

Exercise walk-through

# 11.1

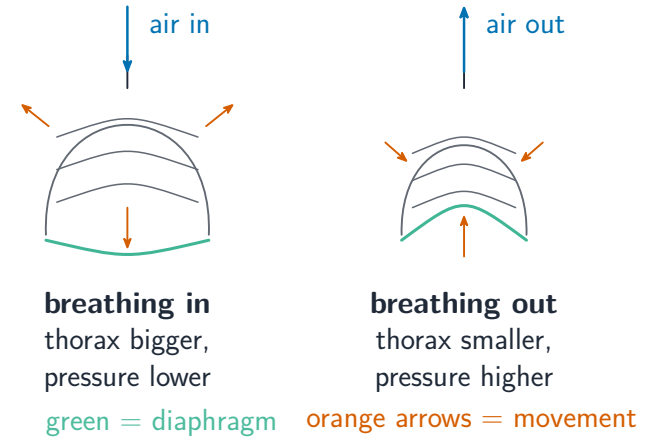
## Gas exchange in humans

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IGCSE Biology

# What we will cover

- 1 A good gas-exchange surface
- 2 The breathing system
- 3 The alveolus
- 4 How you breathe
- 5 Inspired vs expired air
- 6 Exercise & clean airways



*how you breathe*

## A good gas-exchange surface

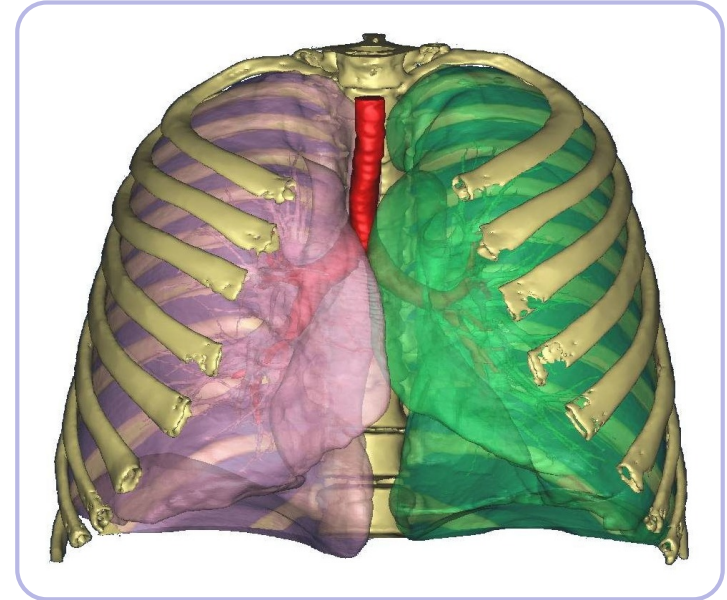
large **surface area**

**thin** – a short distance

good **blood supply**

good **ventilation**

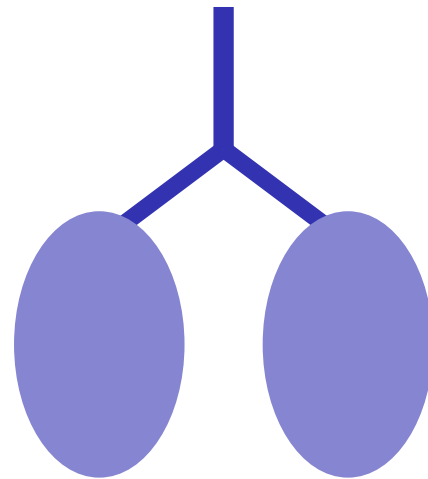
**Gas exchange** :  $O_2$  in,  $CO_2$  out, by  
**diffusion** . A steep concentration difference  
keeps it fast.



*Gas exchange needs a large surface area*

## Check yourself

- 1 Name two features of a good gas-exchange surface.
- 2 Where does gas exchange happen in the lungs?
- 3 What happens to the diaphragm when you breathe in?
- 4 Which gas is higher in expired air?



**Answers** 1. e.g. large surface area & thin 2. the alveoli 3. it contracts and flattens  
4. carbon dioxide

## Exercises 2.1·2.2

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

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

## Exercises 2.1·2.2

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

**2.1**

- any **two** of: large surface area / thin surface / good blood supply / good ventilation
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**2.2** State how expired air differs from inspired air in carbon dioxide. [1]

**2.2**

- expired air contains **more carbon dioxide**

## Exercise 3.1

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**3.1** During breathing in, the diaphragm:

[1]

☐

**A** relaxes and domes up

**B** contracts and flattens

**C** stays still

**D** moves sideways

## Exercise 3.1

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3.1 During breathing in, the diaphragm:

[1]

☐

A relaxes and domes up

B contracts and flattens

C stays still

D moves sideways

3.1 B

- when breathing in, the diaphragm **contracts and flattens**
- A is breathing out; C and D are false

## Exercise 3.2 (a)

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**3.2** Oxygen passes from the alveoli into the blood.

(a) Name the process.

[1]

## Exercise 3.2 (a)

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**3.2** Oxygen passes from the alveoli into the blood.

(a) Name the process.

[1]

(a)

- oxygen moves by **diffusion**

## Exercise 3.2 (b)

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**3.2** Oxygen passes from the alveoli into the blood.

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

[2]

## Exercise 3.2 (b)

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**3.2** Oxygen passes from the alveoli into the blood.

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

[2]

(b)

- millions of alveoli give a **large surface area**
- walls **one cell thick** / good blood supply, so exchange is fast

## Exercise 3.3

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

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

### 3.3

- bubble inspired and expired air through **separate tubes of limewater**
- expired air turns the limewater **cloudy faster** (more CO<sub>2</sub>)