Cell Respiration (3.7)

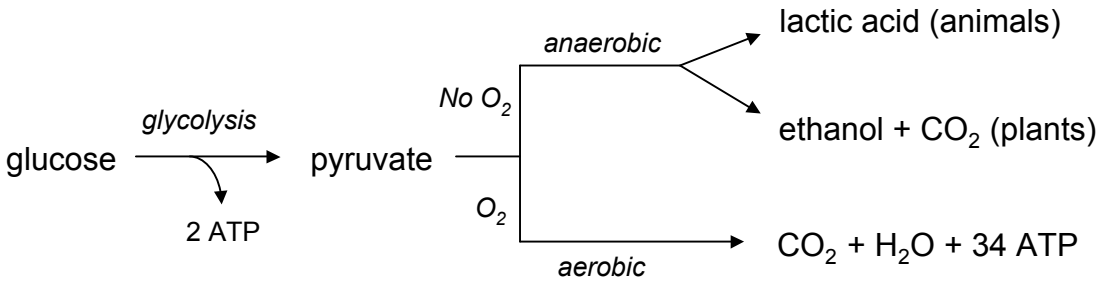
Define cell respiration (3.7.1)

- The controlled release of energy from organic compounds in cells to form ATP
- **Chemical equation:** $C_6H_{12}O_6 + 6O_2 + (36\ ADP + 36\ Pi) \rightarrow 6CO_2 + 6H_2O + 36\ ATP$

Outline the process of glycolysis (3.7.2)

- Glycolysis is the breakdown of glucose (6C) into two molecules of pyruvate (2 × 3C)
- Glycolysis occurs in the cytosol and results in a small yield of ATP (net gain = 2 ATP)
- Can occur via either an anaerobic *(O_2 absent)* or aerobic *(O_2 present)* pathway

Summary of cell respiration



Outline anaerobic respiration (3.7.3)

- Occurs in the **absence** of oxygen
- Occurs in the **cytosol** of the cell
- Results in a **small** yield of ATP:
  - 2 ATP molecules from glycolysis
- Results in the formation of:
  - lactic acid *(**animal** cells)*
  - ethanol + CO_2 *(**plant** cells = fermentation)*

Outline aerobic respiration (3.7.4)

- Occurs in the **presence** of oxygen
- Occurs in the **mitochondria** of the cell
- Results in a **large** yield of ATP:
  - 2 ATP molecules from glycolysis
  - 2 ATP molecules from Krebs Cycle
  - 32 ATP molecules from ETC
- Results in the formation of:
  - carbon dioxide (CO_2) + water (H_2O)

Draw and label a mitochondrion (8.1.3 *[HL]* / C.3.3 *[SL]*)