
eCurriculum System eMAP

Licensed to: TRUMBULL PUBLIC SCHOOLS

COURSE: Honors Biology CODE:

UNIT: Unit 9: Animal and Human Biology MAP LEVEL:

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TIME FRAME: 3 weeks

PERFORMANCE STANDARDS

27.3 SCIENCE - LIFE SCIENCE (V,VI,VII)

27.3.6.7.16 Students will describe the structures of the human digestive, respiratory, and circulatory systems, and explain how they function to bring oxygen and nutrients to the cells and expel waste materials.

27.3.6.7.17 Students will explain how the human muscular/skeletal system supports the body and allows movement.

27.3.6.10.32 Students will describe how bacterial and viral infectious diseases are transmitted and explain the role of sanitation, vaccination and antibiotic medications in the prevention and treatment of infectious diseases.

27.3.6.10.29 Students will describe the flow of matter and energy in the processes of photosynthesis and cell respiration.

ESS/FOCUS QUESTIONS

Essential Questions:

How do heterotrophs obtain energy from their environment?

How do heterotrophs depend on autotrophs for their energy and matter?

How do animals grow, develop and respond to their environment?

Which organ systems are the most important in maintaining body homeostasis?

How do body systems interact in the human organism?

Focus Questions:

What is the overall balanced equation for cell respiration?

What is the difference between aerobic and anaerobic respiration?

What are the two types of fermentation?

What are the stages and locations of cell respiration?

What are the anatomical and physiological differences between the human female and male reproductive systems?

What are the structures and functions of the cardiovascular system?

How do the immune and the integumentary systems defend the body?

How does the digestive system enable animals to obtain energy from macromolecules and chemically and mechanically convert them to micromolecules?

How do the respiratory, urinary, integumentary and digestive systems relate to waste removal from the human body?

How do the nervous and endocrine systems regulate body functions?

How do the musculo-skeletal systems permit movement of and within the body?

CONTENT

1. In the process of aerobic cell respiration, organic molecules are oxidized to produce carbon dioxide, water and useable cellular energy.

2. Anaerobic cell respiration (fermentation) results in a reduced amount of useable cellular energy.
3. The two types of anaerobic cell respiration are lactic acid (mammalian muscle) fermentation and alcoholic (bacteria & yeast) fermentation.
4. The stages of cellular respiration include glycolysis (cytoplasm), Krebs /citric acid cycle (mitochondrial matrix) and the Electron Transport System (mitochondrial membrane).
5. The male reproductive structures are designed for the production and delivery of sperm. The female reproductive structures are designed for the production of ova and for the development of the fertilized ovum.
6. Reproductive hormones are responsible for the development of gametes and secondary sexual characteristics.
7. The cardiovascular system is responsible for the transport of materials to cells and removal of cellular wastes.
8. The structures of the cardiovascular system includes cells and tissues of the blood, vessels and the heart.
9. The immune system includes specific defenses (cellular and chemical) and non-specific defenses (inflammation, cells, fever, skin).
10. Body defenses include discussions regarding antibodies, passive and active immunity, allergies and autoimmune disorders.
11. The digestive system accesses nutrients and energy through the processes of ingestion, digestion, absorption, and elimination.
12. The respiratory system functions in gas exchange removing carbon dioxide from, and absorbing molecular oxygen into, the circulating blood.
13. The urinary system filters impurities, wastes and toxins from the blood and

produces urine.

14. The nervous and endocrine systems regulate body functions to maintain homeostasis.
15. The musculo-skeletal system functions in structural support of the body, movement of and within the body, blood cell production and mineral storage.

SKILLS

Students should be able to:

1. Distinguish between anaerobic and aerobic respiration.
2. Distinguish between lactic acid fermentation and alcoholic fermentation.
3. Describe how energy transfer occurs via redox reactions during cell respiration.
4. Explain the stages of cell respiration and identify the products of each stage.
5. Identify the location of the stages of cell respiration.
6. Label diagrams of the human male and female reproductive systems.
7. Discuss the functions of the reproductive organs.
8. Trace the events that occur from the time of fertilization through development of the embryo/fetus.
9. Trace the flow of blood through both the pulmonary and systemic circuits of circulation.
10. Identify cardiac and vascular structures.
11. Explain the stages of the cardiac cycle and their relationship to blood pressure.
12. Identify the components and functions of blood.
13. Outline the mechanisms by which the immune system defends the body

against infection.

14. Differentiate between passive and active immunity.
15. Briefly discuss the causes of allergies and autoimmune diseases.
16. Trace the path of food through the digestive system.
17. Distinguish between a digestive organ and an accessory gland and explain the function(s) of each.
18. Describe the processes and locations of filtration, reabsorption and secretion in nephrons of the kidney.
19. Identify the divisions of the nervous system.
20. Identify the structures of the brain and spinal cord and their functions.
21. Identify the difference between neurons and neuroglial cells.
22. Distinguish between sensory, association and motor neurons.
23. Label the parts of a neuron.
24. Discuss how a nerve impulse is generated, conducted and transmitted by a neuron.
25. Explain endocrine regulation of the body via positive and negative feedback mechanisms.
26. Label the major bones of the axial and appendicular human skeleton.
27. Identify and illustrate the different types of joints.
28. Distinguish between a tendon and a ligament and their relationship to common injuries.
29. Describe the parts of a bone and their functions.
30. Distinguish between cardiac, smooth/visceral and skeletal muscle.
31. Explain the sliding filament theory regarding muscle contraction.
32. Explain why most skeletal muscles occur in antagonistic pairs.

ASSURED EXPERIENCES

Blood pressure and pulse rate lab

Microscopic analysis of blood

Blood typing lab

BSCS kidney and homeostasis lab

ASSESSMENTS

Blood pressure & pulse rate data sheets

Blood typing data sheets

Kidney and homeostasis activity sheet

Unit/chapter quizzes and tests

OPTIONAL ACTIVITIES

Vital capacity lab

RESOURCES

BSCS Blue Text

Biology Lab Manuals

Outside Readings/Journals/Articles

ADDITIONAL NOTES