Answers to Questions for Comprehension

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Q1. The main function of the human respiratory system is to ensure that oxygen is brought to each cell in the body and that carbon dioxide can leave each cell and be removed from the body.

Q2. External respiration is the process by which oxygen and carbon dioxide are exchanged between the air and the blood, while internal respiration is gas exchange that occurs between the body's tissue cells and the blood.

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Q3. The structures of the upper respiratory tract are: paired nostrils → nasal cavity (turbinate bones) → pharynx → larynx → trachea. Students may also include the epiglottis and the glottis.

Q4. Mucus moistens the air before it enters the respiratory tract and helps to clean the air by trapping foreign particles, such as dust or bacteria. Ciliated cells move the debris back up into the nose and throat. The foreign material can then be expelled by coughing or sneezing.

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Q5. This is a suitable metaphor because each bronchus branches into 2 bronchioles, which then branch into 4 bronchioles, and then 8 bronchioles, and so on.

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Q6. The following are the essential concepts that should be included:

- Inhalation: The rib (intercostal) muscles contract, lifting the rib cage up and out. At the same time, the diaphragm contracts and pulls downward. As the air pressure inside the thoracic cavity decreases, air will move into the lungs from the environment.
- Exhalation: The intercostal muscles relax, allowing the rib cage to return to its normal position. The diaphragm also relaxes and resumes its domed shape. As pressure in the thoracic cavity increases, air moves from the lungs into the environment.

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Q7. External respiration takes place in the lungs. During external respiration, gases are exchanged between the alveoli and the blood in the capillaries that surround each alveolus.

Q8. Each alveolus lies directly alongside a capillary. As the blood moves away from the body tissues, it is oxygen-poor. As it moves through the capillary, oxygen from the air in the alveolus diffuses into the capillary. Carbon dioxide in the capillary diffuses into the alveolus and is expelled from the body when you exhale.

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Q9. Viruses are more likely to cause tonsillitis and laryngitis than bacteria are.

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Q10. Bronchitis is a disorder that causes the bronchi to become inflamed and filled with mucus, which is expelled by coughing. It makes breathing difficult

because the respiratory tract is partially blocked by mucus, reducing the amount of air that can enter the lungs. The inflammation of the bronchi will also result in pain during inhaling and exhaling.

Q11. Pneumonia is a disease that occurs when the alveoli in the lungs inflame and fill with liquids. This interferes with gas exchange, and the body becomes oxygen-starved.

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Q12. Student answer may vary but should include the following: