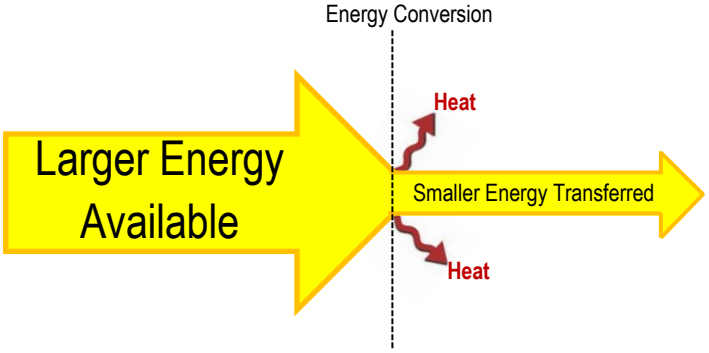
CONCEPT: SECOND LAW OF THERMODYNAMICS

●2nd law: 100% efficient energy conversion is *impossible* since _____ energy is lost, increasing *universal entropy*.

□ All _____ processes *increase* entropy & proceed toward *equilibrium* (minimum potential energy).

□ _____ (system) entropy can decrease as long as it is offset by an increase in _____ entropy.

EXAMPLE: 2nd Law of Thermodynamics.



Exergonic & Endergonic Processes

●Spontaneous processes: *exergonic* (-ΔG) & occur *without outside intervention*.

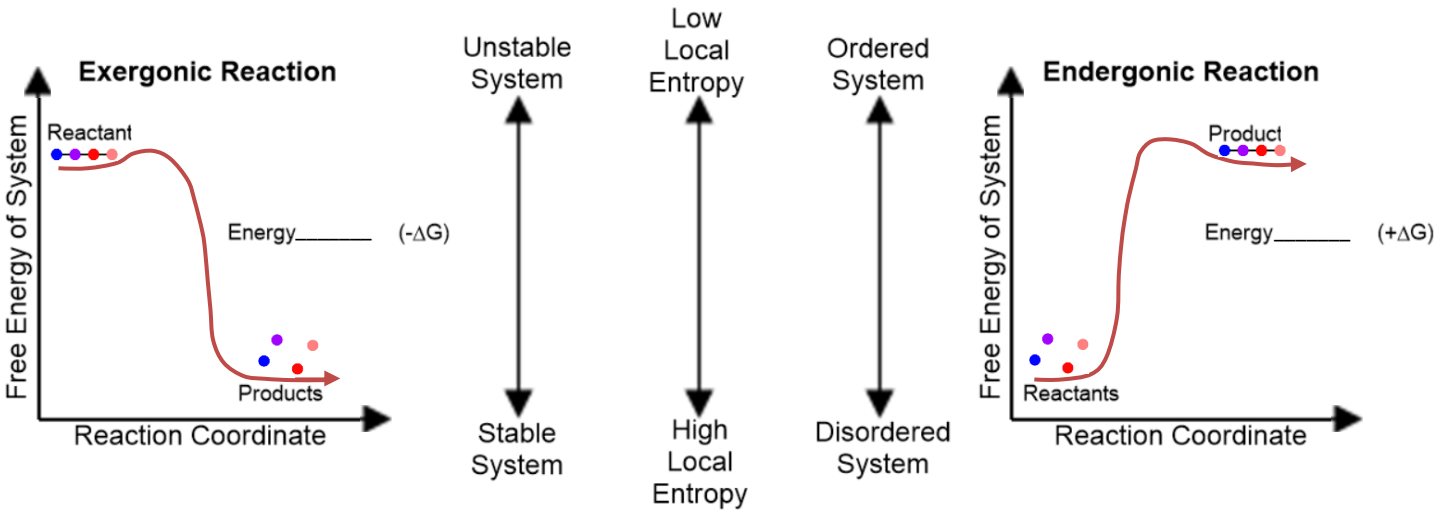
□ Associated with _____ (breaking down) processes & are thermodynamically _____.

●Nonspontaneous processes: *endergonic* (+ΔG) & *require outside intervention* (an *energy input*).

□ Associated with _____ (building up) processes & are thermodynamically _____.

□ Anabolic processes decrease local entropy but are still accompanied by an increase in _____ entropy.

EXAMPLE:



●Exergonic & endergonic processes are both associated with an _____ in universal entropy.

CONCEPT: SECOND LAW OF THERMODYNAMICS

PRACTICE: Which of the following statements is false?

a) All endergonic reactions have a +ΔG.
b) All endergonic reactions are catabolic.
c) All exergonic reactions have a -ΔG.
d) All exergonic reactions are spontaneous.
e) All of the above are true.

PRACTICE: Which of the following statements is true?

a) Spontaneous reactions are fast reactions.
b) Endergonic reactions are spontaneous.
c) Endergonic reactions tend to decrease local entropy.
d) All exergonic reactions decrease universal entropy.
e) All of the above are false.