



## Digestion: Chew on That!

**Lesson Concept** The digestive system mechanically and chemically breaks down food to provide energy for the organism. In humans, digestion begins in the mouth.

**Link** In the previous lesson, students learned that the circulatory and respiratory systems work together to transport nutrients and gases around the human body. In this lesson, students begin their investigation of the digestive system by exploring how the mouth chemically and mechanically breaks down food. In the next lesson, students will learn about the movement of food through the entire digestive system from mouth to anus.

**Time** 50 minutes

**Materials**

Per Partner

- 1 Iodine bottle
- 1 Dropper
- 2 Petri dishes
- 1 unsalted cracker

Individual

- Science notebook
- Unsalted cracker
- Napkin
- Lab sheet (H1)

**Advance Preparation**

1. Duplicate lab sheet (H1) for each student.
2. Set out group materials.

**Procedure:**

**Engage** *(10 minutes) The digestive system breaks down food for energy and is made of several parts.*

1. Ask the students to think about their last meal (breakfast/snack/lunch). Why did they eat (other than they were hungry!)?

2. Have students, in their science notebook, draw and label what they think their digestive system looks like.
3. Ask students to share their drawing with a partner and then compare and contrast the parts they drew. Have several students share their ideas aloud with the classroom and chart on a class chart.

*Teacher Note: If you have a doc camera, have students use it to share their drawings. Keep the class chart until the end of lesson 5.10.*

4. Ask students where they think digestion begins. Based on student responses build on or introduce that it begins in the mouth. Explain that today they will investigate how that occurs.

**Explore**                      **(15 minute) Digestion, both mechanical and chemical, begins in the mouth.**

5. In a think-pair share, ask students how their teeth and tongue help in digestion. Discuss how they aid in the physical tearing and chewing of food. Write the word mechanical digestion on the board to label this action.
6. Write the word chemical digestion on the board and ask students in partners to discuss what that means. Have several share aloud. Build on student answers if they are correct, or say that they will explore what that means in the next activity.
7. Distribute lab sheet (H1) to each student and explain that they will follow the directions on the lab sheet to conduct their investigation.
  - Review the direction and distribute the materials (two Petri dishes, one with a cracker and one without a cracker, and bottle of iodine) to each table group.
  - Give each student a cracker.
  - Ask them to follow the directions on their lab sheet.

*Teacher Note: The color change on the chewed cracker may be subtle; it should be approximately the color of the iodine.*

**Explain**                      **(15 minutes) Amylase, an enzyme found in saliva, converts starch to sugar as a chemical digestion.**

8. Have students pair-share about their observations they made from their experiment.
9. Ask several groups to share aloud. Use their observations on their charts.
  - What did they notice while they were chewing the cracker. Did the cracker taste the same? (It should have started to taste sweet).

- What types of changes happened to the cracker? What is their evidence for the types of change? (mechanically broken—large piece to smaller pieces; chemically broken—starch to no starch; bland to sweet taste)

*Teacher Note: it is not important that students know that amylase is the enzyme that changes starch to sugar, but if you want to introduce the term, this is the appropriate place to do so.*

***Extend/Evaluate (10 minutes) Digestion begins in the mouth with mechanical and chemical digestion.***

10. Show pictures of various types of starches (e.g., pasta, bread, potato) and tell students that these foods all have starch in them. Ask students, if they were to eat these foods, how would they describe the digestion that occurs in their mouth?
11. Discuss their ideas based on what they learned from the digestion of a cracker.
12. Ask students to complete the last prompts (question 1 and 2) on their lab sheet.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Digestion: Chew on That!

### Materials Per Partner Group

- Three crackers and two Petri dishes/plates
- One small bottle of iodine and dropper
- Pencil

### Procedure:

1. Place five drops of iodine on the cracker in the Petri dish. Record observations.
2. Take several bites of the other cracker and chew for two minutes **without swallowing**. Record observations of texture and taste.
3. After two minutes, have one person spit out the chewed cracker in the empty Petri dish and the other person spit out his/her cracker in the napkin provided.
4. Add five drops of iodine to the chewed cracker in the Petri dish. Record observations.

### Lab Chart/Observations:

Observation Chart

Cracker	Observations
with iodine	
chewed	
chewed with iodine	

1. Based on what you learned from eating a cracker, explain to your friend how it was digested: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. I used to think digestion begins \_\_\_\_\_. Now I know \_\_\_\_\_.