Guided Notes - Cellular Respiration releases Energy (ATP)

What is Cellular Respiration? Process that ALL organisms can use to convert Chemical energy (Food) to ATP energy. Glucose

Begins in the Cytoplasm of the cell and ends in the mitochondria.

In prokaryotes, the cell membrane is used instead of the mitochondria.

Overall Equation for Cellular Respiration

Reactants → Products

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2 + \text{energy}$$

(glucose + oxygen → water + carbon dioxide + energy) ATP

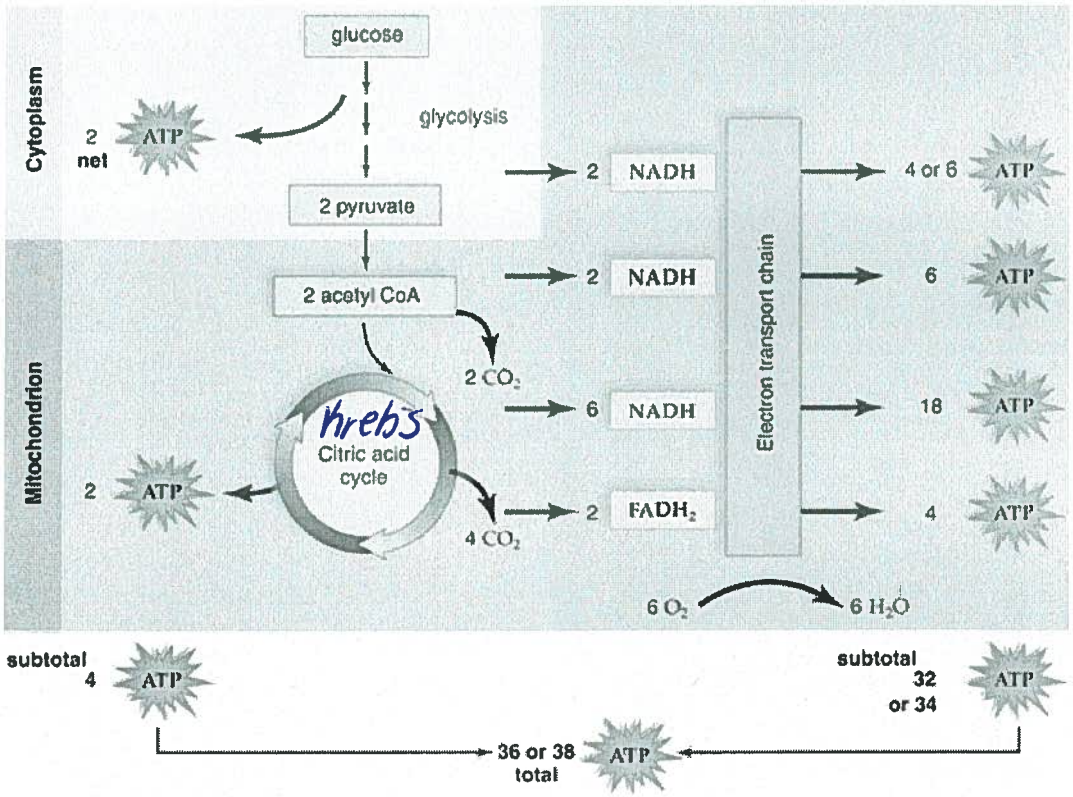
1 3 3 2 12 3

3 Stages/Steps of Cellular Respiration

1. **Glycolysis (anaerobic=without oxygen)**
   a. Occurs in the Cytoplasm.

   NEEDS: Glucose
   2 ATP

   PRODUCES: 2 Pyruvate/Pyruvic Acid, NADH, 4 ATP (4-2=2 ATP Gain)



2. **Kreb's Cycle/Citric Acid Cycle**
   a. Occurs in the mitochondria.

NEEDS: 2 Pyruvate/Pyruvic Acid
↓
2 Acetyl CoA

PRODUCES:
Carbon Dioxide
2 ATP
$NADH$ & $FADH_2$

3. **Electron Transport Chain (aerobic=with oxygen)**
   a. Occurs in the mitochondria of eukaryotes. Cell membrane of prokaryotes

NEEDS: $NADH$ & $FADH_2$
OXYGEN

PRODUCES: Water, 32-34 ATP

★ oxygen accepts the final electrons to make water (H)