

9. Identify the structures or processes described below:
- Main actors in chemical digestion and are contained in digestive juices *Enzymes*
  - Simple molecules produced by the chemical digestion of proteins *Amino acids*
  - Chemical secretions produced by the pancreas *Pancreatic juices*
  - Contractions of the digestive tract allowing food to advance *Peristalsis*
  - Secretion that acts mechanically on fats *Bile*
  - They aid in the chemical digestion of proteins in the stomach *Gastric juices*
  - Passage of nutrients from the digestive tract to the blood or lymph *Absorption*
  - Simple molecules obtained from the chemical digestion of carbohydrates *Glucose*
10. Indicate in which digestive organ(s) each of the following phenomena occurs. Explain whether it is a mechanical or chemical transformation.
- Peristalsis *Esophagus, small intestine and colon*  
*Mechanical transformation*
  - Chewing *Mouth*  
*Mechanical transformation*
  - Action of gastric juices  
*Stomach*  
*Chemical transformation*
  - Action of bile *Small intestine*  
*Chemical transformation*
  - Churning *Stomach, small intestine, colon*  
*Mechanical transformation*
  - Action of salivary amylase  
*Mouth*  
*Chemical transformation*
11. In which organ does the chemical digestion of the following types of nutrients occur? In which organ does it end?
- Carbohydrates *Begins in the mouth and ends in the small intestine*
  - Proteins *Begins in the stomach and ends in the small intestine*
  - Fats *Occurs entirely in the small intestine*
12. In which organs are the following nutrients absorbed in the greatest quantities?
- Water *Large intestine*
  - Glucose *Small intestine*
  - Minerals *Large intestine*
  - Glycerol *Small intestine*
  - Vitamins *Large intestine*

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#### The Dual Role of the Respiratory System (pages 89 and 90)

- Which gas, referred to as an oxidizing agent, makes the combustion of nutrients possible? *Oxygen (O<sub>2</sub>)*
- Is there more carbon dioxide in the air we inhale or in the air we exhale? Where does it come from? *The air we exhale has more carbon dioxide. It is a by-product of cellular respiration.*

- Compare inhaled air with exhaled air using a comparative table like the one below. Enter the names of the gases.

Inhaled air		Exhaled air	
Proportion	Gas	Proportion	Gas
78%	<i>Nitrogen</i>	78%	<i>Nitrogen</i>
21%	<i>Oxygen</i>	16%	<i>Oxygen</i>
0.04%	<i>Carbon dioxide</i>	5%	<i>Carbon dioxide</i>

## The Anatomy of the Respiratory System (pages 90 to 93)

4. Place the following respiratory structures in the order in which air enters them:
- a) Bronchi                      e) Alveoli  
b) Trachea                     f) Bronchioles  
c) Pharynx                      g) Larynx  
d) Nasal cavities
- Answer: *d, c, g, b, a, f, e*
5. Identify the respiratory structures described in the following sentences:
- a) Both air and food pass through this structure. *Pharynx*
- b) This membrane surrounds each lung. *Pleura*
- c) The vocal cords are located in this structure. *Larynx*
- d) This structure is made up of a group of bronchioles and alveoli. *Lung*
- e) This structure warms the air through its blood vessels. *Nasal cavities*
- f) It is the smallest division of the bronchi. *Bronchioles*
- g) This structure, aside from the bronchi, has cilia that filter the air. *Trachea*
- h) This respiratory muscle forms a partition between the lungs and the abdomen. *Diaphragm*
- i) They are grouped together in clusters and are surrounded by blood vessels. *Alveoli*

## The Physiology of the Respiratory System (pages 94 and 95)

6. Which muscles contract during inhalation? *Diaphragm and intercostal muscles*
7. During inhalation, in which direction does the diaphragm move? *It moves downward.*
8. Oxygen and carbon dioxide diffuse. Explain the principle of diffusion. *The gases move from an area of higher concentration (higher pressure) to an area of lower concentration (lower pressure).*
9. Are the following statements true or false?
- a) The volume of the rib cage increases during exhalation. *False*
- b) Air pressure in the lungs decreases during inhalation. *True*
10. Identify the gases involved in the gas exchanges that occur in the alveoli and blood vessels.
- a) Gas A: *Oxygen (O<sub>2</sub>)*
- b) Gas B: *Carbon dioxide (CO<sub>2</sub>)*

