

- **Homeostasis**
 - The maintenance of a constant internal environment, despite changes in the external environment.
 - Homeostasis is important to the survival of an organism because it maintains internal environments, which allows bodily functions and enzymes to perform at their optimal level.
- A positive feedback loop causes a self-amplifying cycle. The stimulus is the same as the positive feedback.
- A negative feedback loop causes a reverse of the stimulus to stay within an optimal range. The stimulus is the opposite of the negative feedback.

- **Hypothalamus**
 - Contains receptors that detect stimuli.
 - Controls subconscious activities. It modulates.
 - Link between nervous and endocrine system, using the pituitary gland.

- **Tolerance range** – The range at which an organism’s internal environment can tolerate living in.
- **Optimal range** – The most optimal range at which an organism’s internal environment is perfect/optimal.
- Falling outside the tolerance range will cause **death** in an organism if not dealt with.

Adaptations of Ectotherms for Thermoregulation	
Definition	Example
Physiological	Vasoconstriction/Vasodilation Shivering/Sweating + Panting Increase in Metabolic Rate/Decrease in Metabolic Rate Piloerection/Hairs lie flat Hibernation + Torpor/Aestivation
Structural	Body size – High SA:V increases heat loss Size of appendages/ears Insulation Counter current exchange
Behavioural	Burrowing Basking Body Orientation Huddling Migration Rolling in Mud/Water

- **Endotherm**
 - An organism that relies largely on metabolic activity for heat energy.
- **Homeotherm**
 - An organism that maintains a constant body temperature.
 - Mostly Endotherms.
 - E.g. Humans, Koalas, Mammals
- **Ectotherm**
 - An organism that relies on their environment for heat energy.
- **Poikilotherm**
 - Body temperature fluctuates with temperature of surroundings.
 - Mostly Ectotherms
 - E.g. Snakes, Lizards, Frogs

- **Torpor**
 - A physiological state of inactivity that animals enter when metabolic rate of the animal is insufficient to maintain the animal's body temperature.
 - Hibernation is long-term torpor.
- **Hibernation**
 - A form of long-term torpor.
 - Allows an animal to survive in cold temperatures with limited food supply.
 - Causes metabolic rate to fall to the basal metabolic rate.
 - Conserves energy and reduces body temperature.
- **Aestivation**
 - A form of torpor that occurs during summer months.
 - Occurs when cooling mechanisms are insufficient in maintaining a constant body temperature.
 - Metabolic rate drops to basal metabolic value.

Hibernation vs Aestivation	
Hibernation	Aestivation
Occurs during winter. Animals find a warm place. Usually performed by endotherms. Long duration.	Occurs during summer. Animals find a cool/moist/shaded area. Performed by ectotherms. Short duration.