

Focus Questions  
Animal Form and Function  
Chapters 40-51  
AP Biology

Chapter 40

- Explain the different ways animals exchange materials with their environment. (40.1)
- Describe the four types of tissues and provide examples of each. (40.1)
- Describe the types of signaling in animal systems. (40.1)
- Explain and provide examples of the different types of feedback mechanisms involved in homeostasis. (40.2)
- What are specific ways homeostasis can be altered over the course of an organism's life? Explain at least two. (40.2)
- How are biological systems impacted by disruptions to homeostasis? (40.2)
- Describe several ways animals respond to external changes in the temperature to maintain homeostasis. (40.3)
- Describe how temperature regulation demonstrates both common ancestry and divergence due to adaptation. (40.3)
- Describe how energy flows through an organism. (40.4)
- What can impact metabolic rates in animals? Explain. (40.4)

Chapter 43

- Compare and contrast innate immunity in invertebrates and vertebrates. (43.1)
- Describe several methods of adaptive immunity in animals. (43.2)
- Describe the function of Helper T Cells, Cytotoxic T Cells, and B Cells and Antibodies. (43.3)
- Explain the biological basis of allergic responses and autoimmune diseases. (43.4)

Chapter 45

- Describe the five different types of intercellular communication. (45.1)
- Describe the different pathways for water-soluble and lipid-soluble hormones. (45.1)
- Using epinephrine as an example, explain how one hormone can have many different effects. (45.1)
- Describe and provide an example of both a simple endocrine pathway and a simple neuroendocrine pathway. (45.2)
- Explain feedback regulation in blood glucose control. (45.2)
- Explain how diabetes mellitus impacts blood glucose regulation. (45.2)

Chapter 47

- Describe how polyspermy is avoided in fertilization. (47.1)
- Explain how cleavage leads to the formation of the blastula. (47.1)
- Explain the process of gastrulation describing the three germ layers. (47.2)
- Describe the process of limb formation in vertebrates. (47.3)

Chapter 48

- Explain how information processing occurs in animals. (48.1)
- Explain how the forms of the three different types of neurons relates to their functions. (48.1)
- How is the resting potential formed in a nerve cell? (48.2)
- Explain how an action potential is conducted through a neuron. (48.3)
- Describe Figure 48.17. (48.4)
- Describe and provide examples of the different types of neurotransmitters. (48.4)

Chapter 49

- Compare and contrast the CNS and the PNS. (49.1)
- Explain the difference between the sympathetic and parasympathetic nervous systems as well as provide examples of the actions of each. (49.1)
- Explain how the arousal and sleep controlled. (49.2)
- Explain how biological clocks are regulated. (49.2)
- Explain how emotional responses are regulated. (49.2)

Chapter 51

- Describe and provide an example of a fixed action pattern. (51.1)
- Explain what triggers and guides animals in migration. (51.1)
- Explain courtship behavior in fruit flies and honeybee dance language. (51.1)
- Provide several examples of how pheromones are used in animals. (51.1)
- Create a chart describing the different types of learning (imprinting, spatial learning, cognitive maps, associative, cognition, problem solving, and social learning) and provides examples of each. (51.2)
- Explain how foraging behavior evolved and relate that to the optimal foraging model. (51.3)
- Describe the different types of mating behaviors and mate choice and explain how they evolved. (51.3)
- Explain how both voles show the genetic basis of behavior and describe the evolutionary benefits of their behaviors. (51.4)
- Explain the evolutionary benefit of altruism. (51.4)
- Explain Hamilton's Rule and what it can tell us. (51.4)

**Chapter 40**

acclimatization  
 adipose tissue  
 basal metabolic rate (BMR)  
 bioenergetics  
 circadian rhythm  
 conformer  
 connective tissue

countercurrent exchange  
 ectothermic  
 endothermic  
 epithelial tissue  
 hibernation  
 homeostasis  
 metabolic rate

negative feedback  
 osteoblast  
 positive feedback  
 regulator  
 response  
 set point  
 standard metabolic rate (SMR)

stimulus  
 thermoregulation  
 tissue  
 torpor

**Chapter 43**

adaptive immunity  
 active immunity  
 AIDS  
 allergens  
 antibody  
 antigen  
 autoimmune disease  
 B lymphocyte (B cell)

cell-mediated immune response  
 cytokine  
 cytotoxic T cell  
 helper T cell  
 histamine  
 HIV  
 immune system  
 immunization

inflammatory response  
 innate immunity  
 interferon  
 lymphocyte  
 lysozyme  
 macrophage  
 natural killer (NK) cell  
 neutrophil

passive immunity  
 phagocytosis  
 primary immune response  
 secondary immune response  
 T lymphocyte (T cell)  
 vaccination

**Chapter 45**

autocrine  
 calcitonin  
 diabetes mellitus  
 endocrine gland  
 endocrine system  
 endorphin

epinephrine  
 glucagon  
 growth hormone (GH)  
 hormone  
 insulin  
 local regulators

melatonin  
 neurohormones  
 neurotransmitters  
 norepinephrine  
 oxytocin  
 paracrine

pheromones  
 prolactin (PRL)  
 signal transduction  
 testosterone  
 tropic hormone

**Chapter 47**

acrosomal reaction  
 animal pole  
 apoptosis  
 blastocoel  
 blastocyst  
 blastomere  
 blastula

cleavage  
 determination  
 differentiation  
 ectoderm  
 endoderm  
 fate map  
 gastrula

gastrulation  
 germ layers  
 mesoderm  
 morphogenesis  
 neural crest  
 neural tube  
 notochord

organogenesis  
 pattern formation  
 positional information  
 totipotent  
 vegetal pole

**Chapter 48**

acetylcholine  
 action potential  
 axon  
 cell body  
 central nervous system  
 dendrite

depolarization  
 dopamine  
 endorphin  
 hyperpolarization  
 ligand-gated ion channel  
 membrane potential

motor neuron  
 neuron  
 neurotransmitter  
 norepinephrine  
 oligodendrocyte  
 peripheral nervous system

resting potential  
 serotonin  
 synapse  
 threshold

**Chapter 49**

Alzheimer's disease  
 amygdala  
 autonomic nervous system  
 biological clock  
 brainstem  
 cerebellum

cerebral cortex  
 cerebral hemisphere  
 cerebrospinal fluid  
 cerebrum  
 forebrain  
 hypothalamus

long-term memory  
 medulla oblongata  
 midbrain  
 parasympathetic division  
 Parkinson's disease  
 reflex

schizophrenia  
 short-term memory  
 sympathetic division

**Chapter 51**

agonistic behavior  
 altruism  
 associative learning  
 behavior  
 behavioral ecology  
 classical conditioning  
 cognition  
 cognitive map  
 communication

fixed action pattern (FAP)  
 foraging  
 game theory  
 habituation  
 Hamilton's rule  
 imprinting  
 inclusive fitness  
 innate behavior  
 kin selection

kinesis  
 learning  
 mate choice copying  
 migration  
 monogamous  
 operant conditioning  
 optimal foraging theory  
 pheromone  
 polyandry

polygamous  
 polygyny  
 problem solving  
 promiscuous  
 reciprocal altruism  
 sensitive period  
 social learning  
 spatial learning  
 taxis