



Lawton Public Schools

Science Curriculum Alignment Guide for Anatomy and Physiology

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Course/Level Anatomy/ Physiology	Graduate Goal – 14 Understands the nature of scientific knowledge.	Time Range 1 st Quarter 2 - 3 days
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National Standard: Know ways in which science distinguishes itself from other ways of knowing and from other bodies of knowledge.

PASS XIII A: The complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing and eliminating the matter and energy used to sustain an organism.

CRT/ITBS: ACT / SAT

Local Objective 1: Define anatomy and physiology.

Level of Specificity: Understand the content of each subject and compare and contrast the two.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Understand the content of each subject and compare and contrast the two.
- Lab Exercise 1: Scientific Method and Measurements

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology Chapter 1

McGraw-Hill, Laboratory Manual for Hole's Essentials of Human Anatomy and Physiology Exercise 1

McGraw –Hill , Biology: The Dynamic of Life

Assessment Sample Format

The branch of biological science that deals with the external and internal structure of the body parts and their physical relationships is called _____?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Knows the general structure and function of cells in organisms.	Time Range 1 st Quarter 1 – 3 days
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National Standard: Understand the chemical reactions involved in cell functions.

PASS XI B: Organisms have behavioral responses to internal changes and to external stimuli.

CRT/ITBS: ACT / SAT

Local Objective 2: Understand homeostasis.

Level of Specificity: Define homeostasis and explain its importance to humans.

Prerequisites:

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- The example of the home thermostat works well because most students have experienced hearing their fans go on when the temperature goes above or below the set temperature. Our brains act as a thermostat to help us maintain body temperature.
- Ask students to list ways our body responds to equalize our internal temperature.
- Identify negative and positive feedback as it applies to homeostasis

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology Chapter 1

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

The tendency for physiological systems to stabilize internal conditions is called_____?



Course/Level Anatomy/ Physiology	Graduate Goal – 4 Know about the unity and diversity that characterizes life.	Time Range 1 st Quarter 1 – 2 days
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National Standard: Unity among organisms of different species becomes apparent from an analysis of internal structures.

PASS XI A: Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures.

CRT/ITBS: ACT / SAT

Local Objective 3: Describe the major body cavities.

Level of Specificity: Tell the locations of and the purpose for each of the major body cavities.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate *	Safety	Inquiry
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Suggested Teaching Strategies

- Lab Exercise 2 “Body Organization and Terminology”

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 1

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercise 2

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

The cranial and the spinal cavity would be found in the _____ body cavity.



Course/Level Anatomy/ Physiology	Graduate Goal – 4 Know about the unity and diversity that characterizes life.	Time Range 1 st Quarter 1 – 2 days
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National Standard: Unity among organisms of different species becomes apparent from an analysis of internal structures.

PASS XI A: Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures.

CRT/ITBS: ACT / SAT

Local Objective 4: Understand the commonly used divisions of the body.

Level of Specificity: Describe relative position, body sections, and body regions.

Prerequisites: None

Blooms	K	C	A *	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate *	Safety	Inquiry
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Suggested Teaching Strategies

- Lab Exercise 2 “Body Organization and Terminology”

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 1

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercise 2

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Which plane passes through the long axis of the body, dividing it into anterior and posterior sections?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 4 days
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National Standard: Understand the chemical reactions involved in cell functions.

PASS Chemistry IX A: Atoms interact with one another by transferring or sharing outer electrons that are farthest from the nucleus. These outer electrons govern the chemical properties of the element.

CRT/ITBS: ACT / SAT

Local Objective 5: Describe an atom and how atomic structure affects interactions among atoms and molecules.
Level of Specificity: Explain how molecular and structural formulas symbolize the composition of compounds. Describe chemical reactions, pH, organic and inorganic compounds.

Prerequisites: Know the parts of an atom.

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify *	Experiment *	Interpret	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- Use a periodic table and show students that group numbers indicate the number of valence electrons.
- Groups I – III will tend to lose electrons. Groups V – VI will tend to gain electrons to gain ions.
- Have students draw models of atoms and ionic and covalent compounds.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 2

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

The chemical behavior of an atom is determined by the number and arrangement of _____.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 4 days
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National Standard: Understand cell differentiation.

PASS X A: A sorting and recombination of genes in reproduction results in a great variety of possible gene combinations from the offspring of any two people.

CRT/ITBS: ACT / SAT

Local Objective 6: Describe the cell life cycle and how cells divide.
Level of Specificity: Describe, in detail, each phase of mitosis and meiosis.

Prerequisites: Know and understand the genetic contents of a cell.

Blooms	K	C	A	A *	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret *	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- Use diagrams that allow students to visualize the different stages of the cell cycle.
- Use microscopic slides that allow students to identify the different stages of the cell cycle
- Laboratory Exercise 7 – Cell Cycle

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 3 pp. 66 – 71

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercise 7

McGraw –Hill , Biology: The Dynamic of Life

Assessment Sample Format

During which phase of cell division do the chromatids separate into daughter chromosome, which move to opposite ends of the cell?



Course/Level Anatomy/ Physiology	Graduate Goal Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 4 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules.

CRT/ITBS: ACT / SAT

Local Objective7: Name and describe the structure and function of the cell.

Level of Specificity: Discuss the concepts of cell theory. Describe the structure, purpose, and function of all of the organelles of the cell.

Prerequisites: None

Blooms	K	C	A	A *	S	E
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Process Skills	Observe *	Classify *	Experiment *	Interpret *	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Have students make a cell from disposal items then they can identify the organelles and their functions.
- Show video that illustrates and describes the structure and function of cellular organelles.
- Laboratory Exercise 5 – Cell Structure and Function

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 3 pp. 50 – 58

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercise 5

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

Synthesis of lipids takes place at which organelle?



Course/Level Anatomy/ Physiology	Graduate Goal 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 3 days
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National Standard: Understand the chemical reactions involved in cell functions.

PASS XIII B: As matter and energy flow through different levels of organization of living systems, chemical elements are recombined in different ways by different structures.

CRT/ITBS: ACT / SAT

Local Objective 8: Explain how cells obtain energy to power their operations.

Level of Specificity: Understand organic molecules, carbohydrates, proteins, and lipids. Know the meaning of anabolism and catabolism.

Prerequisites: Understand the basic processes of cell respiration.

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify *	Experiment	Interpret *	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- Show the students pictures of the structures of the various organic molecules. Proteins have an Amino Group C—NH₂, carbohydrates have C,H,O with ratio 1:2:1, lipids are composed of glycerol and 3 chains of fatty acids.
- Students should be able to recognize each by the small segments characteristic of each type.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 4

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Most of the ATP required to power cellular operations is produced in what organelle?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 3 – 5 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules.

CRT/ITBS: ACT / SAT

Local Objective 9: Understand the mechanisms of cellular transport.
Level of Specificity: Describe the processes of cellular transport such as diffusion, osmosis, exocytosis, endocytosis, and phagocytosis.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify *	Experiment	Interpret *	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- Provide laboratory activity that allows students to investigate a type of passive transport, such as osmosis.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 3 pp. 59 – 65

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

The packaging of extra cellular material in a vesicle at the cell surface for importation into the cell is called ____?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 3 days
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National Standard: Understand the chemical reactions involved in cell functions.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules.

CRT/ITBS: ACT/SAT

Local Objective 10: Explain how metabolic pathways are regulated.

Level of Specificity: Understand ATP formation, anerobic and aerobic respiration, glycolysis, citric acid cycle, carbohydrate metabolism, electron transport system, control of glucose metabolism, lipid metabolism, protein metabolism, basal metabolic rates, energy balance and body weight.

Prerequisites: None

Blooms	K	C	A	A *	S	E
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Process Skills	Observe *	Classify *	Experiment *	Interpret *	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- A good way to introduce metabolism is to connect it to “use of foods”. The use the body makes of foods after they have been digested, absorbed, and circulated to the cells.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology,

McGraw–Hill , Biology: The Dynamic of Life

Assessment Sample Format

The most important metabolic fuel molecule in the body is_____?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 3 days
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National Standard: Understand the chemical reactions involved in cell functions.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules.

CRT/ITBS: ACT / SAT

Local Objective 11: Describe the role of enzymes in cellular metabolism.
Level of Specificity: Know the roles of enzymes in catabolism and anabolism, chemical structures of enzymes, classification and naming of enzymes, and enzymes as catalysts.

Prerequisites: None.

Blooms	K	C	A *	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- The lock & key models help students to understand that enzymes are specific to their substrates.
- Might use lactase tablets to show how an enzyme can catabolize a substrate.

Aligned Instructional Resources

Hole. McGraw-Hill, Essentials of Human Anatomy and Physiology Chapter 4 pp. 77 -78

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

Most of the chemical reactions involved in cellular metabolism are regulated by _____.



Course/Level Anatomy/ Physiology	Graduate Goal – 5 Understand the genetic basis for the transfer of biological characteristics from one generation to the next.	Time Range 1 st Quarter 2 – 5 days
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National Standard: Know the chemical and structural properties of DNA and its role in specifying the characteristics of an organism.

PASS IX B: Cells function according to the information contained in their DNA.

CRT/ITBS: ACT / SAT

Local Objective 12: Explain how genes control cell function.

Level of Specificity: Understand DNA replication, RNA transcription, protein synthesis, the functions of the various RNAs in the formation of a protein, and the mechanisms of disease.

Prerequisites: None

Blooms	K	C	A *	A	S	E	
Process Skills	Observe	Classify *	Experiment	Interpret *	Communicate	Safety	Inquiry *

Suggested Teaching Strategies

- Students can build a DNA molecule with a hypothetical base sequence which can be color coded. It can then replicate and transcribe an m-RNA with complimentary base pairs. This one in turn will code a transfer RNA that would organize the specific amino acid sequence. Pipe cleaners and construction paper can be used for the model.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 4 pp.80 - 88

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

The DNA of the nucleus directly controls the cell by controlling the synthesis of ____ .



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 2 – 3 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 13: Know the primary tissue types.
Level of Specificity: Describe the form and function of each of the primary types of tissue in the human body and give examples of each.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Look at prepared slides of tissue through a microscope.
- Have the students draw the structures seen, taking note of the structural parts that distinguish one type of tissue from another.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 5

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

Tissue that is specialized for the conduction of electrical impulses is called _____ ?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 1 st Quarter 5 – 10 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 14: Name and describe the structures of the integumentary system and the functions and processes associated with each.

Level of Specificity: Name and describe the structures and functions of each layer of the skin and the skin accessory structures. Describe the events that are a part of the healing process.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Make a fingerprint of each student. Mix them, mount them on a poster and then have the students find their own print.
- From a diagram have students identify integumentary system components.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 6.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

The layer of skin that contains the blood vessels and nerves that supply the surface of the skin is the _____ layer.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 2 nd Quarter 8 – 15 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 15: Name the structures and describe the functions of the skeletal system.
Level of Specificity: Identify by name the bones of the skeleton. Describe the general structure and function of bone. Describe how bones develop and grow. Distinguish between axial and appendicular skeletons. List and describe the types of joints.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Have students use a skeleton to aid their identification of each of its bones.
- Using x-rays have students identify the bones visible in the x-ray.
- Forensic lab allowing students to identify the sex, race, and height of a classroom skeleton.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 7.

McGraw–Hill , Biology: The Dynamic of Life

Video: Eyewitness Skeleton

Assessment Sample Format

Identify the two main divisions of the human skeleton, and list the total number of bones found in each division.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 & 8 Know the general structure and function of cells in organisms. Understand the cycling of matter and flow of energy in the living environment	Time Range 2 nd Quarter 10 – 15 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 16: Name the structures and describe the functions and processes involved with the muscular system.
Level of Specificity: Describe the mechanism of muscle contraction at the cellular level. Name the major muscle groups of the body.

Prerequisites: Have a general knowledge of the make up of muscle tissue.

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Students can use mnemonic **LAD SNOR** to recall the seven criteria commonly use to name muscles. Students might look for five to seven muscles that belong under each criteria category.
- Students should be able to identify the origin, insertion, and action of major muscles from each body region.
- Using a comparative mammal perform a dissection allowing students to identify major muscles.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 8.

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

The smallest contractile unit of a muscle is a:

- (a) Fiber
- (b) Myofibril
- (c) Sarcomere
- (d) myofilament



Course/Level Anatomy/ Physiology	Graduate Goal 6 & 8 Know the general structure and function of cells in organisms. Understand the cycling of matter and flow of energy in the living environment	Time Range 3 rd Quarter 10 – 18 days
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National Standard: Understand the structure and function of the nervous system in multicellular organisms.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 17: Name the structures and describe the functions and processes associated with the nervous system.

Level of Specificity: Describe the structure of a neuron. Describe the major parts and functions of each division of the nervous system. Describe the conduction of a nerve impulse. Describe a reflex arc. Name the major parts and functions of the brain. Discuss general senses and their receptors. Discuss the special senses

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe	Classify	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Have students do research on a neurological disease or disorder. Have them report on cause, symptoms, treatments, and possible cure or up to date medical advances in its treatment.
- Dissection of a sheep or beef eye.
- From a diagram identify the major eye structures.
- Might set up lab using different activities involved with vision such as Stoop test, colorblindness charts, Snellen Chart for visual acuity, and astigmatism wheel.
- Using a comparable mammal perform a dissection allowing students to identify nervous organs.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 9 - 10

McGraw-Hill, Biology: The Dynamic of Life

Video: Eyewitness Sight

Assessment Sample Format

Outline the neural pathway involved in the patellar (knee-jerk) reflex.



Course/Level Anatomy/ Physiology	Graduate Goal – 8 Understand the cycling of matter and flow of energy in the living environment.	Time Range 3 rd Quarter 5 – 10 days
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National Standard: Know that because all matter tends toward more disorganized states, living systems require a continuous input of energy to maintain their chemical and physical organization.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules.

CRT/ITBS: ACT / SAT

Local Objective 18: Name the structures and describe the functions and processes associated with the endocrine system.
 Level of Specificity: Discuss how positive and negative feedback mechanisms regulate hormonal secretions. Name the parts of the endocrine system.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Using a diagram identify the major endocrine glands and their locations.
- Compare the effects of hypersecretion and hyposecretion of major hormones.
- Have students compare the homeostatic balance as noticed with two antagonistic hormones such as insulin and glucagon.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 11.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Differentiate between gigantism and dwarfism. Specify which hormone is involved, where it is produced, and the impact that these disorders have on people's lives.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 3 rd Quarter 2 5 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX A: Cells are the fundamental units of life, comprised of a variety of structures that perform functions, such as transport, information, and synthesis of molecules

CRT/ITBS: ACT / SAT

Local Objective 19: Discuss the characteristics of blood and understand its major function.

Level of Specificity: Distinguish between the types of blood cells and list the function of each. Describe blood typing and how to avoid adverse reactions.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- View prepared blood smear slides through light microscopes.
- Do blood typing activities in which the correct father is chosen for several babies.
- Provide paper exercise that describes the genetics of blood types.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 12.

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

Name the two major types of blood cells and list the functions of each.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 3 rd Quarter 8 – 15 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 20: Name the structures and describe the functions and processes of the cardiovascular system.
 Level of Specificity: Give the locations and give the functions of the major parts of the heart. Compare the structures and functions of the major types of blood vessel. Compare the pulmonary and the systemic circuits of the cardiovascular system.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Have students trace a drop of blood from the right atrium back to the right atrium, listing chambers, valves, vessels and lungs.
- Obtain a cow heart and have the students observe the different chambers, valves, and vessels.
- Using paper cups, straws, and pipe cleaners make a heart model
- Using a comparable mammal perform a dissection allowing students to identify circulatory organs.
- Laboratory exercise 39 – Pulse Rate and Blood Pressure

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 13.

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercises 39

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Which type of blood vessels contain valves and why is this necessary?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 8 – 14 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS XI: Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures.

CRT/ITBS: ACT / SAT

Local Objective 21: Name the structures and describe the functions and processes associated with the lymphatic system.
Level of Specificity: Distinguish between specific and nonspecific immunity. List the major parts of the lymphatic system.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Discuss how HIV destroys helper T-cells. Describe the effects HIV has on the entire immune system.
- Might have student perform a skit as they act out the functions of immune system cells.
- Laboratory exercise – Disease transmission

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 14.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

What are the signs of inflammation and why is it of benefit?



Course/Level Anatomy/ Physiology	Graduate Goal - 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 10 – 15 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS XIII A: The complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing and eliminating the matter and energy used to sustain an organism.

CRT/ITBS: ACT / SAT

Local Objective 22: Name the structures and describe the functions and processes associated with the digestive system.
 Level of Specificity: Describe the regulation of digestive secretions. Name and locate the parts of the digestive system. Describe the process of digestion.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Have the students trace the path of a meal which includes carbohydrates, proteins, and fat through the digestive tract from mouth to anus. Include the role the accessory organs play on each type of organic molecule.
- From a diagram identify the structures of the digestive system.
- Using a comparable mammal perform a dissection allowing students to identify digestive organs.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 15.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

What is bile and where is it produced? What is its digestive function? Where is it stored and concentrated?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th quarter 7 – 12 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS XI A: Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures.

CRT/ITBS: ACT / SAT

Local Objective 23: Name the structures and describe the functions and processes associated with the respiratory system.
Level of Specificity: Describe the mechanism of inspiration and expiration. Explain how air and blood allow for gas exchange and how the gases are transported.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Trace the route of air from the external nares to an alveolus.
- From a diagram identify the structures of the respiratory system.
- Using a comparative mammal perform a dissection allowing students to identify respiratory organs.
- Laboratory activity: Calculate lung capacities

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 16.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Explain why less oxygen would enter the blood at a high altitude than would enter the blood at sea level.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 7 – 10 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS XI A: Different species might look dissimilar, but the unity among organisms becomes apparent from an analysis of internal structures.

CRT/ITBS: ACT / SAT

Local Objective 24: Name the structures and describe the functions and processes associated with the urinary system.
 Level of Specificity: Describe the location and the internal structure of the kidneys. Describe the nephron and explain the function of its parts. Describe the processes involved with urine formation.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- List several kidney functions that help maintain body homeostasis.
- Study anatomy of kidney, ureters, bladder, and urethra.
- Using a comparable mammal perform a dissection allowing students to identify urinary tract organs.
- From a diagram identify the structures of the urinary tract

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 17 – 18.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Which of the following is/are classified as an accessory organ of the urinary system?

(a) Ureters
 (b) urinary bladder
 (c) urethra
 (d) all of the above



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 10 – 15 days
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National Standard: Know the structures of different types of cell parts and the functions they perform.

PASS XII D: Living organisms have the capacity to produce populations of infinite size, but environments and resources limit population size.

CRT/ITBS: ACT / SAT

Local Objective 25: Name the structures and describe the functions and processes associated with the male and female reproductive system.
 Level of Specificity: Describe the processes of spermatogenesis and oogenesis. Describe hormonal control of the reproductive system. Describe the symptoms and transmission of sexually transmitted diseases. Discuss methods of contraception.

Prerequisites: None

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Describe the structure and function of the testes and the ovaries.
- Laboratory Exercise 48 – Male Reproductive System
- Laboratory Exercise 49 – Female Reproductive System
- Using a comparable mammal perform a dissection allowing students to identify reproductive organs.
- Simulate the ovulatory cycle with a graphing exercise

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 19.

McGraw-Hill, Laboratory Manual for Hole’s Essentials of Human Anatomy and Physiology Exercises 48 and 49

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

Explain the function of the scrotum.
 What are the main functions of the uterus?



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 1 – 2 days
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National Standard: Understand cell differentiation.

PASS XII D: Living organisms have the capacity to produce populations of infinite size, but environments and resources limit population size.

CRT/ITBS: ACT / SAT

Local Objective 26: Describe the process of fertilization.
Level of Specificity: Define fertilization and zygote. Know fertilization occurs. Identify artificial methods that might lead to fertilization.

Prerequisites: Know the anatomy of the reproductive organs.

Blooms	K	C *	A	A	S	E
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Process Skills	Observe *	Classify *	Experiment	Interpret	Communicate	Safety	Inquiry
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Suggested Teaching Strategies

- Trace the pathway of a sperm from the male testes to the uterine tube of a female.
- Trace the zygote from uterine tube to the implantation into the uterus.

Aligned Instructional Resources

McGraw-Hill, Hole’s Essentials of Human Anatomy and Physiology, Chapter 19.

McGraw-Hill , Biology: The Dynamic of Life

Assessment Sample Format

Explain why millions of sperm must be released for fertilization to occur even though only one sperm normally fertilizes an ovum.



Course/Level Anatomy/ Physiology	Graduate Goal – 6 Know the general structure and function of cells in organisms.	Time Range 4 th Quarter 1 – 3 days
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National Standard: Understand cell differentiation.

PASS IX C: Cells can differentiate and may develop into complex multicellular organisms.

CRT/ITBS: ACT / SAT

Local Objective 27: Describe the process of human development from fertilization through birth.
Level of Specificity: Describe embryo/fetal development from conception to childbirth. Describe the developmental stages of the embryo and the fetus. Describe the birth process and the stages of labor. Describe hormonal changes that occur during pregnancy.

Prerequisites: None

Blooms	K	C	A	A *	S	E
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Process Skills	Observe	Classify *	Experiment	Interpret *	Communicate	Safety	Inquiry *
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Suggested Teaching Strategies

- Describe the implantation process. Distinguish between an embryo and a fetus.
- Use models or diagrams to discuss fetal developmental processes.

Aligned Instructional Resources

McGraw-Hill, Hole's Essentials of Human Anatomy and Physiology, Chapter 20.

McGraw-Hill, Biology: The Dynamic of Life

Assessment Sample Format

All organ systems are formed and functioning by the :

- second month of fetal development
- third month of fetal development
- fourth month of fetal development
- fifth month of fetal development



Local Objectives	Human Anatomy and Physiology
1	Define anatomy and physiology
2	Understand homeostasis
3	Describe the major body cavities
4	Understand the commonly used divisions of the body
5	Describe an atom and how atomic structures affects interactions among atoms and molecules
6	Describe the cell lifecycle and how cells divide
7	Name and describe the structure and function of the cell
8	Explain how cells obtain energy to power their operations
9	Understand the mechanisms of cellular transport
10	Explain how metabolic pathways are regulated
11	Describe the role of enzymes in cellular metabolism
12	Explain how genes control cell function
13	Know the primary tissue types
14	Name and describe the structures of the integumentary system and the functions and processes associated with each
15	Name the structures and describe the functions of the skeletal system
16	Name the structures and describe the functions and processes involved with the muscular system
17	Name and describe the structures and describe the functions and associated with the nervous system
18	Name the structures and describe the functions and processes associated with the endocrine system
19	Discuss the characteristics of blood and understand its major function.
20	Name the structures and describe the functions and processes of the cardiovascular system
21	Name the structures and describe the functions and processes associated with the lymphatic system
22	Name the structures and describe the functions and processes associated with the digestive system
23	Name the structures and describe the functions and processes associated with the respiratory system
24	Name the structures and describe the functions and processes associated with the urinary system
25	Name the structures and describe the functions and processes associated with the male and female reproductive system
26	Describe the process of fertilization
27	Describe the process of human development from fertilization through birth

