IGCSE BIOLOGY • EXERCISE SHEET

11.1 Gas exchange in humans

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

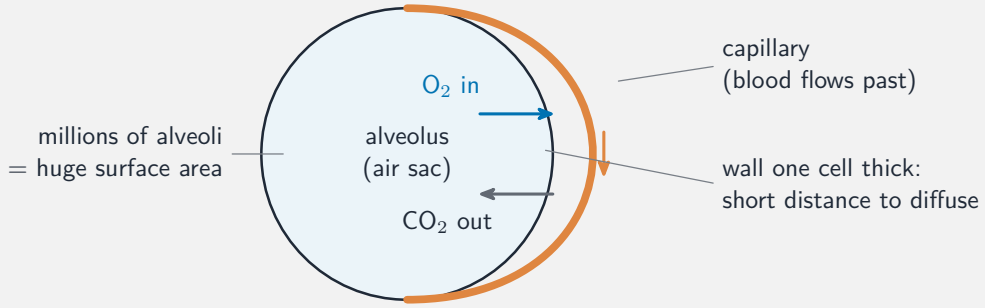
Build the skills to answer exam questions on **gas exchange in humans** 人体气体交换—features of a gas exchange surface, the **alveoli** 肺泡, the breathing mechanism, and inspired vs expired air.

You must be able to:

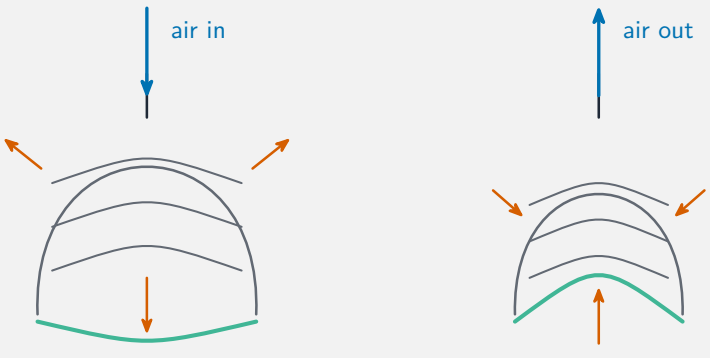
- give the four features of a gas exchange surface
- explain how the alveoli are adapted
- describe breathing in/out and compare inspired and expired air

1 Worked examples

Alveoli and breathing



Alveoli: huge surface area, thin (one cell), good blood supply, well ventilated



green = diaphragm orange arrows = movement

- expired air: less O , more CO , more water vapour. Limewater tests for CO .

2 Practice

2.1 State two features of a good gas exchange surface. [2]

2.2 State how expired air differs from inspired air in carbon dioxide. [1]

3 Exam-style questions

3.1 During breathing in, the diaphragm: [1]

- **A** relaxes and domes up
- **B** contracts and flattens
- **C** stays still
- **D** moves sideways

3.2 Oxygen passes from the alveoli into the blood.

(a) Name the process. [1]

(b) Explain two ways the alveoli are adapted for fast gas exchange. [2]

3.3 Describe how you could use limewater to show that expired air contains more carbon dioxide. [2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **11.1 Gas exchange in humans** past-paper sheet in the Library, or try these in **Practice mode**:

- 0610/21 N25 —Q17 (gas exchange)
- 0610/22 N25 —Q16 (breathing / alveoli)

Solutions

2.1 any two of: large surface area; thin surface; good blood supply; good ventilation.

2.2 expired air contains more carbon dioxide.

3.1 B. The diaphragm contracts and flattens when breathing in.

3.2 (a) diffusion.
(b) millions of alveoli give a large surface area; each wall is one cell thick / has a good blood supply, so exchange is fast.

3.3 bubble inspired and expired air through separate tubes of limewater; the limewater with expired air turns cloudy faster (more CO).