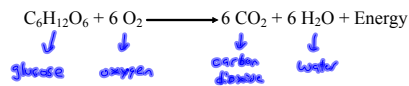


Cellular Respiration - Catabolic



aerobic respiration → a metabolic process that requires oxygen

anaerobic respiration → a metabolic process that does not require oxygen

Cellular respiration is a 3-step process

1. Glycolysis
2. Kreb's cycle *or citric acid cycle*
3. Electron Transport

Glycolysis

- Anaerobic process → *Does not require oxygen*
- takes place in cytoplasm
- glucose is broken down into 2 ATP and 2 NADH and 2 PYRUVATE

Kreb's Cycle - Aerobic Process

- Pyruvate is transformed into CO₂ inside the mitochondria
- Results

* 6 CO₂ 2 ATP 8 NADH 2 FADH₂ *



Electron Transport - Aerobic

- Takes place on the mitochondria membrane
- NADH and FADH₂ donate electrons into the electron transport chain
- H⁺ ions diffuse through ATP synthase and ATP is produced

* 32 ATP produced TOTAL

36 ATP Total

↳ 2 ATP = Glycolysis
 2 ATP = Kreb's cycle
 32 ATP = Elec. Transport

Anaerobic Respiration

- occur when oxygen levels are low
- cells will use glycolysis until NAD⁺ is used up

↳ cannot use Kreb's or Electron transport

Fermentation

- replenishes the NAD⁺ in cell
- 2 types

1. Lactic acid fermentation

- pyruvate from glycolysis converted to lactic acid
- muscle fatigue during exercise

2 ATP

sore muscles

2. Alcohol fermentation

- occurs in yeast
- pyruvate from glycolysis converted to alcohol

Photosynthesis vs. Cell Respiration

Photosynthesis

- need light
- chloroplasts / chlorophyll
- Products = O₂ and glucose
- Reactants = CO₂ and H₂O
- Plants

Cell Respiration

- do not need light
- mitochondria
- Reactants = O₂ and glucose
- Products = CO₂ and H₂O
- Animals
- 36 total ATP

***Photosynthesis and Cell respiration form a cycle where the products from one process are the reactants for the other process and vice versa