

CAIE Biology A-level

Topic 9: Gas Exchange

Flashcards

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How are mammals adapted for gas exchange?



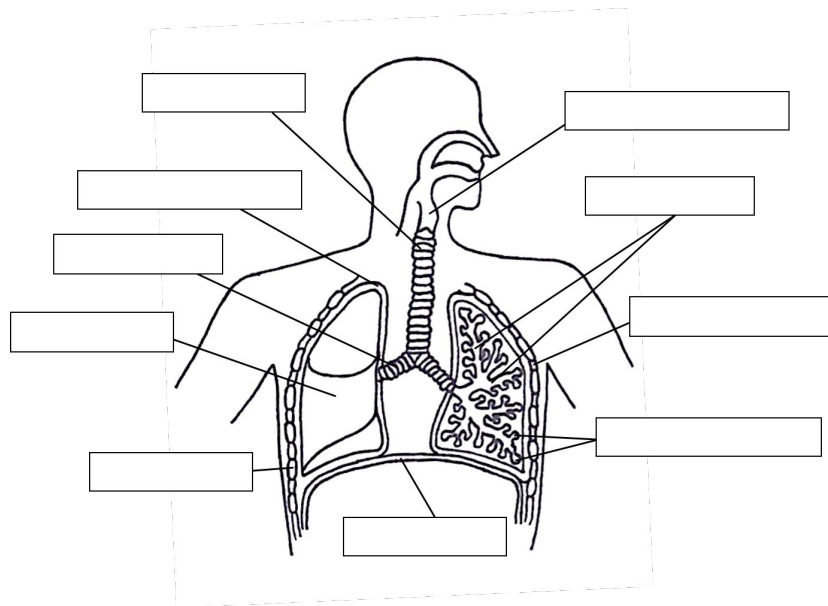
How are mammals adapted for gas exchange?

Alveoli provide a **large surface area** and **thin diffusion pathway**, maximising the volume of oxygen absorbed from one breath.

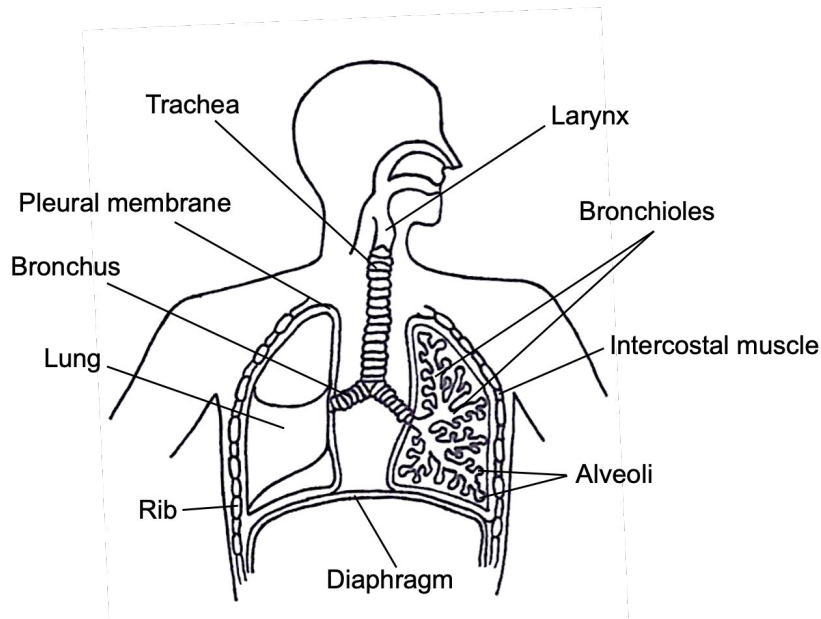
They also have a **good blood supply**, maintaining a **steep concentration gradient**.



Fill in the missing labels in the diagram of the human respiratory system below.



Fill in the missing labels in the diagram of the human respiratory system below.



Describe the structure of the trachea and its function in the mammalian gaseous exchange system.



Describe the structure of the trachea and its function in the mammalian gaseous exchange system.

- Wide tube supported by C-shaped cartilage to keep the air passage open during pressure changes
- Lined by ciliated epithelial cells which move mucus, (produced by goblet cells) up to the back of the throat to be swallowed, preventing lung infections
- Carries air to the bronchi



Describe the structure of the bronchi and their function in the mammalian gaseous exchange system.



Describe the structure of the bronchi and their function in the mammalian gaseous exchange system.

- Supported by rings of cartilage and lined by ciliated epithelial and goblet cells
- Narrower than the trachea
- Allow passage of air into the bronchioles



Describe the structure of the bronchioles and their function in the mammalian gaseous exchange system.



Describe the structure of the bronchioles and their function in the mammalian gaseous exchange system.

- Narrower than the bronchi
- No cartilage
- Contain elastic fibres and smooth muscle which allows constriction to restrict air flow (protective mechanism)
- Allow passage of air into the alveoli



What is the primary gaseous exchange surface in humans?



What is the primary gaseous exchange surface in humans?

Alveoli



Describe the structure of the alveoli and their function in the mammalian gaseous exchange system.



Describe the structure of the alveoli and their function in the mammalian gaseous exchange system.

- Tiny air sacs, lined with epithelial cells
- Site of gaseous exchange
- Walls one cell thick
- Good blood supply to maintain steep concentration gradient
- 300 million in each lung



Describe the exchange of gases between the alveoli and capillary network.



Describe the exchange of gases between the alveoli and capillary network.

Oxygen rich air fills alveoli during inspiration. O_2 concentration greater in alveoli than blood (steep concentration gradient maintained by blood movement). O_2 diffuses across alveolar and capillary wall into blood down its concentration gradient. CO_2 diffuses out of blood into alveoli (CO_2 concentration in alveoli lower than in circulated blood).

