**Negative or Positive Feedback?**

**Determine if the following are examples of positive or negative feedback.**

* Your body temperature rises as you walk around outside in Bangladesh on a hot afternoon. The sensors in your skin detect the rise in your surface temperature so you start to sweat.
* In some developing countries poverty causes illness and contributes to poor standards of education. In the absence of knowledge of family planning methods and hygiene, this contributes to population growth and illness, adding further to the causes of poverty; “a vicious circle of poverty.”
* A thermostat in a central heating system can determine the temperature of your living room. It switches the air conditioner on when the temperature increases to a predetermined level and shuts it off when it cools to another level. The room temperature remains within a comfortable level regardless of the temperature outside.
* Some organisms have internal feedback systems, physiological changes occurring prevent breeding when population densities are high and promote breeding when population densities are low.
* You are lost on a snowy mountain. When your body senses that it is cooling below 37°C, various mechanisms such as shivering help to raise your body core temperature again. However if these are insufficient to restore normal body temperature, our metabolic processes start to slow down, because the enzymes that control them do not work so well at lower temperatures. As a result, you become lethargic and sleepy and move around less and less, allowing your body to cool even further. Unless you are rescued at this point, your body will reach a new equilibrium; you will die of hypothermia.
* Higher temperatures cause more evaporation which leads to more water vapor in the atmosphere. Water vapor is a greenhouse gas so will trap more heat so the atmosphere will warm more.
* As carbon dioxide levels in the atmosphere rise, the temperature of the Earth rises. As the Earth warms the rate of photosynthesis in plants increases, more carbon dioxide is therefore removed from the atmosphere by plants, reducing the greenhouse effect and reducing global temperatures.
* As the Earth warms, ice cover melts, exposing soil or water. Albedo decreases (albedo is the fraction of light that is reflected by a body or surface). More energy is absorbed by the Earth’s surface. Global temperature rises. More ice melts.
* As the Earth warms, upper layers of permafrost melt, producing waterlogged soil above frozen ground. Methane gas is released into the environment. The greenhouse effect is enhanced. The Earth warms, melting more permafrost.
* As the Earth warms, increased evaporation produces more clouds. Clouds increase albedo, reflecting more light away from the Earth. The temperature falls. Rates of evaporation fall.
* As the Earth warms, organic matter in soil is decomposed faster, more carbon dioxide is released. The enhanced greenhouse effect occurs, the Earth warms further and rates of decomposition increase.
* As the Earth warms, evaporation increases. Snowfall at high latitudes increases, icecaps enlarge. More energy is reflected by increased albedo of ice cover. The Earth cools. Rates of evaporation fall.
* As the Earth warms, polar icecaps melt, releasing large numbers of icebergs into oceans. Warm ocean currents such as the Gulf Stream are disrupted by additional freshwater input into oceans. Reduced transfer of energy to the poles reduces temperature at high altitudes. Ice sheets reform and icebergs retreat. Warm currents are re-established.