Topic 4 Worksheet: Digestion

1. Indicate which of the following statements describe **mechanical or chemical transformations.**

a) Teeth grind up ingested food mechanical

b) Muscle contractions push food from esophagus to stomach mechanical

c) Enzymes in the stomach change protein into amino acids chemical

d) Stomach churns food and changes it into chime mechanical

e) Saliva changes starch into glucose chemical

f) Bile allows for the emulsion of fats mechanical

g)Saliva softens food mechanical

2. Fill out the following table:

Part of Digestive Tract	Mechanical Transformation	Chemical secretion
Mouth	Mastication	Salivary amylase
Esophagus	peristalsis	none
Stomach	Peristalsis and churning	Gastric juices, pepsin, HCl
Liver	none	Bile (not an enzyme)
pancreas	none	Pancreatic juices and insulin
Small intestine	Peristalsis and churning	Intestinal enzymes
Large intestine	peristalsis	none

3. Name the four stages of digestion.

Ingestion, digestion, absorption, elimination of waste

4. Define the following terms:

a) Digestion: transformation of complex molecules contained in food into simpler molecules that the body can use.

b) Absorption: nutrients obtained through digestion must be absorbed to be used by the blood and lymphatic system.

5. A) What do we call the transport of nutrients from the digestive tract to the blood and lymph? absorption

   B) Explain where this process takes place and how. Small intestine absorbs the simplified products of carbs, proteins and fats (simple glucose, fatty acids, glycerol, simple amino acids)
6. Why does digestion take place? for foods to be absorbed it must be broken down into smaller nutrients
7. **A)** Name the **enzymes that act on carbohydrates, lipids and proteins.**
   Carbs: salivary amylase and pancreatic and intestinal enzymes

   Protein: gastric, pepsin, (HCl) pancreatic and intestinal enzymes

   Fats: Bile, pancreatic and intestinal enzymes

   B) Where does the chemical breakdown of these nutrients take place?

   Carbs – mouth and small intestine

   Protein- stomach and small intestine

   Fat- small intestine

   C) What are the **simple nutrients** that are formed through digestion?

   Simple glucose, simple amino acids and fatty acids and glycerol

8. When food passes through the digestive system, it undergoes two types of transformations. Name the two types. Explain what happens to the food during these two types of digestion.
   Mechanical: breaks food down physically into smaller pieces or simply moves food through the digestive tract

   Chemical: the molecular breakdown of food molecules into their simplest form to make absorption possible
10. Identify the glands and organs described below:

a) produces bile liver
b) runs along the vertebral column and is connected to the stomach esophagus
c) produce saliva salivary glands
d) entrance to the digestive tract mouth
e) last section of the digestive tract ending at the anus rectum
f) J-shaped pocket located on the left side of the abdomen stomach
g) Glands dispersed throughout the inner surface of the stomach gastric glands
h) Organ common to the digestive and respiratory tract pharynx
i) Leaf shaped, located beneath the stomach pancreas

j) A long tube that is folded several times and is located in the abdomen small intestine
k) Digestive glands located in the small intestine intestinal glands

11. What happens during absorption of nutrients? The nutrients pass through the intestines and enter the blood and lymphatic systems to be transported to areas of the body where they are needed and provide energy.

12. Complete the following table:

Food	**Digestive enzymes that break this food down**	**Nutrient obtained**
Bread contains: carbs	- salivary enzymes - pancreatic - intestinal	Glucose
Steak contains protein	- pancreatic enzymes (insulin) - intestinal enzymes - gastric enzymes and pepsin	Amino acids
Mayonnaise contains fats	- intestinal enzymes - bile	Glycerol and fatty acids

13. What are the glands of the digestive system? Liver, pancreas, gastric glands, intestinal glands, salivary glands
14. Explain how the liver and pancreas play a role in digestion. Liver secretes bile which is important to emulsify fats and the pancreas secretes pancreatic enzymes and insulin.
13. What is the function of bile? Emulsify fats

14. What is the difference between a carbohydrate, a glucose molecule and a simple glucose molecule? Carbohydrate is the nutrient we initially absorb, glucose is when digestion has started, simple glucose is when the nutrient is ready to be absorbed.

15. Fill in the table by describing the physical breakdown occurring in each area.

Mouth	Esophagus	Stomach	Small intestine	Large intestine
Chewing and insalivation	Peristalsis	Peristalsis and churning	Peristalsis and churning	peristalsis

16. Fill in the table by stating all the chemical breakdowns that occur for each nutrient.

	Where 1st bd begins	Gland responsible	Enzyme secreted	Nutrient becomes
Carbs.	Mouth	Salivary	Amylase	Smaller chains of glucose
Protein	Stomach	Gastric glands	Pepsin and gastric juices	Smaller chains of amino acids
Fat	Small intestine	Liver	Bile	Small bits of fat

17. Why can protein only be absorbed in the small intestine and not the stomach?
It has not completed the digestion process until it has gone into small intestine

18. What structure is common to both the respiratory and digestive system? pharynx

19. List, in order, the structures that food would have to pass through within the digestive tract.

Mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum and anus

20. Answer the following questions bellow:

1. What is the end product starch digestion?
2. What is the end product protein digestion?
3. What is the end product fat digestion?
4. Where does starch digestion begin?
5. Where is starch digestion completed?
6. Where does protein digestion begin?
7. Where is protein digestion completed?
8. Where does fat digestion begin?
9. Where is fat digestion completed?

1.Simple glucose

2.Simple amino acids

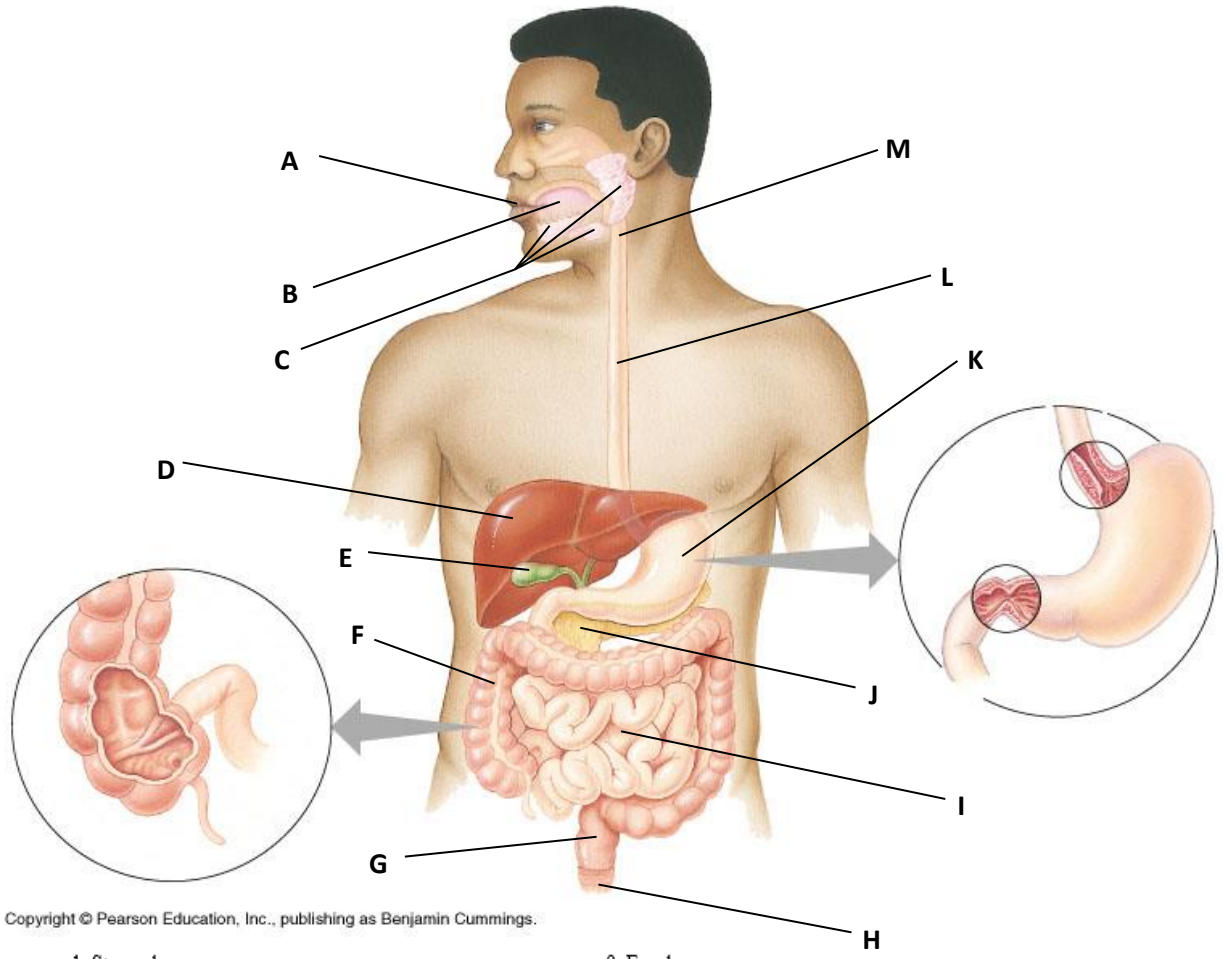
3.Fatty acids and glycerol

4.Mouth

5.Small intestine

6. Stomach
7. Small intestine
8. Small intestine
9. Small intestine

21. Part 1: Match the name of each organ with the letter that represents it on the diagram below.



_____ 1. Stomach

_____ 2. Gall bladder

_____ 3. Oral cavity (mouth)

_____ 4. Liver

_____ 5. Large intestine

_____ 6. Rectum

_____ 7. Salivary glands

_____ 8. Pancreas

_____ 9. Esophagus

_____ 10. Tongue

_____ 11. Small intestine

_____ 12. Pharynx

_____ 13. Anus

1. K 2. E 3. A 4. D 5. F 6. G 7. C 8. J 9. L 10. B 11. I 12. M 13. H

<u>Part 2</u>: Using the key choices below, match the description given with the structure in the alimentary canal that it describes. Choices may be used more than once.

A. Anus	F. Liver	K. Salivary Glands
B. Villi	G. Mouth (Oral cavity)	L. Small intestines
C. Esophagus	H. Pancreas	M. Stomach
D. Gallbladder	I. Pharynx	N. Tongue
E. Large Intestines (Colon)	J. Rectum	O. Teeth P. Peristalsis

_____ 1. Stores bile, which physically breaks down fat into droplets, until it is secreted.

_____ 2. Fingerlike extensions in intestinal wall that increase surface area and absorb nutrients

_____3. used to cut, tear, and grind food; adult has 32

_____ 4. Organ that mixes food in the mouth.

_____ 5. Common passage for food and air.

_____ 6. Literally a food chute; it has no digestive or absorptive role.

_____ 7. Produces a juice that neutralizes stomach acid and contains digestive enzymes.

_____ 8. Organ responsible for absorption of most nutrients.

_____ 9. Organ primarily involved in water absorption and feces formation.

_____ 10. Organ in which protein digestion begins.

_____ 11. Organ into which the stomach empties.

_____ 12. Organ that receives pancreatic juice and bile.

_____ 13. Opening through which feces are expelled from the body.

_____ 14. Produces bile.

_____ 15. Produce enzymes that begin carbohydrate digestion.

_____ 16. Stores feces until they are excreted.

_____ 17. Digestion begins when salivary gland secretions enter this

_____ 18. Muscular movement involving the walls of the digestive tract that serve to mix materials and move them along the tract

1. D 2. B 3. O 4. N 5. I 6. C 7. H 8. L 9. E 10. M 11. L 12. L 13. A 14. F 15. K 16. J 17. G 18. P