

Respiration

Student Name:

Class:

Teacher Name:

School:

Question 1

a) Respiration is the process that the swimmer uses to release energy from the digested food e.g. glucose.

Complete the word equation for aerobic respiration:

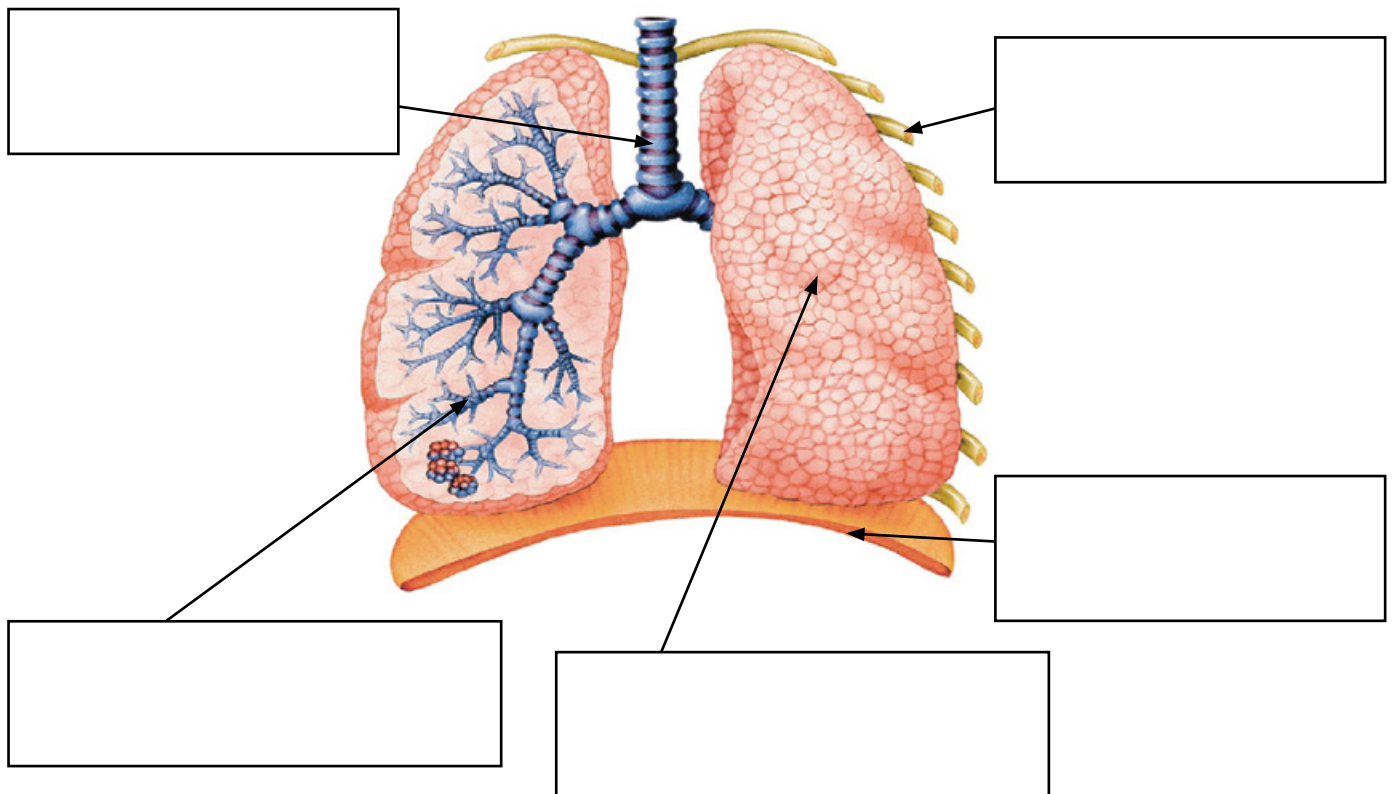
Glucose + **X** → carbon dioxide + **Y** + energy (heat)



Name **X**:

Name **Y**:

b) Label the parts of the respiratory system on the diagram below.



c) The table shows a comparison of the composition of inhaled and exhaled air.

Gas	Inhaled Air %	Exhaled Air %
Carbon Dioxide	0.03 %	4.0 %
Oxygen	21%	16%
Water vapour	variable	More than in inhaled air
Nitrogen	78%	78%

What is the percentage difference in **oxygen** level between inhaled and exhaled air?

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What do you think is the reason for the difference in the levels of oxygen?

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Why is there a higher percentage of **carbon dioxide** in the exhaled air than in the inhaled air?

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Looking at the table, is nitrogen gas used by the body?

YES NO

Explain your answer:

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The diagram shows the exchange of gases taking place in the lungs. What is the name of the air sac in the lungs where gaseous exchange takes place?

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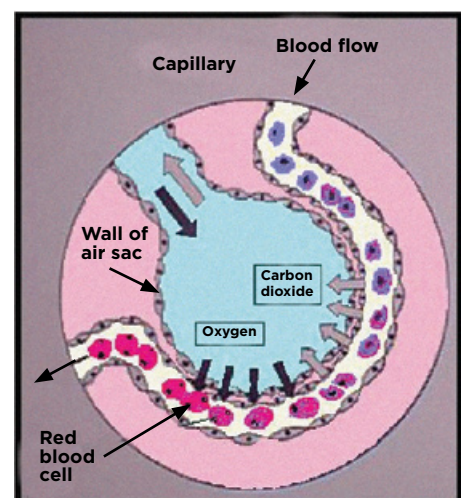
Are the walls of this air sac thick or thin?

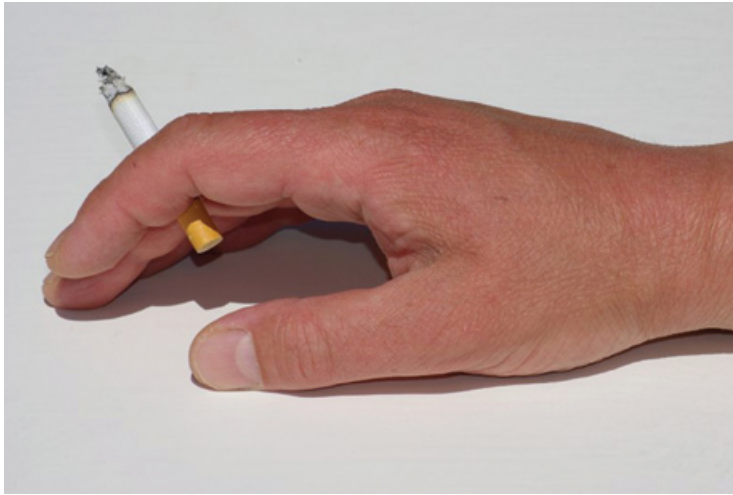
Thick Thin

Explain why you think that they are the thickness you chose.

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.....





Name three harmful substances found in cigarettes:

1.

.....

2.

.....

3.

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Explain how smoking affects gas exchange in the lungs:

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What is meant by passive smoking?

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Is passive smoking harmful?

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Give a reason for your answer:

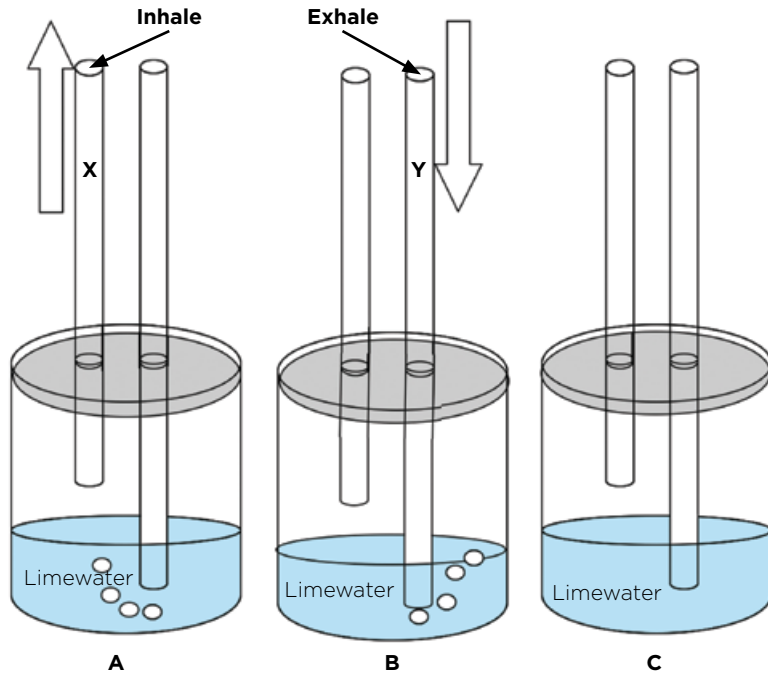
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Question 2

The following investigation was used to show the difference between the contents of inhaled and exhaled air. Limewater turns a milky colour in the presence of carbon dioxide.



- a) Which container of limewater will be first to turn a milky colour?
Circle the correct letter:

A

B

C

Explain your answer:

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.....

Why did the student have container C on the bench while carrying out the investigation?

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How would you show that exhaled air contains water vapour?

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b) When seeds germinate (start to grow), they respire. Some of the chemical energy in the stored food is transformed into another form of energy.

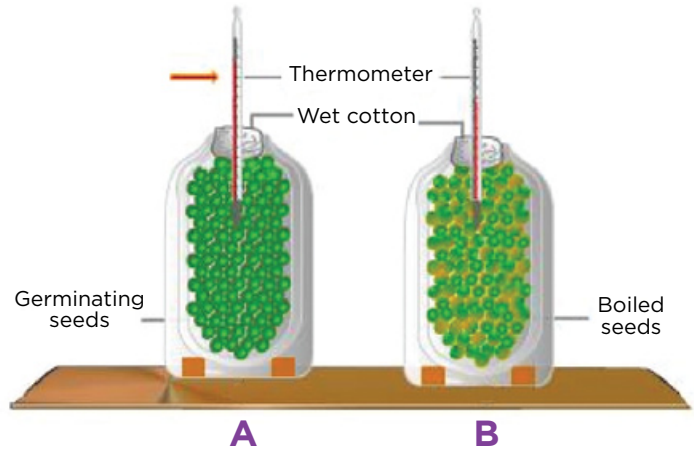
The experiment shown below is investigating to see if this statement is true. Two thermos flasks **A** and **B** were used as shown.

Why is there a thermometer in both flasks?

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Why does the student use a flask of boiled peas?

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How would you know that the chemical energy in the stored food was being transformed into another form of energy by the peas?

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What do you think you will notice happen in flask **A**?

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Explain your answer:

.....

What do you think you will notice happen in flask **B**?

.....

Explain your answer:

.....

What does this investigation tell us about seeds as they start to grow or germinate?

.....

Give two things that the student did to make sure this was a fair test.

1.

2.



Question 3



Compost heap made from grass cuttings and dead leaves.

Week	0	1	2	3	4	5	6	7
Air Temperature/ °C	10	12	14	11	13	12	14	14
Compost Temperature/ °C	10	13	20	34	44	50	33	30

A scientist measured the temperature of the air and the temperature in a compost heap at the same time each day for seven weeks.

The table shows the **average temperatures** in the air and in the compost heap **each week** over a seven week period.

How did the scientist measure the temperatures of the air and the compost?

Air:

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Compost heap:

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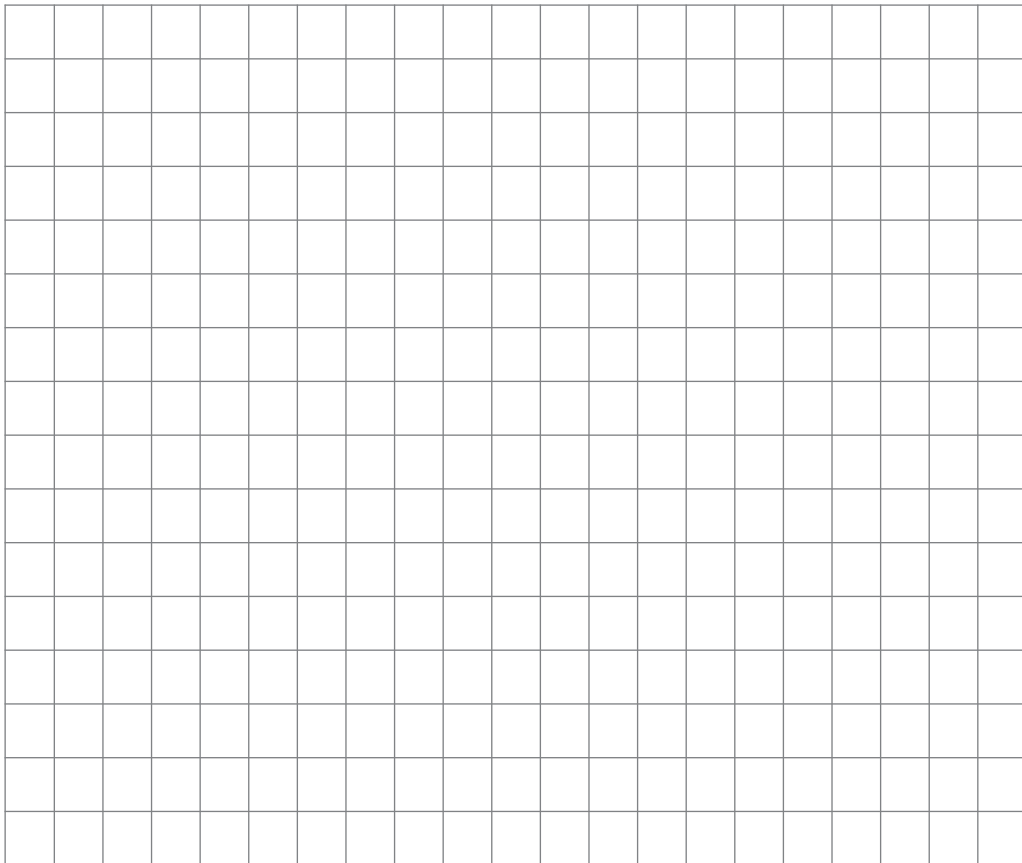
Give one precaution taken when measuring the temperature of the compost each day.

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How did he calculate the average weekly temperature?

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Using the table on the previous page, draw a graph to show how temperature varies with time for the compost heap **and** the air for the 7 weeks.



Describe what happened to the temperature in the compost heap for the first 5 weeks.

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What do you think caused this?

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Why is the temperature of the air so different from that of the compost heap?

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Why does the temperature of the compost heap start to fall after 5 weeks?

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b) When seeds germinate (start to grow), they respire. Some of the chemical energy in the stored food is transformed into another form of energy.

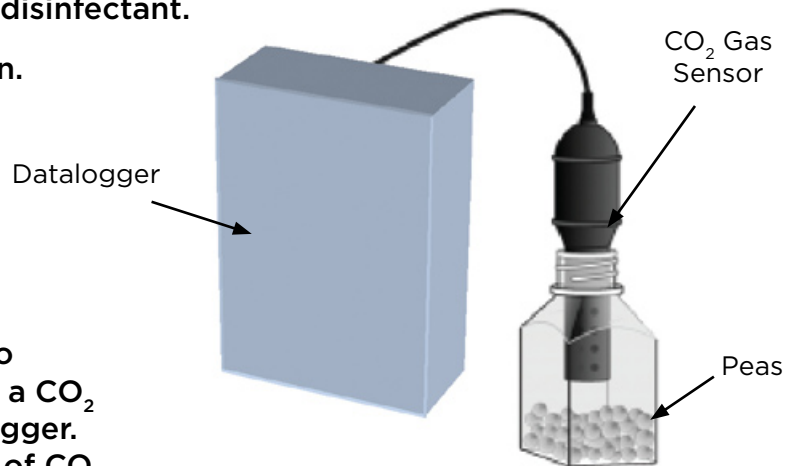
A student wanted to investigate respiration in germinating peas. She carried out the following steps:

She got 40 dried peas which she knew were not germinating.

She got 80 peas that had been soaked in water and had begun to germinate. She divided these into 2 groups of 40.

She washed all the peas in Milton disinfectant.

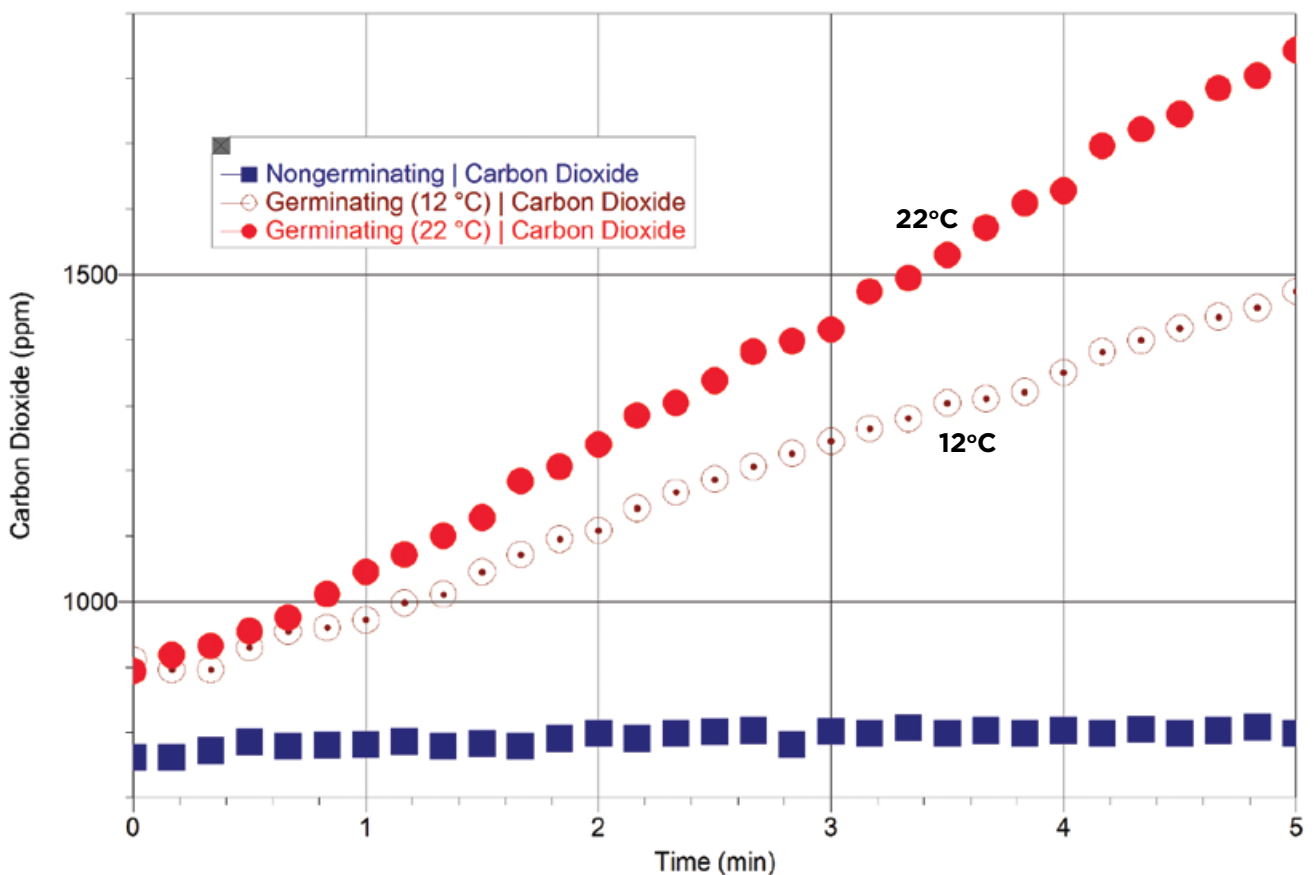
She set up her apparatus as shown.



She collected data from the non-germinating peas and the two groups of germinating peas using a CO₂ Gas Sensor connected to a datalogger. The sensor measured the amount of CO₂ produced by the peas.

One of the groups of germinating peas was studied at 12°C and the other at 22°C.

The graphs from the 3 sets of data collected by the sensor are shown below.



Why were the peas washed with Milton disinfectant?

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Why do you think that the carbon dioxide level for the non germinating peas is so low compared to the germinating peas?

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Suggest the reason for the increase in the carbon dioxide level in the germinating peas.

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Give a possible reason for the difference between carbon dioxide level in the peas germinating at 12°C and those germinating at 22°C.

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Why did the student include non-germinating peas in the investigation?

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Why did the student place the same number of peas in each container?

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For teacher use only.

Comment:

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How to improve:

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