

How the Digestive System Breaks Down Food and Absorbs Nutrients

Florida Benchmark: SC.5.L.14.2 - Explain the function of the digestive system in breaking down food and absorbing nutrients.

NGSS Standard: LS1.A - Structure and Function – In multicellular organisms, the body is a system of multiple interacting subsystems. The digestive system breaks down food to provide energy and nutrients.

A. GRADE LEVEL: 5th Grade

B. SUBJECT: STEM/Science

C. DATE: [Insert Date]

D. DURATION: [Insert Duration]

E. LESSON FOCUS: Understanding the digestive system and how it processes food for energy and nutrients.

F. MATERIALS:

- Crackers or bread (for the chewing experiment)
- Clear plastic bags (to simulate the stomach)
- Water and vinegar (to act as stomach acid)
- Sponge (to represent nutrient absorption in the small intestine)
- Printed digestive system diagrams
- Projector and PowerPoint presentation

G. LESSON OBJECTIVES: By the end of the lesson, students will be able to:

1. Identify the major organs of the digestive system.
2. Explain how food is broken down and how nutrients are absorbed.
3. Demonstrate understanding through a hands-on digestion simulation.

H. PROCEDURES:

1. INTRODUCTION:

- Use a PowerPoint presentation to introduce the digestive system.
- Show labeled diagrams of digestive organs and their functions.
- Ask students what they already know about digestion.
- Distribute a small piece of cracker or bread to each student.
- Instruct students to chew for 30 seconds without swallowing.
- Ask guiding questions:
 - How did the cracker's taste change? (It got sweeter!)

- Why did this happen? (Saliva started breaking it down into simpler sugars.)
- Explain: Digestion starts in the mouth, and our body continues breaking down food as it moves through the digestive system. Today, we will explore how that happens!

2. EXPERIMENT: The Digestive System in Action: Simulating Stomach Digestion

- **Stomach Model Activity:**
 1. Place a piece of cracker in a clear plastic bag (represents the stomach).
 2. Add a little water and vinegar (simulates stomach acid).
 3. Seal and gently mash the bag to show how the stomach churns food.
 4. Observe how the food breaks down into a liquid form.
- **Small Intestine Absorption Activity:**
 1. Dip a sponge into the liquid mixture from the plastic bag.
 2. Explain that like the sponge absorbs liquid, the small intestine absorbs nutrients into the bloodstream.

3. OBSERVATION:

- Students record their observations about how the cracker changes in both activities.
- Discuss how food is transformed at each stage of digestion.

4. GENERALIZATION:

- Lead a class discussion on why our bodies need nutrients.
- Ask: What would happen if we didn't digest food properly? (Lack of energy, poor growth, health problems.)
- Review key vocabulary: digestion, absorption, stomach, small intestine, nutrients.

5. ASSESSMENT:

1. **Exit Ticket:** Draw and label the digestive system and write one sentence about each part.
2. **Think-Pair-Share:** Have students explain to a partner how food changes as it moves through the body.
3. **Quick Quiz:**
 - Where does digestion begin?
 - What does the stomach use to break down food?
 - What happens in the small intestine?

Note 1: Safety Considerations

For safety, ensure that students do not swallow excessive amounts of food during the chewing experiment. Also, when handling vinegar and plastic bags, emphasize careful use

to avoid spills or irritation. Students should wash their hands before and after the experiment to maintain hygiene.

Note 2: Accommodations for ELL, ESE, etc.

- **ELL Students:** Provide labeled pictures and sentence starters (e.g., "The stomach helps by ____").
- **ESE Students:** Use simplified diagrams with word banks for labeling. Provide step-by-step instructions and hands-on guidance.
- **Advanced Learners:** Encourage them to research how digestion differs among different species.