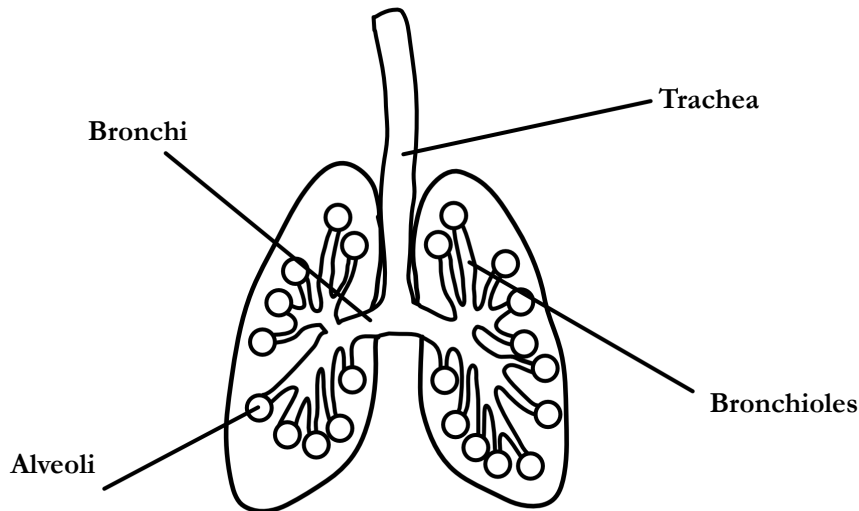




Gas Exchange and the Lungs

- 1 Label the structures of the lungs indicated by the arrows.



[4 marks]

- 2 Name the two gases that we exchange via the lungs and state how they travel around the body

- 1) Oxygen - binds to haemoglobin in the RBC's of the blood
- 2) Carbon dioxide - dissolves in the plasma of the blood

[4 marks]

- 3 Why do we need a specialised exchange system to exchange the gases mentioned in Question 2?

Because we are so large, our surface area to volume ratio is too low to rely on diffusion

We need a plentiful supply of oxygen for cellular respiration, and must get rid of carbon dioxide as it is a harmful waste product

[2 marks]

- 4 State and explain 3 ways in which the alveoli are adapted to their role of gas exchange

- 1) Wall is single cell thick - short diffusion pathway
- 2) Moist - gases can dissolve and diffuse faster
- 3) Higher surface area - quicker diffusion
- 4) Any other sensible answer such as - can recoil to expel air and maintain concentration gradients

[6 marks]

- 5 A sprinter runs a 400m race. She takes 42 breaths in the three and a half minutes before the race and 33 breaths in the 90 seconds after the race. What was her breathing rate before and after the race?

$$\text{Before race: } 42/3.5 = 12$$

$$\text{After race: } 33/1.5 = 22$$

$$\text{Breathing rate before the race} = 12 \text{ m / min}$$

$$\text{Breathing rate after the race} = 22 \text{ m / min}$$

[4 marks]

[Total 20 marks]