

Biology Karaoke #1: "Makin' ATP Rap" (Remix)
To the tune of "Make It Rain" by Fat Joe w/Lil Wayne
Written by: Ryan Tatar

CHORUS

Yeah, I'm in this business for energy
 Got a hand full of glucose gonna make me some ATP
 I break it down, break it down
 I'm in this business for energy
 Got a hand full of glucose gonna make me some ATP
 I break it down, break it down (3x)
ECHO: Break it down in the plasm (3x)
 I'm eating at Mc Donalds, breakin' it down in the sarcoplasm

VERSE 1

In case you didn't hear me I'm in it for the energy bro
 Split from the bloods with the help of hexokinase yo
 Turned from that G6P into F16P
 And now I'm cruising down through cycling, and G3P
 Just anaerobically produced my first known ATP
 I make it rain with adenosine tri-phosphate babe
 Especially when I'm using pyruvate kinase k
 From pyruvate to lactate we be doin' it all day (CHORUS)

VERSE 2

Hey Tricarboxylic Acid Cycle where you at?
 Yo' it's TCA and I'm chillin jus doin' business down in the M-I-T-O-C-H-O-N-D-R-I-A
 Are you still with us cuz we're rolling down to TCA
 Led by Acetyl CoA, where Citrate inhibits PFK
 From Isocitrate to Alpha Ketoglutarate
 Decarboxylase, 3 ATP made
 With three more on the way down south to Succinyl CoA
 Another ATP on the way to Succinate
 Substrate level phosphorylation time to celebrate
 Oxidation reaction to get to Fumarate
 Gotta get some H₂O on my way to Malate bro
 From NAD to NADH⁺ hydrogen yo
 That's oxidation reaction get with the program man
 Get to Oxaloacetate and that's a grand slam (CHORUS)

VERSE 3

L-I-P-O-L-Y-S-I-S is what I'm talking about
 Hormones bind to receptors then they work it out
 I'm a take a leap of faith and leave the rest out
 Cuz you know Beta Oxidation is what it's all about
 Fatty Acyl CoA starts of the party right
 Add Acetyl CoA and party all night
 Making the most ATP's from 18 C's aiiight
 In fact 147 ATP's to be precise (CHORUS)

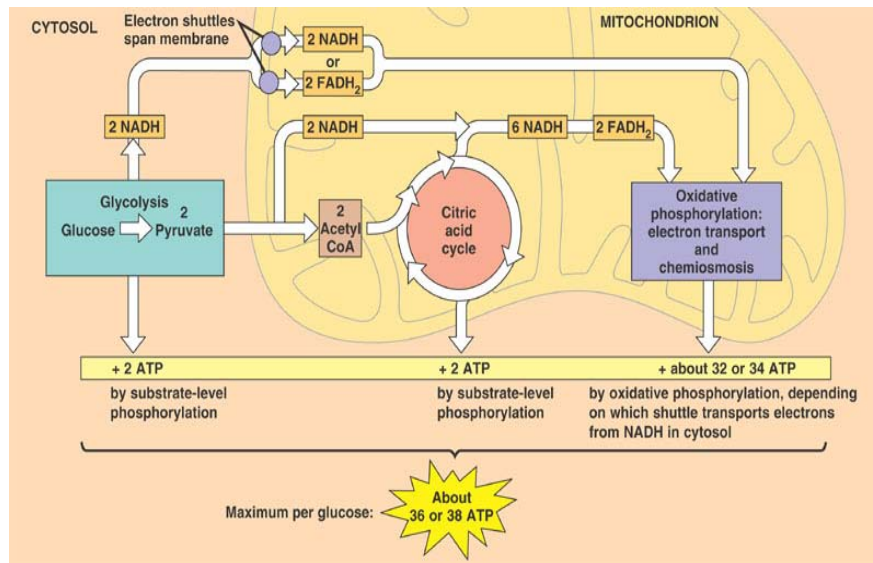
ELECTRON CARRIERS

NAD⁺ = Nicotinamide Adenine Dinucleotide
 (oxidized form)

NADH = Nicotinamide Adenine Dinucleotide
 Phosphate (reduced form)

FAD⁺ = Flavin Adenine Dinucleotide (oxidized form)

FADH₂ = Flavin Adenine Dinucleotide Phosphate
 (reduced form)

**Review Questions**

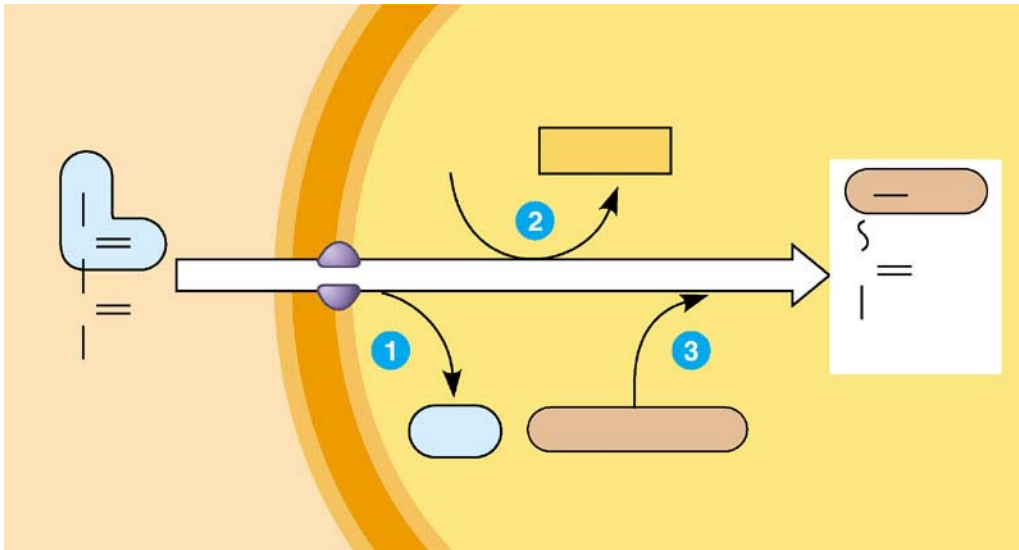
1. Briefly, and in your own words, explain the approximate ATP yield per molecule of glucose at each stage of cellular respiration using Fig. 9.16 above & on p. 173 of your text.

2. In the rap “Makin’ ATP”, Verse 1 describes the process of _____, a metabolic pathway that occurs in all living cells and serves as the starting point for fermentation or aerobic respiration.

Verse 2 explains the next major phase of cellular respiration, _____, a chemical cycle occurring within the mitochondrion involving eight steps that completes the metabolic breakdown of glucose molecules to carbon dioxide.

Finally, Verse 3 attempts to summarize _____, the final phase of the production of ATP using energy derived from the redox reactions of an electron transport chain.

3. Begin by completely labeling Figure 9.10 below. Then, explain in your own words what occurs at steps 1, 2, and 3 in the illustration of the conversion of pyruvate to Acetyl coenzyme A, the entry compound for the citric acid cycle in cellular respiration.



4. Complete the following.

_____ enables some cells to produce ATP without the use of oxygen. _____ generates 2 ATP whether in the presence of oxygen or anaerobically as well as in the absence of oxygen, _____.

5. What effect would an absence of O_2 have on the process shown in Figure 9.15 on p. 174.
