Digestive System Worksheet

Name_____________________

Section A: Introduction
The digestive system includes the digestive tract and its accessory organs, which process food into molecules that can be absorbed and utilized by the cells of the body. Food is broken down, bit by bit, until the molecules are small enough to be absorbed and the waste products are eliminated. The digestive system prepares nutrients for utilization by body cells through six activities, or functions.

- **Ingestion** - take in food through the mouth.
- **Mechanical Digestion** - large pieces of food have to be broken into smaller particles … begins in the mouth with mastication (chewing) and continues with churning and mixing actions in the stomach.
- **Chemical Digestion** - uses water and digestive enzymes to break down the complex molecules … enzymes speed up the hydrolysis process.
- **Movements** - the food particles move from the mouth into the pharynx, and then into the esophagus … movement is deglutition (swallowing). Mixing movements occur in the stomach as a result of smooth muscle contraction. These repetitive contractions usually occur in small segments of the digestive tract and mix the food particles with enzymes and other fluids. The movements that propel the food particles through the digestive tract are called peristalsis -- rhythmic waves of contractions that move the food particles through the various regions in which mechanical and chemical digestion takes place.
- **Absorption** - simple molecules that result from chemical digestion pass through the lining in the small intestine into the blood or lymph capillaries.
- **Elimination** - food molecules that cannot be digested or absorbed need to be eliminated from the body … indigestible wastes (feces) is released by defecation (elimination).

http://training.seer.cancer.gov/anatomy/digestive/

1. What occurs during mechanical digestion? _____________________________________________

2. What occurs during chemical digestion? _______________________________________________

3. What is mastication? ______________________________________________________________

4. When teeth and muscles physically break down food, this digestion is referred to as ______.

5. What is deglutition? ______________________________________________________________

6. What is peristalsis? ________________________________________________________________

7. What has to happen to molecules before absorption can occur? __________________________

8. Where does absorption of nutrients occur? ____________________________________________

9. What happens to indigestible materials? ________________________________________________

Section B: Upper GI Tract
1. How is food mechanically broken down in the mouth? _________________________________

2. How is food chemically broken down in the mouth? _________________________________

3. What is the function of saliva? ______________________________________________________

4. What enzyme is produced by the salivary glands and what is its function? _________________

5. What is peristalsis? _________________________________

6. What is the function of the uvula? ____________________________________________________

7. What is the function of the epiglottis? ________________________________________________

8. What is a bolus? __________________________________________________________________

9. What is the name of the tube that carries food from the pharynx to the stomach? ___________
10. What sphincter is located at the junction of the esophagus and the stomach?

11. What are the 3 parts of the stomach?

12. How does the stomach mechanically break down food?

13. What are rugae?

14. In the stomach, what chemically breaks down the food?

15. What is chyme?

16. What sphincter is located between the stomach and the small intestines?

17. In the lining of the stomach, gastric juice is a mixture of several chemicals that aid in digestion of our food. There are various cells that produce secretions. Identify these secretions and the function of each.
   a. Chief cells produce __________________. Function: ________________________________
   b. Mucous cells produce __________________. Function: ________________________________
   c. Parietal cells produce __________________. Functions: ________________________________
   d. Other gastric cells produce ________________ which is a hormone. Function: ________________________________

18. List the layers of digestive tract walls from deep to superficial. These layers are found in the esophagus to the colon.
   a. ____________________ (deepest layer)
   b. ____________________
   c. ____________________
   d. ____________________

19. Which layer contains the blood vessels, lymphatic vessels and nerve endings? ____________________

20. Which layer lines the lumen and secretes mucus? ____________________

21. What is the lumen? ____________________

22. What type of tissue makes up the muscularis externa?

23. The serosa is made of two layers: parietal peritoneum and the visceral peritoneum. Which layer is attached to the abdominal cavity? ____________________

24. ____________________ is an extension of the parietal peritoneum that maintains the position of the intestines.

25. Label the layers – muscularis externa, mucosa, submucosa, serosa

<table>
<thead>
<tr>
<th>Lamina propria</th>
<th>A.</th>
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<tbody>
<tr>
<td></td>
<td>B.</td>
</tr>
<tr>
<td></td>
<td>C.</td>
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<td>D.</td>
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</tbody>
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**Section C: Lower GI Tract**

1. What sphincter is found between the stomach and the small intestines? _______________________

2. What are the 3 parts of the small intestines? _____________________________________________

3. What is the main function of the small intestines? _________________________________________
   ___________________________________________________________________________________

4. In what part of the small intestines does the pancreas and liver release their secretions into? _______________________

5. What is the function of the villi and microvilli on the mucosa lining of the small intestines? ___________________________________________________________________________________

6. When food arrives at the ilium, what happens next? ____________________________________________
   ___________________________________________________________________________________

7. What is the function of the villi and microvilli on the mucosa lining of the small intestines? ___________________________________________________________________________________

8. Mucosa cells in the villi secrete the hormones, cholecystokinin and secretin. What is the function of these hormones? ___________________________________________________________________________________


<table>
<thead>
<tr>
<th>Organ</th>
<th>Enzymes/Secretions</th>
<th>Functions</th>
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<tbody>
<tr>
<td>Pancreas</td>
<td>Amylase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trypsin</td>
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</tr>
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<td></td>
<td>Lipase</td>
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<td></td>
<td>Nuclease</td>
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<tr>
<td></td>
<td>Sodium Bicarbonate</td>
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</tr>
<tr>
<td>Liver</td>
<td>Bile</td>
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</tbody>
</table>

10. What structure stores excess bile? _______________________

11. What sphincter is found between the small and large intestines? ___________________________________________________________________________________

12. What are the parts of the large intestines? ___________________________________________________________________________________

13. What is the function(s) of the large intestines? ___________________________________________________________________________________

14. The digestive tract lining contains goblet cells. What is the function of goblet cells? ___________________________________________________________________________________

15. Explain how food moves through the digestive tract. ___________________________________________________________________________________

16. Color and label the diagram of the digestive system.

- Stomach
- Liver
- Esophagus
- Pharynx
- Common Bile Duct
- Transverse Colon
- Descending Colon
- Ascending Colon
- Sigmoid Colon
- Jejunum
- Ileum
- Duodenum
- Pancreas
- Gall bladder
- Appendix
- Rectum
Section D: Nutrition and Metabolism

1. Essential nutrients are needed for the body to grow and maintain cellular processes. What is the function of the following nutrients?
   a. Carbohydrates - 
   b. Lipids - 
   c. Proteins - 
   d. Vitamins and Minerals - 

2. What is the difference between HDLs and LDLs?

3. ______________________ is the amount of heat produced by the body per unit of time when at rest.

4. What does your BMR (basal metabolic rate) reflect?

5. What factors influence your BMR?

6. How can you increase your BMR?

7. How can you decrease your BMR?

8. How is basal metabolic rate different from total metabolic rate?

9. Losing weight is very difficult for most people, but really it’s quite simple. Decrease your __________________ and increase your __________________. If you do this then you will lose weight.