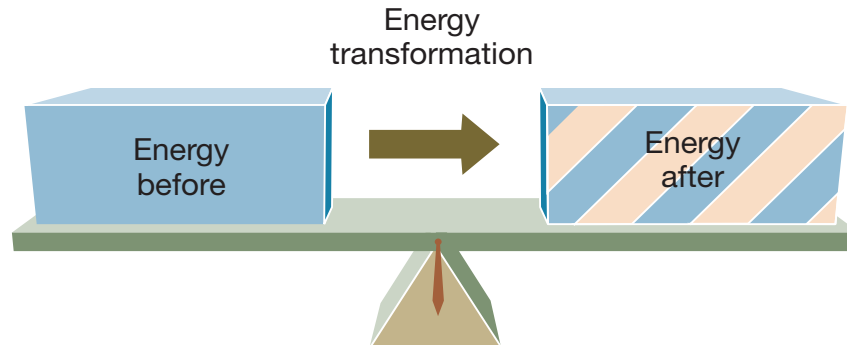


(A)

The First Law of Thermodynamics

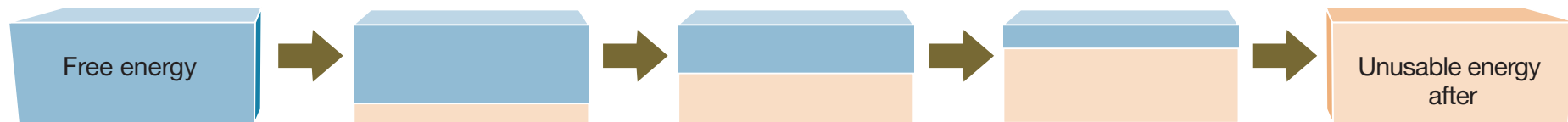
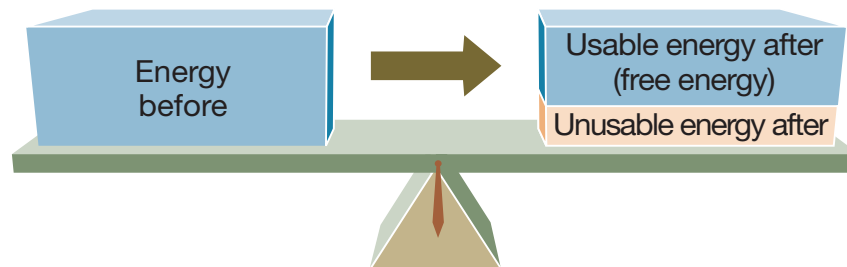
The total amount of energy before a transformation equals the total amount after a transformation. No new energy is created, and no energy is lost.



(B)

The Second Law of Thermodynamics

A transformation does not change the total amount of energy within a closed system (one that is not exchanging matter or energy with the surroundings), but after any transformation the amount of energy available to do work (called free energy) is always less than the original amount of energy.



Another statement of the second law is that in a closed system, with repeated energy transformations, free energy decreases and unusable energy (disorder) increases—a phenomenon known as the increase in **entropy**.