

Biology 1.2 - Respiration & Respiratory System in Humans - Higher Tier

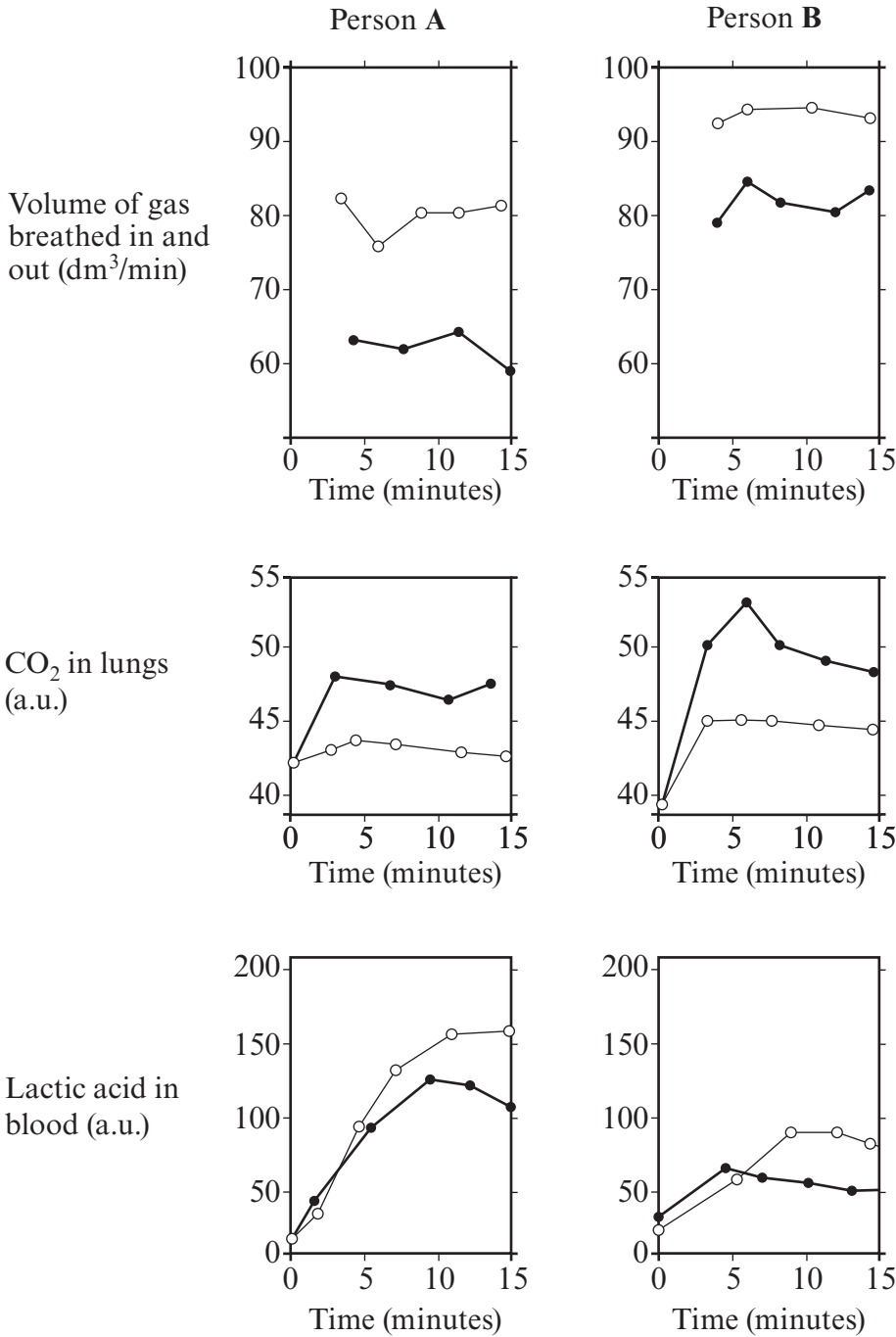
Question 1.

Examiner only

Two people, A and B, exercised vigorously for 15 minutes. The following measurements were taken for each person during the exercise:

- volume of gas breathed in and out
- carbon dioxide in the lungs
- lactic acid in the blood

The people then rested and repeated the process while breathing pure oxygen. The results are shown in the following graphs.



(a) (i) Use the graphs opposite to state the effect of breathing pure oxygen, compared to breathing normal air, on the **volume** of gas breathed in and out per minute. [1]

(ii) Person **B** is a trained athlete; person **A** is not. Give **three** pieces of evidence from the graphs to support this. [3]

I.

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II.

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III.

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(b) State the chemical that is changed into lactic acid. [1]

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(c) Suggest why there is more carbon dioxide present in the lungs when pure oxygen is breathed rather than breathing normal air. [1]

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(d) Give a reason for the lower level of lactic acid when pure oxygen is breathed. [1]

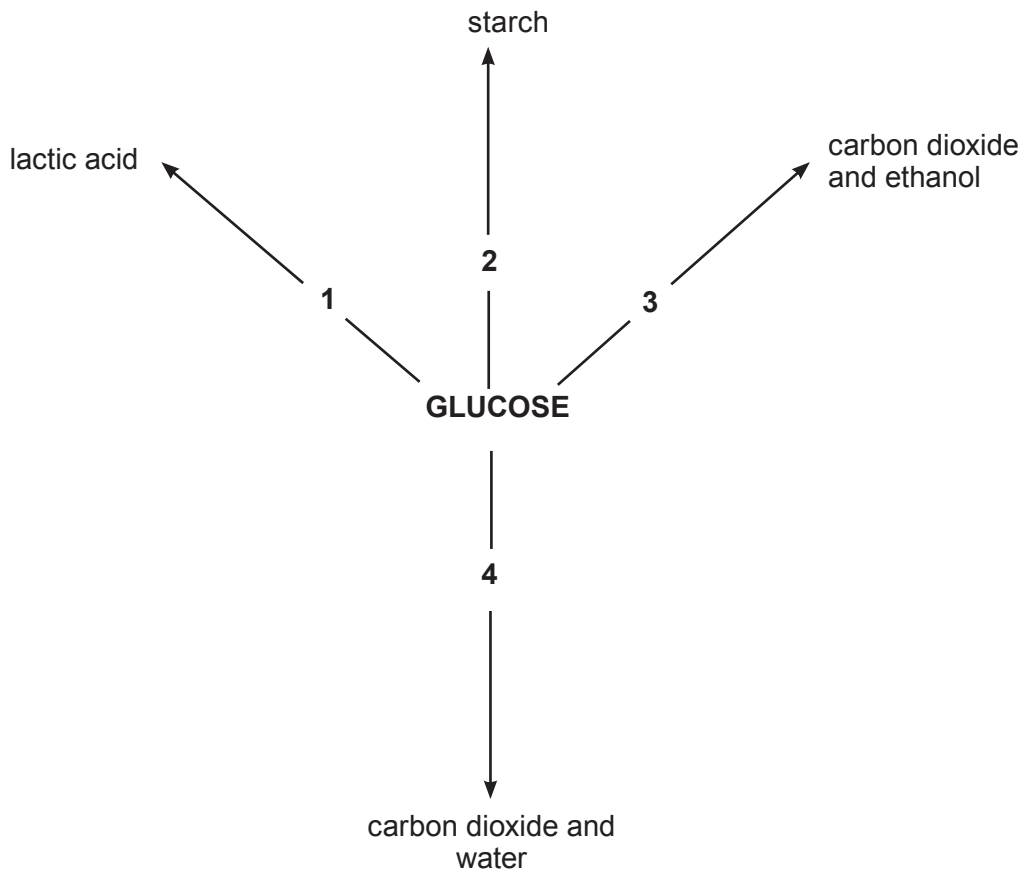
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Question 2.

The diagram below shows a summary of how glucose is used by different organisms.



Examiner only

(a) From the diagram above, use a number to show the process which

[3]

- (i) does NOT release energy;
- (ii) releases most energy per molecule of glucose;
- (iii) takes place in yeast without using oxygen.

Question 3.

Examiner only

The diagrams show side views of the chest cavity.

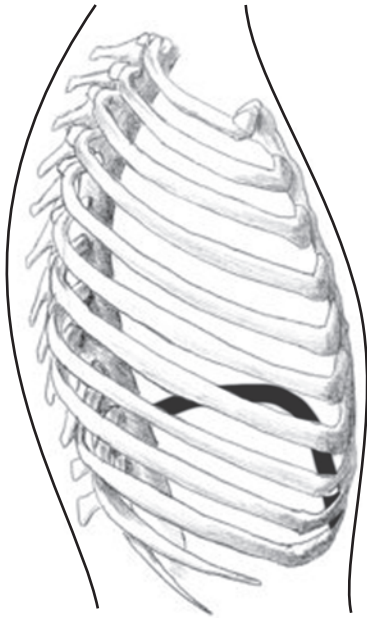


Diagram A

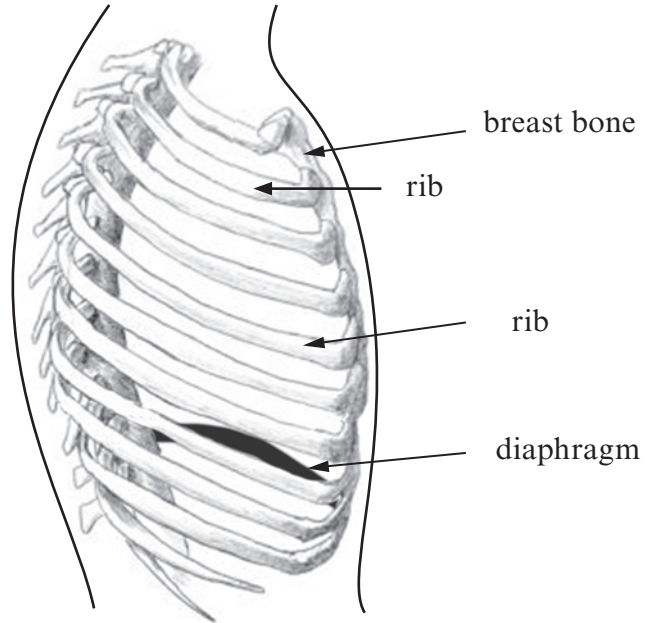


Diagram B

(a) State, with reasons, which of the diagrams A or B shows the chest after inspiration. [2]

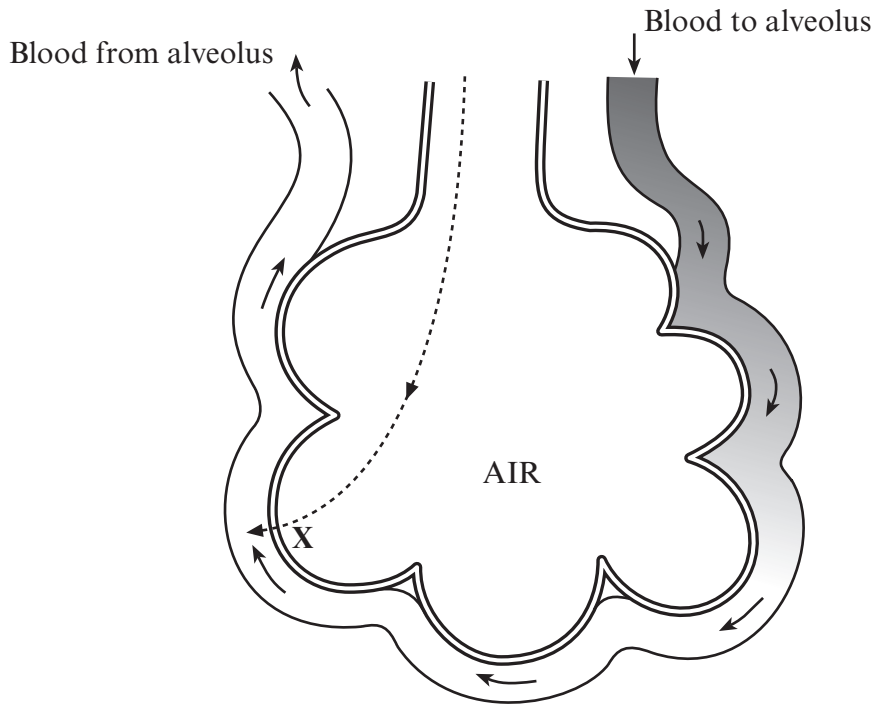
Diagram

Reasons

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(b) The diagram below shows an alveolus in a lung. The dotted line shows the movement of a gas.



(i) Describe what is happening at point X on the diagram. [2]

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(ii) Explain how **two** of the adaptations of alveoli enable them to perform their function. [2]

I

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II

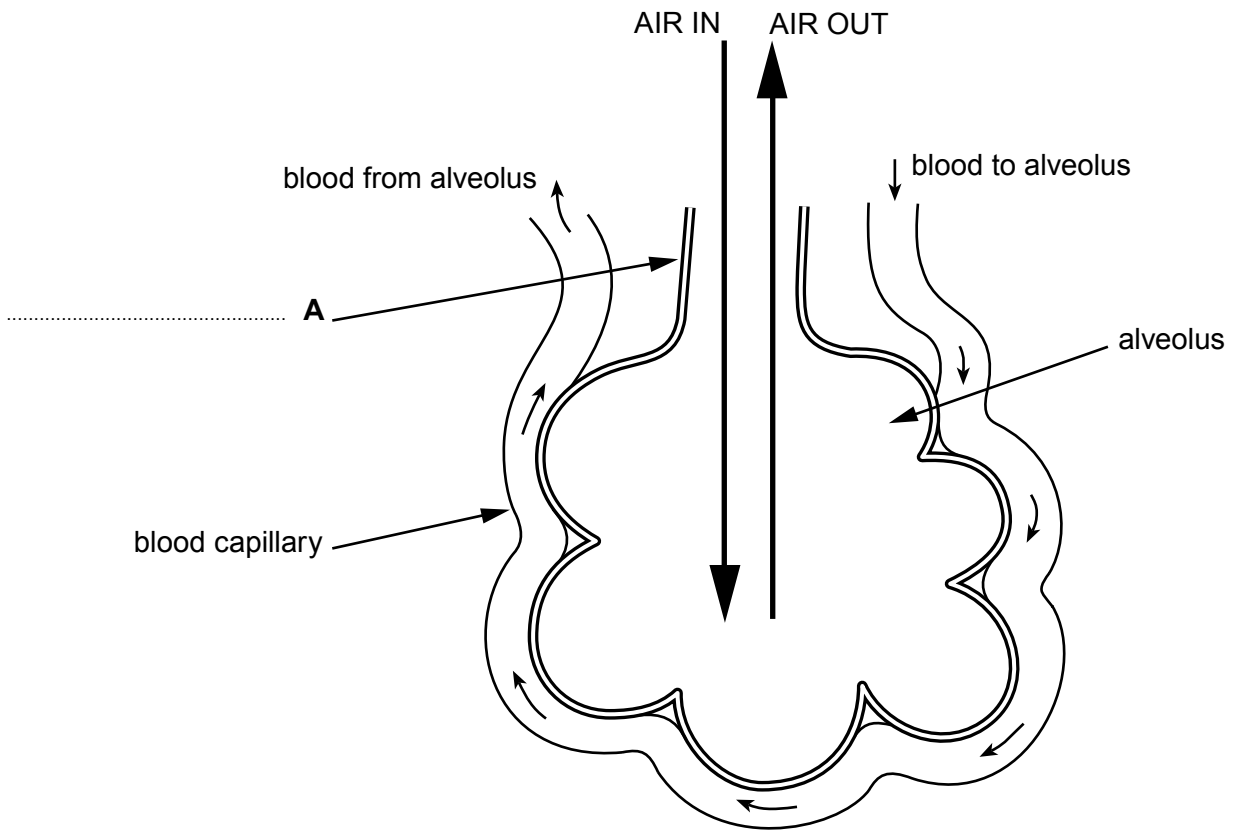
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Question 4.

The diagram shows an alveolus and its blood supply.

Examiner
only



(a) Complete label **A** on the diagram above.

[1]

(b) Explain how gas exchange takes place between the alveolus and blood capillary. Include in your answer a description of how the alveolus is adapted to help this gas exchange. [6 QWC]

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Question 5.

The following information appeared in a newspaper in Wales in 2010.



- Some parents who smoke in the car with the window open when travelling with their children think that the smoke will have no effect on their children's health.
- The British Lung Foundation states that smoking just one cigarette, even with the car window open, creates a greater concentration of second-hand smoke than a whole evening's smoking in a pub or a bar.
- Levels of second-hand smoke in cars can be as much as 27 times greater than in a smoker's home.
- Young children breathe faster than adults, their lungs are smaller and are still growing.

(a) (i) Using the information above, explain why the lungs of young children in particular are in danger from breathing in second-hand smoke. [3]

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- (ii) The Welsh Government is considering introducing strict new laws where parents who smoke while driving with their children face prosecution. Using the information given previously suggest **two other** important pieces of evidence that the Welsh Government may consider in coming to a decision about introducing these new laws. [2]

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- (b) State **two** effects that cigarette smoke has on the cleaning mechanism of the lungs. [2]

- (i)
- (ii)