

- 1 (a) Fig. 1.1 shows the human gas exchange system. The functions of the parts of the gas exchange system are given in Table 1.1.

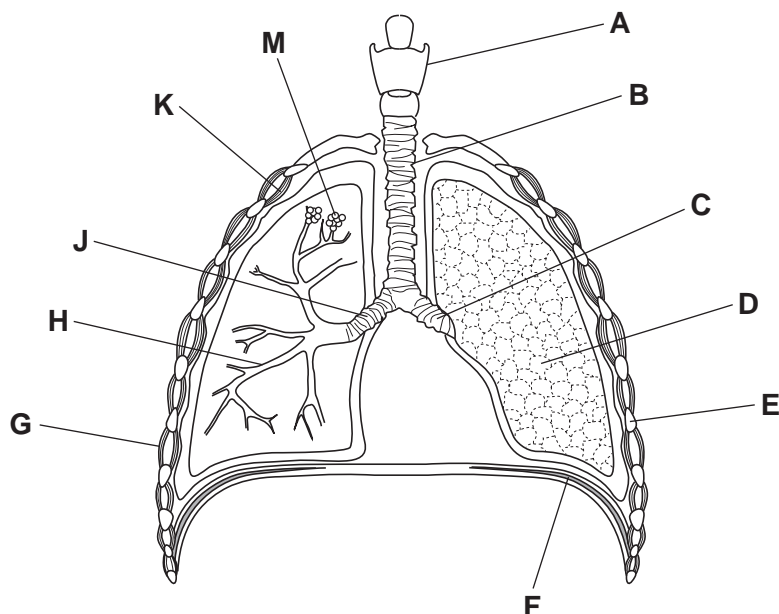


Fig. 1.1

Complete Table 1.1. One row has been done for you.

Table 1.1

function	letter on Fig. 1.1	name
structure that makes sounds	A	larynx
bone that provides protection for the lungs		
airway that allows passage of air only into the right lung		
airway that allows passage of air into both lungs		
contracts to increase volume of thorax		
muscle that contracts to lower the ribcage		
site of gas exchange		

[6]

(b) The gas exchange system contains cartilage.

Describe the function of cartilage in the gas exchange system.

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.....

[2]

(c) Soon after starting physical activity the concentration of carbon dioxide in the blood increases.

(i) Name the process inside cells that produces carbon dioxide.

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.....

[1]

(ii) State the effect on breathing of an increase in carbon dioxide concentration in the blood.

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[1]

(iii) Explain how this effect on breathing is coordinated.

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[3]

[Total: 13]

2 Fig. 4.1 shows part of the human gas exchange system.

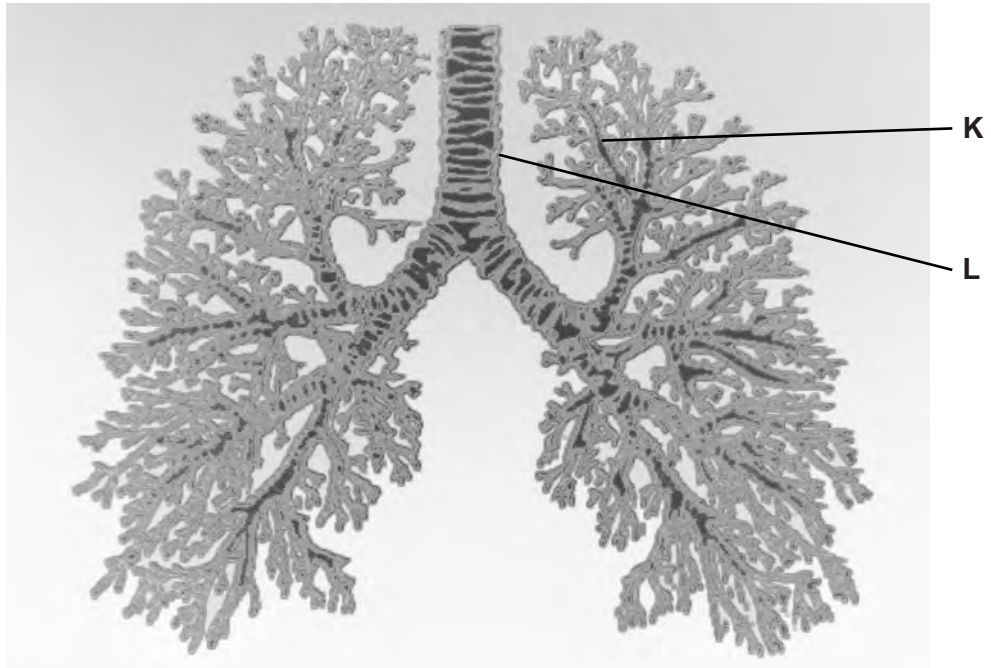


Fig. 4.1

(a) (i) Name structure **K**.

..... [1]

(ii) Ciliated cells and goblet cells line structure **L**.

Explain the function of these cells in structure **L**.

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..... [3]

(b) Gas exchange occurs at the alveoli.

(i) Describe how oxygen molecules move from the alveoli into the blood.

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..... [3]

(ii) During inspiration, air moves from the atmosphere into the lungs.

Describe the mechanism of inspiration.

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..... [4]

(iii) Name **one** gas that is found in a higher concentration in expired air than in inspired air.

..... [1]

(c) Tobacco smoke affects the gas exchange system.

Name **two** components of tobacco smoke and describe their effect on the gas exchange system.

component 1

effect

.....

.....

component 2

effect

.....

.....

[4]

[Total: 16]

- 3 The pressure in the lungs of a student before and during the start of a volleyball match was recorded.

The results are shown in Fig. 2.1.

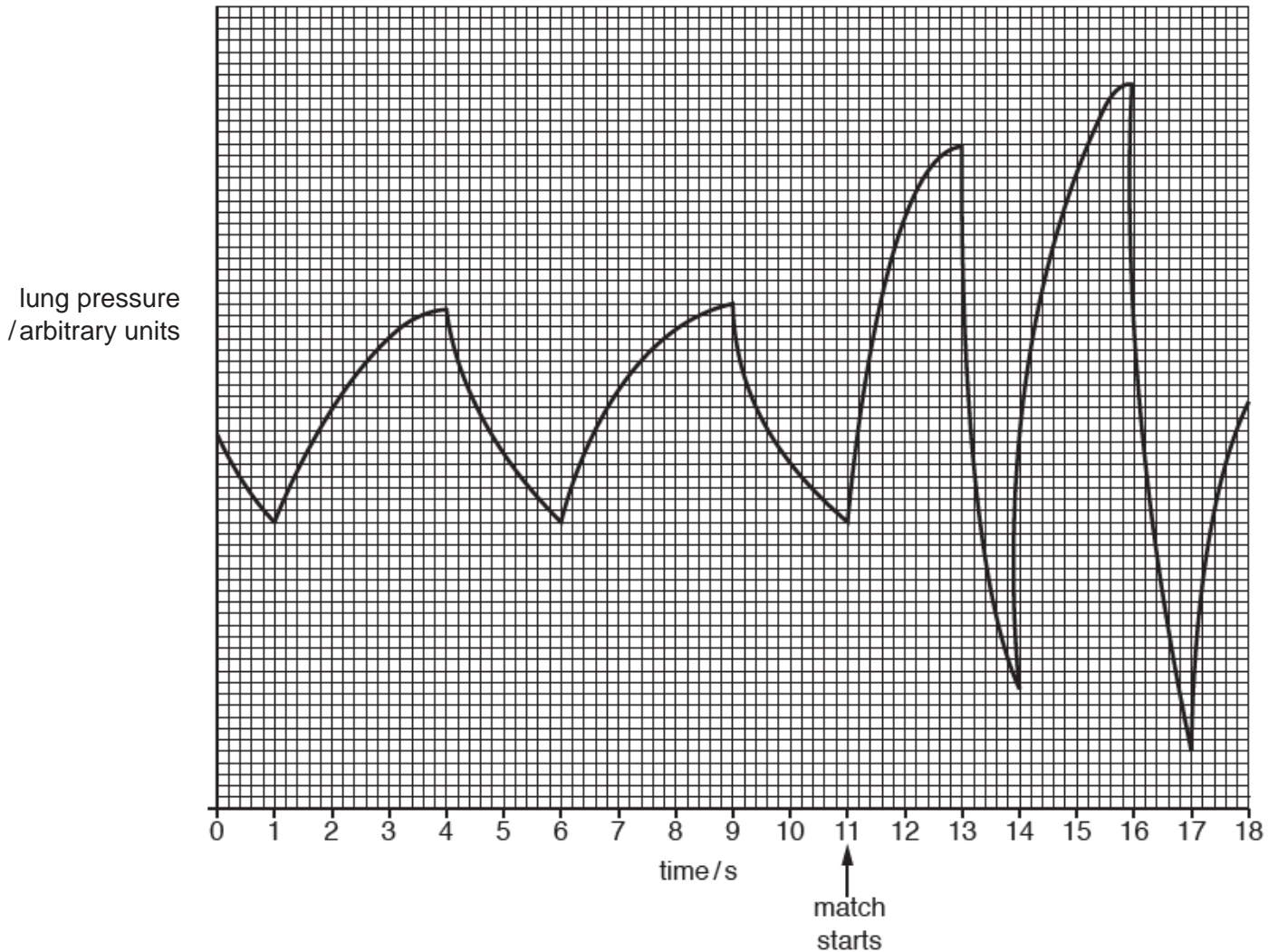


Fig. 2.1

- (a) (i) Use the results in Fig. 2.1 to calculate the breathing rate before the start of the match. Express your answer to the nearest whole number.

Show your working.

.....breaths per minute

[2]

(ii) Use the results in Fig. 2.1 to describe how the pattern of breathing during the match is different from the pattern of breathing before the match starts.

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.....[3]

(b) Describe the process of inhalation.

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.....[4]

(c) Carbon dioxide is excreted from the body through the lungs.

(i) Explain why this process is termed *excretion*.

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.....
.....[1]

(ii) Name the part of the blood in which most carbon dioxide is transported.

.....[1]

(iii) Describe the effect of increased carbon dioxide concentration on blood pH.

.....[1]

(d) Carbon dioxide moves from the blood capillaries into the alveoli by diffusion.

Explain why the rate of diffusion of carbon dioxide increases during exercise.

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.....[2]

[Total: 14]

4 Fig. 6.1 shows the movement of the ribs and the diaphragm during breathing in.

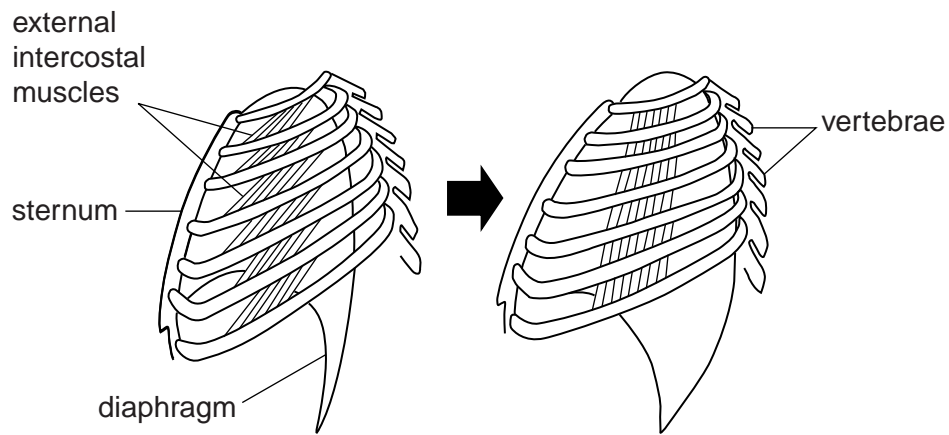


Fig. 6.1

(a) State what happens to the following structures during breathing in.

diaphragm.....

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ribcage.....

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external intercostal muscles

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.....[3]

(b) Explain the effect of strenuous physical activity on the pH of the blood.

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.....[3]

[Total: 6]