Open vs Closed system

An open system is a system that freely exchanges energy and matter with its surroundings. It is not completely isolated from its environment and it can adapt and interact with outside influences. In contrast, a closed system is one in which energy and matter does not flow freely between the system and its environment, or if it does, the rate of exchange is significantly limited.

Difference between open and closed system

An open system is a type of system that interacts with, shares resources and exchanges feedback with its environment. It is said to be 'open' because it interacts freely with its external environment. An example of an open system would be a business responding to customer feedback on its products or services.

A closed system, by contrast, has little or no interaction with its external environment. A closed system may exchange raw materials, energy and waste but not information or feedback. An example of this is a sealed food jar that can be heated in a microwave but does not allow any other objects or substances to come into contact with the food inside.

Similarities

1. Both open and closed systems are used to process information in some form.

2. Both systems have the ability to receive feedback, allowing it to react to changes that take place outside of their environment.

3. The output of one system can affect the input of another – they are therefore both dependent on external forces and their internal state.

4. They both have limitations on how much input can be processed and generate information from that input as well as allow for connections with other resources outside the system’s environment.

5. Both systems require maintenance to continue functioning properly in order to remain effective over a long period of time.

Examples

Open System

1. The Earth's Ecosystem

2. Open-Source Software Development

3. The human body

4. Combustion engine

5. Plants

Closed System:

1. Closed Circuit Television

2. An Air-Conditioned Room

3.

Living vs Nonliving System

Living systems are systems of organized complexity in which components interact to maintain a dynamic state. Examples of living systems include organisms, ecosystems, and social organizations.

Nonliving systems are systems that do not have the capacity for growth, reproduction, response to stimuli, or adaptation from their environment and lack the ability to self-maintain homeostasis. Examples of nonliving systems include weather patterns and machines.

Difference

Living things are made up of complex structures and decompose when not active. Non-living systems are made up of simpler components and remain intact until acted upon externally. Living systems require energy, whereas non-living systems do not. Living systems interact with the environment to maintain homeostasis, while non-living systems maintain a state of equilibrium through the transfer of energy or forces without interacting with the environment in any way.

Similarities

1. Both living and non-living systems have inputs, outputs, processes, and stores of energy.

2. Both can be observed in terms of structure and function.

3. Both consist of related components working together as a system to process information and produce behavior.

4. Both rely on interaction between their parts, or subsystems, to accomplish the task for which it is designed.

5. Both can be studied for greater efficiency and better understanding of the system in its environment.

Examples

Living system:

- Animals

- Humans

- Plants

Nonliving system:

- Computers
- Buildings
- Airplanes