

**Project 3.2.2 and Project 3.2.3: Student Resource Sheet**

Use the information found below to guide your research and to design your model. Take notes, answer questions, and complete sketches in your laboratory journal.

**1. Oral cavity, pharynx, (must also include accessory organs such as salivary glands, tongue, and teeth)**

* What is the oral cavity and what does it contain?
	+ The oral cavity is the first section of the mouth, which is bordered in the front and to the sides by the two alveolar arches containing the teeth.
* What is the function of the salivary glands?
	+ The function of the salivary glands is to produce saliva, which plays a role in starting food digestion and provides continuous moisture for the mouth.
* What is the function of the tongue?
	+ The tongue is required for chewing food, swallowing food, and speaking.
* What is a bolus?
	+ A bolus is a small rounded mass of substance, especially of chewed food at the moment of swallowing.
* Where are the soft and hard palate located and what are their functions?
	+ The soft palate, which is responsible for closing off the nasal passage and airway when you are swallowing, is the back part of the roof of the mouth. The hard palate is the front part of the mouth’s roof and is needed for feeding and speaking. The hard palate makes a sort of vacuum to force liquids into the mouth to later be ingested.
* What mechanical and chemical digestion occurs in the oral cavity?
	+ The mechanical digestions that occur in the oral cavity are chewing and mastication (to grind, crush, and chew in preparation for swallowing) of foods to break down. Chemical digestions that occur in the oral cavity are that enzymes found in saliva begin the breaking down of foods.
* What mechanisms are in place to make sure food does not “go down the wrong tube” and into the windpipe?
	+ The epiglottis (a flap of skin separating the esophagus from the trachea) prevents food and liquid from going to the wrong place.

**2. Esophagus and Stomach**

* What is peristaltic movement and how does it function in the esophagus?
	+ Peristaltic movement is constriction and expansion of esophageal muscles. It also occurs in the stomach and intestines. It functions in the esophagus when food is taken in.
* Does any digestion of food occur in the esophagus?
	+ Yes, saliva helps to break down some foods with starch.
* What are the primary functions of the stomach?
	+ The primary function is to secrete acid and enzymes for food digestion.
* What is chyme and how does the stomach mix this material?
	+ Chyme is a thick semifluid mass of partially digested food. Muscles in the stomach contract and grind to help mix this material.
* What role does the stomach play in decontaminating the incoming food matter?
	+ The stomach releases enzymes that kill bacteria and balance pH levels in food while also breaking down and digesting it.
* What cells in the stomach function to form enzymes and acids?
	+ Stomach cells chief and parietal form enzymes and acids {pepsin and hydrochloric acid (HCI)}.
* Why doesn’t gastric juice digest the inside of the stomach?
	+ The stomach has a mucous membrane on the inside that is able to withstand the gastric juice it encounters.
* What are sphincters and how are they related to the stomach?
	+ Sphincters are the two openings in the stomach.
* What mechanical and chemical digestion occurs in the stomach?
	+ As far mechanical digestion goes, the stomach churns and grinds to break down food for digestion. The stomach also releases a chemical called gastric acid, which helps to break down food as well.

**3. Small Intestine and Large Intestine**

* What are the three sections of the small intestine and what role does each section play in digestion or absorption?
	+ The first section is the duodenum, which breaks down the food halfway, and the next sections are the jejunum then the ileum, and they both finish the work of the duodenum by fully breaking down the food.
* What is the pH within the small intestine and how is this pH maintained?
	+ The smaller intestine has a pH of 6. Substances from the stomach that come into the intestine are very acidic, so the pancreas, gallbladder, and the lining of the intestine secrete a buffer to lower acid levels.
* Where do bile and pancreatic enzymes enter the small intestine?
	+ Bile and pancreatic enzymes enter from the top of the small intestine known as the duodenum.
* How does food move through the intestines?
	+ Enters the small intestines from the duodenum to the jejunum to the ileum and to the cecum to the colon to the rectum.
* What enzymes act inside the small intestine and what are the functions of these enzymes?
	+ The three enzymes are: Amylase- breaks down starches to smaller carbohydrate molecules. Protease- breaks down protein to amino acids. Lipase- breaks down dietary fats into fatty acids and glycerol.
* What is the function of the large intestine in relation to digestion?
	+ The large intestine absorbs water from solid waste product. The intestine also stores waste material until they can be thrown out of the body.
* What are the three sections of the large intestine and what roles does each play in digestion or absorption?
	+ Cecum- takes in digested liquids from the ileum and passes it to the colon.

Colon- reabsorbs water and, when it is needed, salts.

Rectum- place where the leftover waste sits until it get emptied through the anus.

* How does the large intestine help maintain a water balance in the body?
	+ It digests and removes water from feces, or the remains of food.

**4. Pancreas, Liver and Gallbladder**

* What are the size and the location of the pancreas?
	+ The pancreas, which is approximately six inches long, is located behind your stomach on the right side of the abdomen.
* What are the different functions of the pancreas, and how is the pancreas directly related to digestion?
	+ The pancreas is responsible for both endocrine and exocrine functions. It also releases enzymes to break down food and then converts the food into energy for the body.
* How does the pancreas connect to the rest of the digestive system?
	+ The pancreas is connected to the first part of the small intestine called the duodenum.
* What enzymes are produced by the pancreas and what are their functions?
	+ The pancreas secretes endocrine and exocrine hormones, such as amylase, that are used to aid in the breaking down of carbohydrates, proteins, and fats the body takes in.
* How is insulin related to the digestive system?
	+ Insulin is a hormone secreted by the pancreas, an organ in the digestive system. It is used to maintain healthy glucose levels in the body.
* What is the size of the liver and where is it located?
	+ In a five year old, the liver is approximately 5 centimeters, but as you grow it does as well, making it the largest organ in the body with a weight of 1.25 to 15 kilograms. It is located on the right side of your abdomen behind the ribs.
* How does the liver function in relation to digestion?
	+ Your liver is how nutrients taken in by the small intestine are processed and stored. It also releases bile salts to help break down food.
* What are other functions of the liver in the body?
	+ The main function of the liver is to clear waste, hormones, drugs, and any other toxins from your body. The liver also produces essential sugars, fats, and proteins.
* What is the relationship between the liver and the gallbladder?
	+ The liver and gallbladder, located next to each other, are connected by bile ducts.
* What is the function of bile and where does it enter the digestive tract?
	+ Bile salts released into a special duct by the liver is responsible for breaking down food.