

AQA – Organism exchange substances with their environment – AS Biology P2

1. June/2021/Paper_2/No.2

0 2 . 1

Describe and explain **one** feature of the alveolar epithelium that makes the epithelium well adapted as a surface for gas exchange. Do **not** refer to surface area or moisture in your answer.

[2 marks]

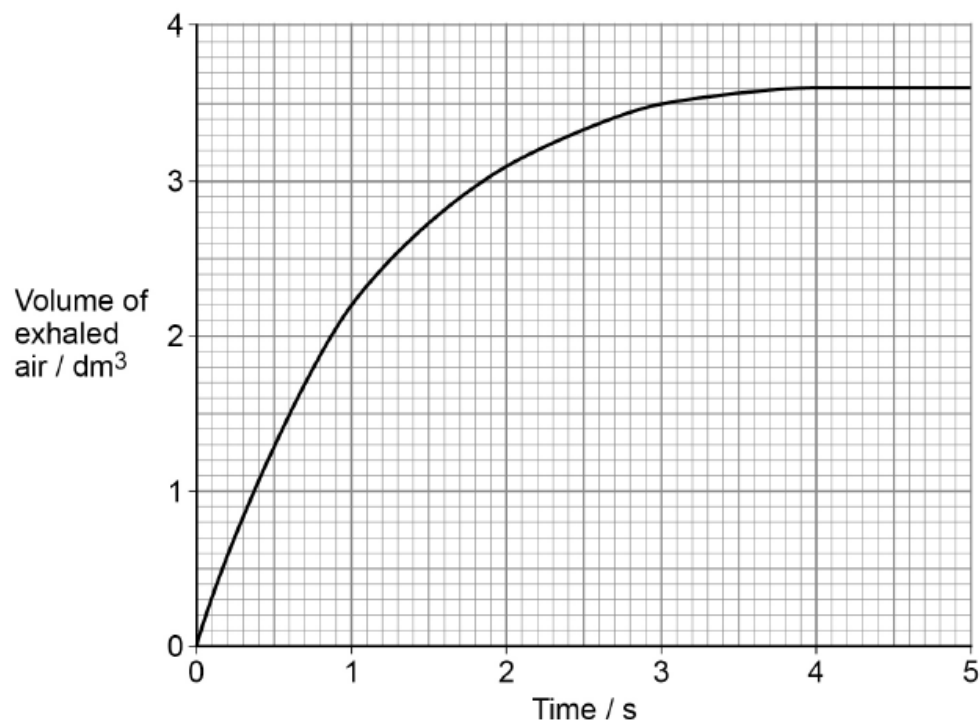
Doctors measure the health of lungs by calculating the $FEV_1:FVC$ ratio.

- FEV_1 is the maximum volume of air exhaled in one second.
- FVC is the maximum volume of air exhaled in one breath.

The minimum $FEV_1:FVC$ ratio of healthy lungs is 0.7:1

A man with the lung disease emphysema inflated his lungs fully. He then exhaled as much of this air as quickly as possible in one breath. **Figure 3** shows how the volume of exhaled air changed during this breath.

Figure 3



0 2 . 2 Use the information provided to determine the $FEV_1:FVC$ ratio of this man's lungs.

Go on to determine how many times greater the minimum ratio of healthy lungs is than his ratio.

[2 marks]

$FEV_1:FVC$ ratio of man's lungs = _____

How many times greater? _____

0 2 . 3

Tidal volume is the volume of air inhaled and exhaled during a single breath when a person is resting. The tidal volume in a person with emphysema is reduced compared with the tidal volume in a healthy person.

Suggest and explain how a reduced tidal volume affects the exchange of carbon dioxide between the blood and the alveoli.

[3 marks]
