

DISCOVERIES ABOUT DIGESTION

BENCHMARKS AND TASKS

SC.F.1.2.1 The student knows that the human body is made of systems with structures and functions that are related.

SC.F.1.2.3 The student knows that living things are different but share similar structures.

- The student knows that processes needed for life are carried out by the cells and that complex animals have specialized organs to carry out life processes.
- The student uses a model to explain the functions of the major organ systems of the human body (e.g., digestive, respiratory, circulatory, skeletal, nervous, muscular, excretory).

KEY QUESTION

What path does food follow through the digestive tract?

BACKGROUND INFORMATION

The digestive tract is the body's passageway through which food moves and digests. The digestive tract includes the mouth, esophagus, stomach, small intestine, large intestine, and the anus. Other **organs** that support digestion are the salivary glands, pancreas, liver, and gall bladder.

The digestive **system** physically and chemically breaks down food to supply the body with its **energy** and nutrient needs for growth and repair. The teeth physically break the food into smaller pieces. The tongue moves the food particles into a ball that is swallowed. The food moves down the throat into the esophagus, the food tube that is lined with muscles that help to mix the food and push it down toward the stomach. The stomach, which can hold two to four liters of food, kneads the food, breaking it down more. The stomach also adds chemicals to the food, turning it into a soupy liquid. The food then passes into the small intestine, a narrow tube and the longest part of the digestive tract. The food is then broken down into particles small enough to be absorbed into the bloodstream.

The liver produces bile, which is stored by the gallbladder and then released into the small intestine where it helps to break down the fats. The liver stores the fats and carbohydrates we use for energy along with iron and other vitamins. It also regulates the blood sugar levels in the body. The pancreas produces chemicals that help in the digestion of carbohydrates, fats, and proteins. It also helps to neutralize the stomach acids. The digestive tract is a continuous muscular tube that runs from the mouth to the anus. An adult's digestive tract is approximately nine meters (30 ft.) in length – about five times the adult's height.

MATERIALS

Per student or per group (See Teaching Tips)

1 body cutout from craft paper	construction paper
cash register tape or crepe paper	scissors

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glue

calculator

TEACHING TIPS

1. Give students a piece of craft paper or butcher paper and ask them to have someone at home trace around their body. They should cut this out and bring it to school on the designated day.
2. As an alternative, one student per group could volunteer to create the body outline. Then students could work as a group to create one digestive tract model per group. This would require less space in the classroom.

ENGAGE

1. Ask students to predict how long their digestive tract is from their mouth to their anus. They should cut a piece of cash register tape this length and write their name on it.
2. Next, have students use calculators to determine the actual length of their digestive tracts, using the following measurements:

Mouth to esophagus	10 cm
Esophagus	25 cm
Stomach	15 cm
Small intestine	student's height x 3
Large intestine to anus	student's height + 15 cm
3. Add these amounts to find the total length of the digestive tract.

EXPLORE

1. Have students trace around their bodies on craft paper or have them bring these cutouts from home – as assigned earlier.
2. Have students cut cash register tapes or crepe paper strips about 5-8 cm wide to the lengths listed in the Engage section.
3. The strips can be rolled to form an actual tube. (For the large intestine, two strips can be glued along the edges to form a larger tube.)
4. Students should position the paper strips representing the digestive tract on their body cutouts. Once the strips are in place, students will glue them to the body outline.
5. Have students draw the remaining main organs (stomach, liver, pancreas, and gall bladder) on construction paper and cut them out.
6. They should position the organs on the model, glue them in place, and then label them. Students should label the mouth, esophagus, stomach, liver, pancreas, gall bladder, small intestine, large intestine, and anus.
7. Each group should research the various organs included in the digestive system and be prepared to use the model to trace the path of food through the digestive tract.

EXPLAIN

What is the function of the digestive system? (the physical and chemical breakdown of food to supply the body with energy and nutrients needed for growth and repair)

Where does digestion begin? (the mouth)

Where does digestion end? (Waste products pass from the large intestine through the anus and are expelled from the body.)

What is the role of each organ in digestion? (See Background Information.)

What is the longest organ of the digestive tract? (the small intestine)

Why do you think the small intestine is so long? (There the food is broken down into particles small enough to be absorbed into the bloodstream.)

Approximately how long is the digestive tract in an adult? (about five times the adult's height)

EXTEND/APPLY

Have students determine the average ratio of their heights to the length of their digestive tracts.

ASSESSMENT

Have students answer the key question: What path does food follow through the digestive tract?