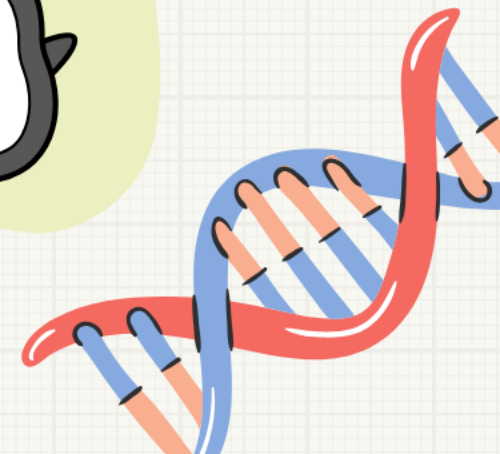
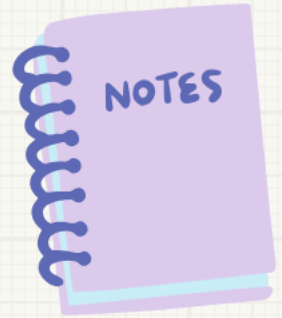
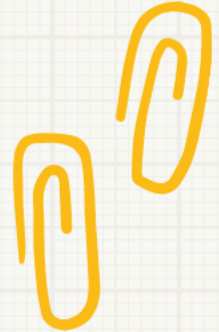
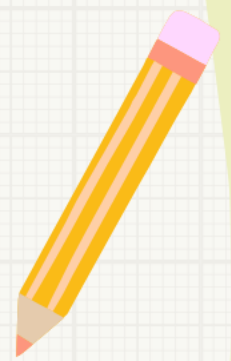


AP Bio

FRQ Fridays

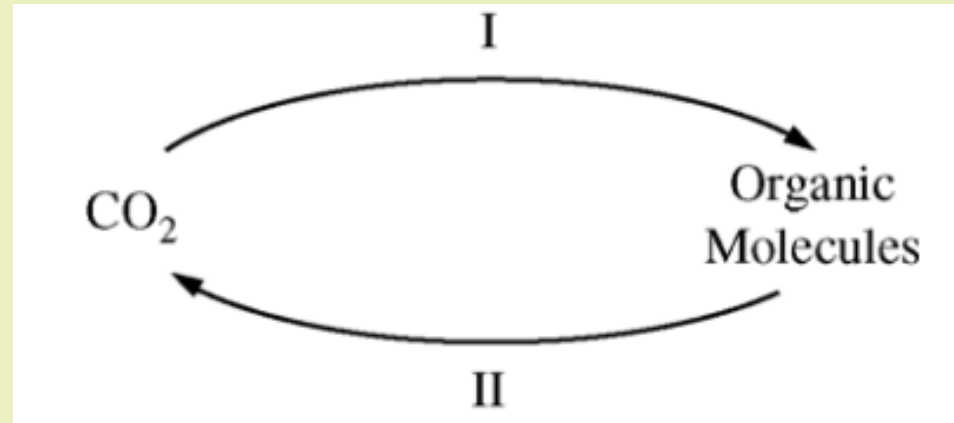
2013 #4
Carbon Cycle



FRQ Friday #26

2013 #4

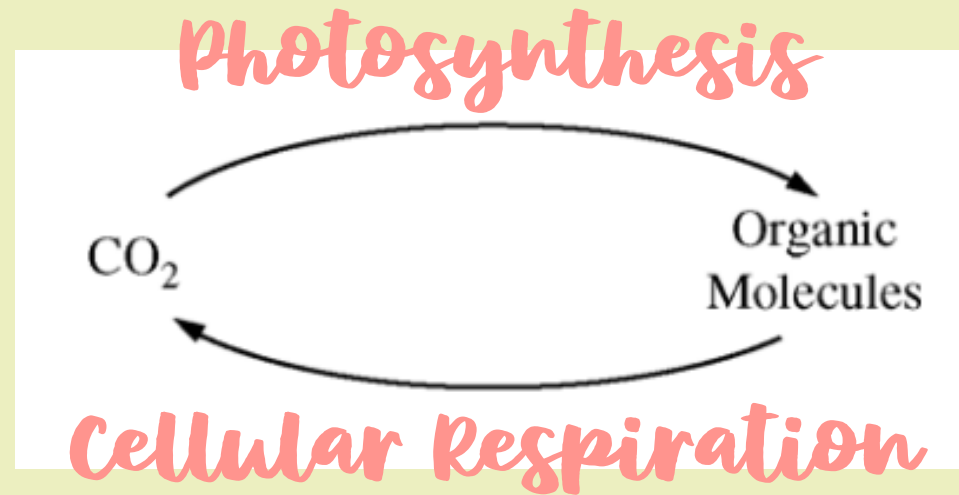
Matter continuously cycles through an ecosystem. A simplified carbon cycle is depicted below.



FRQ Friday #26

2013 #4

- (a) **Identify** the key metabolic process for step I and the key metabolic process for step II, and briefly **explain** how each process promotes movement of carbon through the cycle. For each process, your explanation should focus on the role of energy in the movement of carbon.



I = photosynthesis / Calvin cycle

AND

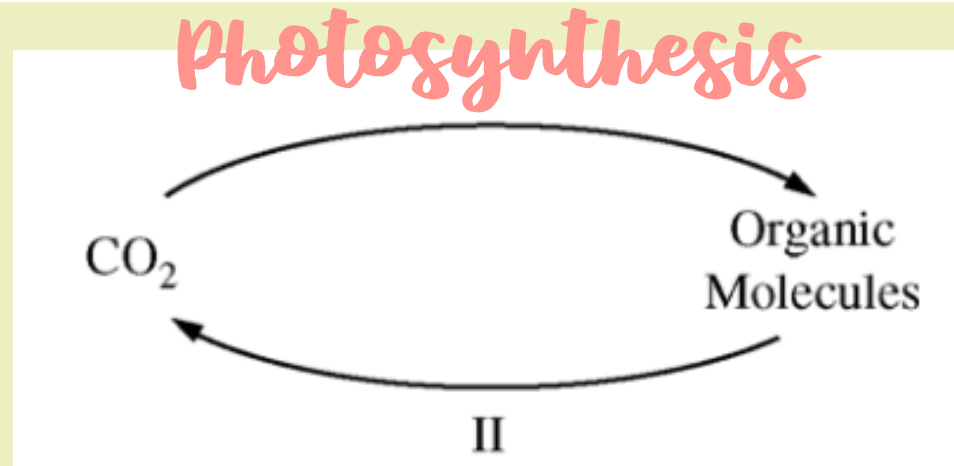
II = (cellular) respiration / citric acid cycle / Krebs cycle



FRQ Friday #26

2013 #4

- (a) **Identify** the key metabolic process for step I and the key metabolic process for step II, and briefly **explain** how each process promotes movement of carbon through the cycle. For each process, your explanation should focus on the role of energy in the movement of carbon.



Process	Carbon Input	Role of Energy in the Movement of Carbon	Carbon Output
Photosynthesis	CO ₂ is fixed	Uses (light) energy OR ATP from light reactions	Organic molecules



FRQ Friday #26

2013 #4

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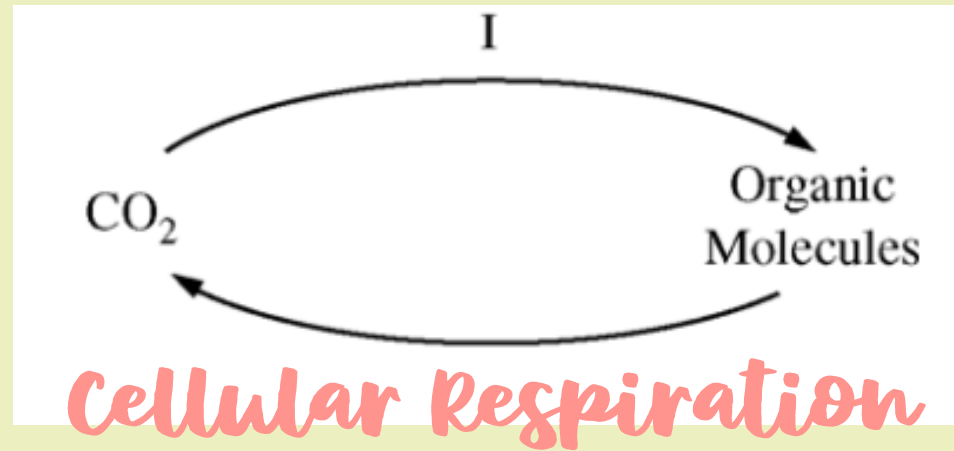
a) Step I is photosynthesis. During photosynthesis, the energy of the sun is used to excite electrons. The movement of these e⁻ releases this energy, which is then utilized to convert CO₂ into C₆H₁₂O₆ (glucose) and other organic molecules which store the energy. In this way, C is moved from CO₂ to organic molecules.



FRQ Friday #26

2013 #4

- (a) **Identify** the key metabolic process for step I and the key metabolic process for step II, and briefly **explain** how each process promotes movement of carbon through the cycle. For each process, your explanation should focus on the role of energy in the movement of carbon.



Process	Carbon Input	Role of Energy in the Movement of Carbon	Carbon Output
(Cellular) Respiration	Organic molecules are hydrolyzed / broken down	Uses energy for cellular processes such as growth and /or ATP production	CO_2



FRQ Friday #26

2013 #4

- (a) **Identify** the key metabolic process for step I and the key metabolic process for step II, and briefly **explain** how each process promotes movement of carbon through the cycle. For each process, your explanation should focus on the role of energy in the movement of carbon.

Process	Carbon Input	Role of Energy in the Movement of Carbon	Carbon Output
(Cellular) Respiration	Organic molecules are hydrolyzed / broken down	Uses energy for cellular processes such as growth and /or ATP production	CO ₂

Step II is cellular respiration, in which organic molecules (glucose) are broken down to release energy, which is used to form ATP. CO₂ is a waste product released as a result of the breakdown of C₆H₁₂O₆. In this way, C moves from C₆H₁₂O₆ to CO₂ again.



FRQ Friday #26

2013 #4

(b) Identify an organism that carries out both processes.

- Plant
- Algae
- Photosynthetic protist (e.g., Euglena)
- Cyanobacterium
- CO₂ fixing bacterium
- Lichen (not fungus)

b) A plant (such as a pine tree) exhibits both processes described above.

