AP Biology **Name**_____

Chapter 40.3 - .4 Basic Principles of Animal Form and Function

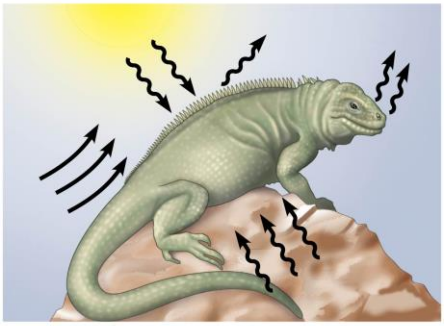
Guided Reading (10ed)

1. What is thermoregulation?

2. Describe the difference between *endothermy* and *ectothermy* and give an example of each.

Property	**Description**	**Example**
Endothermy		
Exothermy		

3. What are the four processes by which heat is exchanged with the environment? Use this figure and explain each process.



4. Discuss how each of the following is a thermoregulatory adaptation:

Fur/feathers

Adipose tissue

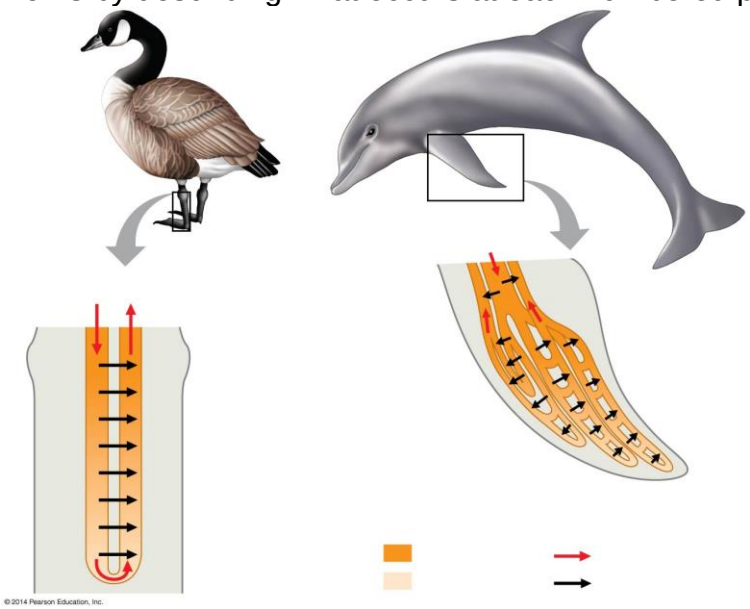
Goose bumps

Vasodilation/vasoconstriction

Panting/sweating

Burrowing/sunning

5. *Countercurrent exchange* mechanisms help maintain homeostasis in several different systems. For example, heat loss in extremities is reduced by *countercurrent exchange*. Use this figure to explain how *countercurrent exchange* works by describing what occurs at each numbered point. (Page 880 for numbers)



1.

2.

3.

6. What is the role of the *hypothalamus* in temperature regulation?

7. What is the *metabolic rate*? In what units is it usually measured?

8. What is *basal metabolic rate (BMR)*?

9. What is the relationship between BMR and body mass?

10. What are the evolutionary advantages of *torpor* and *hibernation*?

11. If a mouse and a small lizard of the same mass (both at rest) were placed in experimental chambers under identical environmental conditions, which animal would consume oxygen at a higher rate? Explain.

12. For each challenge, describe how the challenge has been solved in plants as well as animals.

Challenge	**Plant Solution**	**Animal Solution**
Nutritional Mode		
Environmental Response		
Growth and Regulation		
Transport		
Reproduction		
Absorption		
Gas Exchange		