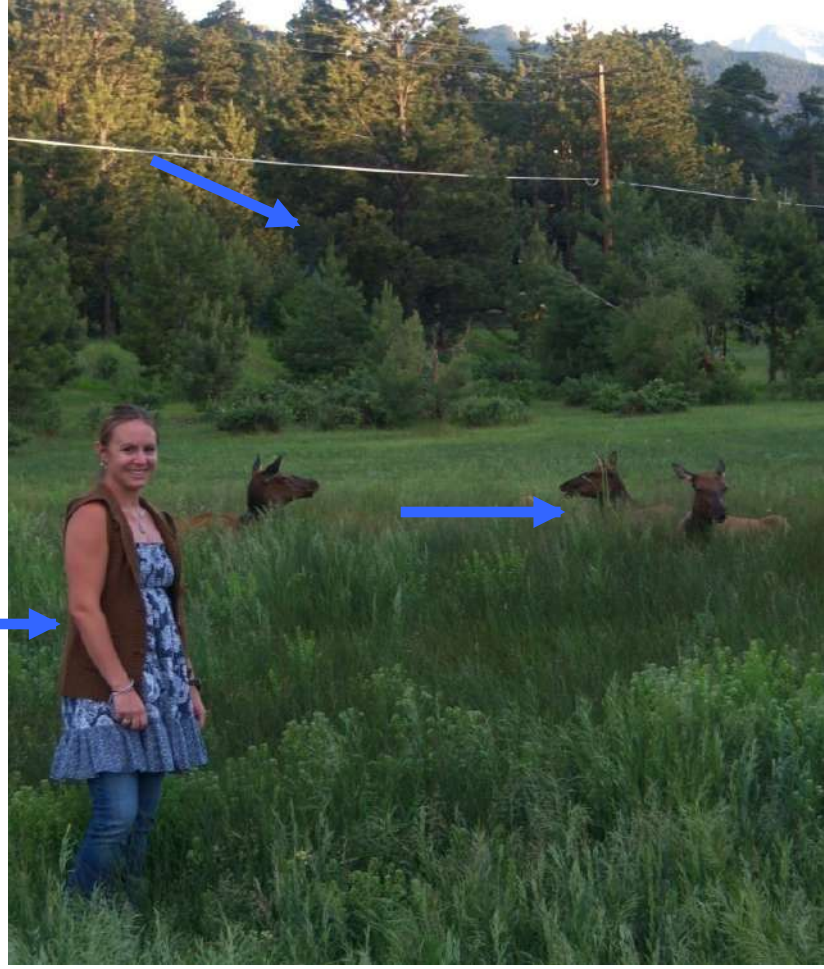
Unit 1, Pt 3

Maintaining Homeostasis

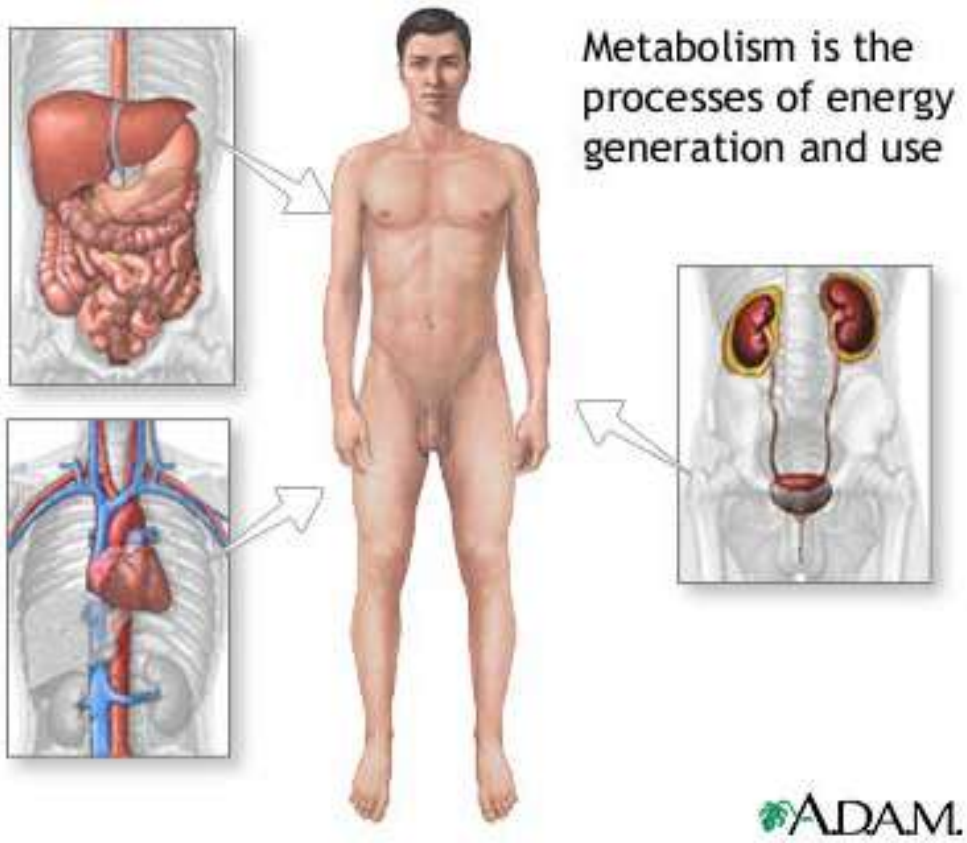
Homeostasis – Necessary Life Functions

- *What defines all living organisms?*
  - Maintain boundaries
  - Movement
    - Locomotion
    - Movement of substances
  - Responsiveness
    - Ability to sense changes & react
  - Digestion
    - Break-down & absorption of nutrients



Homeostasis – Necessary Life Functions

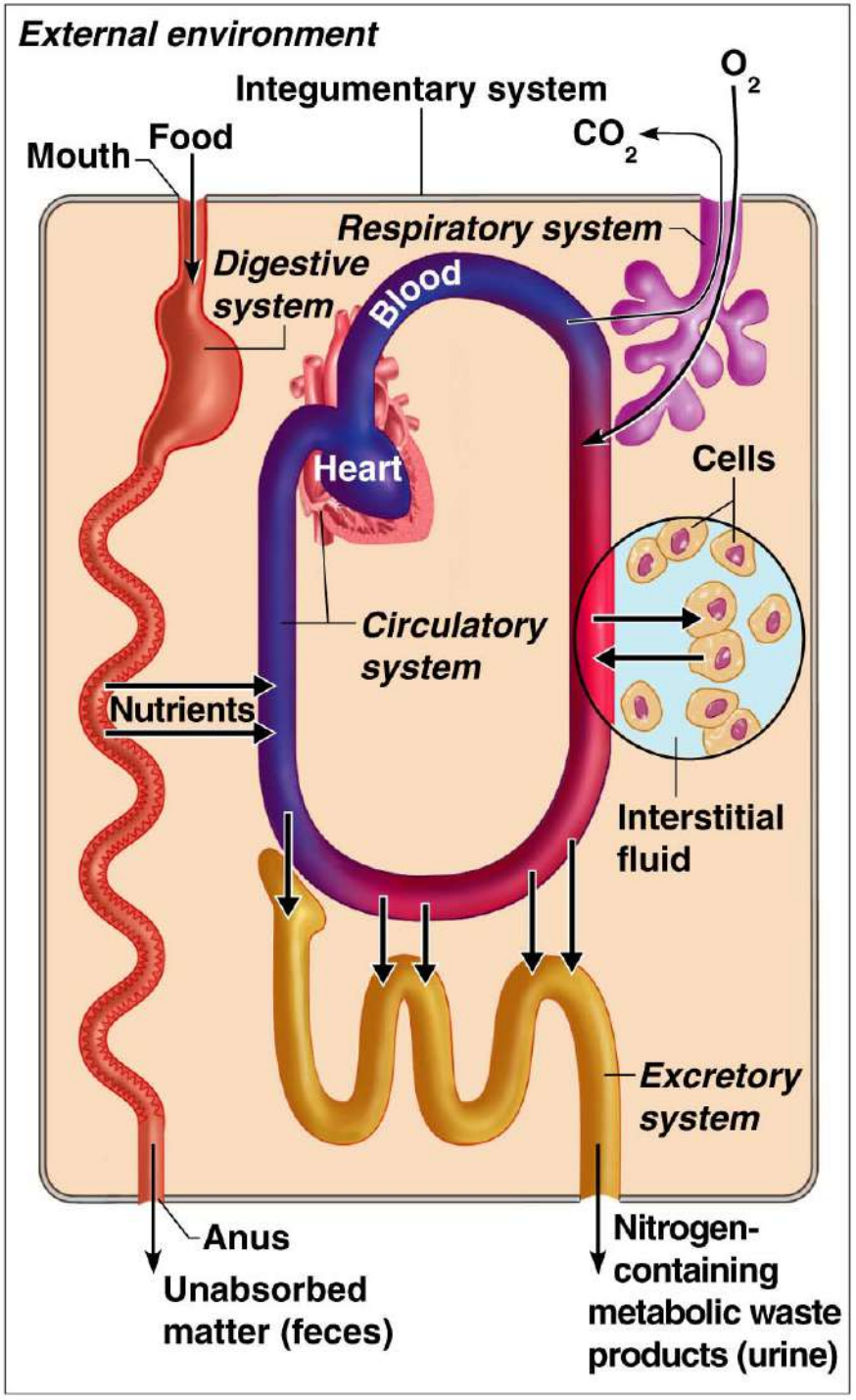
- *What defines all living organisms?*
  - Metabolism—chemical reactions within the body
    - Produces energy
    - Makes body structures
  - Excretion
    - Eliminates waste from metabolic reactions
  - Reproduction
    - Produces future generations
  - Growth
    - Increases cell size & number of cells



Homeostasis – Survival Needs

- Nutrients
  - Chemicals for energy and cell building
  - Includes carbohydrates, proteins, lipids, vitamins & minerals
- Oxygen
  - Required for chemical reactions
- Water
  - 60–80% of body weight
  - Provides for metabolic reaction
- Stable body temperature
- Atmospheric pressure
  - Must be appropriate

Homeostasis – Interrelation-Among Systems



Homeostasis

- Homeostasis—maintenance of a stable internal environment
  - A dynamic state of equilibrium
- Homeostasis is necessary for normal body functioning & to sustain life
- Homeostatic imbalance
  - A disturbance in homeostasis resulting in disease, illness death

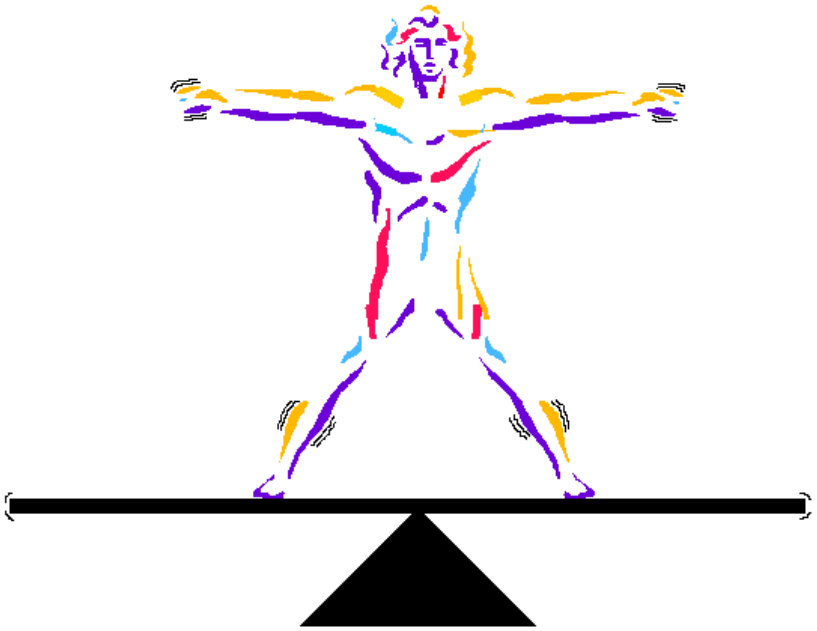


Figure 1.4, step 1a

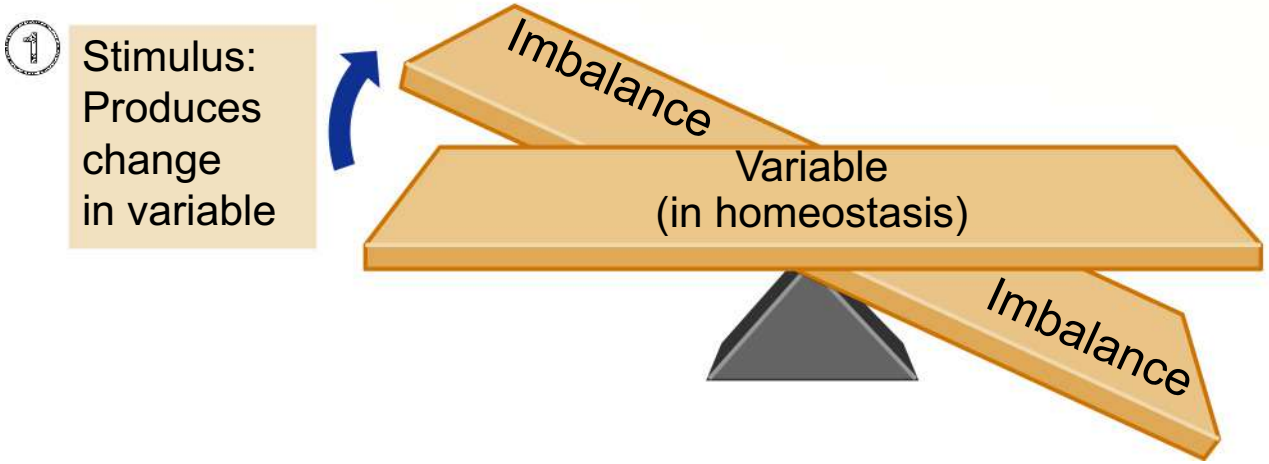


Figure 1.4, step 1b

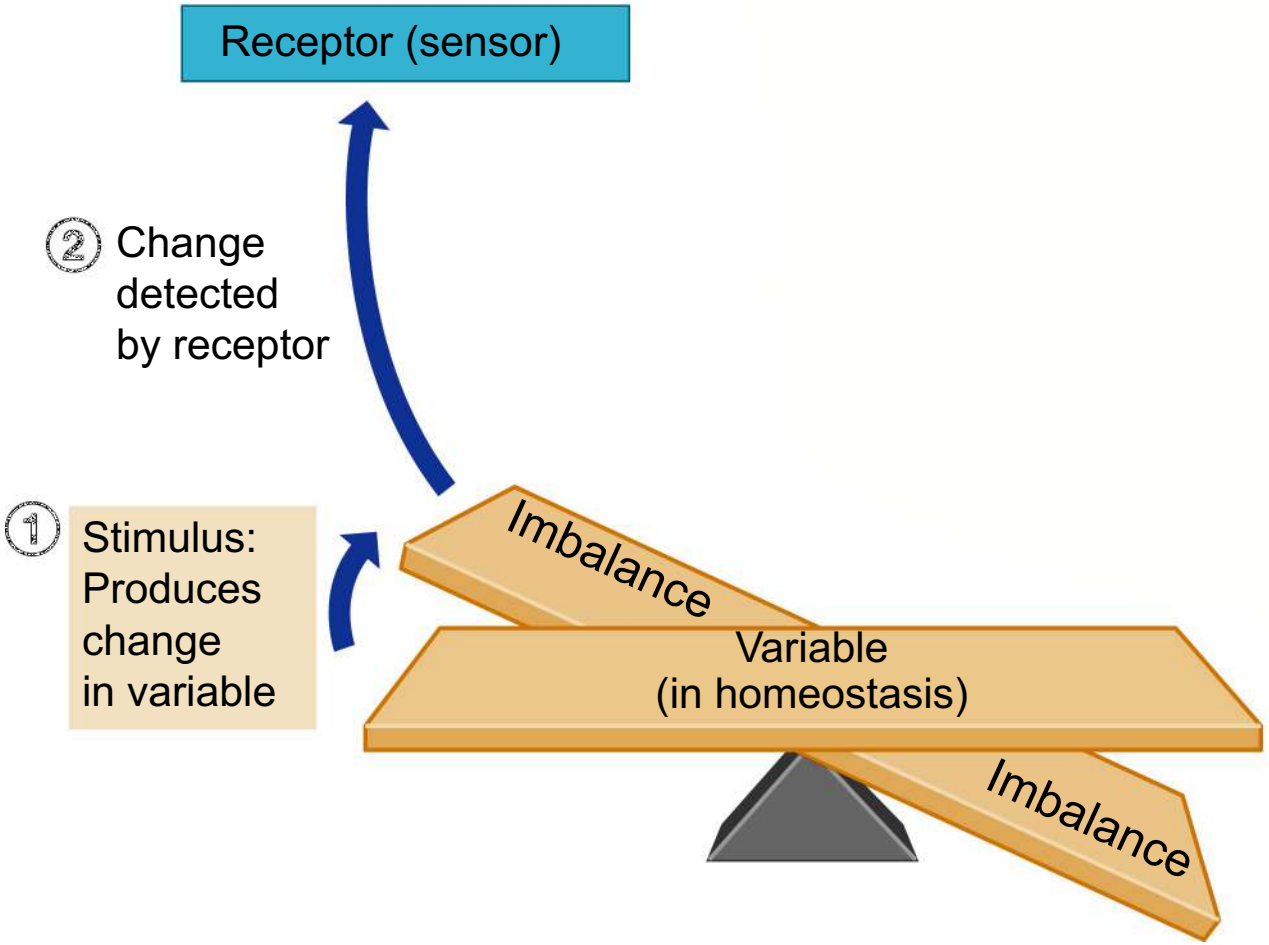


Figure 1.4, step 2

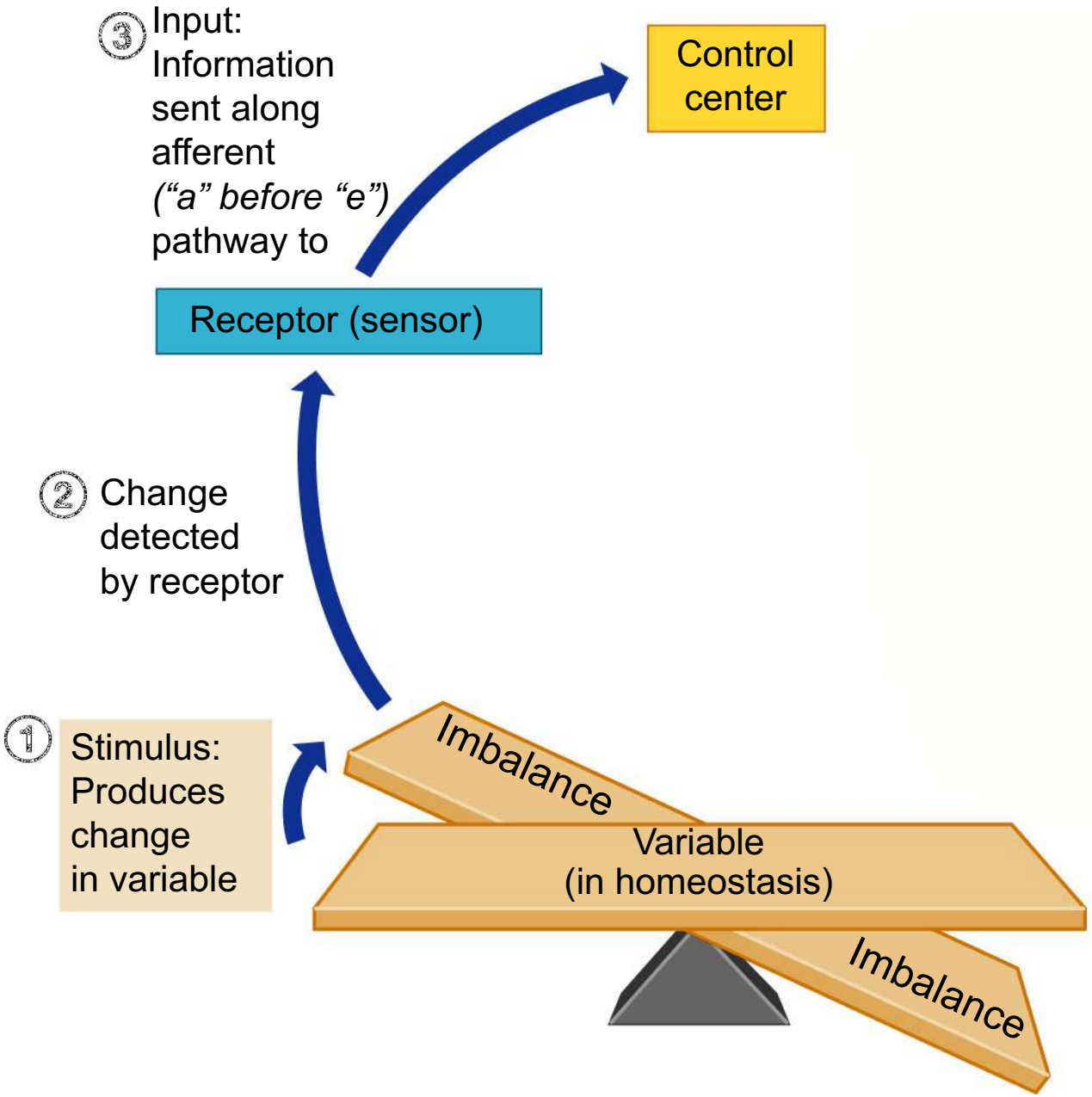


Figure 1.4, step 3

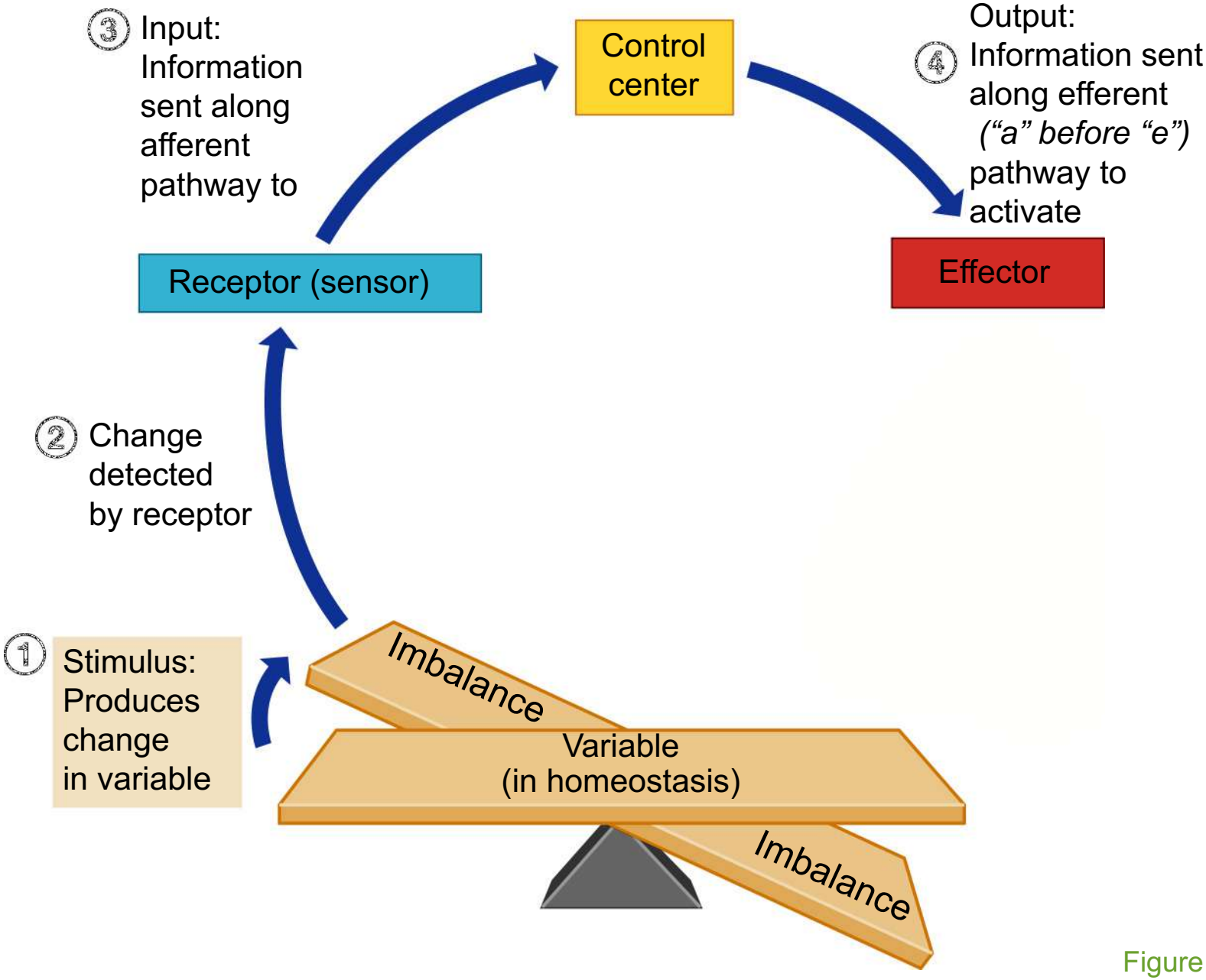


Figure 1.4, step 4

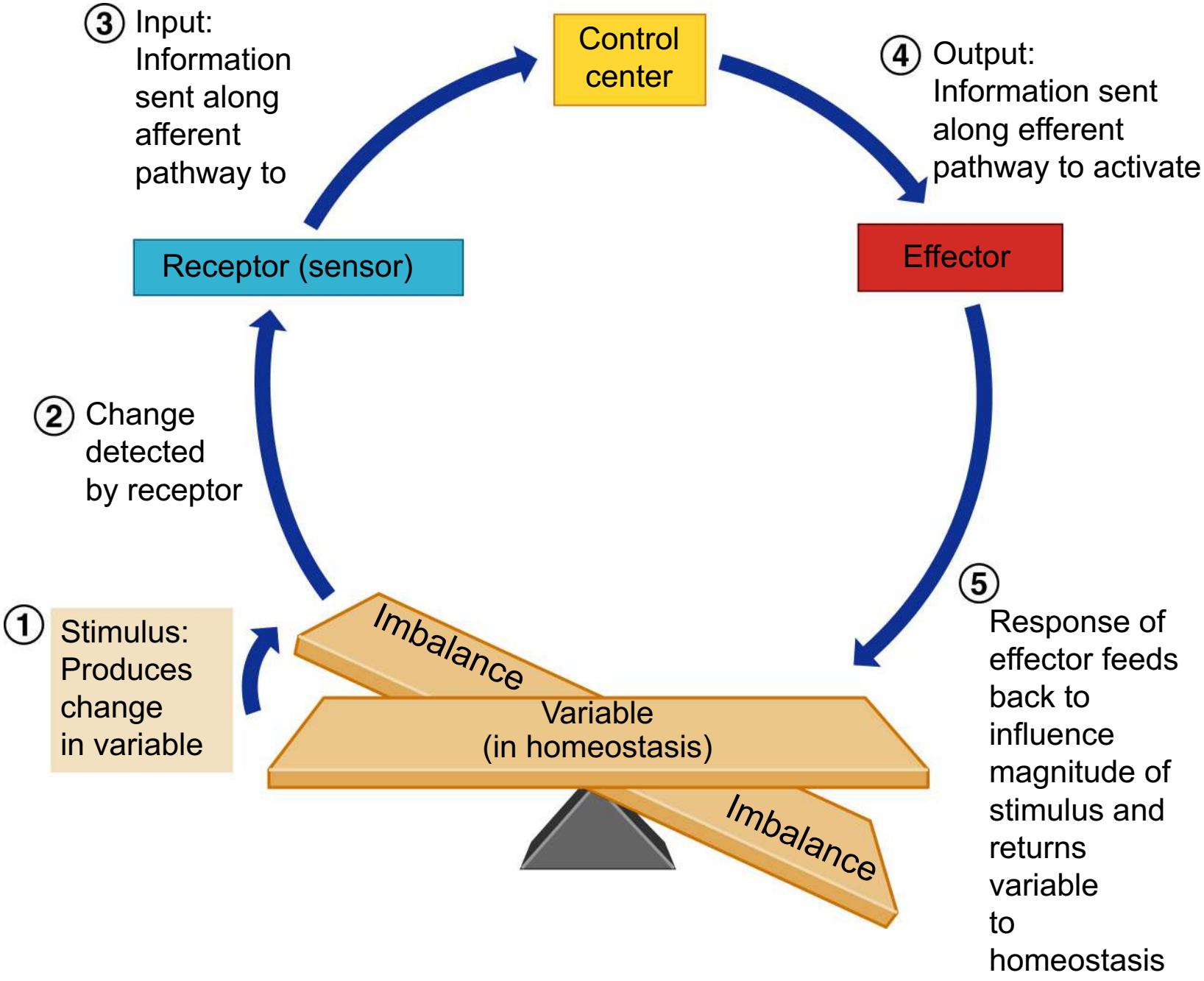
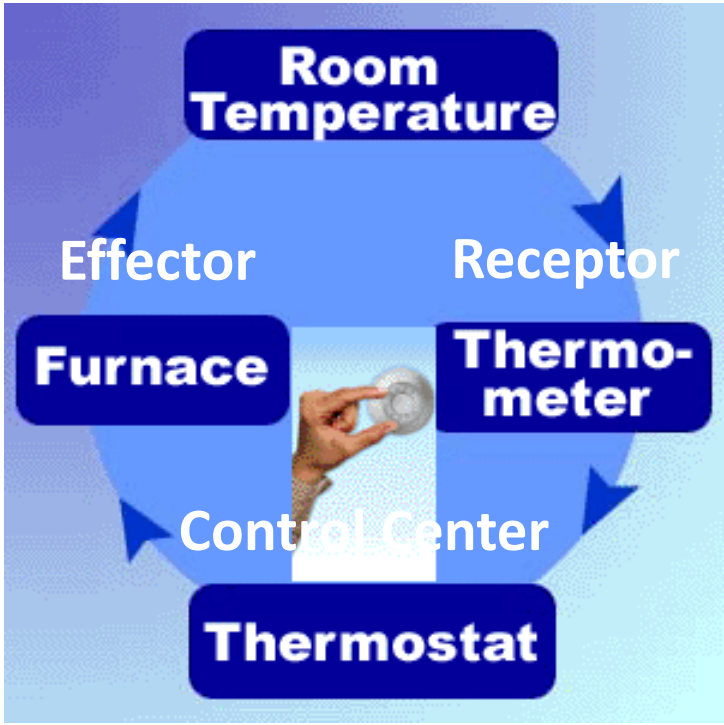


Figure 1.4, step 5

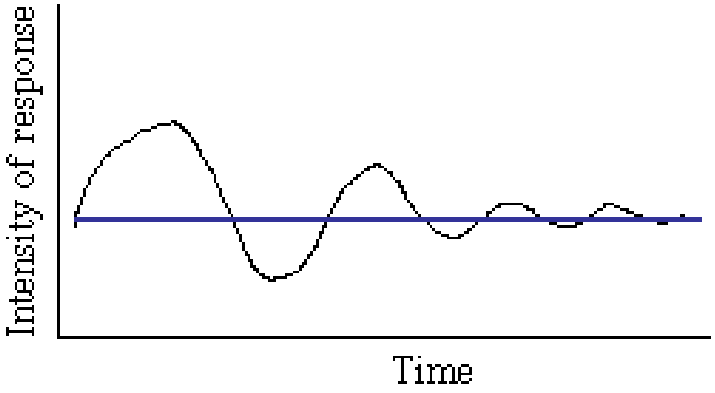
Maintaining Homeostasis

- The body communicates through neural (**Nervous System**) & hormonal (**Endocrine System**) control systems
  - **Receptor**
    - Responds to changes in the environment (stimuli)
    - Sends information to control center
  - **Control center**
    - Determines set point (threshold)
    - Analyzes information
    - Determines appropriate response
  - **Effector**
    - Provides a means for response to stimulus



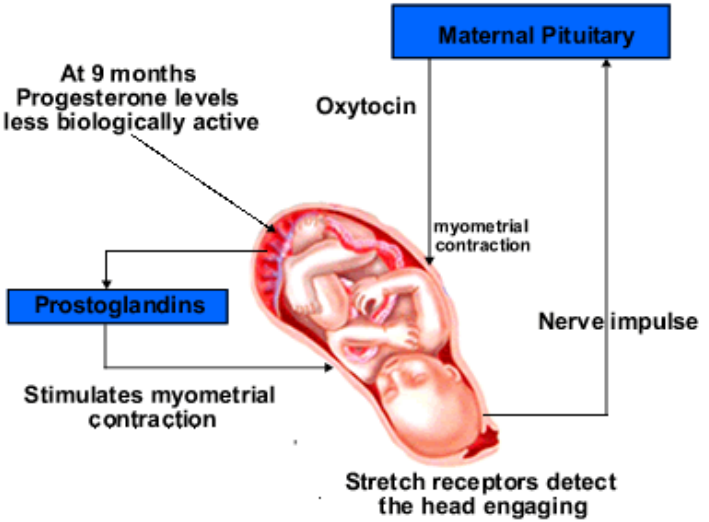
Feedback Mechanisms

- **Negative feedback** *(ALWAYS A GOOD THING!!! ☺)*
  - Includes most homeostatic control mechanisms
  - Shuts off the original stimulus, or reduces its intensity
  - Works like a *household thermostat*
    - Increase in temperature outside = increase in temperature inside
    - Thermostat senses increasing temperature
    - Thermostat turns fan/air conditioner on
    - Inside temperature decreases
    - Regulation of body temperature - *thermoregulation*

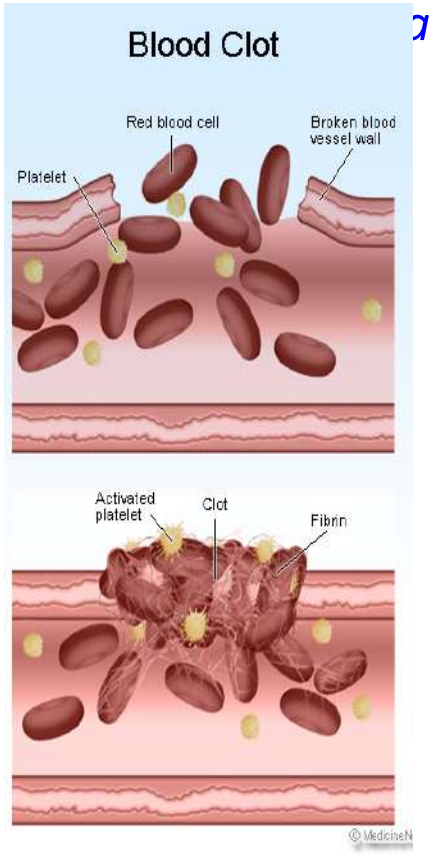


Graph showing example of ***negative*** *feedback*

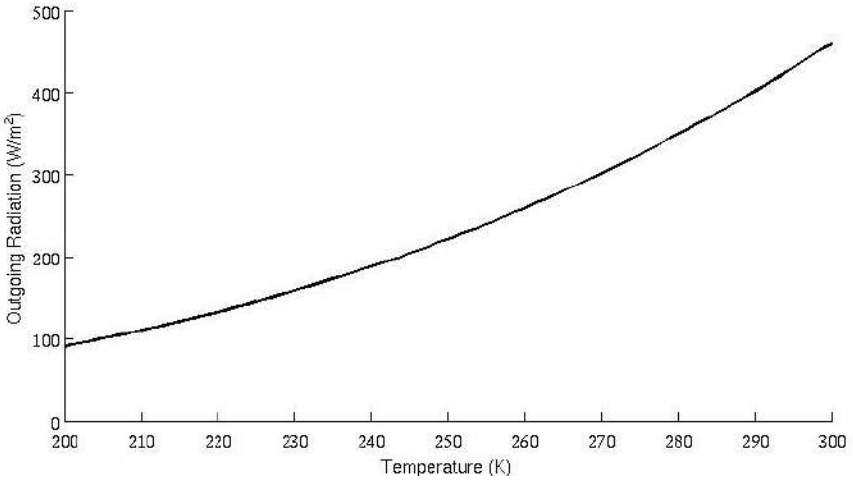
Feedback Mechanisms



- **Positive feedback**
  - Increases the original stimulus to push variable farther
  - *In the body, THIS IS **NOT** A GOOD THING in fact it is a sign of something VERY BAD except…)*
  - In the body, this only occurs in blood clotting & birth (labor contractions)



*Graph showing example of **positive** feedback*



???s on Positive or Negative Feedback Mechanisms?

???s on Homeostasis?