

Excretion

Aerobic Respiration:

Aerobic respiration involves chemical reactions in cells that use oxygen to break down nutrient molecules, releasing energy for processes like muscle contraction, protein synthesis, cell division, active transport, growth, nerve impulses, and maintaining body temperature.

Investigations:

1. **Oxygen Uptake:** A simple respirometer measures the oxygen uptake in respiring organisms. The movement of a dye in a capillary tube indicates oxygen consumption, as CO₂ is absorbed by soda lime.
2. **Temperature Effect on Respiration:** A similar setup with germinating seeds shows how temperature affects respiration. The rate of respiration can be calculated by the movement of the dye in the tube at different temperatures (e.g., 30°C, 40°C).

Anaerobic Respiration:

Anaerobic respiration breaks down nutrients without oxygen and releases less energy than aerobic respiration. The process differs between muscles and yeast:

- **Muscles:** Glucose → Lactic acid + Energy
- **Yeast:** Glucose → Ethanol + CO₂ + Energy

Lactic Acid & Oxygen Debt:

Sourced from: <https://freeexamacademy.com>

During vigorous exercise, when oxygen supply is insufficient, muscles perform anaerobic respiration, producing lactic acid as a byproduct. After exercise, oxygen is needed to break down lactic acid in the liver. This oxygen requirement is called "oxygen debt." Fast heart rate and deep breathing after exercise help transport and eliminate lactic acid.