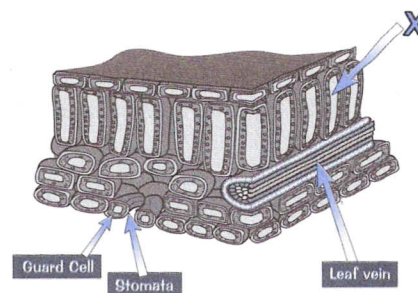


Photosynthesis

Q1 The diagram opposite shows a section across a leaf.

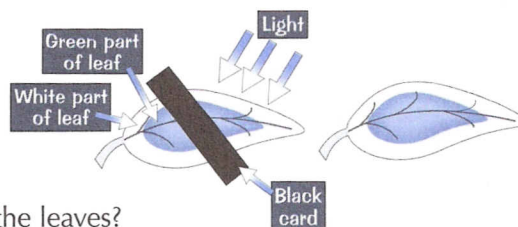
- Give a function of the **leaf vein**.
- Pores allow gases to move in and out of the leaf.
 - What name is given to the **pores** in the leaf?
 - Which cells **control** the movement of gases in and out?
- Give the name for **cell X**.
The main function of these cells is to make food.
 - How are the cells **adapted** to their function?
 - Where** does the energy required for making food come from?



Q2 A variegated plant (its leaves have two colors) was placed in a dark cupboard for 48 hours to use up all of its starch. A strip of black card was then placed across the middle of one of its leaves. The plant was placed in the light for 24 hours. The leaf was then tested for starch.

- Copy the unlabeled leaf, and shade in the areas where **starch** would have been found.
- What **indicator substance** is used to test a leaf for starch?
 - What **color** does the indicator turn when starch is present?
- Why was it **necessary** to get rid of the starch from the leaves?
- Write out** the correct conclusion(s) that can be drawn from this experiment.

... carbon dioxide is needed for photosynthesis	... chlorophyll is needed for photosynthesis
... light is needed for photosynthesis	... water is needed for photosynthesis

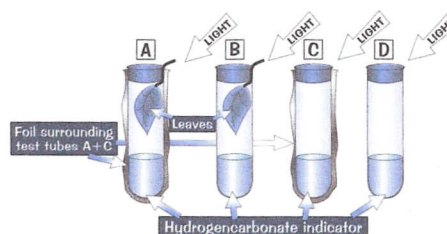


Q3 Write out the equation for photosynthesis.

- in **words**
- in **chemical symbols**

Q4 Four test tubes were set up **as shown in the diagram**, with hydrogencarbonate added to the tubes as an indicator. The table records the color of the hydrogencarbonate in each tube after one hour.

RESULTS	
Tube	Color of hydrogencarbonate indicator after one hour
a	Yellow
b	Purple
c	Orange
d	Orange



- Which tubes act as **controls**?
- What **substance** do you think made the indicator turn **yellow** in test tube **a**?
 - What **process** produces this substance?
- Why do you think the indicator turned **purple** in test tube **b**?
 - What **process** is occurring in test tube **b** that does not occur in test tube **a**?

Cellular Respiration

Q1 Name the main **substance** used for respiration in animals.

Q2 Write out both the **word** and **formula** equations for aerobic and anaerobic respiration.

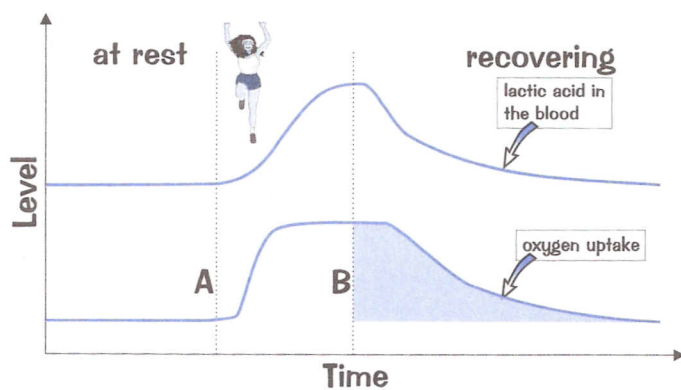
Q3 The word equations below show the processes of aerobic and anaerobic respiration in animal cells.



- a) Using your knowledge and the word equations for aerobic and anaerobic respiration, describe the **similarities** and **differences** between the two forms of respiration.
- b) Adenosine triphosphate, or ATP, is a chemical made by cells using energy from respiration. ATP acts as a temporary store of energy that can be used to drive the chemical reactions in cells. One molecule of glucose produces 38 molecules of ATP by aerobic respiration, but only 2 molecules of ATP by anaerobic respiration. **Suggest a reason** for this difference.

Q4 Kathryn has entered a running race. The graph on the right shows the amount of lactic acid in her blood, and her rate of oxygen uptake during the race. The race takes place between the times marked **A** and **B** on the graph.

- a) What **type** of respiration is most likely to be occurring when Kathryn is resting before the race?
- b) Why does her **rate of oxygen** uptake increase when she begins to run?
- c) Why does Kathryn's rate of oxygen uptake reach a **maximum** during the race? **Why** can't she take up any more oxygen than this?



- d) Why does the concentration of **lactic acid** in her blood increase during the race?
- e) As Kathryn approaches the end of the race, the **muscles** in her legs start to **ache**. Give a **reason** for this.