

2001 National Teacher Training Institute

Grade 7

From One End to the Other

Master Teacher

Becky Haigler

Time Allotment

Four 45-minute class periods

Overview

The digestive system is comprised of a group of organs working together to break down foods into a form usable by the human body. This system is composed of organs through which the food passes (alimentary canal) and organs such as the liver, pancreas, and gall bladder that provide chemical substances such as enzymes needed for chemical digestion. The organs that make up the alimentary canal are the mouth, esophagus, stomach, small intestine, large intestine, and anus.

Digestion begins in the mouth, where mechanical (digestion such as the tearing, cutting, and grinding of food by the teeth) and chemical (type of digestion that breaks down large molecules into molecules small enough to dissolve in water and pass through cell membranes) digestion occurs. From here the food is then moved down the esophagus by a process called peristalsis (the wavelike contraction of the walls of the esophagus that forces the food through the esophagus). Once food leaves the esophagus, it enters the stomach through the cardiac sphincter (a circular valve of muscle that works like a draw-string on a sack). The stomach, a j-shaped organ, continues the chemical and mechanical digestion of food. Digestive enzymes secreted by the gastric glands in the lining of the stomach continue the further chemical digestion of food. Once the food has been changed into a thick liquid known as chyme, it moves from the stomach through the pyloric sphincter into the small intestine. Secretions from the pancreas and liver aid in completing the chemical digestion. The capillaries located in the villi of the small intestine absorb nutrients (digestive

foods). Materials not absorbed by the villi will then enter the large intestines, where reabsorption of water occurs, producing semisolid feces. Waste will then be eliminated from the body through the anus.

Through the activities presented in this lesson, students will become more familiar with how our food is broken down mechanically and chemically. Students will also be able to trace the food through the alimentary canal.

Subject Matter

Life Science

Learning Objectives

Students will be able to:

- ✎ trace a piece of food through the alimentary canal
- ✎ differentiate between mechanical and chemical digestion
- ✎ explain the process of peristalsis
- ✎ describe the function of the mouth, esophagus, stomach, small intestine, large intestine, rectum, liver, pancreas, and gall bladder

South Carolina Standards

(These Standards can be found at <http://www.state.sc.us/sde/educator/crindex.htm>.)

Life Science—Grade 7

- II. A. 4.
 - f. *Illustrate the parts of the digestive system.
 - f. *Describe the functions of the mouth, esophagus, stomach, small intestine, large intestine, rectum, liver, pancreas, and gall bladder.

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Media Components

Video

The Inside Story with Slim Goodbody, Lesson 3: Down, Down, Down looks at the human digestion system. This program is targeted at audiences younger than the seventh grade. The graphics, however, are an excellent tool to explain the digestive process to older students. When using the video, mute the sound and just use the pictures on the screen.

Web Sites

A Look Inside the Human Body. Type in *Yahooligans.com*. In the go box (search), type in digestive system. Scroll down to the ninth bullet and click on *A Look Inside the Human Body*. Next, click on the *Digestive System*. This Web site lets you take a closer look at the major systems of the human body and how they work.

Digestive System. Type in *Yahooligans.com*. In the go box (search), type in digestive system. Click on the first hit or bullet, *Digestive System*, a diagram and overview of the different parts of the digestive system and what they do.

Digestive System. Type in *Yahooligans.com*. In the go box (search), type in digestive system. Click on the third hit or bullet, *The Digestive System*. Here you will find diagrams and descriptions of the parts of the system and their functions.

Materials

Per student:

1 Tootsie Roll
graph paper
Diagram of the Digestive System (Activity Sheet 1)
Graphic Organizer for the Process of Digestion (Activity Sheet 2)
paper and pencil

Per class:

Disgusting Digestion by Nick Arnold

For each group:

a supply of five different colors of yarn
meter stick
scissors
masking tape

Prep for Teachers

- ✍ Prior to teaching the lesson, bookmark all Web sites that will be used during the lesson.
- ✍ Cue the videotape to the first excerpt and familiarize yourself with where the mute button is on the TV set.
- ✍ Make sure you have enough yarn and Tootsie Rolls for students.
- ✍ Have access to a stopwatch or clock with a second hand to time students for the activity under **Step 2, Learning Activities**.

Introductory Activity: Setting the Stage (Day 1)

Step 1

To prepare your students for the journey they are about to enter through the digestive system, the following excerpts from *Disgusting Digestion* by Nick Arnold will excite them and motivate them into learning. Begin reading on page 5 with “Here’s a disgusting science story . . .” and end on page 7 with “Have you got the stomach for some really disgusting discoveries?”

Once you have finished reading the introduction, go to page 16 and begin reading with “Would want to inspect . . .” and end on page 24 with “Fighting violent crime seemed easy after this.”

Step 2

Another way to excite your students is by telling them interesting facts about the digestive system found at *Yahooligans.com*. In the go box (search), type in digestive system. Click on *A Look Inside the Human Body*. Next, click on the *Digestive System*. At the bottom of the page, click the icon at the end of the sentence that says, “To see some amazing facts about the digestive system.” This takes you to

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Amazing Facts. Review the information found here with the students.

Step 3

Focus for Media Interaction: Students will be introduced to mechanical and chemical digestion. Type in *Yahooligans.com*. In the go box (search), type in digestive system. Click on the first hit or bullet, also called *Digestive System*. This has an illustration of the mouth. Click on one of the green dots at the mouth and it will tell you more about the functions of the mouth. Show students the two different types of digestion that occur in the mouth.

Learning Activities

Step 1

Focus for Media Interaction: Ask students to look for types of digestion that occur in the mouth. Give out graphic organizer and diagram of the digestive system (Activity Sheets 1 and 2).

Insert the *Slim Goodbody* video but keep the volume muted. START the video at the beginning and STOP the video after the children have finished flossing and brushing their teeth for the third time and Slim is singing “. . . so I’ll keep you clean and I won’t miss use you.” Then to make sure you are at the right spot, you’ll hear Slim say, “You know your mouth. . .” and Slim is standing next to a very large mouth. PAUSE the video and leave it at this spot until the next day’s lesson activities. Students are to fill in the appropriate space on both the diagram and the graphic organizer with the word of mouth.

Step 2

Give each student a Tootsie Roll. (Be ready to time the students.) Have them put the Tootsie Rolls in their mouths and not chew. They will be experiencing chemical digestion. Once the Tootsie Roll has been completely digested, tell the students to raise their hands so that the time can be recorded. Take the data and graph the times, comparing boys

and girls, the class in general, or all of the classes. This will get the students interested in digestion.

Learning Activities (Day 2)

Step 1

Focus for Media Interaction: See what digestive organs the students can name before viewing the lesson. Then insert the *Slim Goodbody* video again. PRESS MUTE. The students do not need to hear *Slim Goodbody*. The illustrations on the screen are what’s important. START the video where you left off yesterday (after the children have finished flossing and brushing their teeth and you see Slim standing next to a very large mouth). FAST FORWARD to where you see the esophagus and Slim says, “The trip the food takes . . .” As soon as you see the full digestive system, PAUSE.

Focus for Media Interaction: Take a dry-erase marker and label the parts of the digestive system. Once that is done, turn the TV off but leave the video at the same location for a review later.

Step 2

Focus for Media Interaction: At the following Web site, students are to look for more information on the digestive system in order to add that to their graphic organizers.

Type in *Yahooligans.com*. In the go box (search), type in digestive system. Click on the first hit or bullet, which is *Digestive System*. It will take you to a diagram of the digestive system and the system’s parts light up when they are clicked on. All parts should have a green dot. When those dots are clicked on, they will demonstrate what each organ does. Have students add any missing information to their graphic organizers.

Step 3

To review what the students have learned, type in *Yahooligans.com*. In the go box (search), type in

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digestive system. Click on the third hit or bullet, which is called *The Digestive System*.

Focus for Media Interaction: Have a student walk a piece of food through the digestive system on the computer screen.

Learning Activities (Day 3)

Once students feel comfortable with the organs and their functions, they can measure their digestive systems.

Step 1

Students will take a piece of purple yarn and measure from the corner of their mouths to their ears to get the length of their mouth, and cut.

Step 2

Students will use yellow yarn to measure from the bottom of their chins to where their ribcages separate to get the lengths of their esophagi, and cut.

Step 3

Students will use a piece of red yarn to measure from their thumbs to their pinkies to get the length of their stomach, and cut.

Step 4

Students will use blue yarn to measure from their heads to their feet and multiply that by four to get the length of their small intestines, and cut.

Step 5

Students will use orange yarn to measure from their heads to their feet once to get the length of their large intestines, and cut.

Step 6

Once these measurements have been made and the yarn cut, students will connect the pieces of yarn using masking tape.

Step 7

Students will then measure the lengths of these

organs using centimeters to get the lengths of their digestive tracts

Step 8

Turn the TV back on (the video has been left exactly where you stopped yesterday) and have some of the students come up to the *Slim Goodbody* screen and label the organs. This could serve as an informal evaluation.

Culmination Activity/Assessment (Day 4)

Students will be given a rubric (Activity Sheet 3) prior to this activity. Students will need to choose from one of the two prompts to write a narrative about the digestive system. The assignment will be found on the rubric. This assignment ties the entire lesson together and can be used as another form of assessment.

Cross-Curricular Extensions

English: Read *A Ride You Will Never Forget* (a ride through the digestive system).

Read *Joey Pigza Swallowed the Key* by Jack Gantos.

Math: Measuring the digestive tract.

Health: Study some of the gastrological diseases.

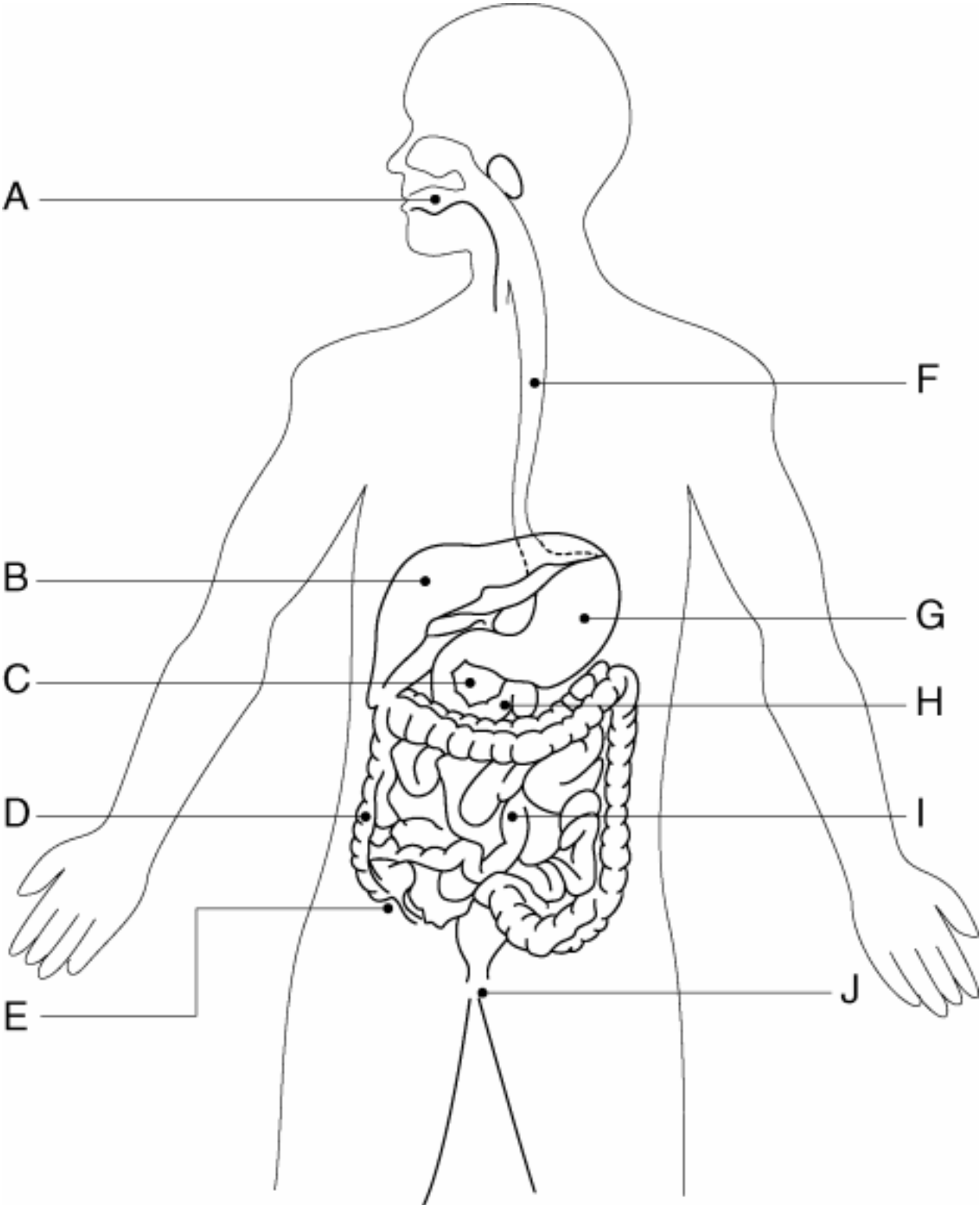
Social Studies: Examine the timeline of the changes in medicine and discoveries of digestive diseases.

Community Connections

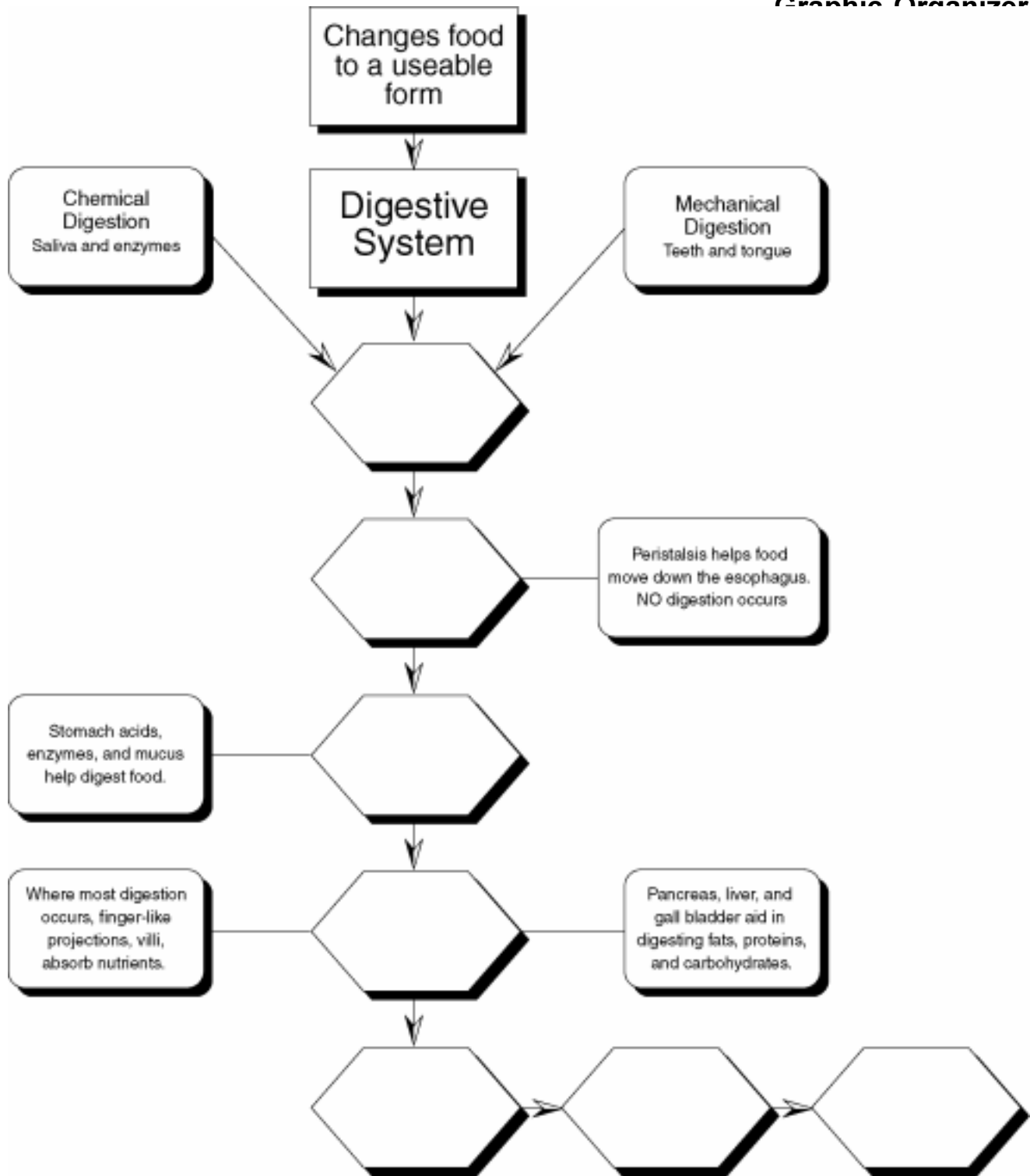
Invite the following people to speak to the class:

- ✍ a gastrointestinal doctor
- ✍ a person who has had a colonoscopy
- ✍ someone with an eating disorder
- ✍ guidance counselor

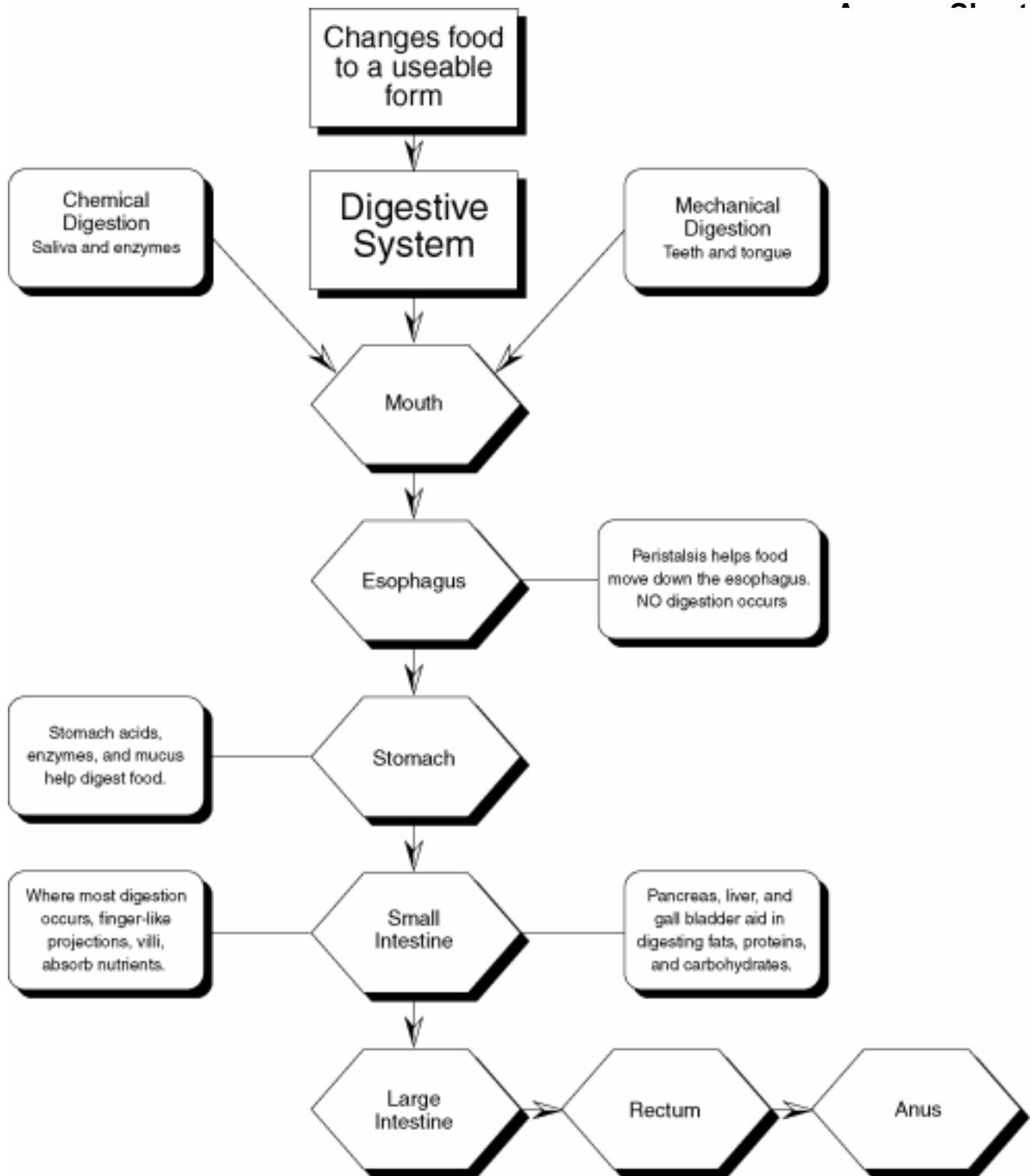
Activity Sheet 1
Diagram of the Digestive System



Activity Sheet 2 Graphic Organizer



Activity Sheet 2A
Graphic Organizer



Activity Sheet 3 Digestive Paper Rubric

Name _____

Title of Story _____

PROMPT 1: A young child you know has asked you where his food goes once he swallows it. Write a story for this child in which you explain how the digestive system works. Be creative and informative, using a tone that would catch the attention of this child.

PROMPT 2: You are sitting in class and chewing the top of your pen while you are reading. All of a sudden, a loud announcement comes on, startling you and causing you to swallow the top. Write a creative story in which you explain how nature takes its course.

GRADING GUIDE

Content and Development	16	12	8	4
Follows digestive tract accurately				
Applies appropriate processes and activities that occur within organs				

Organization	8	6	4	2
Clear organizational strategy is present				
Logical progression and smooth transition between ideas				
Clear introduction, body, and conclusion				

Voice	6	4	2
Creative, imaginative approach			
Uses precise, vivid vocabulary appropriate for audience			
Phrasing is effective, not predictable			
Varied sentence structure—not all simple sentences			
Strongly aware of audience; tone is consistent and appropriate			

Conventions	4	3	2	1
Rules of standard English are applied consistently				
Sentences are constructed correctly				
Few errors in capitalization, punctuation, and spelling				
Errors, when present, do not detract from the writer’s meaning				

Score x 3	_____			
+				

Prewriting—Graphic Organizer	5	4	3	2
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Total Score	_____			
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Teacher’s Comments _____