

## *Understanding by Design Template: Lesson Planning Block III*

**Teacher:** Erica Stickler

**Grade:** Grade 5

**Subject:** Science: Taught Lesson 2

**Date:** April 10

### **Desired Results**

**CCSS and/or NYS Learning Standards** (*Rubric Line 35 and 39*):

**NYS MST Standard 4: Science Content**

Performance Indicator 5: Organisms maintain a dynamic equilibrium that sustains life.

5.2a- Food provides molecules that serve as fuel and building material for all organisms. All living things, including plants, must release energy from their food, using it to carry on their life processes.

5.2b- Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water. Each substance is vital to the survival of an organism.

**NTSLS for Health, Physical Education and Family and Consumer Sciences:**

\* Standard 1: Students will understand human growth and development and recognize the relationship between behaviors and healthy development.

\* Students know how basic body systems work and interrelate in normal patterns of growth and development.

**Essential Questions** (*Rubric Line 36*):

In what ways does the stomach further digestion?

**Enduring Understandings**(*Rubric Line 36*):

*Students will understand that...*

Students will understand that the components of the stomach work together to further the digestion process.

Students will understand that each component maintains a specific function that are interdependent on one another.

**Objectives** (*Rubric Line 31*):

*Students will be able to ...*

See the process of digestion through the use of a physical model/experiment.

Identify the stomach through various representations (Ziploc bag, crackers, soda) and explain how chemical and mechanical digestion work.

### **Assessment Evidence** (*Rubric Line 32*)

**Performance Tasks:**

Students will be asked to follow along with the SMART Board presentation regarding the digestive system, specifically the stomach for this lesson. The students will then listen to part of *Guts*, a book

written by Seymour Simon to review information regarding the stomach, its function, and its components. To conclude, students will complete the “Stomach Juices” experiment and will be asked to answer the questions that correspond.

**Other Evidence:**

Informal Assessment: Questioning/Discussion  
Verbal Checks for Understanding

**Areas of Child Development** (*Rubric Line 28*)

**Cognitive** development is supported because students are reviewing information to prepare for their unit exam on the digestive system.

**Social** development is supported because students will be interacting with peers throughout the experiment and well as in discussion before and after.

**Linguistic** development is supported because students will be reading the story problem scenario, and writing to complete the hypothesis, observation data, and questions on the assessment worksheet.

**Learning Plan**

**Classroom Arrangement:**

For this lesson, students will begin on the carpet in front of the SMART Board in a location of their choosing, for the introduction story problem, discussion, and reading of excerpts from the book. Then, students will return to their assigned seats at tables of four or five to complete the experiment. As students are working they will remain at their seat to complete the “Stomach Juices” worksheet. Finally, students will turn in their worksheet, and return to the carpet to discuss the lesson and answer the questions to clarify any discrepancies.

**Materials:**

Story Problem- Kids Health  
SMART Board  
*Glue* book written by Seymour Simon  
“Stomach Juices” Worksheet  
Ziploc Bag  
Crackers  
Soda  
Pencil

\*Note: Both a book, as well as a modified form of literature (Kids Health excerpt) is used to enhance the appeal of the lesson and present a story problem for the students. In this lesson, the Kids Health excerpt is from the website and will be displayed on the SMART Board as well as the presentation for students, who have difficulty seeing, reading small font, or are seated farther in the back of the classroom.

## Learning/Instructional Activities (Rubric Lines 29, 33, 34, 39):

### **Anticipatory Set** (Rubric Line 38):

\* Begin by walking into the room clenching my stomach dramatically. While walking around say in a very loud and moaning voice: "Ouch! My stomach hurts really badly! I wonder why..."

### **Procedure**

#### **Story Problem** (Rubric Line 40):

\* Read aloud the following prompt provided by *Kids Health*:

- You wake up in the middle of the night with stomach cramps, clutch a pillow and curl your body around it. That helps a little and you go back to sleep. But in the morning, the pain is still there. "Ouch, I have a stomachache!" you tell your mom or dad. That's when the questions begin: What is going on?

\***Note:** This prompt was chosen to appeal to student interests and can be relatable to a student in the fifth grade, thus presenting the children with a real life scenario to think about during the lesson.

#### **Discrepant Event:**

Prior Knowledge Activation: Students may have misconceptions regarding what causes various instances of stomach pain and aches. Students should brainstorm with their peers about what may cause the pain, specifically focusing on food as a main idea. What attributes regarding different types of food may cause the stomach to hurt? How does the stomach aide in digestion? (Bloom's: Synthesis, Application)

- *You might feel stomach pain for several reasons: \*Constipation, infection, appendicitis, and food!* Some kids get abdominal pain because they ate too much of something, ate a food that was too spicy or greasy, ate a food they have an allergy to, or ate food that sat around in the fridge for too long and went bad. The pain is the body's way of telling you that your stomach and intestines are having a tough job breaking down or digesting this food. For example, some people have lactose intolerance, which means they have a tough time digesting lactose, a type of sugar found in milk and other dairy foods. Whatever the cause, funky foods can quickly make your tummy feel funky! (Kids Health)

#### **Investigation:**

After students conclude the discrepant event, I will read a few pages from the book *Guts* written by Seymour Simon. The purpose of this will be to refresh student's prior knowledge regarding the stomach, its function, and components to help with the exploration and experiment portion of the lesson. The story also includes real life images of inside the digestive system:

- Page 2: Review
- Pages 9-10: Stomach
- Pages 11-12: Gastric Juices

- Pages 13-14: Chyme/Muscles
- Additional pages if time allows

### **Stomach Juices Experiment:**

At the conclusion of the book, students will return to their seats. Hand out the Ziploc bags, one per student, crackers, soda, as well as the Stomach Juices worksheet. Begin by asking students to hypothesize what they think will happen when all of the ingredients are added together.

1. Give a few crackers to each student. Instruct students to crush the crackers slightly as they put them into the bag. Ask: “What does this represent?” \* Mechanical Digestion by the mouth
2. Have each student pour a small amount of soda into their bag and seal the bag tightly to be sure not to leak. If leaking occurs, have the students double bag the materials.
3. The students then squeeze the bag for one minute.
4. Students will write down their observations of what they see in the bag. By now, the soda will have dissolved the crackers, turning the mixture into slush.

\* As students are mixing discuss what is happening to the crackers and soda, and how this relates to the stomach, its function, and its juices.

5. When students are finished ask students what they think happened.
6. Have students answer the questions on the “Stomach Juices” Worksheet as a closing assessment.

### **Resolve the Discrepancy:**

After students have turned in their questions, bring them back to the carpet. I will then go over the questions with them. The answers are provided below:

1. Ziploc Bag: Stomach; a muscle that squeezes the food
2. Crackers: Turns to liquid, represents the food becoming ready to be absorbed into the small intestine and/or blood stream
3. Soda: Gastric/Stomach Juices
4. Breaking apart crackers: mechanical digestion
5. Chemical Digestion: order for food to be digested in the body, the food is mixed with acidic juices in the stomach. The process begins in the mouth when the food is chewed, then travels down the digestive tract. Food is broken down as it travels, and eventually moves to the small intestine where the process is finished. (Students should answer along the same lines; answers will vary)

### **Assessment (Rubric Line 32):**

For this lesson, the assessment will be the questions in the “Stomach Juices” worksheet distributed to kids in the beginning of class. The hypothesis and observations may be completed in small groups, however the final five questions must be completed individually and turned in upon completion.

**Evaluation of Teaching:** N/A

### References

Durani, Y. (February 2014). Belly Pain. *Kids Health: For Kids*. Retrieved from

[http://kidshealth.org/kid/ill\\_injure/aches/abdominal\\_pain.html#](http://kidshealth.org/kid/ill_injure/aches/abdominal_pain.html#)

Simon, S. (2005). *Guts: Our Digestive System*. New York, NY: Harper Collins.

# Stomach Juice Activity

## Materials:

- Ziploc Bag
- Crackers
- Soda
- Muscle!



## Hypothesis:

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## Procedure:

1. Place crackers in bag
2. Pour soda into bag
3. Squeeze for 1 minute!

## Observations:

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Questions:

1. What does the Ziploc bag represent? \_\_\_\_\_
2. What do the crackers represent? \_\_\_\_\_
3. What does the soda represent? \_\_\_\_\_
4. When we break apart the crackers before putting the soda in the bag, what type of digestion is represented? \_\_\_\_\_
5. How does the stomach break down food chemically? Be specific!

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SMART Board Presentation:

# Stomach Juices Experiment



You wake up in the middle of the night with stomach cramps, grab a pillow and curl your body around it. That helps a little, and you go back to sleep. But in the morning, the pain is still there. "Ouch, I have a stomach ache!" you tell your mom and dad. That's when the questions begin: What is going on?



Why might you feel stomach pain?



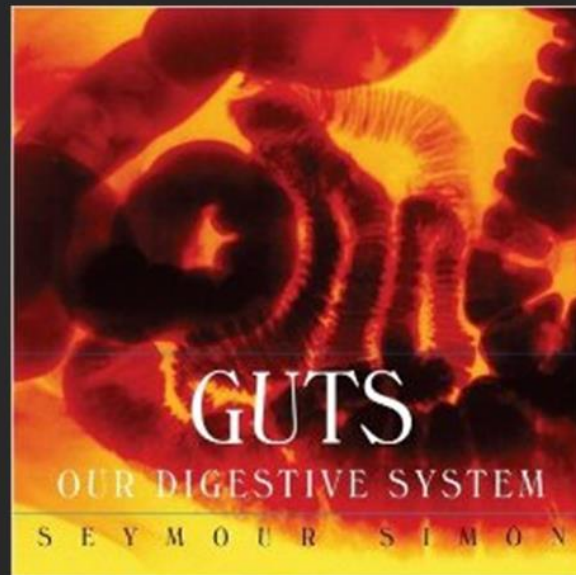
**Answer:**

- \* Constipation
- \* Infection
- \* Appendicitis
- \* Food!



- *Eat too much*
- *Spicy/Greasy*
- *Allergies*
- *Spoiled Food (lactose intolerance)*

Let's take  
a closer look!



## You will need:

- \* 1 Ziploc Bag
- \* Crackers
- \* Small Soda (1 per table)
- \* "Stomach Juices" Worksheet

## Hypothesis:

What do you think is going to happen and why?



## Observation:

What do you notice?

What is happening?



## Review:

1. What does the Ziploc bag represent?

2. What do the crackers represent?

3. What does the soda represent:



(click images to reveal answer)

4. What do we show when we break apart the crackers?

5. How does the stomach break down food chemically?