

Human Anatomy & Physiology

Unit 1: Introduction and Biochemistry / Cells Review

3 weeks

A&P1, A&P2

Biblical Worldview Essential Questions

Does the study of anatomy at the molecular and cellular level support a creationist theory about our origins?

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• List and describe the major characteristics and the major requirements of life• Define homeostasis and describe the parts of a homeostatic mechanism explaining how they function together• Describe the major body cavities as well as naming their respective organs and membranes• Identify the major organ systems, including naming their respective organs and functions• Properly use the terms that describe relative positions, body sections, and body regions• Describe how atomic structure determines how atoms interact• Describe the relationships between atoms and molecules• Describe three types of chemical reactions• Explain what acids, bases, and buffers are• List the major groups of inorganic chemicals common in cells• Describe the functions of various types of	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition• Hole's essentials of Human Anatomy and Physiology 10th edition	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Lab report• Teacher made test

<p>organic chemicals in cells</p> <ul style="list-style-type: none">• Explain how cells differ from one another• Explain how the structure of a cell membrane makes possible its function• Describe each type of organelle, and explain its function• Compare and contrast various ways that substances move through cell membranes• Describe the parts of the cell cycle and identify the major activities during each part• Explain why regulation of the cell cycle is important to health			
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Human Anatomy & Physiology

Unit 2: Cellular Metabolism

3 weeks

A&P2

Biblical Worldview Essential Questions

Does the intricate processes of our metabolism support a creationist theory about our origins?

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• Compare and contrast anabolism and catabolism• Describe how enzymes control metabolic reactions• List the basic steps of an enzyme-catalyzed reaction• Describe how energy in the form of ATP becomes available for cellular activities• Describe the general metabolic pathways of carbohydrates, lipids, and proteins• Explain how DNA carries genetic information• Describe how DNA molecules replicate• Describe the steps of protein synthesis	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 4	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 3: Tissues and the Integumentary System

2 ½ weeks

A&P3, A&P4

Biblical Worldview Essential Questions

**How does the design of the integumentary system point us towards God as our creator?
In what ways is our integumentary system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• List the four major tissue types, and tell where each is located in the body• Describe the general characteristics and functions of epithelial tissues• Name the types of epithelium, and for each type, identify an organ in which that type is found• Compare and contrast the general cellular components, structures, fibers, and extracellular matrix (where applicable) in each type of connective tissue• Explain the major functions of each type of connective tissue• Distinguish among the four major types of membranes• List the general functions of the skin• Describe the structure of the layers of the skin• Describe the anatomy and physiology of each accessory structure of the skin• Explain how the skin helps regulate body temperature• Describe the events that are part of wound healing	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapters 5 & 6	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 4: Skeletal System

3 weeks

A&P3, A&P4, A&P5

Biblical Worldview Essential Questions

**How does the design of the skeletal system point us towards God as our creator?
In what ways is our skeletal system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• list the active tissues in a bone• describe the macroscopic and microscopic structure of a long bone, and list the functions of these parts• distinguish between intramembranous and endochondral bones, and explain how such bones develop and grow• discuss the major functions of bones• distinguish between the axial and appendicular skeletons, and name the major parts of each• locate and identify the bones and the major features of the bones that compose the skull, vertebral column, thoracic cage, pectoral girdle, upper limb, pelvic girdle, and lower limb• classify joints according to the type of tissue binding the bones together, describe their characteristics, and name an example of each• list six types of synovial joints, and	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 7	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

<p>describe the actions of each</p> <ul style="list-style-type: none">• explain how skeletal muscles produce movements at joints, and identify several types of joint movements			
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Human Anatomy & Physiology

Unit 5: Muscular System

3 ½ weeks

A&P1, A&P3, A&P4, A&P6

Biblical Worldview Essential Questions

**How does the design of the muscular system point us towards God as our creator?
In what ways is our muscular system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• describe how connective tissue is part of a skeletal muscle• name the major parts of a skeletal muscle fiber, and describe the function of each• discuss nervous stimulation of a skeletal muscle• identify the major events of skeletal muscle fiber contraction• describe the energy sources for muscle fiber contraction• describe how oxygen debt develops and how a muscle may become fatigued• distinguish between a twitch and a sustained contraction• explain how muscular contractions move body parts and help maintain posture• distinguish between the structures and functions of multiunit smooth muscle and visceral smooth muscle• compare the contraction mechanisms of skeletal and smooth muscle fibers	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 8	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

<ul style="list-style-type: none">• compare the contraction mechanisms of cardiac and skeletal muscle fibers• explain how the attachments, locations, and interactions of skeletal muscles make possible certain movements• describe the locations and actions of the major skeletal muscles of each body region			
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Human Anatomy & Physiology

Unit 6: Nervous System

3 weeks

A&P1, A&P3, A&P4, A&P6

Biblical Worldview Essential Questions

**How does the design of the nervous system point us towards God as our creator?
In what ways is our nervous system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• distinguish between the two types of cells that comprise nervous tissue• explain the general functions of the nervous system• state the functions of neuroglial cells in the central nervous system• distinguish among the types of neuroglial cells in the central nervous system• describe the Schwann cells of the peripheral nervous system• describe the general structure of a neuron• explain how differences in structure and function are used to classify neurons• explain how information passes from one neuron to another• describe the events that lead to the conduction of a nerve impulse• compare nerve impulse conduction in myelinated and unmyelinated neurons in terms of the all-or-none response• identify the changes in membrane potential associated with excitatory and inhibitory neurotransmitters	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 9	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 7: The Senses

3 weeks

A&P1, A&P3, A&P4, A&P5

Biblical Worldview Essential Questions

**How does the design of our senses point us towards God as our creator?
In what ways are our senses fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• describe the receptors associated with the senses of touch, pressure, temperature, and pain• describe how the sense of pain is produced• identify the locations of the receptors associated with the special senses• explain the relationship between the senses of smell and taste• explain the mechanism for smell• explain the mechanism for taste• explain the function of each part of the ear• distinguish between static and dynamic equilibrium• explain the function of each part of the eye• explain how the eye refracts light• describe the visual nerve pathway	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 10	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 8: Circulatory System

3 ½ weeks

A&P1, A&P3, A&P4, A&P5, A&P6

Biblical Worldview Essential Questions

**How does the design of the circulatory system point us towards God as our creator?
In what ways is our circulatory system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• describe the general characteristics of blood, and discuss its major functions• distinguish among the formed elements and liquid portion of blood• explain the significance of red blood cell counts• summarize the control of red blood cell production• distinguish among the five types of white blood cells, and give the function(s) of each type• describe the functions of each of the major components of blood plasma• define hemostasis, and explain the mechanisms that help achieve it• name the structures composing the cardiovascular system• distinguish between the various coverings of the heart and the layers that compose the wall of the heart• identify and locate the major parts of the heart, and discuss the functions of each part• trace the pathway of blood through the	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 12 & 13	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

<p>heart and the vessels of coronary circulation</p> <ul style="list-style-type: none">• discuss the cardiac cycle and the cardiac conduction system• identify the parts of a normal ECG pattern, and discuss the significance of this pattern• explain how the cardiac cycle is controlled• compare the structure and functions of the major types of blood vessels• describe how substances are exchanged between blood in capillaries and the tissue fluid surrounding body cells• explain how blood pressure is produced and controlled			
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Human Anatomy & Physiology

Unit 9: Digestive System

3 weeks

A&P1, A&P3, A&P4, A&P6

Biblical Worldview Essential Questions

**How does the design of the digestive system point us towards God as our creator?
In what ways is our digestive system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• describe the general functions of the digestive system• name the major organs of the digestive system• describe the structure of the wall of the alimentary canal• explain how the contents of the alimentary canal are mixed and moved• describe the functions of the structures of the mouth• describe how different types of teeth are adapted for different functions, and list the parts of a tooth• identify the function of each enzyme secreted by the digestive organs• describe how digestive secretions are regulated• describe the mechanisms of swallowing and defecating• explain how the products of digestion are absorbed• list the major sources of carbohydrates, lipids, and proteins• describe how cells utilize carbohydrates, lipids, and amino acids• describe an adequate diet	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 15	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 10: Respiratory System

3 weeks

A&P1, A&P3, A&P4, A&P5

Biblical Worldview Essential Questions

**How does the design of the respiratory system point us towards God as our creator?
In what ways is our respiratory system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• identify the general functions of the respiratory system• describe the locations of the organs of the respiratory system• describe the functions of each organ of the respiratory system• explain the mechanisms of inspiration and expiration• define each of the respiratory volumes and capacities• locate the respiratory areas in the brainstem and explain how they control breathing• discuss how various factors affect the respiratory areas• describe the structure and function of the respiratory membrane• explain how air and blood exchange gases• list the ways blood transports oxygen and carbon dioxide	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 16	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test

Human Anatomy & Physiology

Unit 11: Excretory System

3 weeks

A&P1, A&P3, A&P4, A&P5

Biblical Worldview Essential Questions

**How does the design of the excretory system point us towards God as our creator?
In what ways is our excretory system fearfully and wonderfully made?**

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ul style="list-style-type: none">• list the general functions of the organs of the urinary system• describe the locations and structure of the kidneys• list the functions of the kidneys• trace the pathway of blood through the major vessels within a kidney• describe a nephron, and explain the functions of its major parts• explain how glomerular filtrate is produced, and describe its composition• explain the factors that affect the rate of glomerular filtration and how this rate is regulated• discuss the role of tubular reabsorption in urine formation• define tubular secretion, and explain its role in urine formation• describe the structure of the ureters, urinary bladder, and urethra• explain the process and control of micturition	<ul style="list-style-type: none">• Lecture• Discussion• Group lab activity	<ul style="list-style-type: none">• Hole's essentials of Human Anatomy and Physiology 10th edition, chapter 17	<ul style="list-style-type: none">• Participation in class discussion• Responses to textbook questions• Responses to lab investigation questions• Teacher made test