**AP BIOLOGY (WHEATLEY)**

**RESPIRATION AND ANIMAL HOMEOSTASIS UNIT GUIDE 2015**

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| **MONDAY** | **TUESDAY** | **WEDNESDAY** | **THURSDAY** | **FRIDAY** |
| **1/11**  **TEST CORRECTIONS** | **1/12**  \*Cellular respiration  POGIL – **Due at the end**  **of the period** | **1/13**  \*Cell respiration notes | **1/14**  \*Cell respiration notes | **1/15**  **HALF DAY** |
| **1/18**  **NO SCHOOL** | **1/19 (2nd semester)**  \*Cellular respiration lab | **1/20**  \*Immune system | **1/21** | **1/22** |
| **1/25** | **1/26**  \*Pathway with friends  \*Cell communication | **1/27**  \*Cell communication  **POGIL – DUE 1/28** | **1/28**  \*Endocrine system  webquest | **1/29**  \*Endocrine system  webquest – **Due at the**  **end of the period.** |
| **2/1**  \*Nervous system | **2/2** | **2/3** | **2/4**  **REVIEW FOR TEST** | **2/5**  **RESPIRATION AND ANIMAL HOMEOSTASIS TEST** |

Supplemental Resources:

1. Bozeman Science Videos
   1. Endocrine System
   2. Nervous System
   3. Positive and Negative Feedback Loops
   4. Immune System
   5. Bioenergetics
   6. Cellular Respiration
   7. Life Requires Energy
2. Crash Course Videos
   1. ATP and Respiration
   2. Your Immune System: Natural Born Killer
   3. Great Glands: Your Endocrine System
   4. The Nervous System

Reading: Read Chapters 6, 24, 26, and 28 and answer the prompts below.

A. Cellular Respiration: Aerobic Harvesting of Energy

6.2 Explain how breathing and cellular respiration are related.

6.3 Provide the overall chemical equation for cellular respiration. Compare the   
efficiency of this process in cells to the efficiency of a gasoline automobile   
engine.

6.4 Explain how the human body uses its daily supply of ATP.

6.5 Explain how the energy in a glucose molecule is released during cellular   
respiration.

6.5 Explain how redox reactions are used in cellular respiration.

B. Stages of Cellular Respiration

6.6 List the cellular regions where glycolysis, the citric acid cycle, and oxidative phosphorylation occur. Note whether substrate-level phosphorylation or chemiosmosis occur at each of these sites.

6.7–6.12 Compare the reactants, products, and energy yield of the three stages of cellular respiration.

C. Fermentation: Anaerobic Harvesting of Energy

6.13 Compare the reactants, products, and energy yield of alcohol and lactic acid fermentation. Distinguish between strict anaerobes and facultative anaerobes.

D. Connections Between Metabolic Pathways

6.15 Explain how carbohydrates, fats, and proteins are used as fuel for cellular   
respiration. Explain why a gram of fat yields more ATP than a gram of starch or protein.

6.16 Explain how nutrients are used in biosynthesis.

E. Innate Immunity

24.2 Describe the steps of the inflammatory response and explain how they help to prevent the spread of disease.

**F. Adaptive Immunity**

24.4 Describe the specific nature of adaptive immune system responses. Define the terms antigen, antibody, passive immunity, and active immunity.

24.5 Describe the development and functions of B lymphocytes and T lymphocytes. Define and distinguish between the humoral immune response and the cell-mediated immune response.

24.6 Describe the nature of antigens. Explain how an antigen and an antibody   
interact.

24.7 Describe the process of clonal selection and compare a primary immune   
response to a secondary immune response.

24.9 Describe four effector mechanisms of the humoral immune system. Explain how antibodies work with innate defenses to form a complete defense system.

24.11 Describe the specific functions of helper T cells and how they interact with   
other cells.

24.12 Explain how cytotoxic T cells destroy infected body cells.

24.13 Explain how HIV infects cells, multiplies, and causes disease.

24.14 Explain why it has been difficult to develop a successful treatment for AIDS.

24.15 Explain how the immune system identifies the body’s own molecules and how this system complicates organ transplantations.

G. Disorders of the Immune System

24.16 Describe how the malfunction or failure of the immune system can cause   
disease.

24.17 Explain why allergies occur and what causes anaphylactic shock.

H. The Nature of Chemical Regulation

26.1 Compare the mechanisms and functions of the endocrine and nervous systems, noting areas of overlap.

26.1 Distinguish between hormones, local regulators, pheromones, and   
neurotransmitters.

26.2 Distinguish between the two major classes of vertebrate hormones and compare the two general mechanisms by which hormones trigger changes in target cells.

I. Hormones and Homeostasis

26.5 Describe the functions of the thyroid gland. Describe the symptoms of hypothyroidism, hyperthyroidism, and goiter.

26.6 Explain how the thyroid and parathyroid glands maintain calcium homeostasis.

26.7 Explain how insulin and glucagon manage blood glucose levels.

26.8 Compare the causes and symptoms of type 1 diabetes, type 2 diabetes, and   
hypoglycemia.

26.9 Compare the functions of the hormones released by the adrenal medulla and the adrenal cortex. Describe the benefits and risks of using glucocorticoid drugs.

26.10 Describe the three major categories of sex hormones and their functions.

26.11 Describe the diverse functions of prolactin in vertebrate groups.

**J. Nervous System Structure and Function**

28.1 Describe the structural and functional subdivisions of the nervous system.   
Describe the three parts of a reflex, distinguishing the three types of neurons that may be involved in the reaction.

28.2 Describe the structures and functions of neurons and myelin sheaths.

K. Nerve Signals and Their Transmission

28.3 Define a resting potential and explain how it is created.

28.4 Explain how an action potential is produced and the resting membrane potential restored.

28.5 Explain (a) how an action potential propagates itself along a neuron, (b) why action potentials move in only one direction, and (c) how action potentials relay different intensities of information.

28.6 Compare the structures, functions, and locations of electrical and chemical   
synapses.

28.7 Compare excitatory and inhibitory neurotransmitters. Explain how the number and location of bound neurotransmitters influence a receiving cell.

28.8 Describe the types and functions of neurotransmitters known in humans.

28.9 Explain how drugs can alter chemical synapses.