We need energy to live, but how do we get it? We eat food and, via the process of respiration, we transfer the energy within this food to energy our bodies can use. Respiration is the chemical process of releasing energy from organic compounds. It is a series of enzyme-controlled reactions in which energy is transferred to produce adenosine triphosphate (ATP) from adenosine diphosphate (ADP) and inorganic phosphate (P).

**GLYCOLYSIS**

Occurs in cytoplasm

Oxidation of glucose to form pyruvate

- **Net products:** 2 ATP (from glycolysis)
- **Net ATP yield:** 2 ATP

**ANAEROBIC RESPIRATION**

Respiration that uses final electron acceptors other than oxygen

- **Net ATP yield:** 2 ATP (from glycolysis)
- **Net products:** 2 pyruvate

**ELECTRON TRANSPORT CHAIN**

Using electron transport to power the transport of protons (H+), leading to the production of ATP

- **Net ATP yield:** The amount of ATP made per molecule of glucose varies according to conditions. In theory, each can yield a maximum of 38 ATP, but around 30 is more likely.

**GLASSOLOGY**

- **Acetyl CoA:** An intermediate formed in the degradation of the sugar of carbohydrate sources. Acetate contains two carbon atoms. ATP transfers a coenzyme that transfers energy.
- **Anaerobic:** Using oxygen
- **Anaerobic:** Without oxygen
- **ATP:** Adenosine triphosphate. A molecule that transfers energy; it is involved in the transfer of energy. Most of all, ATP is made during respiration.
- **ATP (adenosine triphosphate):** A molecule that transfers energy; it is involved in the transfer of energy. Most of all, ATP is made during respiration
- **ATP synthase:** An enzyme that catalyses the synthesis of ATP from ADP and inorganic phosphate. It is also very important elsewhere in the cell.
- **Decarboxylation:** A chemical reaction in which carbon dioxide is given off.
- **Electron transport:** The gain of electrons or the loss of oxygen by a compound.
- **Glycolysis:** The splitting of glucose. This pathway is involved in the catabolism of glucose. It is the first stage of the metabolic process of respiration.
- **GTP (guanosine triphosphate):** A molecule that transfers energy; it is involved in the transfer of energy. Most of all, ATP is made during respiration.
- **NAD (nicotinamide adenine dinucleotide):** A molecule that transfers energy; it is involved in the transfer of energy. Most of all, ATP is made during respiration.