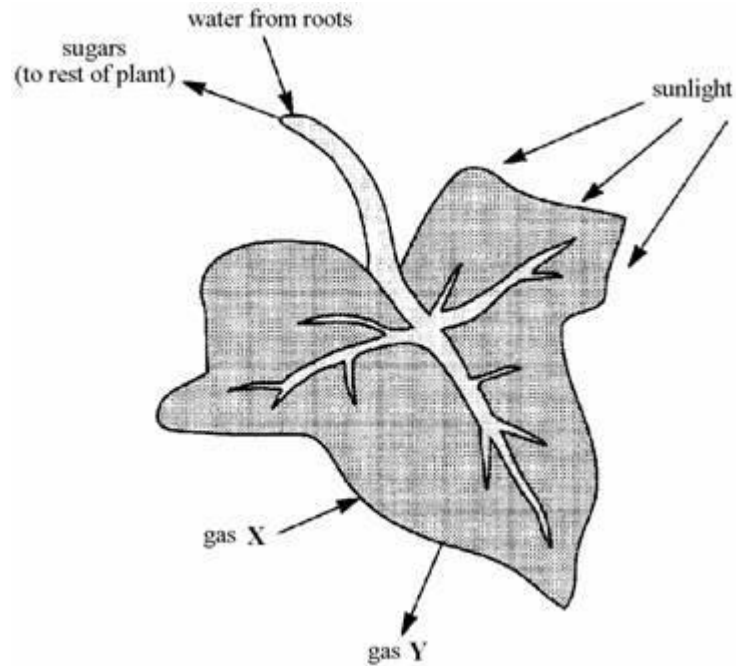


1 The diagram shows a plant leaf during photosynthesis.



(a) Name:

(i) gas X; \_\_\_\_\_

(ii) gas Y. \_\_\_\_\_

(2)

(b) Why is sunlight necessary for photosynthesis?

---

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(1)

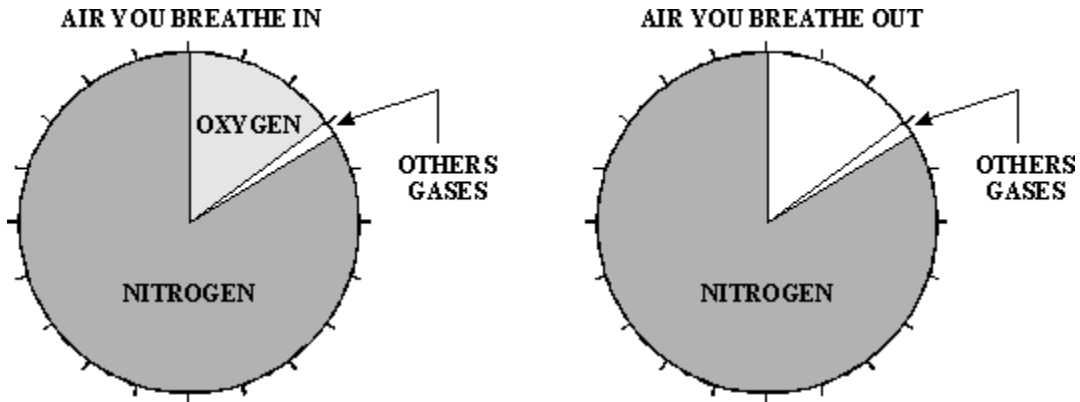
(Total 3 marks)

2

(a) Breathed-out air is different from breathed-in air.

The two pie-charts show the percentages of different gases in each.

Complete the second pie-chart, using the information from the table.



This air contains less than 1% carbon dioxide. (Too little to show)

Gases in breathed-out air	
nitrogen	79%
oxygen	16%
carbon dioxide	4%
other gases	1%

(3)

(b) Use the information above to complete the following sentences.

The air you breathe out contains more \_\_\_\_\_ than the air you breathe in.

The air you breathe out contains less \_\_\_\_\_ than the air you breathe in.

(2)

(Total 5 marks)

3

(a) (i) Complete the word equation for the process of aerobic respiration.

Glucose + \_\_\_\_\_ → carbon dioxide + water

(1)

(ii) Which organ removes carbon dioxide from your body?

\_\_\_\_\_

(1)

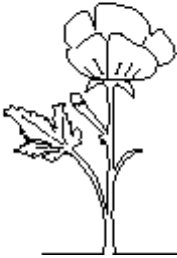
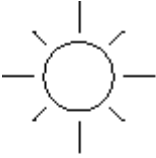
(b) Use names from the box to complete the **two** spaces in the passage.

carbon dioxide    lactic acid    nitrogen    oxygen    water
--

Anaerobic respiration can occur when an athlete does vigorous exercise.  
This is because there is not enough \_\_\_\_\_ in the body.  
The product of anaerobic respiration is \_\_\_\_\_.

(2)  
(Total 4 marks)

**4** Energy for living organisms comes from the Sun.



Complete the sentences by using the correct words from the box.

<b>animals    carbohydrates    carbon dioxide    oxygen    plants    water</b>
--

Light energy is captured by green \_\_\_\_\_.  
They use this energy to make \_\_\_\_\_.  
To do this, they also use \_\_\_\_\_.

(Total 3 marks)

5

The table shows the percentage of some gases in the air a boy breathed in and out.

<b>Gases</b>	<b>Air breathed in</b>	<b>Air breathed out</b>
carbon dioxide	0.04%	4.0%
oxigen	20.0%	16.0%
water vapour	1.0%	6.0%

(a) What happens in the lungs to change the levels of oxygen and carbon dioxide in this way?

Oxygen \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Carbon dioxide \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(4)

(b) Compare the percentage of water vapour in the air breathed out with the percentage in air breathed in.

\_\_\_\_\_

(2)

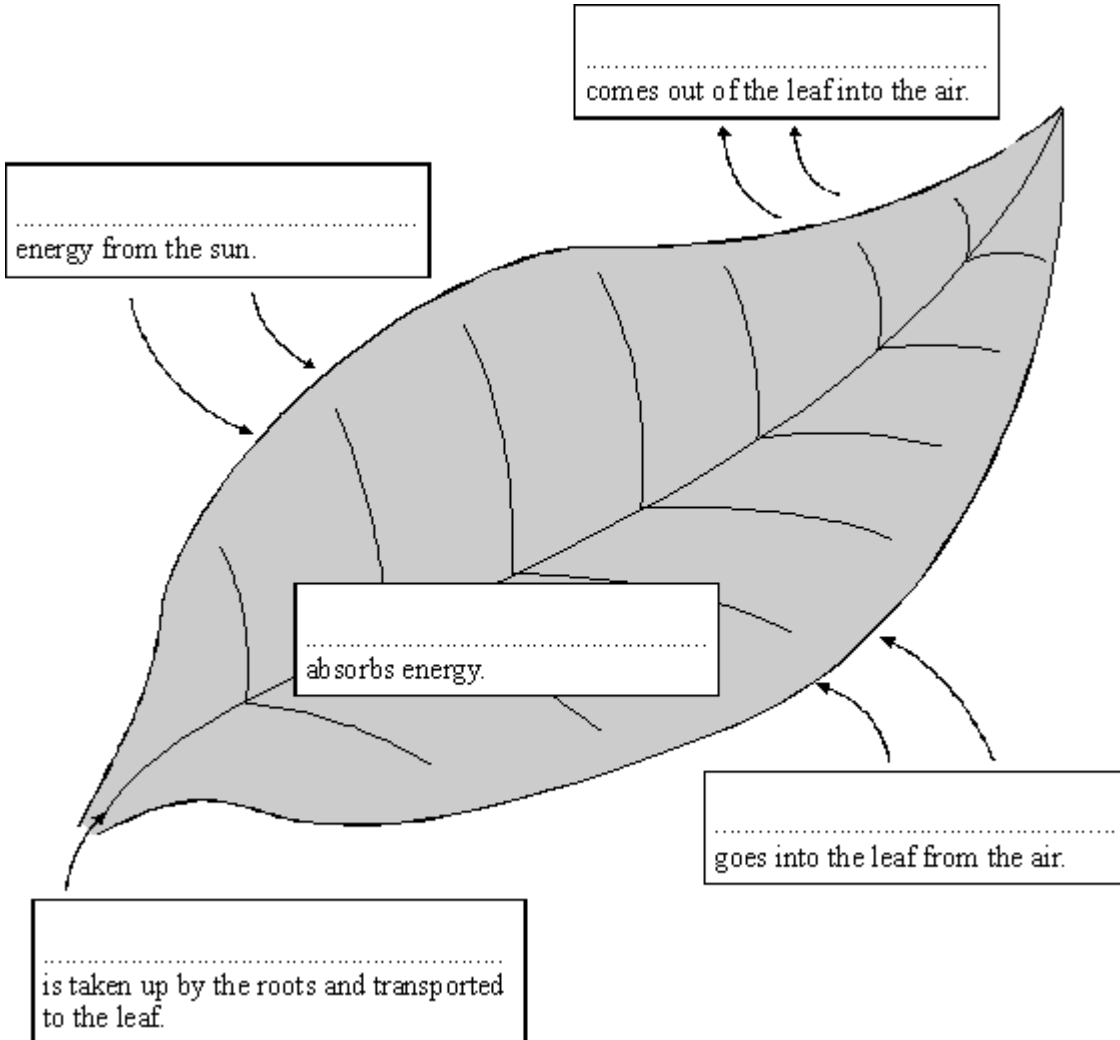
(Total 6 marks)

6

The diagram shows how a leaf of a green plant makes glucose.

- (a) Use words from the box to complete the labels on the diagram. You may use each word once or not at all.

carbon dioxide    chlorophyll    glucose    heat  
light    oxygen    water



(5)

- (b) (i) Complete the following sentence.

Glucose in food is a type of \_\_\_\_\_. When we eat it, it gives us energy.

(1)

- (ii) The plant turns some of the glucose into starch. Why is starch useful to the plant?

---

---

(1)

(iii) What does the plant do with the rest of the glucose?

\_\_\_\_\_

(1)

(c) (i) What is the name of the process outlined in the diagram?

\_\_\_\_\_

(1)

(ii) Give **one** way that leaves are adapted to do this process.

\_\_\_\_\_

(1)

(Total 10 marks)

7

(a) The air you breathe in and the air you breathe out are different.

Use the names of gases from this box to complete the **three** spaces.

argon    carbon dioxide    nitrogen    oxygen    water vapour
---

Compared to the air you breathe in, the air you breathe out contains:

- **more** \_\_\_\_\_
- **more** \_\_\_\_\_
- **less** \_\_\_\_\_

(3)

(b) The process of aerobic respiration takes place in your cells.

(i) Complete the space in the word equation for this process.

\_\_\_\_\_ + oxygen → carbon dioxide + water

(1)

(ii) Complete the space to give the main energy transfer which takes place in this process.

chemical energy → \_\_\_\_\_ energy

(1)

(iii) What is the name of the organ where oxygen from the air passes to your blood?

\_\_\_\_\_

(1)

- (c) The athlete is taking part in vigorous exercise.



Complete the **two** spaces in the passage.

The cells in our muscles respire anaerobically during vigorous exercise. This results in \_\_\_\_\_ debt and the production of \_\_\_\_\_ acid.

(2)  
(Total 8 marks)

## Mark schemes

- 1** (a) (i) carbon dioxide / CO<sub>2</sub> (*reject* CO) 2
- (ii) oxygen / O<sub>2</sub> / O (*reject* water vapour)  
*for 1 mark each*
- (b) (provides) energy 1  
*for 1 mark*
- [3]**
- 2** (a) carbon dioxide in range 2.5-5%  
*gains 1 mark*
- but**  
carbon dioxide closer to 4% than to 3% or 5%  
*gains 2 marks*
- OR**  
oxygen in range 15-17.5%  
*gains 1 mark*
- but**  
If 3 sectors drawn and two correctly labelled,  
award marks and ignore remaining sector  
Oxygen and carbon dioxide sectors labelled  
*for 1 mark* 3
- (b) carbon dioxide  
oxygen  
*for 1 mark each*
- Do not allow water vapour.  
(Allow correct symbols/formulae) 2
- [5]**
- 3** (a) (i) oxygen  
*do not credit air* 1
- (ii) lung(s)  
*do not credit blood or nose or windpipe alone but accept as a neutral answer if included with lungs* 1



(b) oxygen

1

lactic acid

*both words required*

1

[4]

4

plants

1

carbohydrates

*accept oxygen*

1

carbon dioxide

*accept water*

*(these words must be in this order)*

1

[3]

5

(a) oxygen passes from the air/lungs into the body

*gains 1 mark*

**but**

oxygen passes from the air/lungs into the blood

*gains 2 marks*

carbon dioxide passes from the body into the air/lungs

*gains 1 mark*

**but**

carbon dioxide passes from the blood into the air/lungs

*gains 2 marks*

4

(b) increased/5% more

*gains 1 mark*

**but**

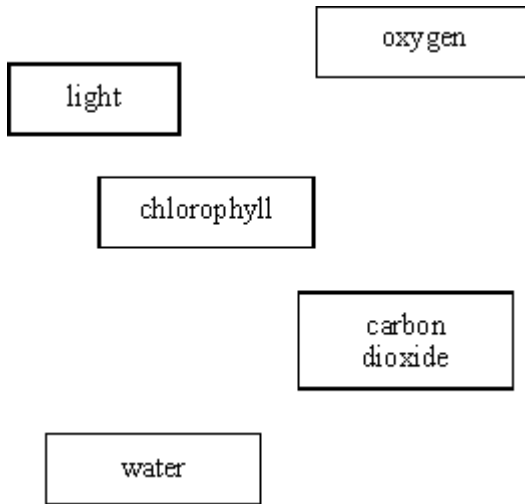
6 times more (in air breathed out)

*gains 2 marks*

2

[6]

6 (a)



5

(b) (i) sugar **or** carbohydrate

1

(ii) it can be stored **or** it is insoluble  
*accept it has no osmotic effect*

1

(iii) any **one** from:  
respires it **or** releases **or** transfers  
energy  
turns it **or** stores it as fructose **or**  
sucrose **or** lipid **or** protein **or**  
cellulose

1

(c) (i) photosynthesis

1

(ii) any **one** from:  
flat surface  
stomata  
thin  
chloroplasts  
veins  
large surface area  
air spaces

*do **not** accept chlorophyll*

1

[10]

- 7 (a) more water vapour  
*accept more water* 1
- more carbon dioxide 1
- less oxygen 1
- (b) (i) glucose  
*accept carbohydrate(s)*  
*accept sugar(s)* 1
- (ii) heat  
*or thermal*  
*or internal kinetic* 1
- (iii) lungs  
*accept alveoli / alveolus*  
*do not credit air sacs*  
*do not credit capillaries*  
*both neutral if included with lungs* 1
- (c) oxygen  
*accept O<sub>2</sub>* 1
- lactic 1

[8]