Chapter 40.2 - 40.4 Temperature Regulation

*Bozeman Videos: Thermoregulation, Homeostasis Hugs (Counter Current Exchange)*

1. Explain the differences between endothermic and ectothermic animals.
2. What are the sources of heat for an organism?
3. How is heat exchange controlled between an organism and its environment?
4. Why do smaller endotherms require more energy per unit of mass than larger endotherms?
5. How does shivering and sweating regulate body temperature in endotherms?
6. Why is the hypothalamus compared to a thermostat?
7. What is the purpose of the counter current exchange mechanism? Provide examples of its use in both aquatic and terrestrial animals.

Comparison of Animal Systems

Use the following sections to compare and contrast various strategies found in organisms for gas exchange, circulation, digestion, excretion and osmoregulation.

49.1-49.2, 50.1-50.2, 51.2, 52.1-52.4

*Bozeman Videos: Cooperative Interactions, Organ Systems*

Gas Exchange**:**

1. Explain the components of Fick’s law of diffusion.
2. Compare and contrast the mechanisms of gas exchange in aquatic and terrestrial animals.
3. Compare and contrast the respiratory organ systems of aquatic and terrestrial animals.

Circulation:

1. Describe the circulatory organs which function to circulate fluids in multicellular organisms.
2. Compare the circulatory systems of fish, amphibians and mammals.

Digestion:

1. Compare and contrast saprobes, detritivores, herbivores, carnivores, omnivores, filter feeders, and fluid feeders.
2. Compare and contrast gastrovascular cavity and tubular gut.

Excretion and Osmoregulation:

1. Compare and contrast the mechanisms of nitrogenous waste production and elimination in aquatic and terrestrial animals.
2. Compare the excretory systems in flatworms, earthworms and vertebrates.

Chapter 42.1-42.3, 42.5, 42.7 Animal Defenses

1. Why are defense systems needed in multicellular organisms?
2. What is the difference between nonspecific and specific defenses?
3. Identify some nonspecific defenses used by the human body.
4. Briefly describe the four key features of the adaptive immune system.
5. Distinguish between the humoral immune response and the cellular immune response.
6. Explain how a specific immune response can be triggered.
7. Explain the specificity of antibodies.
8. Discuss how a second exposure results in a more rapid immune response.
9. Define the following in terms of the immune system:
   1. Allergic reaction
   2. Autoimmunity
   3. AIDS

Chapter 39.1, 39.2 Plant Defenses

1. Identify some first lines of defense for plants.
2. How do plants prevent pathogens from spreading throughout its body?
3. Describe how the hypersensitive response contains an infection.
4. List some ways that herbivory enhances plant growth.
5. List some examples of how plants protect themselves from herbivores.