9. Gas exchange

Starter Quiz ·

A-Level Biology Name: _____ Score: _____

1. The C-shaped rings of cartilage in the trachea and bronchi:

   ☐ sweep mucus upward

   ☐ make mucus

   ☐ hold the airway open so it cannot collapse

   ☐ narrow the airway

2. Alveoli have a large surface area and very thin walls for fast gas exchange.

   ☐ True ☐ False

3. The squamous epithelium of the alveoli is very thin and flat because this:

   ☐ holds the airway open

   ☐ makes more mucus

   ☐ gives a very short distance for gases to diffuse

   ☐ narrows the airway

4. Which feature makes alveoli good for gas exchange?

   ☐ a small surface area and thick walls

   ☐ no blood supply

   ☐ a large total surface area with very thin walls

   ☐ a dry lining

5. Bronchioles are held open by C-shaped rings of cartilage, like the trachea.

   ☐ True ☐ False

6. Oxygen diffuses:

   ☐ from blood into the alveolus walls only

   ☐ from the blood into the air

   ☐ in no particular direction

   ☐ from the alveolar air into the blood

7. The tiny hair-like structures that beat to sweep mucus up out of the lungs are called _____.

   _____

8. Carbon dioxide diffuses from the blood into the alveolar _____, to be breathed out.

   _____

9. What do tracheal cilia do?

   ☐ They move mucus upward.

   ☐ They pump air into the blood.

   ☐ They replace cartilage.

10. Breathing and the flow of blood keep gas exchange fast because they:

    ☐ reduce the surface area

    ☐ maintain steep concentration gradients

    ☐ dry out the lining

    ☐ thicken the walls

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Answers ·

A-Level Biology

1. **hold the airway open so it cannot collapse**

   Cartilage supports the airway, keeping it open as air pressure changes during breathing.

2. **True**

   A large surface area, thin walls, a rich blood supply and a moist lining all speed up gas exchange.

3. **gives a very short distance for gases to diffuse**

   A thin, flat lining means a short diffusion distance, so gas exchange is fast.

4. **a large total surface area with very thin walls**

   Large surface area, thin walls, a rich blood supply and a moist lining all speed up gas exchange.

5. **False**

   False. The trachea and bronchi have cartilage; the smallest airways, the bronchioles, have none and contain smooth muscle that can narrow them.

6. **from the alveolar air into the blood**

   Oxygen is higher in the alveolar air than in the blood, so it diffuses air → blood.

7. **cilia**

   Cilia beat in a wave, moving the dirt-laden mucus up to the throat to be swallowed.

8. **air**

   CO_2 is higher in the blood, so it diffuses blood → air and is then exhaled.

9. **They move mucus upward.**

   The beat carries mucus toward the throat.

10. **maintain steep concentration gradients**

    Fresh air and moving blood keep concentrations different on each side, so the gradients stay steep.