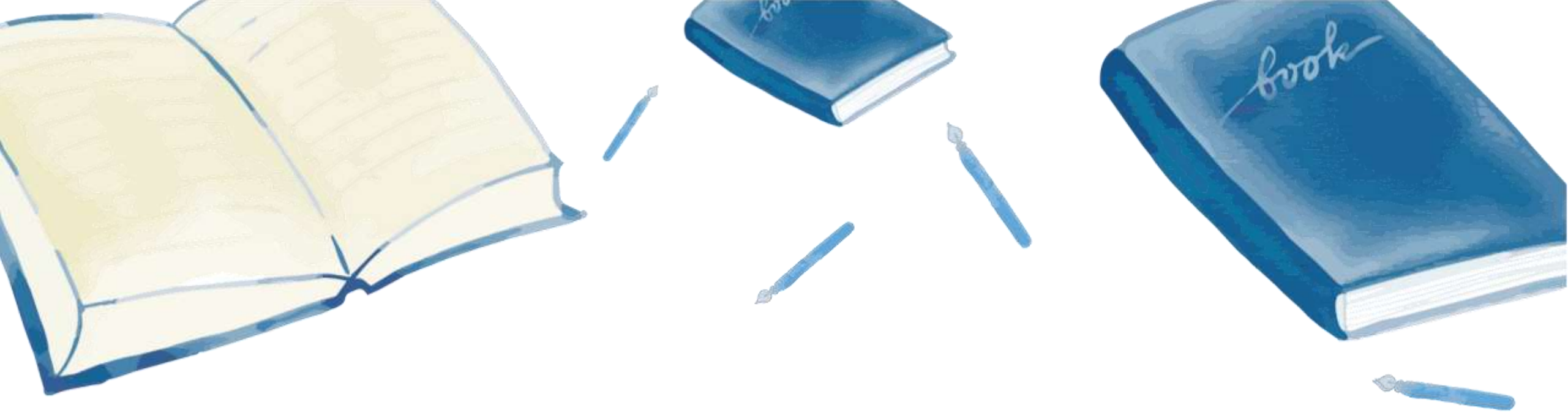
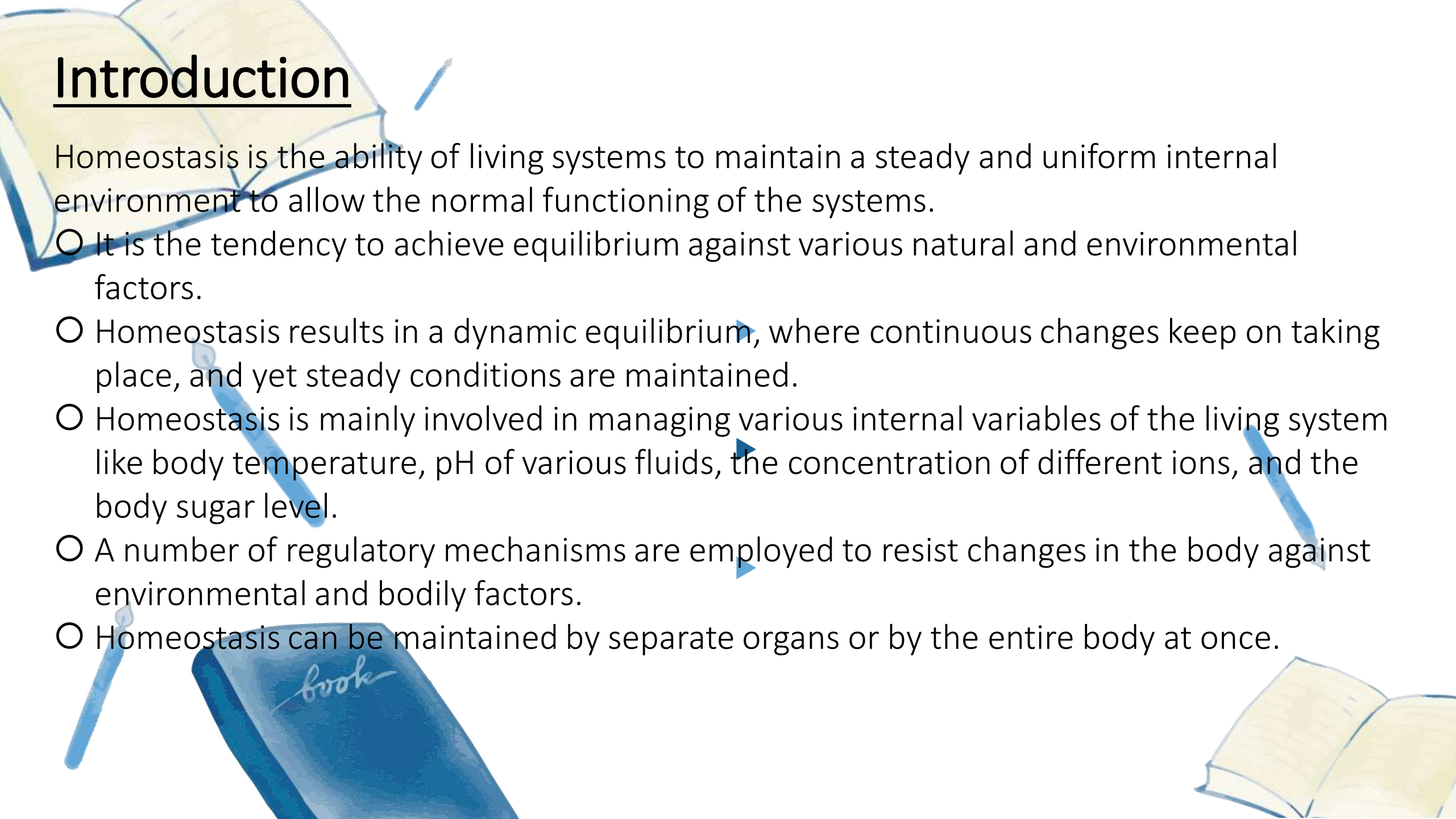




Homeostasis



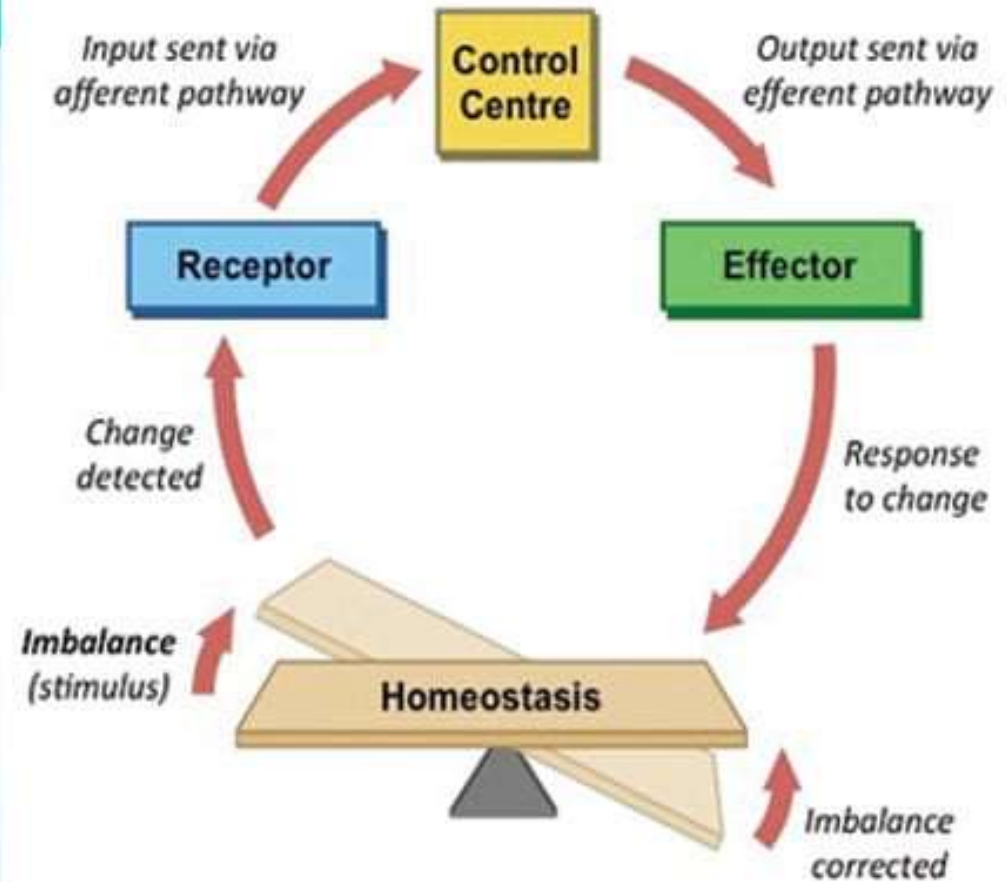
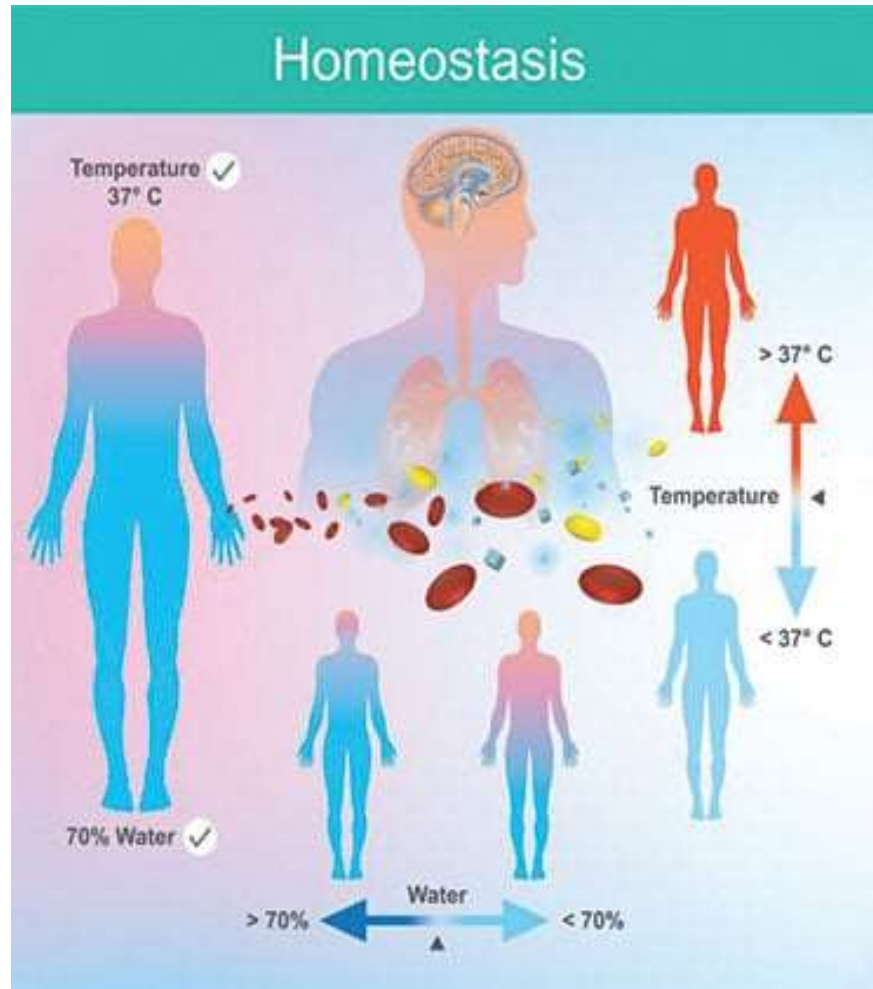
The background features a light blue and white color scheme with decorative elements. In the top left, there is a yellow book with blue outlines. In the bottom left, a blue book with the word 'book' written on its cover is visible. In the bottom right, another yellow book is shown. A blue pen is positioned vertically on the left side, and several blue arrows point towards the text area.

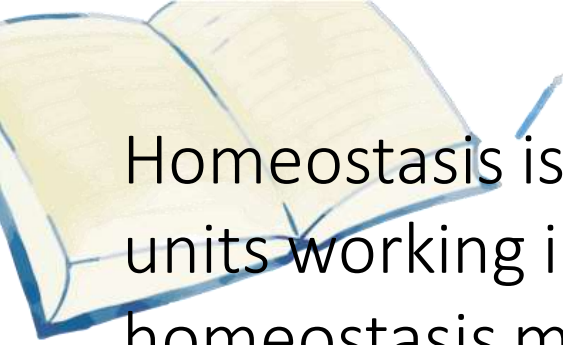
Introduction

Homeostasis is the ability of living systems to maintain a steady and uniform internal environment to allow the normal functioning of the systems.

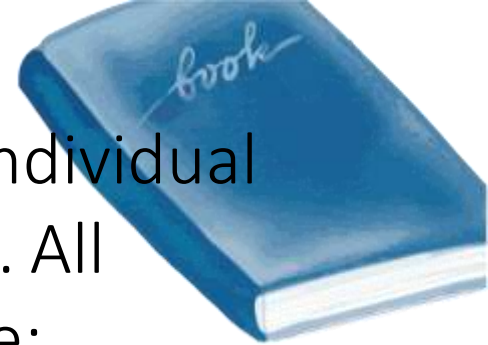
- It is the tendency to achieve equilibrium against various natural and environmental factors.
- Homeostasis results in a dynamic equilibrium, where continuous changes keep on taking place, and yet steady conditions are maintained.
- Homeostasis is mainly involved in managing various internal variables of the living system like body temperature, pH of various fluids, the concentration of different ions, and the body sugar level.
- A number of regulatory mechanisms are employed to resist changes in the body against environmental and bodily factors.
- Homeostasis can be maintained by separate organs or by the entire body at once.

Homeostasis





Homeostasis Mechanisms



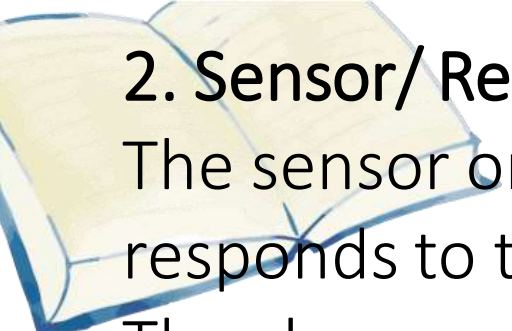
Homeostasis is maintained by a complex system that consists of individual units working in a particular sequence to balance a given variable. All homeostasis mechanisms consist of four separate units, which are:

1. Stimulus

The stimulus is something that results in changes within the system involving the variable.

The stimulus represents that the variable has moved away from its normal range, initiating the process of homeostasis.

One example of this is the increased temperature of the body above 37°C due to various causes. The increased temperature indicates that the temperature of the body has gone higher than its higher range.



2. Sensor/ Receptor

The sensor or receptor is the sensing unit of homeostasis, where it monitors and responds to the changes in the body.

The changes in the system are realized by the sensor, which then sends the information to the control unit.

The nerve cells and receptors like thermoreceptors and mechanoreceptors are examples of sensor/ receptors.

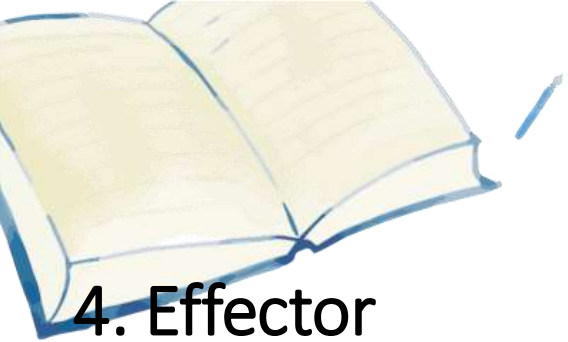
3. Control unit

Once the information is sent to the control unit, it tallies the changed value to its normal value.

If the value is different from the normal value, the control center activates the effectors against the stimulus.

The thermoregulatory unit in the hypothalamus of the brain that controls the temperature of the body is an example of the control unit.





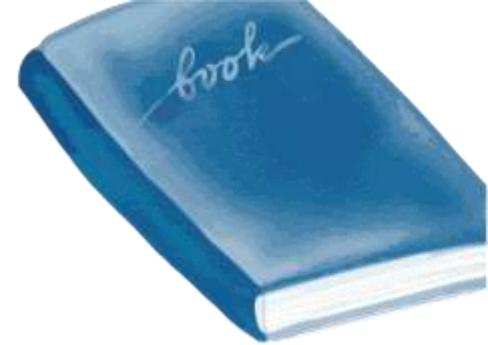
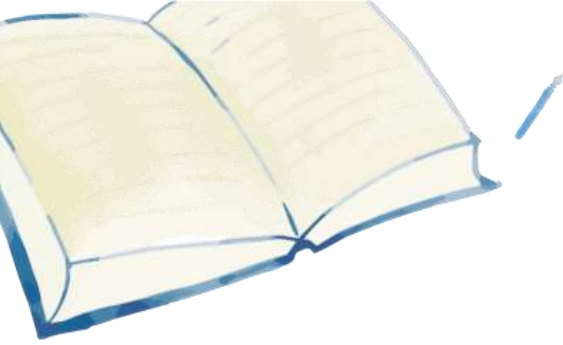
4. Effector

Effectors can be muscles, organs, glands, or other similar structures that are activated as a result of the signal from the control unit.

An effector is a target which is acted upon by the control unit to bring the value of variable back to normal.

The effector essentially counteracts the stimulus to nullify its effect.

In the case of thermoregulation, the sweat glands are effectors that are acted upon by the thermoregulatory unit to produce sweat so as to bring the value of body temperature back to its normal value.



Mucosal Homeostasis of Gut Microbiota

