marine ecosystems. An orca is an example of a very high-level consumer. An orca might eat a sea lion, which eats a salmon, which eats an anchovy, which eats zooplankton, which eats a single-celled alga. The orca is a fifth-level consumer. And when the great white shark eats the orca...you get the idea.

Energy, on the other hand, comes from the Sun, passes from organism to organism for various periods of time, and then is gone. Energy passes through once and is lost to the life process. Energy transfers but does not recycle. The fate of virtually all energy that passes through the trophic system is to be radiated into the environment as heat. Once released to the environment, it is gone.

Summary

Living organisms are complex. Their bodies are made of atoms. That is the biomass of life. The functions of living organisms are driven by energy. The energy for life comes from the Sun, captured in energy-rich molecules. The energy-rich molecules are called food.

Every organism needs a constant supply of atoms and energy. Autotrophs (producers) get atoms and energy from raw materials in the environment. Heterotrophs (consumers) get atoms and energy by eating other organisms. Atoms and energy move up through the trophic levels in an ecosystem by feeding relationships.

Dead organic matter still has valuable atoms and energy. Decomposers get the last bit of energy out of organic matter and reduce the atoms to simple chemicals. The energy that entered the ecosystem as sunlight leaves the ecosystem as heat. The atoms that entered the ecosystem as food made by producers return to the environment to be used by living organisms again.

Energy passes through the ecosystem only once. Matter recycles again and again and again. The simple chemicals from which life is constructed—water, carbon dioxide, minerals—can enter and reenter the life process time and time again. Matter recycles.