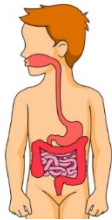


## BIO 26 PAL Worksheet

### Week 12 (#1): The Digestive System

After you take a bite of your favorite food, it takes a long trip through your digestive system. At each step along the digestive journey, food is modified and broken down into usable pieces. Today, your group will be investigating the form and function of digestive system and accessory organs so you can gain a better understanding of the fate of food after it enters your body.

1. Start by drawing a very simple digestive system on your whiteboard (see example below, body not necessary). It doesn't even have to show accessory structures yet – that's for next week. Make the drawing as tall as your whiteboard but place it on either side of the board so you have room for labels, arrows, and notes. Decide what that bite of your favorite food is and place it in the mouth.



2. Next, label the main organs/structures of the digestive system. Include the main anatomical regions of the small and large intestines. Finally, add and label four important sphincters regulating the movement of your bite through the digestive system.
3. Let's focus on the big picture now. Discuss the following with your group members:
  - a) What functions shared by all organs/structures of the digestive system allow your bite to travel from mouth to anus? Hint: you are eating a dry piece of bread during inversion therapy (you're hanging upside down to stretch your spine).
  - b) Name the layers of your digestive system organs responsible for these functions.
4. Your digestive system breaks down and absorbs nutrients from your favorite bite to use for energy, growth and cell repair. Let's see how that works! It's time to include the liver and pancreas in your drawing.
  - a) Which three macronutrients are likely contained in your favorite bite?
  - b) Where and with the help of which enzymes are these macromolecules broken down? Name and place enzymes synthesized/found in each digestive structure/organ in your drawing (use a specific color for all enzymes to distinguish them from hormones).
  - c) At what point (where in your digestive tract) are all your macronutrients broken down?
5. In order to move your bite and all the following bites through your digestive system in an organized fashion, hormones are released. Use a new color for hormones.
  - a) Add two hormones released by endocrine cells of the stomach to your diagram. Use arrows to indicate their effect on the digestive system (e.g. increasing/decrease of digestive enzyme X; opening/closing of sphincter X). Above the arrow use (+) for increase/opening and (-) for decrease/closing.
  - b) Add two hormones released by endocrine cells of the small intestines to your diagram. Repeat the process explained under a).

Bonus: does hormonal control of digestive juices and sphincters allow your favorite bite to be digested efficiently? Explain.