

HOMEOSTASIS SCREENCAST NOTES

2nd Law of Thermodynamics is one of the fundamental laws of nature.

It states that the universe and everything in it is always moving in the direction of _____.

Any Other Examples?

Yet, life appears to be the exact _____ of this, for life is very _____ and living organisms maintain that organization until they die.

This is this property that separates _____ from _____.

HOMEO - _____, STASIS - _____

- The ability of life to _____

_____ is called _____.

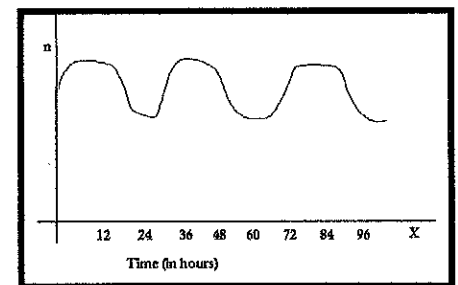
- Along with evolution, this is one of the guiding principles of modern biology.

Even the simplest life form, an amoeba, maintains a distinctly _____ separate from its external environment.

Why?

The more complex the life form, the more elaborate and _____ are the homeostatic mechanisms they have evolved.

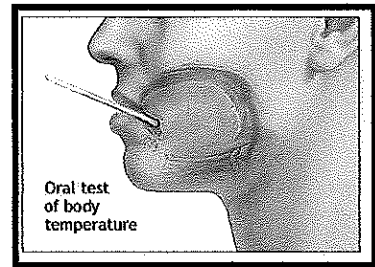
In humans, we have (as much as possible) _____ all of our _____ from the external environment; thus, improving the quality of our 'internal seawater'.



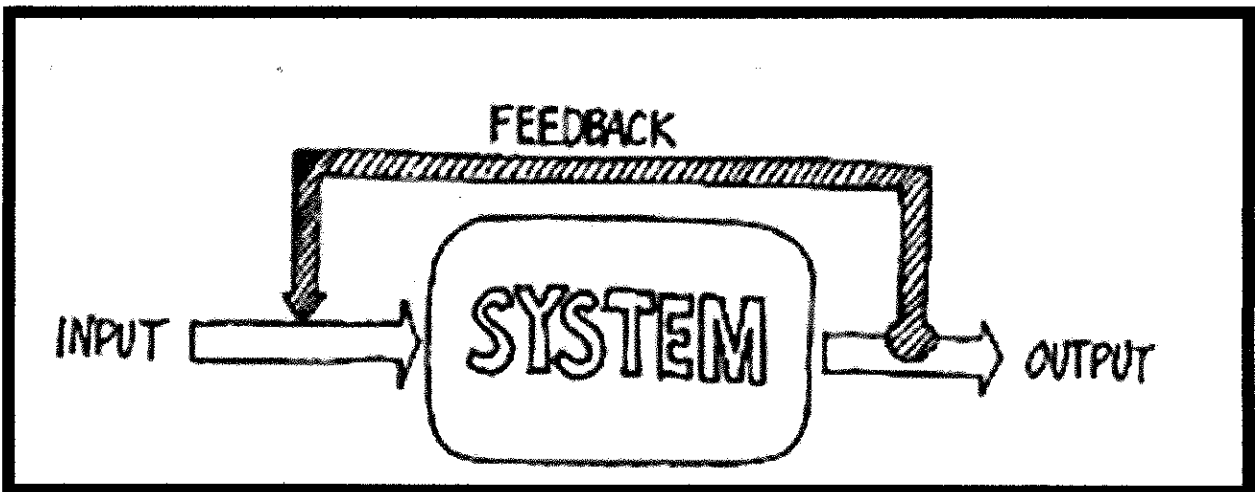
We have evolved '_____ ' which allows us to _____ and _____ our internal environment within very narrow parameters.

Homeostatic Mechanisms

- _____ monitor each condition under homeostatic control. For example:
 - _____ @ 37°C
 - _____ @ 120/80
 - _____ @ 0.07%
 - _____ (salt levels) @ 0.1M
 - _____ @ 7



- These _____ in some way (usually by nerves or hormones) to mechanisms capable of _____ in the particular state (ie: warm the body temperature).
- A _____ (of receptors and corrective mechanisms) is called a _____.



Feedback Loops

There are two types of feedback loops:

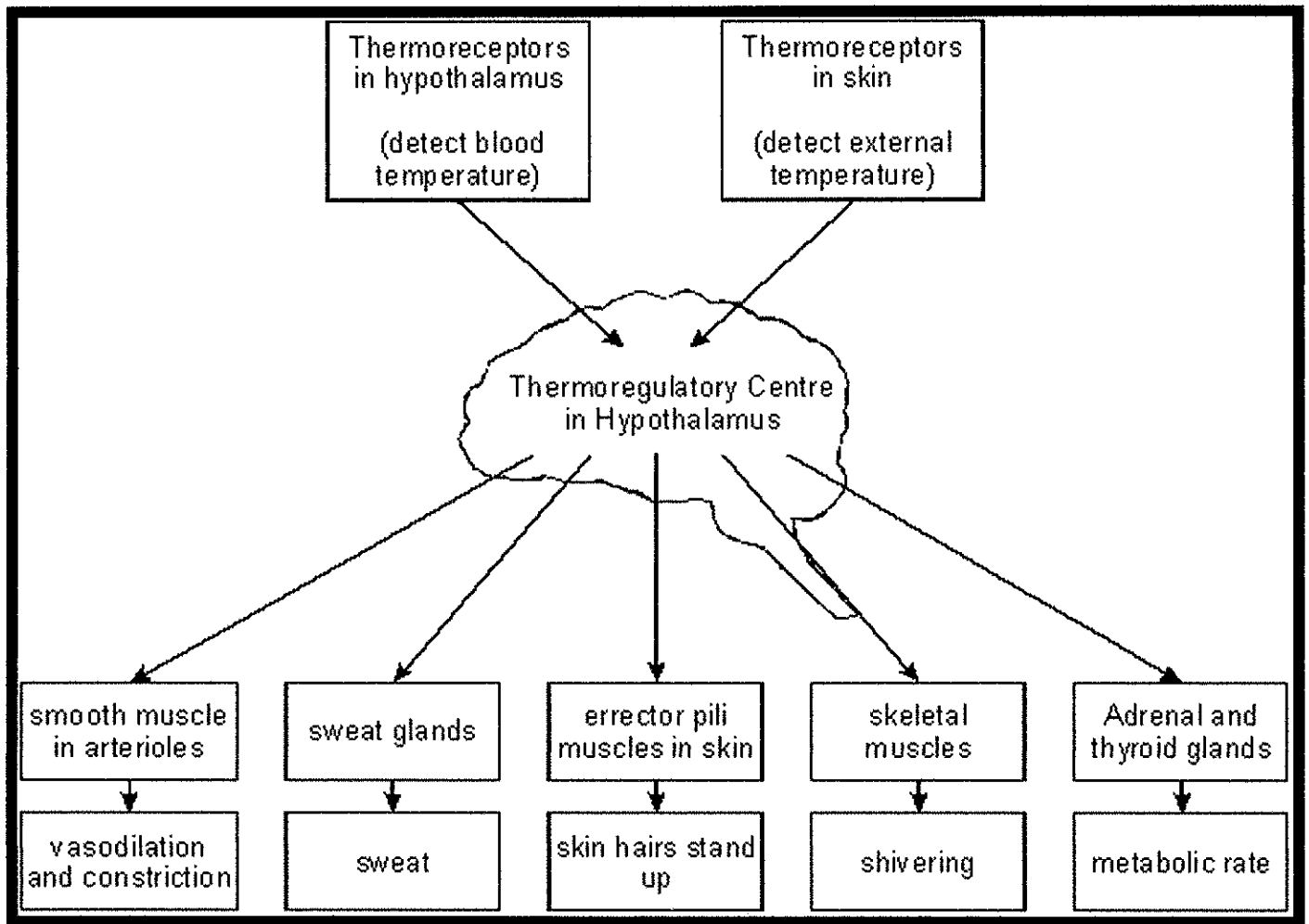
- _____ Feedback Loops
- _____ Feedback Loops

NEGATIVE FEEDBACK LOOPS

This type of a feedback loop occurs where _____ from some body system _____ (shuts itself off) at a certain _____.

Example: with both a _____ in furnace or in the brain (hypothalamus)

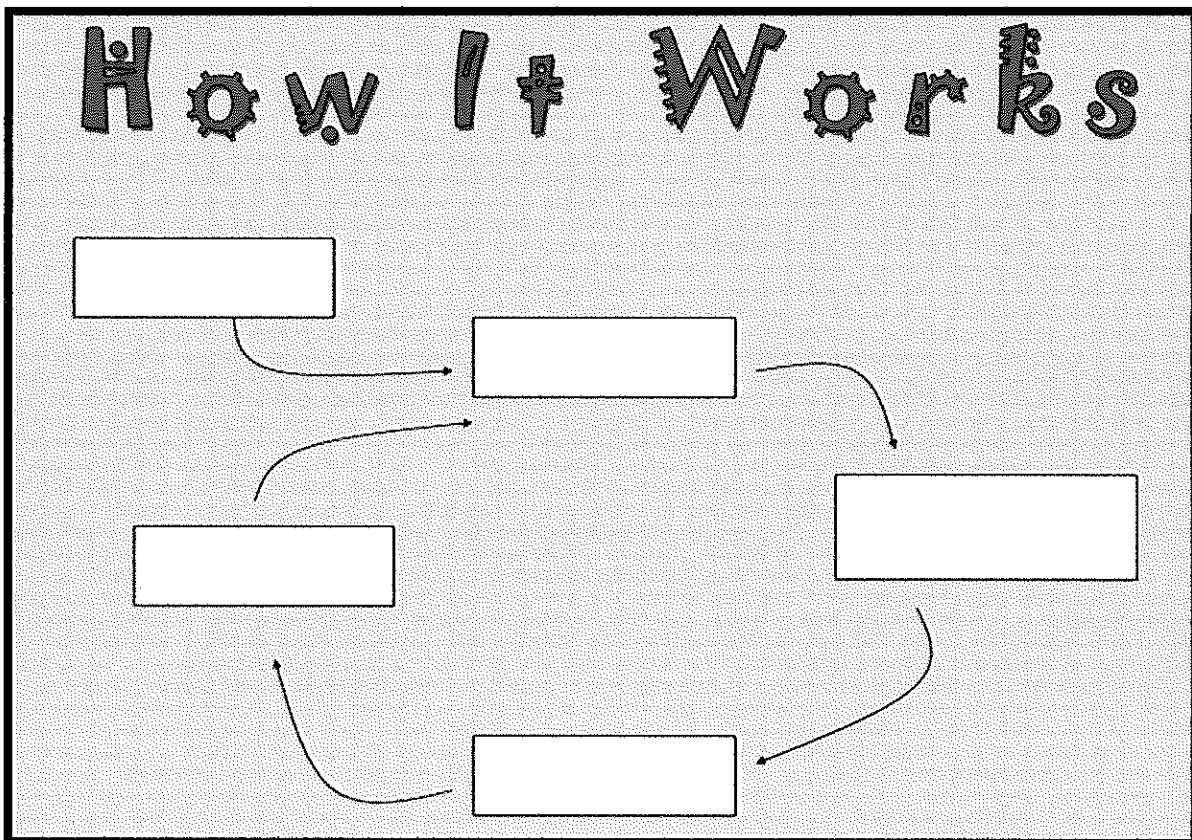
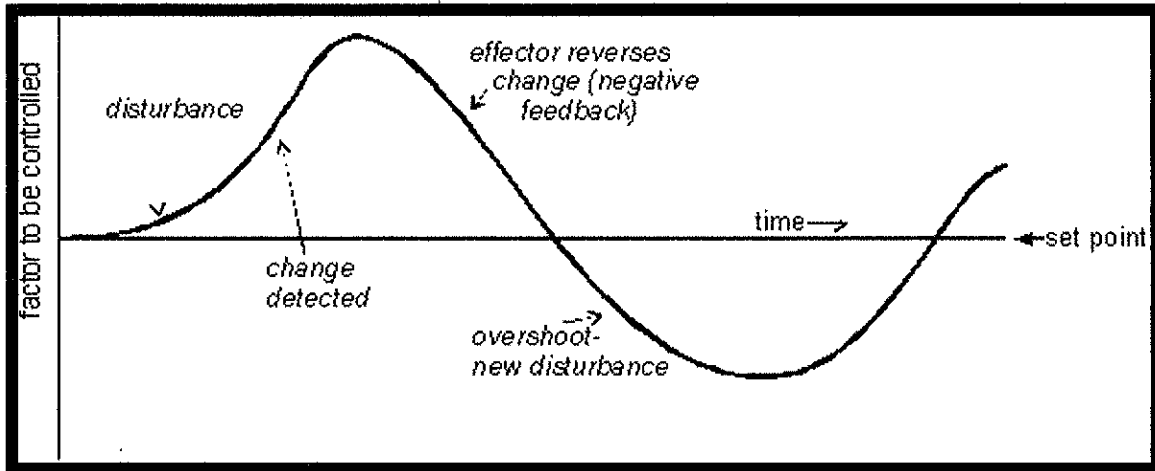
- When the heat increases, the furnace is _____
- When the heat decreases, the furnace is _____



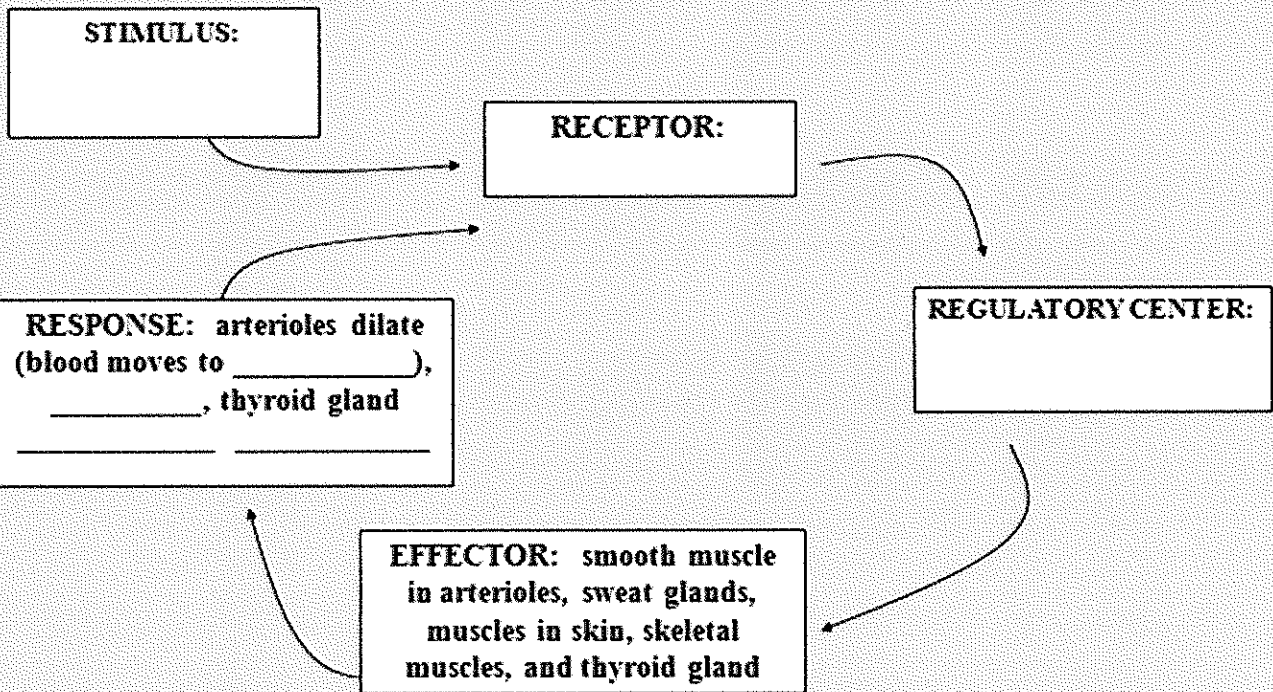
The hypothalamus maintains a set point of _____ in most mammals.

The temperature is _____ determined by a 'high' and 'low' set point ($\pm 0.5\text{ }^{\circ}\text{C}$)

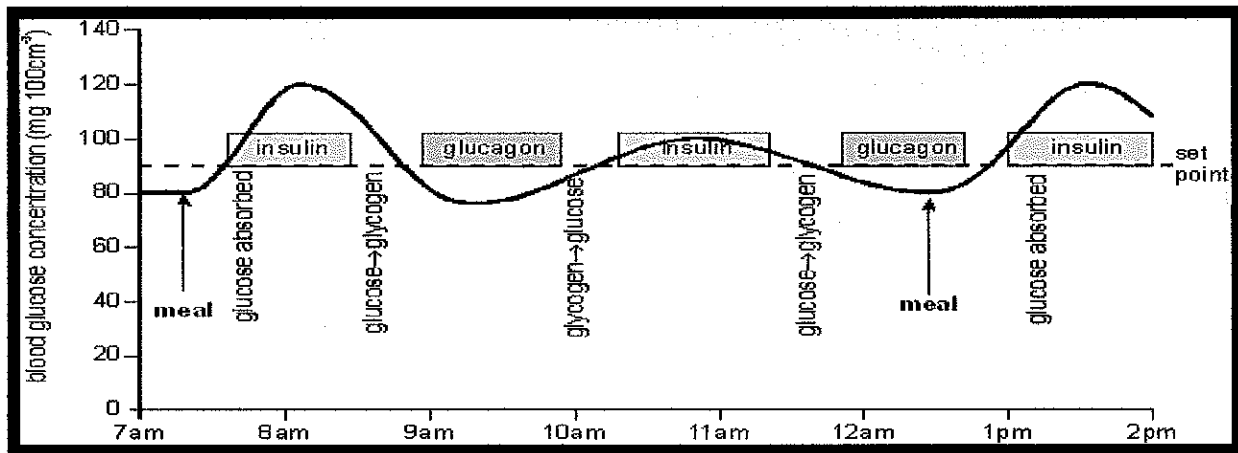
Whenever a change occurs in a system, the change automatically causes a _____ to start, which reverses the original change and brings the system back to _____.



How It Works: an example



BLOOD SUGAR CONTROL



POSITIVE FEEDBACK LOOPS

This type of a feedback loop occurs _____
_____ or causes

Example: _____ (the pressure of the babies head on the uterus) stimulates the pituitary gland in the brain to release the hormone oxytocin.

The _____ causes the uterus to contract, which leads to increased pressure. Contractions cause the pituitary to produce more oxytocin and the cycle continues until you give birth.



More examples of positive feedback?

- 1.
- 2.
- 3.

How is a negative feedback loop different from a positive feedback loop?