

Aerobic &

Anaerobic Exercise

Revision Guide

St Mary's Catholic Academy

GCSE Physical Education



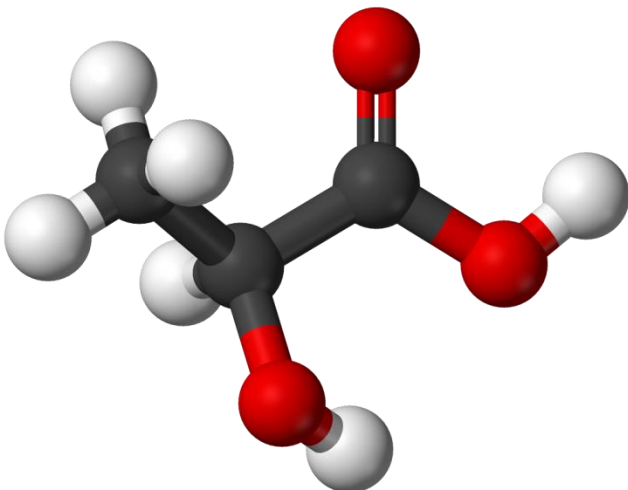
Anaerobic Respiratory system

The **anaerobic respiratory** system **supplies energy very quickly** for sports such as vaulting in gymnastics or throwing a javelin where the **activity only lasts a few seconds**.

This **system breaks down glucose into lactic acid**. It produces energy very quickly.

Lactic acid energy system produces the **majority of the energy** for moderate to high intensity activities such as running 400 metres.

Lactic acid is a fatiguing by-product of this energy pathway and **causes pain and discomfort** in the working muscles.



Glucose → energy +
lactic acid

EPOC (Oxygen Debt)

The anaerobic systems **require oxygen** to **restore them** which is called an. We also refer to an **oxygen debt** as EPOC:

Excess, Post – Exercise, Oxygen, Consumption

After taking part in exercise, a person **continues to breathe** more **deeply and rapidly** than when at rest to take in additional oxygen to **repay this oxygen debt**.

A period of activity such as a **cool down** is the best way to **recover**.

Cool downs should be followed by **rehydration and refuelling**.

The refuelling should involve foods which are rich in **carbohydrate and protein** to ensure excellent recovery.

Many athletes and elite teams also use **ice baths** to improve recovery.

The use of cold conditions pushes blood flow to deep tissue, **preventing swelling and pain** in the arms and legs.

When blood flow returns to these areas it helps to **flush out lactic acid** and other impurities built up during performance.

The oxygen is then used to:

- 1) Maintain higher than resting breathing rate, heart rate and temperature
- 2) Break down and **oxidise lactic acid**
- 3) Gradually **reduce body temperature**
- 4) **Remove excess carbon dioxide** from the body



Aerobic respiratory system

The **aerobic respiratory** system is responsible for producing the **majority of our energy** while our bodies **are at rest** or taking part in **low-intensity exercise for long periods** of time such as jogging or long-distance cycling.

Glucose + oxygen →
energy + water + carbon
dioxide



Glucose from **carbohydrates and fats** supply the **energy for the aerobic energy** system and can supply energy for long periods of time.

Carbohydrate food sources include rice, bread, potatoes, bananas and energy drinks. Fat food sources include butter, oils, cheese, milk and nuts.

Quick Questions

Which of the following sporting performances is powered anaerobically?

- 1) Pole Vault
- 2) Cross Country Skiing
- 3) Road Cycling

Which sugar is broken down to produce energy and lactic acid in the absence of oxygen?

- 1) Protein
- 2) Glucose
- 3) Fat

Which fatiguing by-product is made in the legs of a 400 m runner during anaerobic exercise?

- 1) Lactic Acid
- 2) Oxygen
- 3) Haemoglobin

For how long can anaerobic exercise be continued before fatigue?

- 1) A few hours
- 2) A few minutes
- 3) A few seconds

Which of these food sources contain the most carbohydrate?

- 1) Butter
- 2) Meat
- 3) Rice

Which of these performances is powered aerobically?

- 1) Triathlon**
- 2) 100M**
- 3) Triple Jump**

Which of the following is a by-product of aerobic respiration?

- 1) Lactic acid**
- 2) Water**
- 3) Oxygen**

Which system of producing energy takes place in the presence of oxygen?

- 1) Anaerobic**
- 2) Aerobic**
- 3) Heart Rate**

What will be experienced by an athlete as they accumulate lactic acid during an interval training session?

- 1) Fatigue**
- 2) A feeling of lightness**
- 3) Increased intensity**

Which of the following foods is a good source of fat?

- 1) Bread**
- 2) Banana**
- 3) Nuts**

Answers

- 1) Pole Vault
- 2) Glucose
- 3) Lactic Acid
- 4) A few seconds
- 5) Rice
- 6) Triathlon
- 7) Water
- 8) Aerobic
- 9) Fatigue
- 10) Nuts

