

Cellular Respiration

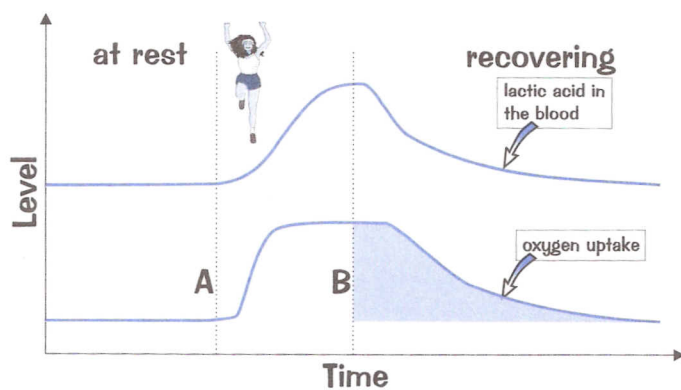
- Q1** Name the main **substance** used for respiration in animals.
- Q2** Write out both the **word** and **formula** equations for aerobic and anaerobic respiration.
- Q3** The word equations below show the processes of aerobic and anaerobic respiration in animal cells.

glucose + oxygen → carbon dioxide + water (+ energy released)

glucose → lactic acid (+ energy released)

- 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.