

The Digestive System in Action: Simulating Stomach Digestion

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.

Lesson: Understanding how the stomach breaks down food using a hands-on digestion simulation.

Objective: Observe how food is broken down in the stomach by simulating digestion using common household materials.

Materials:

- 1 cracker
- 1/4 cup vinegar (represents stomach acid)
- 1/4 cup water (represents saliva)
- 1 ziplock bag (represents the stomach)
- 1 spoon (to mix)

Safety Precautions:

- Do not consume any materials used in the experiment.
- Handle vinegar carefully to avoid spills or irritation.
- Wash hands after completing the experiment.

Procedures:

1. **Observation:** Examine a cracker and think about what happens when chewing food. Consider how saliva helps break it down before reaching the stomach.
2. **Prepare the "Stomach":** Open the ziplock bag and pour in 1/4 cup of water (saliva) and 1/4 cup of vinegar (stomach acid).
3. **Add the Food:** Place the cracker inside the ziplock bag and seal it tightly.
4. **Mixing Action:** Gently squeeze and mash the bag to simulate the stomach muscles churning the food.
5. **Observe the Breakdown:** After a few minutes, notice how the cracker softens and breaks down into smaller pieces, similar to the process in the stomach.
6. **Reflection:** Think about what happened to the cracker and what happens next in the digestive process.

Experiment Report Questions:

1. What do you predict will happen to the cracker inside the bag?
2. How does saliva (water) help in breaking down food?
3. What role does vinegar (stomach acid) play in digestion?
4. How does the movement of the bag represent the stomach's function?
5. What changes did you observe in the cracker after a few minutes?
6. Why do you think the stomach needs both acid and movement to digest food?
7. How do you think the body absorbs nutrients from digested food?
8. What happens to the food after it leaves the stomach?
9. How is this experiment similar to what actually happens inside the human body?
10. What did you learn from this experiment about the digestive process?

Note: Clean-up

- Dispose of the contents properly after the experiment.
- Wipe down any surfaces where spills occurred.
- Wash hands thoroughly.