

B12 - RESPIRATION

USES OF ENERGY IN LIVING ORGANISMS

- Muscle contraction
- Protein synthesis
- Cell division
- Passage of nerve impulses
- Maintenance of constant body temperature *homeostasis*

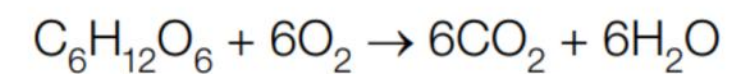
AEROBIC RESPIRATION

The chemical reaction in cells that uses oxygen to break down nutrient molecules to release energy

Equation

Glucose + oxygen → carbon dioxide + water

word



balanced symbol

ANAEROBIC RESPIRATION ≡

The chemical reactions in cells that break down nutrient molecules to release energy without using oxygen

Releases much **less energy per glucose molecule** than aerobic respiration

Equation

Glucose → lactic acid

OXYGEN DEBT

Lactic acid builds up in muscles and blood during exercise

Causes oxygen debt ≡

How is it removed after exercise?

EPOC (excess post oxygen consumption)

Continuation of **fast heart rate**

To transport lactic acid in the blood from muscles to the liver

Continuation of **deeper and faster breathing**

To supply oxygen for aerobic respiration (oxidation) of lactic acid

Aerobic respiration of lactic acid in the liver (broken down)

B12.1 Respiration	
Core	Supplement
1 State the uses of energy in living organisms, including: muscle contraction, protein synthesis, cell division, growth, the passage of nerve impulses and the maintenance of a constant body temperature	
2 Describe aerobic respiration as the chemical reactions in cells that use oxygen to break down nutrient molecules to release energy	
3 State the word equation for aerobic respiration as: glucose + oxygen → carbon dioxide + water	4 State the balanced symbol equation for aerobic respiration as: $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$ 5 Describe anaerobic respiration as the chemical reactions in cells that break down nutrient molecules to release energy without using oxygen

- Supplement
- State that anaerobic respiration releases much less energy per glucose molecule than aerobic respiration
 - State the word equation for anaerobic respiration in muscles during vigorous exercise as:
glucose → lactic acid
 - State that lactic acid builds up in muscles and blood during vigorous exercise causing an oxygen debt
 - Outline how the oxygen debt is removed after exercise, limited to:
 - continuation of fast heart rate to transport lactic acid in the blood from the muscles to the liver
 - continuation of deeper and faster breathing to supply oxygen for aerobic respiration of lactic acid
 - aerobic respiration of lactic acid in the liver