

Goal: How do the processes of cellular metabolism **relate** to one another, and what is their **significance**?

Answer the following questions:

1) Complete the following chart:

At which stage(s) in the overall process is each of the reactants used?		At which stage(s) in the overall process is each of the products produced?		
$C_6H_{12}O_6$	$+ 6O_2$	$\rightarrow 6CO_2$	$+ 6H_2O$	$+ \text{Energy}$
glycolysis.	electron transport chain. (of oxidative phosphorylation)	- conversion of pyruvate to acetyl-CoA ($2CO_2$) - citric acid cycle ($4CO_2$)	electron transport chain (of oxidative phosphorylation)	every stage captures some energy either in ATP or NADH. every stage captures some energy either in ATP or NADH.

2) Complete the following chart:

What is/are the overall function(s) of glycolysis?	What is/are the overall function(s) of the citric acid cycle (Kreb's cycle)?	What is/are the overall function(s) of oxidative phosphorylation?
<p>^(oxidize) Break down glucose to one two molecules of pyruvate</p> <p>Synthesize a net of 2 ATP and 2 NADH</p>	<p>- oxidize a derivative of the two molecules of pyruvate (acetyl-CoA) to CO_2</p> <p>- Synthesize a net of 2 ATP and 6 NADH (including conv. to CoA) and 2 $FADH_2$.</p>	<p>- transform the energy in NADH and $FADH_2$ by oxidizing them down an electron transport chain, eventually reducing O_2 to H_2O and using the energy to pump H^+ ions across the inner membrane, creating a proton-motive force.</p> <p>- The proton-motive force is used to drive synthesis of ~ 34 ATP by ATP synthase as H^+ ions travel back across the</p>

3) Complete the following chart:

Are the compounds listed here <i>used</i> or <i>produced</i> in:	Glycolysis?	The Citric Acid Cycle?	Oxidative Phosphorylation?
Glucose	used	/	/
O ₂	/	/	used
CO ₂	/	produced	/
H ₂ O	/	/	produced
ATP	produced	produced	★ produced ★
ADP + Pi	used	used	★ used ★
NADH	produced and used ↳ produced overall	produced	used
NAD ⁺	used and produced ↳ used overall	used	produced
FADH ₂	/	produced	used
FADH	/	used	produced.

