

17 Which muscles in the breathing system contract during inspiration?

- A** external intercostal and diaphragm only
- B** external intercostal and internal intercostal only
- C** external intercostal, internal intercostal and diaphragm
- D** internal intercostal and diaphragm only

16 Which row describes what happens when breathing in?

	diaphragm	external intercostal muscles
A	contracts	contract
B	contracts	relax
C	relaxes	contract
D	relaxes	relax

18 Which changes cause expiration?

	external intercostal muscles	diaphragm
A	contract	relaxes and moves down
B	contract	relaxes and moves up
C	relax	relaxes and moves down
D	relax	relaxes and moves up

- 5 A student investigated the effect of humidity on water vapour loss in plant leaves. As water vapour was lost, the mass of the leaves decreased.

Similar-sized leaves were collected from one species of plant.

The leaves were divided into two groups, **A** and **B**. The leaves in group **A** were placed in a low humidity environment and the leaves in group **B** were placed in a high humidity environment. The leaves in each group were kept in their environment for 12 hours.

The temperature in each environment was maintained at 20 °C.

The mass of the leaves in each group was measured at the start of the investigation and then every hour throughout the 12-hour period.

The student calculated the mass of water vapour lost as a percentage of the starting mass of the leaves for each group.

Fig. 5.1 shows the student's results.

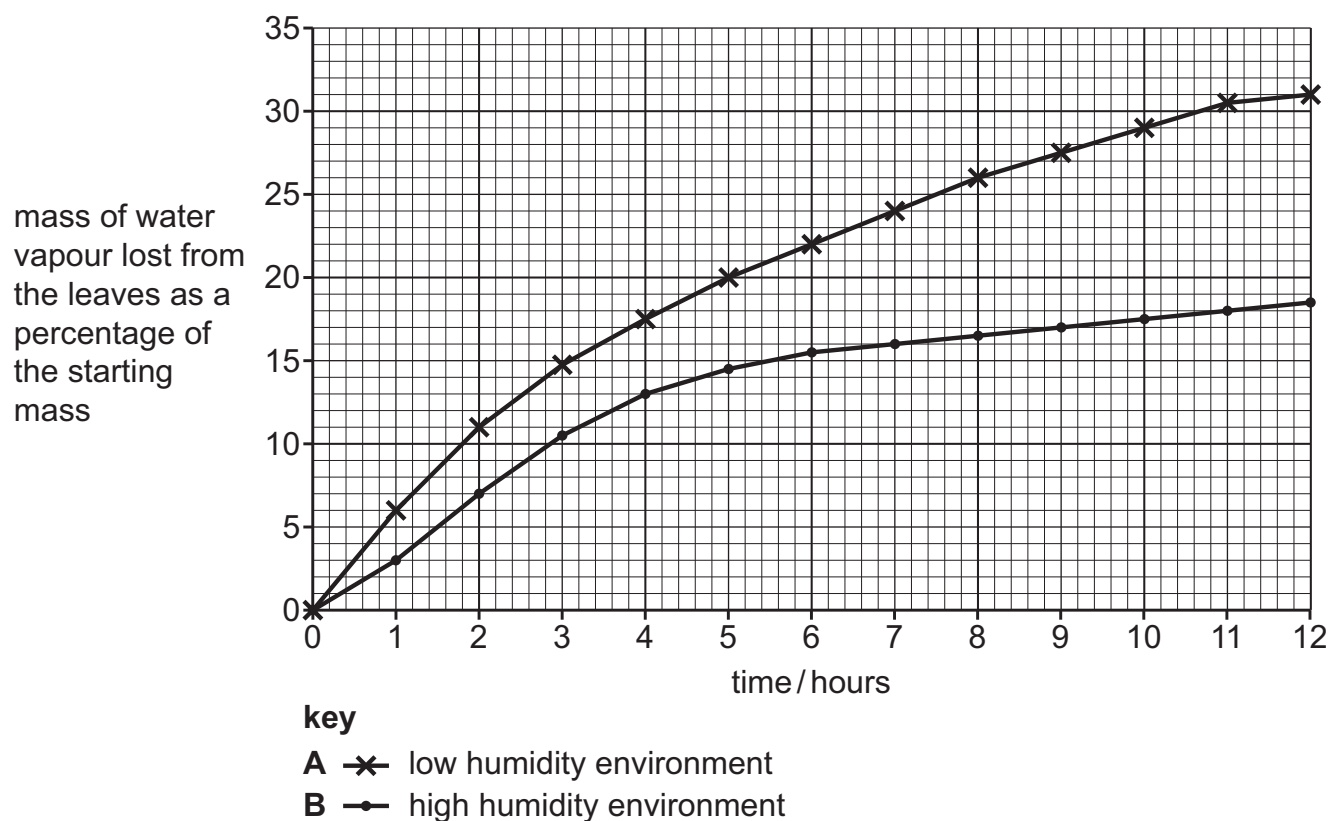


Fig. 5.1

- (a) (i) State the name of the process by which water vapour is lost from plant leaves.

..... [1]

(ii) Compare **and** explain the effects of high and low humidity shown in Fig. 5.1.

[5]

(iii) The students repeated the investigation at a temperature of 35°C.

The leaves were kept in a low humidity environment.

Draw a line **on the graph** in Fig. 5.1 to predict the results of this investigation.

(b) Humans also lose water vapour from their bodies by sweating.

(i) Explain how sweating helps a person to maintain a constant internal body temperature.

[3]

(ii) State **one** other way that humans lose water vapour from their bodies.

[1]

[Total:11]

3 (a) Scientists investigated the relationship between height and the vital capacity of the lungs in people.

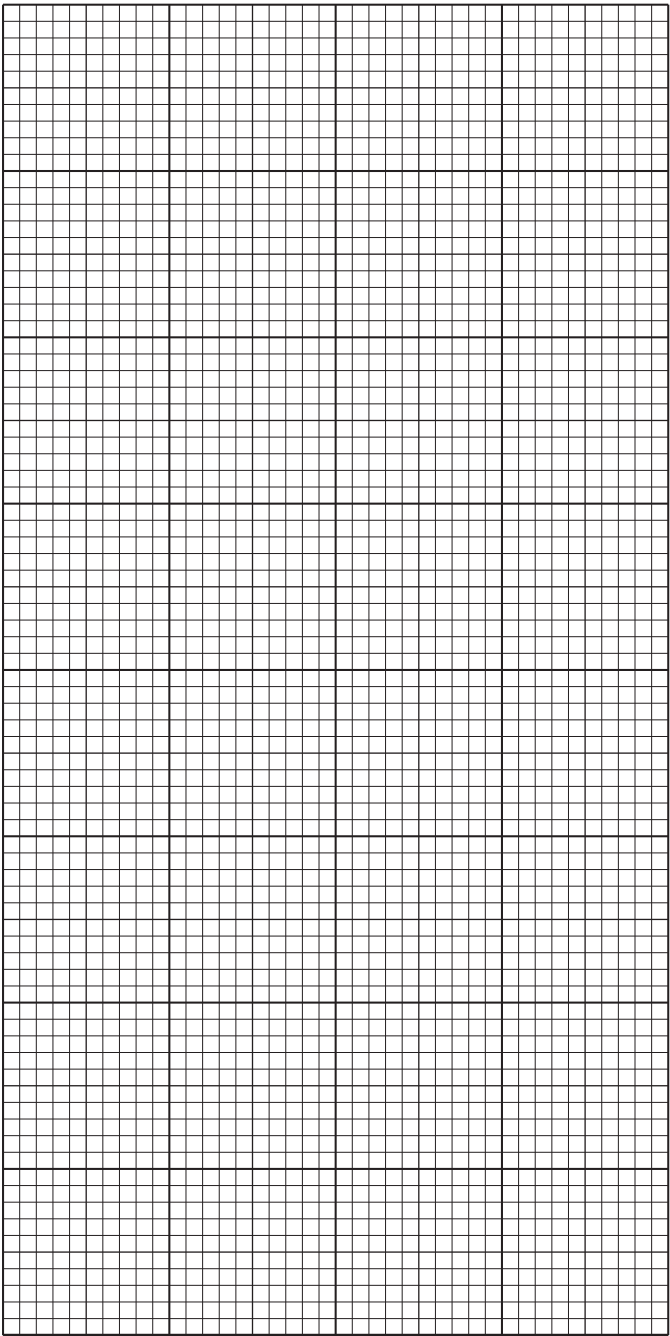
The vital capacity is the maximum volume of air that can be expelled from the lungs after taking the deepest possible breath.

Table 3.1 shows the results of the investigation.

Table 3.1

height of the person /cm	vital capacity / dm ³
130	1.9
140	2.2
150	2.9
160	3.4
170	4.1
180	5.1
190	6.2
200	7.2

(i) Plot a line graph on the grid of the data in Table 3.1.



[4]

(ii) Describe the relationship shown in your graph between height and vital capacity.

.....

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..... [1]

(iii) Use your graph to estimate the vital capacity of a person with a height of 175 cm.

Indicate **on your graph** how you obtained your estimate.

(b) In people with certain lung diseases, the enzyme elastase is more active. Elastase is a protein.

State the name of the reagent that is used to test for protein.

..... [1]

[Total: 8]

2 (a) Alveoli are the gas exchange surface in humans.

State **three** features of alveoli that make them an effective gas exchange surface.

1

2

3

[3]

(b) Fig. 2.1 is a diagram of the human breathing system.

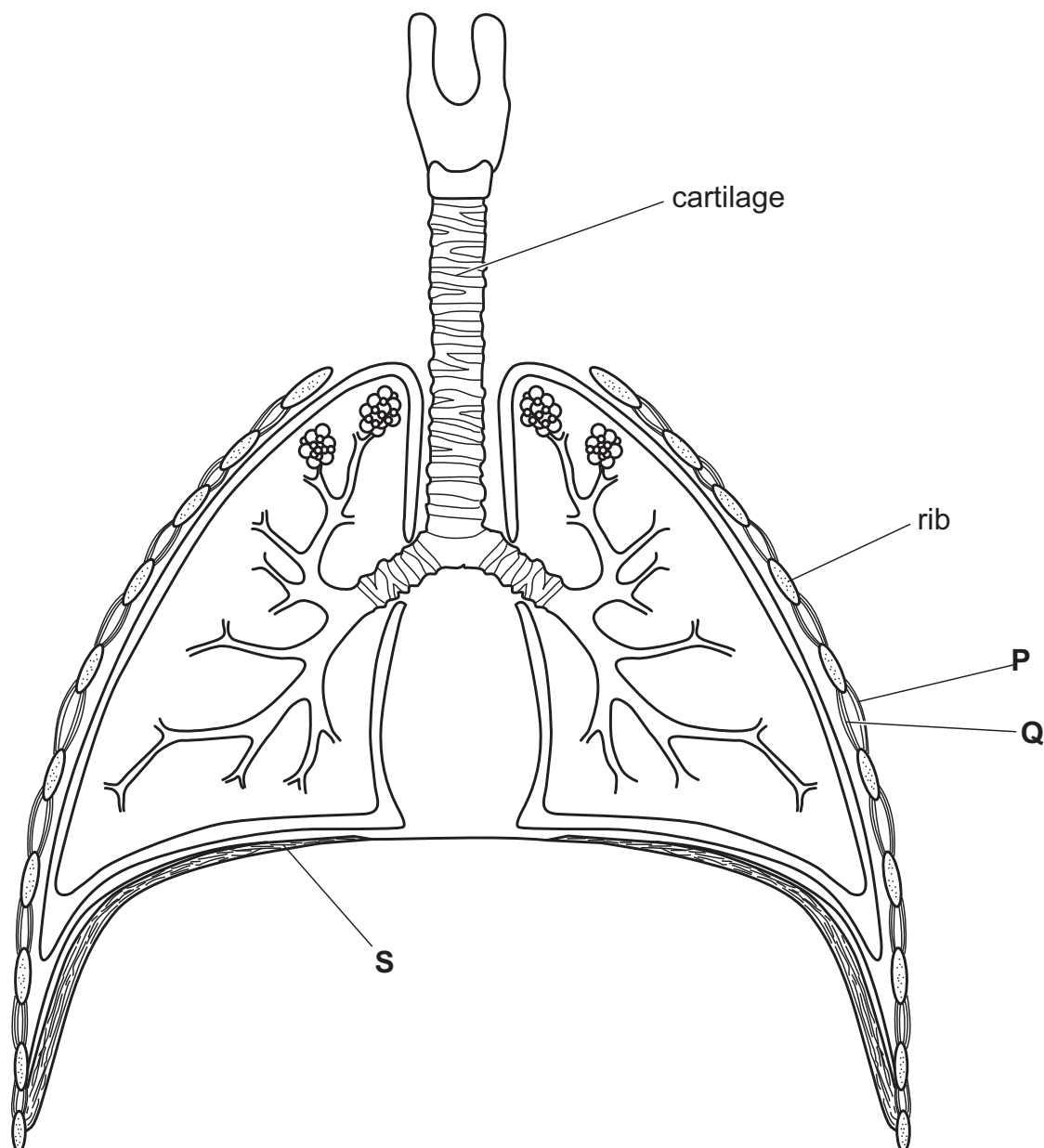


Fig. 2.1

(i) Three muscles involved in inspiration are labelled **P**, **Q** and **S** in Fig. 2.1.

Identify the letters in Fig. 2.1 that label the muscles which contract during inspiration.

..... [1]

(ii) State the function of cartilage in the breathing system.

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..... [1]

(c) (i) State the balanced chemical equation for aerobic respiration.

..... [2]

(ii) During physical activity breathing changes.

Explain the mechanism that links the increase in physical activity to the changes in breathing.

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..... [3]

[Total: 10]

18 What helps to keep the trachea open during breathing?

- A cartilage
- B cilia
- C external intercostal muscles
- D larynx