Exchange Surfaces

Question Paper 2

Level	A Level
Subject	Biology
Exam Board	OCR
Module	Exchange and transport
Topic	Exchange Surfaces
Booklet	Question Paper 2

Time allowed: **42 minutes**

Score: **/31**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E
>69%	56%	50%	42%	34%	26%

(a) (i) Name the **two** types of epithelial tissue found in the lungs and airways. **[2]**

(ii) The epithelial cells in the lungs are arranged into structures called alveoli.

Explain how the alveoli create a surface for efficient gaseous exchange.

In your answer you should use appropriate technical terms, spelled correctly.

[6]

(b) To improve gaseous exchange, the air in the alveoli is refreshed by ventilation. The air movement created by ventilation can be recorded using suitable apparatus.

(i) Name the apparatus used to record these air movements.

[1]

Fig. 3.1 shows a trace recorded from this apparatus.

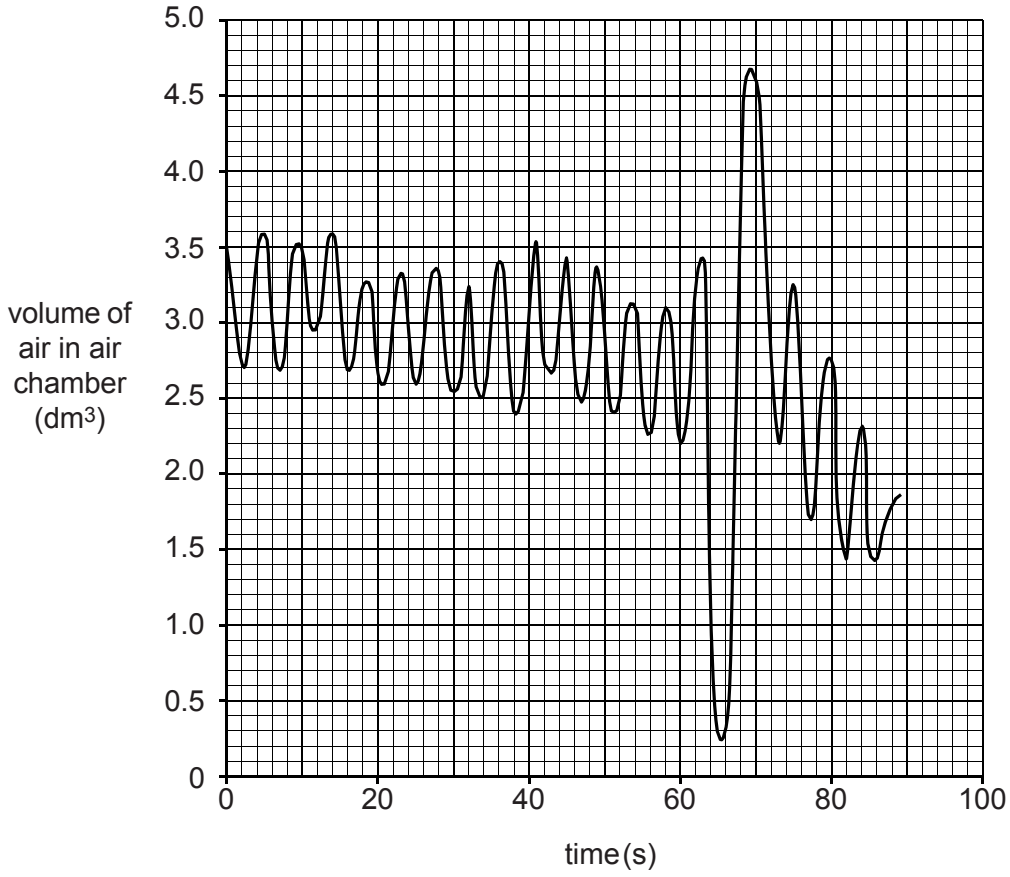

Fig. 3.1

(ii) Calculate the rate of breathing over the first minute from the trace. **[1]**

(iii) Using the trace, calculate the rate of oxygen consumption over the first minute.

Show your working. **[2]**

[Total: 11]

Many teachers use models to demonstrate and explain breathing and lung function in mammals.

Fig. 2.1 is a model of the mammalian chest.

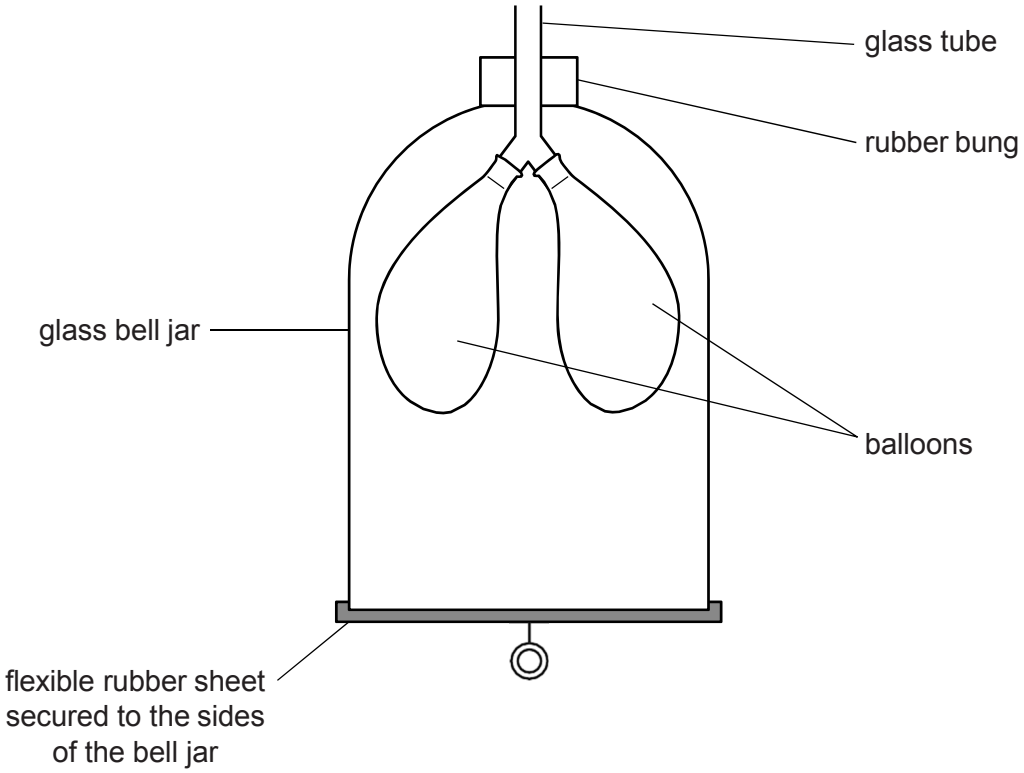

Fig. 2.1

(a) When the rubber sheet is pulled down the balloons expand.

Explain why the balloons expand. **[3]**

(b) A teacher used the model in Fig. 2.1 to demonstrate the difference between tidal volume and vital capacity.

(i) Explain the meaning of the term *tidal volume*. **[2]**

(ii) Suggest how the teacher may have used the model to demonstrate tidal volume. **[2]**

(iii) Explain the meaning of the term *vital capacity*. **[2]**

(iv) Suggest how the teacher may have used the model to demonstrate vital capacity. **[1]**

[Total: 10]

Fig. 5.1 shows the changes in the volume of air in the lungs of a student at rest during one breath.

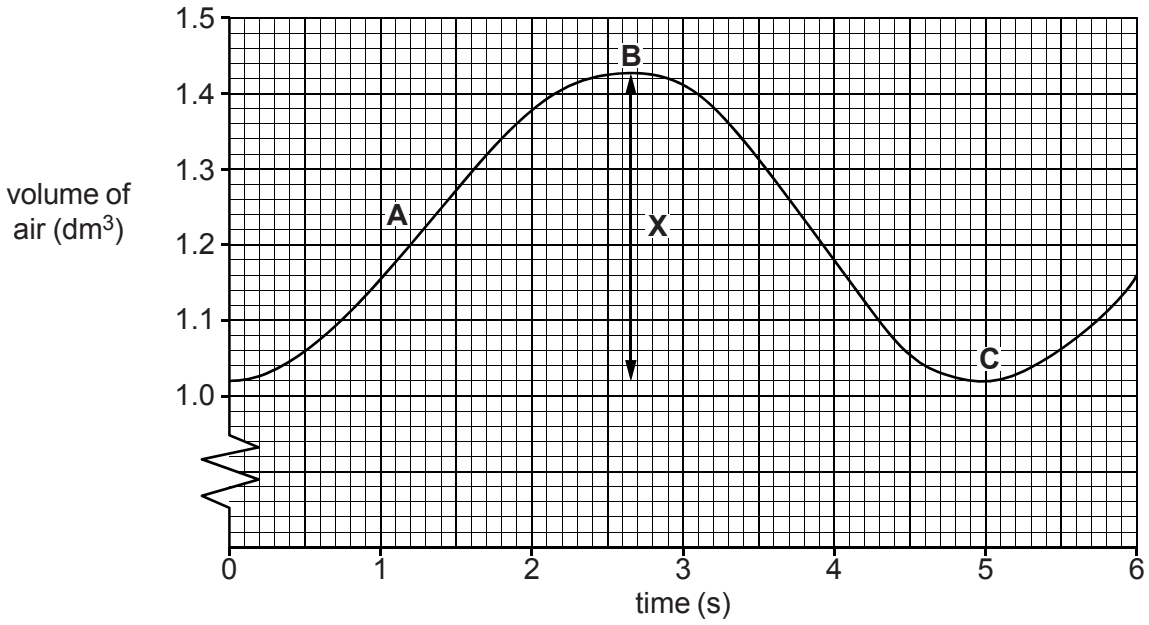

Fig. 5.1

(a) (i) Name the measurement represented by the line **X**. **[1]**

(ii) What is happening to the elastic fibres in the walls of the alveoli at point **A**? **[1]**

(b) Explain what causes the change in the volume of air between points **B** and **C** on Fig. 5.1.

In your answer you should use appropriate technical terms, spelt correctly. **[4]**

(c) Using Fig. 5.1, calculate the breathing rate of this student in breaths per minute. **[2]**

(d) About 1 dm^3 of air cannot be expelled from the lungs. This is known as the residual volume.

Suggest why it is **not** possible to expel all the air from the lungs. **[2]**

[Total: 10]