

Name: _____ Student ID: _____
CHEM 161 PAL Fall 2026

Worksheet #26: Glucose Metabolism Review

1. Write the overall balance equation for the oxidation of glucose via cellular respiration.

2. Fill in the table below with the missing information:

Metabolic Pathway	Net ATP produced per glucose	Net NADH produced per glucose	Net FADH ₂ produced per glucose
Glycolysis			
Lactic Acid Fermentation			
Pyruvate Dehydrogenase Complex			
TCA Cycle			

3. How does glucose metabolism change in a muscle cell during high intensity exercise?

4. How much ATP is produced via glycolysis vs. oxidative phosphorylation? Why does aerobic respiration produce far more ATP?

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5. In the space provided, construct an integrated metabolic map showing how glycolysis, lactate fermentation, pyruvate oxidation, the TCA cycle, and oxidative phosphorylation are interconnected during glucose catabolism. Include the chemical structure of each intermediate (except for cyt c, abbreviated structures of Q, FAD/FADH₂, NAD⁺/NADH and other cofactors are okay), label the enzyme that catalyzes each reaction, and highlight the major regulatory steps. For oxidative phosphorylation focus on the overall reaction for each complex and enzyme.