It may be easier to first sculpt all of the organs on the gastrointestinal tract and then go back and add any accessory organs.

ACCURACY OF SIZE AND PLACEMENT COUNTS!

Students can build the palate, the roof of the mouth, above the mouth and below the nasal cavity. A projection of this tissue known as the uvula hangs down from the middle of the soft palate over the roof of the tongue. The **palate and uvula are shown in white** and the **tongue should be constructed using terra cotta clay**. The tongue is a very powerful muscle. The tongue extends back to the hyoid bone, its bony attachment. Students may want to add salivary glands and teeth to the oral cavity. The pharynx directs food into the esophagus and sits directly behind the palate and the tongue (it is the open space you see when you open up and say “ahh”). The tube runs from the mouth and halfway down the neck where it becomes the esophagus. In this model, the pharynx and the esophagus are shown in pink. Make sure to hollow out a funnel at the top of the pharynx to show the opening of the cavity.

Build the J-shaped stomach and attach the organ on the left side of the abdominal cavity. The esophagus pipes directly into the stomach. The pylorus, the region of the stomach that attaches to the duodenum, points over to the side under the rib cage. In this model, the stomach has been sculpted in **pink clay**.

The duodenum, the first part of the intestine, attaches to the pylorus and forms a letter “C” so it can curve around the head of the pancreas. All of the organs of the GI tract can be constructed in the same color of clay to show the direct pathway of food. In this model, the small intestine should be constructed out of **blue clay** for emphasis.

Humans have approximately 18 - 20 feet of small intestine. Use a clay extruder or roll out thick spaghetti stands for the remainder of the small intestines in **blue clay**. About 6-8 feet of intestine was used to construct the organ in the picture belowTwist the long strand back and forth to create the remaining two parts of the intestine, the jejunum and the ileum. Attach the twisted intestine to the end of the duodenum and fill the abdominal cavity with the organ. Secure the intestine on the back support and on the ilium of the pelvic bone.

Roll out a thicker tube to represent the large intestine use **Green clay**. Approximately 14-16 inches of orange clay was used to create the intestine shown below. Attach the ileum of the small intestine to the cecum of the large intestine. The cecum is shown as a thicker pouch at the beginning of the large intestine. Wrap the intestine upward to represent the ascending colon, wind the clay across the abdominal cavity to form the transverse colon, and bend the clay downward to represent the descending colon. Bring the clay back behind the small intestine and next to the sacrum to represent the rectum and the anus.

The pancreas is then constructed using **yellow clay**. The organ takes the shape of a sideways comma. Reinforce that this organ is part of the digestive system, supplying enzymes needed to break down food, and part of the endocrine system, producing the hormone insulin. The pancreas fits inside the “C” shape of the duodenum and extends across the abdomen. You may have to pick up the duodenum and hold the stomach in place to secure the pancreas.

The liver is located in the upper abdomen under the diaphragm. This large organ is constructed using **terra cotta clay.** A small gallbladder is assembled using **green clay** and is placed in the hollowed-out underside of the liver.

Next, use toothpicks to show where enzymes are released during the digestive system. Include: lipase, pepsin, amylase, trypsin, and protease.

Each group should be assigned a different “bite of food.” Use foods that are representative of different macromolecules. Possible items include bread, butter, steak or other protein, candy, or celery (to discuss hard to digest foods high in cellulose). As students give their presentations and trace the path of their bite of food, the class should see the fate of all types of macromolecules and begin to appreciate the specificity of enzymes in the digestive tract. Students may use toothpick flags to label the location and function of key digestive enzymes. These flags can be removed at the end of the activity or left in for further study.