**Digestion in a Bag Lab: Lesson Plan**

*Adapted from Explorit Science Center’s Science Assembly Program at the University of California, Davis*

**Resources**

* Saltine Crackers
* Water
* Ziploc-style quart freezer bag
* Sponge
* Vinegar (soda or orange juice will also work)
* Scissors
* Trash can
* Spoon
* Pen or pencil
* Student worksheet with table and discussion questions
* Physiology & Pathology by Visible Body

\*This lab can be modified to be a group activity using large freezer bags.

**Objectives**

1. Understand the different steps of digestion.
2. Understand the difference between chemical and mechanical digestion.
3. Understand the roles of saliva and stomach acid in digestion.

**Introduction**

15 minutes: Begin by reviewing the different components and stages of digestion.

If you choose to have the students conduct self-study, you may instruct them to explore the Gastrointestinal Tract lesson. Students should also view the Peristalsis animation and the Absorption animation in the Physiology & Pathology app by Visible Body.

You may choose to review the digestive system with your students. All the underlined items below can be found in the Gastrointestinal module of the Physiology & Pathology app by Visible Body.

 Let’s review some important structures of the gastrointestinal tract:

* The first structure of the gastrointestinal tract is the mouth (oral cavity). Food enters the mouth, where chewing begins mechanical digestion. Food is combined with saliva and swallowed. Each swallowed mass is called a bolus.
* The swallowed food moves down the esophagus via muscular contractions, which produce a wave-like action called peristalsis.
* The esophagus delivers the food to the stomach. In the stomach, the stomach wall secretes digestive acids that help to break down the food. The food in the stomach is now referred to as chyme.
* Next, the chyme enters the small intestine. In the small intestine, enzymes from the pancreas and bile from the liver help to further break down chyme. The chyme moves through the small intestine via peristalsis. Most of the absorption of nutrients takes place in the small intestine.
* The contents from the small intestine enter the large intestine. In the large intestine, water is removed from the contents and a solid waste is formed.
* That waste is then stored in the rectumuntil it is ready to be excreted through the anus.

**Activity**

30 minutes: This activity consists of two parts. The first part of this activity involves demonstrating mechanical digestion, chemical digestion, absorption of nutrients and water, and elimination. Students should keep in mind what each of these everyday objects in the activity represents.

Direct the students to Inflammatory Bowel Diseases and GERD assets in the Gastrointestinal unit of Visible Body’s Physiology & Pathology app.

The second part of this activity consists of answering reflection questions.

**Discussion Questions**

1. Describe the pathological changes hallmarked in inflammatory bowel disease. What are some examples of inflammatory bowel diseases?
2. What is the difference between mechanical digestion and chemical digestion? Where do each of these events take place?
3. What are the three parts of the small intestine?
4. What is the importance of the enzymes and acids released by the stomach? What causes these contents to enter the esophagus in GERD?
5. What accessory organs are involved in digestion?