

Q: Energy can change from one form to another, it cannot be created or destroyed. What principle is this?

A: First Law of Thermodynamics.

Q: What is entropy? What principle explains this?

A: the nature of energy will change from a more-ordered state to a less ordered state. Explained by the second law of thermodynamics.

Q: Water, carbon dioxide, and light energy from the sun are transformed to produce sugar. What process is this?

A: Photosynthesis

Q: Sugar is broken down into carbon dioxide, water, and energy during what process?

A: Cellular Respiration.

Q: What is the approximate efficiency of light energy to chemical energy in photosynthesis?

A: 1%

Q: What is the approximate percentage of electrical energy converted to heat in the average incandescent light bulb?

A: 95%

Q: What is the maximum efficiency possible in an energy-conversion process that is not limited by the second law of thermodynamics?

A: 100%

Q: During the first step in the nitrogen cycle, bacteria take what gas and convert it to what, during what process?

A: Nitrogen fixing bacteria convert Nitrogen gas,  $N_2$ , into ammonia,  $NH_3$ , during nitrogen fixation.

Q: What step makes nitrogen useable to living organisms and how?

A: Nitrification converts ammonium into nitrate ions.

Q: What is the final process of the nitrogen cycle?

A: Denitrification converts nitrates back to nitrogen gas.

Q: What process releases water vapor from the leaves of plants?

A: transpiration

Q: What is the main reservoir in the hydrologic cycle?

A: The oceans

Q: What is the largest reservoir in the carbon cycle?

A: Sedimentary rock

Q: How are humans affecting the carbon cycle?

A: Burning fossil fuels and deforestation.

Q: Why is phosphorus considered a limiting factor for plant growth.

A: Most phosphorus is insoluble, bound up in rock and only slowly released, by weathering.

Q: If we get too hot, our sweat glands pump out moisture that evaporates to cool us down. What type of feedback loop does this represent?

A: Negative Feedback Loop

Q: Once vegetation has been cleared to expose soil, erosion may become progressively more severe if the forces of water or wind surpass the rate of vegetative regrowth. What type of feedback loop does this represent?

A: Positive feedback loop.

Q: When decomposers in an aquatic system consume enough oxygen to cause oxygen concentrations in bottom waters to plummet, suffocating shrimp and fish it is known as what?

A: A dead zone

Q: What process is characterized by nutrient overenrichment, blooms of algae, increased production of organic matter, and subsequent ecosystem degradation?

A: Eutrophication

Q: The energy or the organic matter stored by plants after they have metabolized enough for their own maintenance is known as the net primary productivity. How is it calculated?

A: Net Primary Productivity = Gross Primary Productivity – respiration.