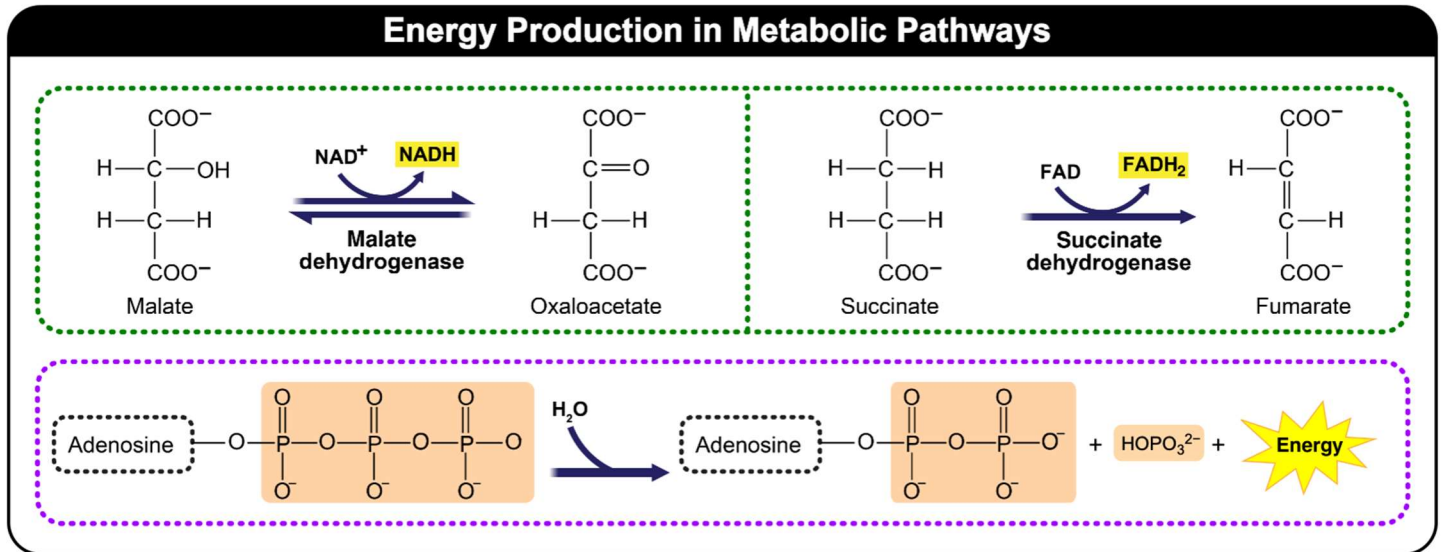


## CONCEPT: ENERGY PRODUCTION IN BIOCHEMICAL PATHWAYS

• Biochemical systems most commonly employ \_\_\_\_ methods to produce energy.

- 1) \_\_\_\_\_ reactions produce energy in the form of electron carriers (e.g., **NADH** and **FADH<sub>2</sub>**).
- 2) \_\_\_\_\_ (Hydrolysis) of high-energy bonds to release energy stored in them.



**EXAMPLE:** Identify if the following biochemical reaction would use energy or produce energy.



- This reaction would produce energy.
- This reaction would use energy.

**PRACTICE:** Which of the following biochemical reactions would not produce energy?

- $\text{ATP} + \text{H}_2\text{O} \longrightarrow \text{ADP} + \text{HOPO}_3^{2-} + \text{H}^+$
- $\text{Glycerol-3-phosphate} + \text{FAD} \longrightarrow \text{Dihydroxyacetone phosphate} + \text{FADH}_2$
- $\text{Pyruvate} + \text{NAD}^+ + \text{HS-CoA} \longrightarrow \text{Acetyl CoA} + \text{CO}_2 + \text{NADH}$
- $\text{Glucose} + \text{ATP} \longrightarrow \text{Glucose-6-phosphate} + \text{ADP} + \text{H}^+$