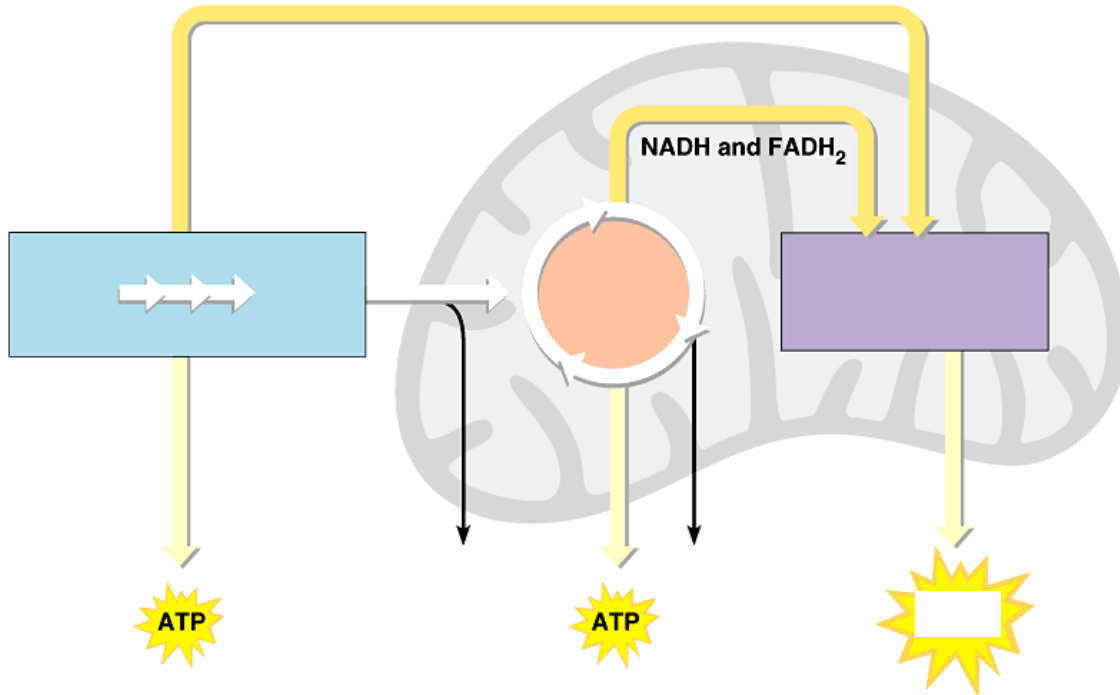


Chapter 6 – *How Cells Harvest Chemical Energy*

EXAM REVIEW

The illustration in Module 6.8 introduces the three stages of cellular respiration. After studying it, see if you can label the diagram below without referring to the text. Be certain to include the following terms: *electron transport chain and chemiosmosis, pyruvic acid, mitochondrion, CO₂, high-energy electrons carried by NADH, Krebs cycle, glycolysis, cytoplasmic fluid, ATP, glucose, and NADH and FADH₂*. {Web/CD Activity 6A}

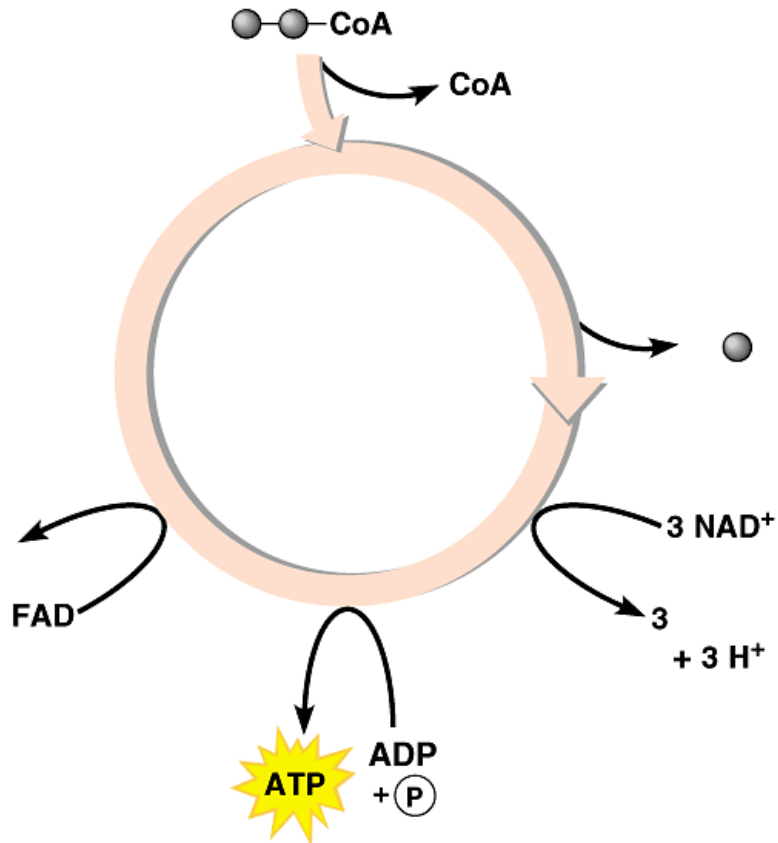


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Glycolysis is the first of three steps in cellular respiration. Review glycolysis by matching each phrase on the right with a term on the left. Some terms are used twice. {Web/CD Activity 6B}

- | | |
|---------------------|--|
| A. NADH | _____ 1. compound formed between glucose and pyruvic acid |
| B. Pyruvic acid | _____ 2. not involved in glycolysis |
| C. ATP | _____ 3. fuel molecule broken down in glycolysis |
| D. NAD ⁺ | _____ 4. produced by substrate-level phosphorylation |
| E. Glucose | _____ 5. invested to energize glucose molecule at start of process |
| F. Glycolysis | _____ 6. reduced as glucose is oxidized |
| G. ADP AND P | _____ 7. glucose converted to two molecules of this |
| H. Oxygen | _____ 8. assembled to make ATP |
| I. Intermediate | _____ 9. "splitting of sugar" |
| | _____ 10. carries hydrogen and electrons from oxidation of glucose |

Pyruvic acid from glycolysis is chemically altered and then enters the Krebs cycle, a series of steps that completes the oxidation of glucose. The energy of pyruvic acid is stored in NADH and FADH₂. To review these processes, fill in the blanks in the diagram below. (Try to do as many as you can without referring to the text.) Include the following terms: *NAD⁺*, *pyruvic acid*, *CO₂*, *FADH₂*, *NADH*, *coenzyme A*, *ATP* and *acetyl CoA*. {Web/CD Activity 6C}



Check your overall understanding of cellular respiration by matching each of the phrases below with one of the three stages of the process. Use (G) for *glycolysis*, (K) for *Krebs Cycle*, and (E) for *electron transport and chemiosmosis*. {Web/CD Activity 6A, 6B, 6C, 6D}

- _____ generates most of the ATP formed by cellular respiration
- _____ begins the oxidation of glucose
- _____ occurs outside the mitochondrion
- _____ produces 4 ATP's per glucose by substrate-level phosphorylation, but 2 ATP's per glucose are used to get it started
- _____ oxidizes NADH and FADH₂ , producing NAD⁺ and FAD
- _____ carried out by enzymes in the matrix (fluid) of the mitochondrion
- _____ here electrons and hydrogen combine with O₂ to form H₂O
- _____ occurs along the inner mitochondrial membrane
- _____ generates most of the CO₂ produced by cellular respiration
- _____ FADH₂ and NADH deliver hydrogen ions and electrons to this stage
- _____ ATP synthase makes ATP
- _____ Reduces NAD⁺ and FAD, producing NADH and FADH₂

Review the molecules that can be used as fuel for cellular respiration by writing their names in the blanks in this diagram. Include the following terms: *glucose, amino acids, fats, fatty acids, proteins, sugars, polysaccharides, and glycerol*. {Module 6.16}

