Assignment:3  
Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_\_\_\_

**Cellular Respiration – Harvesting Cellular Energy**

**Overview of Cellular Respiration**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - occurs in the cytoplasm

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Respiration**

* Respiration \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ O2
* In cytoplasm

1. \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ Fermentation OR \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Fermentation

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Respiration**

* Respiration \_\_\_\_\_\_\_\_\_\_ O2
* In mitochondria

1. \_\_\_\_\_\_\_\_\_\_\_\_\_ oxidation
2. \_\_\_\_\_\_\_\_ cycle
3. \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_

*With or without oxygen…***Stage 1: Glycolysis**

* Breaking down \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + “\_\_\_\_\_\_-\_\_\_\_\_\_\_” (splitting sugar)
  + Ancient pathway which harvest energy
    - Is the starting point for \_\_\_\_\_\_ cellular respiration
  + But it’s inefficient
    - Generates only \_\_\_\_\_\_\_ for every \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Occurs in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Overview – 10 reactions
  + Convert \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Produces \_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_
  + Uses \_\_\_\_\_\_\_\_\_\_
  + End result: \_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_\_\_\_

*If there is oxygen…***Stage 2 & 3: Oxidation of Pyruvate and Krebs Cycle**

**Mitochondria – Structure**

* Double membrane energy harvest organelle
  + Smooth \_\_\_\_\_\_\_\_\_\_ membrane
  + Highly \_\_\_\_\_\_\_\_\_\_\_ inner membrane
    - Cristae
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Fluid-filled space between membranes
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Inner fluid-filled space

**Oxidation of Pyruvate**

* Pyruvate enters mitochondrial matrix
  + As it enters…
    - Breaks off a \_\_\_\_\_\_\_\_ and makes 2 \_\_\_\_\_\_\_\_\_
    - Makes 2 \_\_\_\_\_\_\_\_\_
    - Produces 2 \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ molecules
  + Acetyl CoA enters \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Krebs Cycle**

* So we fully broke down glucose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_ & ended up with \_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_!
* Krebs cycle produces large quantities of \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_
  + Go to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_!
* Net gain = 2 \_\_\_\_\_\_\_, 8 \_\_\_\_\_\_\_\_\_\_\_\_\_ and 2 \_\_\_\_\_\_\_\_\_\_\_

**Stage 4: Electron Transport Chain**

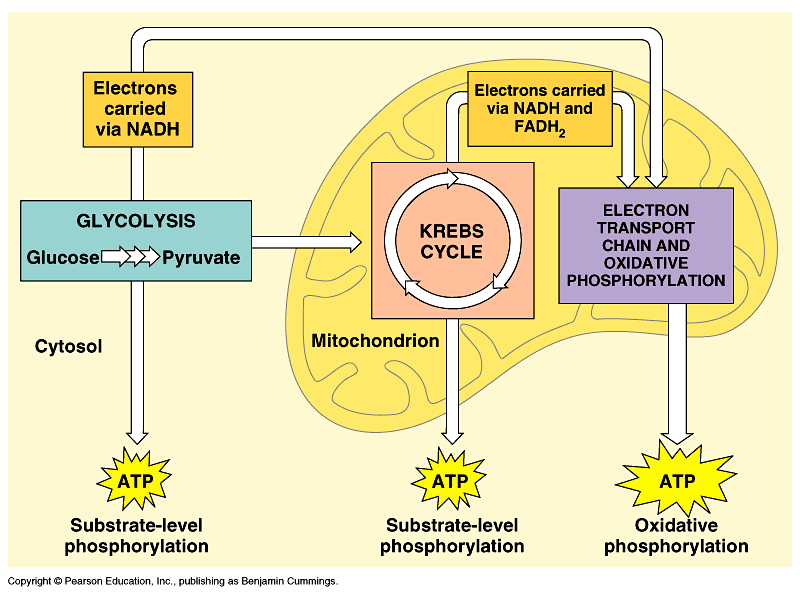
**ATP accounting so far…**

* Glycolysis 🡪 \_\_\_ ATP
* Kreb’s Cycle 🡪 \_\_\_ ATP
* Life takes a lot of energy to run, need to extract more energy that \_\_\_ \_\_\_\_\_!

**Electron Transport Chain**

* Series of proteins built into\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Transport of electrons down ETC that bring \_\_\_\_\_\_\_\_\_\_\_\_\_ ions \_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_
* These hydrogen electrons fuel a protein that makes \_\_\_\_\_\_
* This stage make \_\_\_\_\_\_\_\_\_\_\_ from 1 glucose!
* Only happens WITH \_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* As \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ move through the \_\_\_\_\_\_\_\_\_\_\_\_\_, they drop off \_\_\_\_\_\_\_\_\_\_\_ and make \_\_\_\_\_\_\_\_\_

**We did it!**

* Set up a \_\_\_\_\_ gradient
* They want to move from \_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_
* As they move to low the \_\_\_\_\_\_\_\_\_\_\_ flow through ATP synthase
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ ATP