ORGAN SYSTEMS AND INTRODUCTORY DEFINITIONS

Anatomy: study of structure of body parts
Physiology: study of function of body parts

Structural Organization

- **Cells** are the smallest unit of structure and function.
- **Tissues** are composed of many cells that all do the same thing.
- **Organs** are composed of many different tissues, all working together to help the organ function.

For example, the heart has a strong layer of muscle tissue. It is also lined with epithelial tissue that protects it, connective tissue that keeps everything held together and well-insulated, and nervous tissue that controls the rate and strength of the muscle contraction.

Organ Systems:

1. **Integumentary** System: skin protects us
2. **Muscular** System: movement
3. **Skeletal** System: structure
4. **Nervous** System: communication
5. **Endocrine** System: communication
6. **Digestive** System: food breakdown, absorption and excretion of wastes
7. **Respiratory** System: gas exchange
8. **Cardiovascular** System: transportation of substances such as nutrients and gases through the body
9. **Immune/Lymphatic** System: fight infection and cancer cells; drain excess fluids from tissues
10. **Urinary** System: rid body of nitrogenous wastes; fluid volume and acid/base balance
11. **Reproductive** System: make more humans

Homeostasis is the body's ability to maintain a stable internal environment even though the external environment (temperature, food sources, etc.) fluctuates. **Homeostatic imbalance means that the body's internal environment is not what it should be.**

Negative Feedback is a control system in which a stimulus ceases once the body has adequately responded. It is analogous to a teeter-totter that is constantly brought back to center balance.
Example 1: Body water level is low (stimulus). You become thirsty (body's reaction to the stimulus). You drink (your response to the stimulus). Water level returns to normal. **You are no longer thirsty.**
Example 2: Body temperature is low. You begin to shiver. Body temperature rises. **You no longer shiver**.

Positive Feedback: A stimulus causes more and more of an activity; compared to the "snowball" effect. There are only two key examples of this in the body.
Example 1, blood clotting: You cut yourself and begin to bleed. Platelets are activated and become sticky. Sticky platelets activate other platelets. Thus, more and more platelets are activated to form a plug at the site of injury.
Example 2, labor/delivery and breast-feeding: The hormone oxytocin causes the uterus to contract. Stretch receptors send signals to brain, which causes more hormones to release and further stimulate uterine contractions. This process continues, with mounting strength, until the baby is delivered. Similarly, when the baby suckles at nipple, nervous signals go to the brain and cause the release of oxytocin that cause milk ejection. Baby continues suckling, milk continues to flow.