

Chemical Energy Chart

Name _____

Process	Main Function	Inputs	Outputs
Glycolysis	Oxidation of glucose to 2 pyruvate, 2 ATP net	Glucose 2 ATP 2 NAD ⁺ 4 ADP + P	2 pyruvate 4 ATP (2 net) 2 NADH + 2H ⁺ 2H ₂ O
Pyruvate to acetyl CoA	Oxidation of pyruvate to acetyl CoA, which then enters Krebs cycle	2 pyruvate 2 CoA 2 NAD ⁺	2 acetyl CoA 2 CO ₂ 2 NADH + 2H ⁺
Krebs/Citric Acid cycle	Acetyl CoA is combined with oxaloacetate to produce citrate, which is cycled back to oxaloacetate as redox reactions produce NADH and FADH ₂ , ATP is formed by substrate-level phosphorylation, and CO ₂ is released	2 acetyl CoA 2 oxaloacetate 2 ADP + P 6 NAD ⁺ 2 FAD	2 CoA 4 CO ₂ 2 ATP 6 NADH + 6H ⁺ 2 FADH ₂
Electron transport chain & chemiosmosis	NADH (from glycolysis and Krebs) and FADH ₂ (from Krebs) transfer electrons to carrier molecules in mitochondrial membrane. In a series of redox rxns, H ⁺ is pumped into intermembrane space, and electrons are delivered to 1/2 O ₂ . Proton-motive force drives H ⁺ through ATP synthase to make ATP.	10 NADH + H ⁺ 2 FADH ₂ H ⁺ + O ₂ 6O ₂ 34 ADP + P	10 NAD ⁺ 2 FAD H ₂ O 34 ATP
Fermentation	Anaerobic catabolism: glycolysis followed by regeneration of NAD ⁺ so glycolysis can continue. Pyruvate is either reduced to ethyl alcohol and CO ₂ or to lactate.	See glycolysis above 2 pyruvate 2 NADH	2ATP 2 NAD ⁺ 2 ethanol and 2 CO ₂ or 2 lactate

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