

The Journey Inside

OBJECTIVE/RATIONALE

Digestion is an important component of metabolism. The student will identify the relationships between anatomical and physiological functions of the digestive system.

TEKS 121.13 (c) 4B, 10A

TAKS ELA 1
Science 1, 2

National Science Standards A9-12; C9-12; F9-12; G9-12
National Health Care Skills Standards .07

KEY POINTS

- I. Digestive System
 - a. Alimentary Canal - Structure food travels through from the mouth to the anus. Breaks food down into usable molecules.
 - b. Accessory Organs - Organs that aid in digestion.
- II. Digestive Processes:
 - a. Ingestion - Process of taking in food.
 - b. Mechanical Digestion - Physically breaks down food (mastication).
 - c. Swallowing - Voluntary movement of food from mouth to esophagus.
 - d. Chemical Digestion - Process in which large food nutrient molecules are broken down into chemicals small enough to be absorbed by the lining of the small intestine.
 - e. Absorption - Transport of nutrients from the gastrointestinal tract to the blood.
 - f. Defecation - Elimination of indigestible substances from the body in the form of feces.
- III. Anatomy of the Digestive System
 - a. Alimentary Canal:
 1. Mouth - site of ingestion.
 - a. Teeth - tear and grind food.
 - b. Tongue - mixes food with saliva to form bolus.
 - c. Salivary Glands - secrete saliva to: moisten food, and breakdown carbohydrates (enzyme = salivary amylase).
 2. Pharynx - passageway for food propelled by peristalsis.
 3. Esophagus - passageway for food propelled by peristalsis.
 4. Stomach - temporary storage pouch for food. Converts food to chyme. Secretions include:
 - a. Hydrochloric acid - activates other enzymes.

- b. Pepsinogen - digests proteins.
 - c. Intrinsic Factor - required for vitamin B-12 absorption.
 - d. Gastrin - regulates secretions and contractions.
 - e. Mucus - produced by goblet cells to protect the stomach wall from hydrochloric acid.
 - 5. Small Intestine - major organ for absorption of nutrients. Three regions: duodenum, jejunum, ileum. Secretions include:
 - a. Intestinal juice - mixture of enzymes able to breakdown carbohydrates and proteins.
 - b. Mucus - neutralizes chyme.
 - 6. Large Intestine - dries out indigestible food residues by absorbing water and eliminates feces.
- IV. Accessory Digestive Organs
- 1. Salivary Glands
 - 2. Liver - produces bile, a fat emulsifier, stores vitamins A, E, D, & K, aids in detoxification.
 - 3. Gallbladder - stores and concentrates bile.
 - 4. Pancreas - produces pancreatic juice capable of breaking down proteins, carbohydrates, and nucleic acids.
- V. Digestive Enzymes

ACTIVITIES

- I. Identify anatomical structures of digestive system on dissected cat.
- II. Research in cooperative groups, a cause and effect relationship of the following:

a) consequences of poor nutrition	e) chemical imbalance
b) effect of aging	f) effects of vomiting on electrolytes
c) stress	g) effects of binging and purging
d) congenital anomalies	

 Present to class.

ASSESSMENT

Oral Presentation Rubric.
Team Rubric

ACCOMMODATIONS

For reinforcement, the student will complete the **Journey Inside worksheet.**

For enrichment, the student will research and report on the major enzymes involved in digestion, their source, and action. Explain what might happen if enzymes were not present.

REFLECTIONS

The Journey Inside

Instructions:

Write a story in which you are a cheeseburger with everything on it and describe what happens to you on your trip through the digestive system. In your story, include and underline the following terms:

These structures and how each contributes to digestion:

1. mouth
2. salivary glands
3. pharynx/epiglottis
4. esophagus
5. stomach
6. small intestine (name the 3 regions)
7. large intestine
8. liver
9. gallbladder
10. pancreas

These digestive processes and where they occur:

1. ingestion
2. propulsion
3. mechanical digestion
4. chemical digestion
5. absorption
6. defecation

These food groups, what part of the hamburger they come from, and where they are digested:

1. carbohydrates
2. proteins
3. lipids
4. nucleic acids

Name the major enzymes involved in digestion, their source, and actions.