

## Anatomy and Physiology Objectives

\* Indicates Power Standard

### Goal 11: Inquiry (Integrated into the whole year)

*Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.*

#### STANDARD A

Know and apply the concepts, principles and processes of scientific inquiry.

- \_\_\_\_\_ Formulate hypotheses referencing prior research and knowledge.
- \_\_\_\_\_ Design procedures to test the selected hypotheses.
- \_\_\_\_\_ Conduct systematic controlled experiments to test the selected hypotheses.
- \_\_\_\_\_ Apply statistical methods to make predictions and to test the accuracy of results.
- \_\_\_\_\_ Report, display and defend the results of investigations.
- \_\_\_\_\_ \*Conduct experiments; collect, organize and analyze data to form conclusions.
- \_\_\_\_\_ \*Graph and interpret the results of scientific investigations

### Goal 12: Content

*Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.*

#### STANDARD A

Know and apply concepts that explain how living things function, adapt and change.

#### STANDARD B

Know and apply concepts that describe how living things interact with each other and with their environment.

**Life Science** (Power Standards to be integrated into each unit)

- \_\_\_\_\_ \*Analyze the relationship between form and function within each body system.
- \_\_\_\_\_ \*Explain the chemical processes and recognize patterns that are part of the physiology of each body system (e.g. firing of neurons, ion channels, muscle contractions)
- \_\_\_\_\_ \*Recognize the importance of how each system helps to maintain homeostasis.
- \_\_\_\_\_ \*Describe the structure and function of each body system from microscopic to macroscopic (molecular, cell organelles, cells, tissue, organs, organ systems).
- \_\_\_\_\_ \*Describe the metabolic processes, including the chemical reactions involved, and how they are controlled in the organism.
- \_\_\_\_\_ \*Compare and contrast types of tissues, both structurally and functionally.

#### Quarter 1

##### Unit I Levels of Organization

- \_\_\_\_\_ Identify anatomical terms.
- \_\_\_\_\_ Describe the chemical constituents of cells, including the enzyme substrate complex.
- \_\_\_\_\_ Compare and contrast movement through cell membranes.
- \_\_\_\_\_ Describe metabolic processes and how they are controlled.
- \_\_\_\_\_ Analyze metabolic reactions and the energy production in each.

##### Unit II Tissues and Integuments

- \_\_\_\_\_ Identify examples of types of tissues.
- \_\_\_\_\_ Compare and contrast the four common tissues, both structurally and functionally.
- \_\_\_\_\_ Recognize and name skin structures from a diagram or model.
- \_\_\_\_\_ Describe the major functions of the skin.
- \_\_\_\_\_ Discuss mechanisms and dysfunctions of all reproduction and tissue repair.
- \_\_\_\_\_ Identify and explain each of the body membranes.
- \_\_\_\_\_ Recognize the structure and function of tissues.

#### Quarter 3

##### Unit III Support and Movement

- \_\_\_\_\_ Explain the functions of the skeletal system.
- \_\_\_\_\_ Identify the major anatomical areas of a long bone.
- \_\_\_\_\_ Describe the process of bone formation.
- \_\_\_\_\_ Identify the bones of the axial and appendicular skeleton from a model or diagram.
- \_\_\_\_\_ Compare and contrast the major joints of the body and their movements.
- \_\_\_\_\_ Describe the similarities and differences in the three types of muscle tissue.
- \_\_\_\_\_ Analyze a model of the events of a muscle cell contraction.
- \_\_\_\_\_ Explain how muscles are named using anatomical terminology

## Unit IV Integration, Coordination and Control

- \_\_\_\_\_ Identify the general functions of the nervous system.
- \_\_\_\_\_ Label a diagram of a neuron.
- \_\_\_\_\_ Describe and model the events of nerve impulse transmission.
- \_\_\_\_\_ Define central nervous system and peripheral nervous system and list the parts of each.
- \_\_\_\_\_ Discuss the function of the sense organs
- \_\_\_\_\_ Locate the major endocrine glands from a diagram.
- \_\_\_\_\_ Explain how hormones bring about their effects in the body.
- \_\_\_\_\_ Explain how homeostasis is regulated by the endocrine glands and give examples.

## Unit V Transport

- \_\_\_\_\_ Locate the parts of the cardiovascular system on a diagram or model.
- \_\_\_\_\_ Trace the path of blood through the systemic and pulmonary circulation.
- \_\_\_\_\_ Compare and contrast the structure and function of the heart, arteries, veins and capillaries.
- \_\_\_\_\_ Identify factors that affect the health of the heart.
- \_\_\_\_\_ Describe common disorders of the circulatory system.
- \_\_\_\_\_ Analyze an experiment that demonstrates the effect of vessel diameter on flow rate and pressure.
- \_\_\_\_\_ Describe the structure and function of blood and its components.
- \_\_\_\_\_ Identify blood disorders and their symptoms.
- \_\_\_\_\_ Explain the blood clotting mechanism.
- \_\_\_\_\_ Identify the A, B and O blood groupings and their compatibility.
- \_\_\_\_\_ Describe the two major structures of the lymphatic system and explain their functions.
- \_\_\_\_\_ Distinguish between specific and nonspecific defense systems, giving examples of each.

## Quarter 3

### Unit VI Maintenance

- \_\_\_\_\_ Identify all the organs of the digestive system and explain their functions.
- \_\_\_\_\_ Trace the pathway of food from the entrance into the body to absorption into the blood.
- \_\_\_\_\_ Compare and contrast digestion and assimilation of proteins, carbohydrates and fats.
- \_\_\_\_\_ Identify the nutritional functions of carbohydrates, lipids, proteins, water, vitamins and minerals.
- \_\_\_\_\_ Describe diseases of the digestive system.
- \_\_\_\_\_ Identify the components of the urinary system and describe their functions.
- \_\_\_\_\_ Explain how a nephron produces urine.
- \_\_\_\_\_ Identify the organs of the respiratory system and explain their functions.
- \_\_\_\_\_ Describe the transport of gases and their exchange in the lungs and tissues.
- \_\_\_\_\_ Name and define each of the respiratory air volumes and capacities.
- \_\_\_\_\_ Identify common respiratory diseases and disorders (including the effects of smoking).

### Unit VII Human Life Cycle (Reproduction)

- \_\_\_\_\_ Identify the organs of the reproductive systems and explain their functions.
- \_\_\_\_\_ Explain how the endocrine and exocrine products of the reproductive glands control reproduction.
- \_\_\_\_\_ Describe the nature of genetic inheritance and the importance of genetic screening.

## Goal 13: Connections (Integrated into the whole year)

*Understand the relationships among science, technology and society in historical and contemporary contexts.*

### STANDARD A

**Know and apply the accepted practices of science.**

- \_\_\_\_\_ Demonstrate safe lab procedures.
- \_\_\_\_\_ Explain criteria that scientists use to evaluate the validity of scientific claims and theories.
- \_\_\_\_\_ Identify ways that scientists collect data on the human body.
- \_\_\_\_\_ **\*Demonstrate safe and ethical lab procedures in the laboratory.**

### STANDARD B

**Know and apply concepts that describe the interaction between science, technology and society.**

- \_\_\_\_\_ **\*Analyze and describe the processes and effects of scientific and technological breakthroughs in medical/health research.**
- \_\_\_\_\_ **\*Analyze the benefits and effects of health care issues (e.g., fetal tissue for Parkinson's disease, BGH for increased milk production, cardiovascular analysis).**
- \_\_\_\_\_ **\*Identify careers requiring a background in anatomy and physiology.**