

## Concept 7.4

**Electrons “fall” from food to oxygen during cellular respiration.**

### **Relationship of Cellular Respiration to Breathing :**

Cellular respiration is an **aerobic** process.

During cellular respiration the cell takes in oxygen and releases carbon dioxide.

### **Overall Equation for Cellular Respiration :**

Glucose + Oxygen -- -- CO<sub>2</sub> + H<sub>2</sub>O + 38 ATP

### **“Falling” Electrons as an Energy Source :**

An atom's positively charged nucleus exerts an electrical “pull” on negatively charged electrons. When an electron “falls” toward the nucleus, potential energy is released.

Oxygen attracts electrons very strongly and during cellular respiration the carbon-hydrogen bonds in a sugar molecule change partners and bond with oxygen atoms instead. As the electrons of these bonds “fall” toward oxygen, energy is released and is used to generate ATP molecules.

## **Electron Transport Chains :**

Cellular respiration unlocks the energy in glucose in small amounts which is used in the formation of ATP molecules.

Glucose is broken down in several steps and in each step a carrier holds the electrons more strongly and at the end of the chain oxygen pulls electrons from the final carrier molecule and joins them with hydrogen ions, forming water.