Review: During glycolysis, one molecule of glucose is split to form two pyruvate molecules, with a net profit of two ATP. The two pyruvate molecules then enter the mitochondria, where they are converted to acetyl CoA.

Once pyruvate is converted to acetyl CoA, it enters the Krebs cycle (also known as the citric acid cycle).

The Krebs cycle is an eight-step cycle in which acetyl CoA is added to oxaloacetate, which is further broken down producing CO₂, reduced coenzymes (NADH + H⁺ and FADH₂), and ATP.

---

**The Krebs Cycle**

**Step 1:** In the first step of the Krebs cycle, acetyl CoA is added to oxaloacetate to form citrate.

Note that coenzyme A (CoA-SH) is removed in the process.

**Step 2:** Citrate is isomerized forming isocitrate, which is less stable than citrate.

During this step, one water molecule is removed and another water molecule is added.

**Step 3:** Isocitrate is converted into α-ketoglutarate. In this process, isocitrate is decarboxylated (carbon dioxide is removed), and NAD⁺ is reduced, forming NADH + H⁺.
Step 4: Alpha-ketoglutarate is converted to succinyl CoA. During this step coenzyme A is added, carbon dioxide is lost, and NAD$^+$ is reduced, forming NADH + H$^+$. 

Step 5: Succinyl CoA is converted to succinate. During this step, coenzyme A is released and GTP is made. GTP is then hydrolyzed to form ATP.

Step 6: Succinate is converted to fumarate. During this step FAD is reduced forming FADH$_2$.

Step 7: Fumarate is converted to malate with the addition of water.
Step 8: In the last step of the Krebs cycle, malate is converted to oxaloacetate. In the process, NAD$^+$ is reduced to form NADH + H$^+$. Oxaloacetate can then accept another acetyl CoA and begin the Krebs cycle again.