. Snip one corner of the Ziploc® bag and squeeze the mixture out of the Ziploc® bag into the rolled paper towel, which represents the small intestine and the colon.
7. Describe what is happening to the food as it passes through the intestines. (The liquid passes into the paper towel just as liquid nutrients are passed into the blood stream. The solid food goes out the end of the rolled paper towel as waste, just as the solid food goes out of the colon as waste in the digestive system.)
8. Are there ways to move food more effectively through the digestive system? (Drink sufficient amounts of water, eat fiber daily and engage in physical activity).