HBS Final Exam: EOC (End of Course) Assessment Information 2015-2016

HBS Final Exam Components

1) End of Course (EOC) Assessment (51 multiple choice questions) = 50% of Semester 2 Exam
    a. Section 1: 26 multiple choice questions (40 minutes)
    b. Section 2: 25 multiple choice questions (40 minutes)
2) Short Answer Section = 50% of Semester 2 Exam
3) Test schedule:
    a. Friday (June 3): Short Answer Section (Semester 2 content only)
    b. Exam day (June 6, 7, or 8): Multiple Choice Section 1 and Section 2 (Content from entire year)

PLTW EOC Test Policies

Materials that are authorized for use by students taking PLTW End of Course Assessments:

1) A calculator
2) Blank scratch paper (will be provided by the teacher) and pencil or pen

HBS End of Course (EOC) Assessment Information

1) Approximate percent of test items per unit and lesson→

Unit.Lesson	Approximate Percent
1.1	2%
1.2	6%
1.3	4%
2.1	6%
2.2	9%
2.3	4%
2.4	5%
3.2	7%
3.3	5%
3.4	6%
4.1	3%
4.2	9%
4.3	8%
4.4	5%
5.1	4%
5.2	6%
5.3	8%
6.1	3%

2) The EOC is scored as a Stanine score on a scale of 1-9. The explanation for the Stanine scores is shown below.

End of Course Score	Basic			Proficient				Advanced	
	The student demonstrates a minimal or limited understanding of course concepts. Major gaps may be present in the student's knowledge and skills.			The student demonstrates a competent understanding of the course concepts. The student can apply knowledge and skills to familiar situations. There may be minor gaps in the student's understandings.				The student demonstrates a comprehensive and complex understanding of the course concepts. The student has the capability to transfer knowledge and skills to novel situations. Gaps in knowledge and skills are minimal.	
	1	2	3	4	5	6	7	8	9

3) Requirement for college credit: You must receive at least a Stanine score of 7 to be eligible to receive college credit through MSOE.

HBS EOC (End of Course) Assessment Study Guide

UNIT 1: IDENTITY

Lesson 1.1: Human

Key terms:

- Anterior
- Deep
- Directional terms
- Distal
- Dorsal
- Identity
- Inferior
- Medial
- Posterior
- Proximal
- Regional terms
- Superficial
- Superior
- System
- Ventral

1.1.1 Multiple body systems are interconnected. The interactions between systems is necessary for life.

- In what ways do different human body systems work together to complete specific functions?
- What features of structure and function are common to all humans?

1.1.2 Directional terms describe the position of anatomical structures in relation to other structures or locations in the body and regional terms specify specific anatomical landmarks on the body.

- Terms to understand: anterior, posterior, superior, inferior, proximal, distal, deep, superficial, ventral, dorsal, medial, lateral.

Lesson 1.2: Tissues

Key terms:

- Adipose tissue
- Appendicular skeleton
- Axial skeleton
- Connective tissue
- Epithelial tissue
- Femur
- Forensic anthropology
- Humerus
- Pelvis
- Skull
- Tibia
- Tissue

1.2.1 A tissue is a group of similar cells designed to carry out a specific function.

- What are four main tissue types in the human body? Give examples of each.
- How does the distribution and structure of different types of tissue in the body contribute to personal identity?
- How does the structure of epithelial tissue lend this form of tissue to its function?
- What does muscle tissue have the ability to do that other tissue types do not? What are the three types of muscle tissues? How do the structures and functions of the three types of tissues vary?

1.2.2 The bones of the human skeletal system protect the body's internal organs while allowing for movement and great range of mobility.

- What type of tissue is bone classified as? What primary function of this tissue type pertains to bone?
- Identify bones of the human skeletal system.
- What are the main functions of the skeletal system?

1.2.3 The specific structure of bone reveals information about a person's gender, stature, age and ethnicity. Interpret bone markings, bone landmarks, and bone measurements to determine a person's gender, stature, age, and ethnicity.

- What is forensic anthropology and how does this field relate to human body systems?
- Why do you think the pelvis is often the first bone forensic anthropologists look to in determining sex from skeletal remains?

- What is the difference between qualitative and quantitative data/evidence? What purpose does each form of data play in establishing identity?
- What key bones would forensic anthropologists use to establish a probable ethnic background? What skeletal features of this bone are key to identifying ethnicity?
- Which type of bone and what are the specific bones that are best for height/stature determination? Why is it best to have two or more bones for height calculations?
- Which features of each bone are used to determine gender, height, age, and ethnicity?

Lesson 1.3: Molecules and Cells

Key terms:

- Agarose
- Biometrics
- Deoxyribonucleic acid (DNA)
- Gel electrophoresis
- Restriction enzyme
- ***Restriction fragment length polymorphisms (RFLPs)***

1.3.1 Restriction enzymes recognize and cut specific sequences in DNA.
Gel electrophoresis separates DNA fragments based on size and is used in Restriction Fragment Length Polymorphism (RFLP) analysis.
Demonstrate the steps of gel electrophoresis and analyze the Restriction Fragment Length Polymorphisms (RFLPs.)

- What is the structure and function of DNA?
- What factor(s) determine the speed by which DNA fragments will move through an electrophoresis gel?
- What are restriction enzymes and how are the names of restriction enzymes derived?
- Why would it be important to use more than one restriction enzyme when performing an RFLP analysis using gel electrophoresis?
- In terms of positive and negative poles, describe the direction DNA fragments would move through an electrophoresis gel chamber and explain why.
- What is PCR? Define its role in DNA analysis?
- What characteristics of electrophoresis gels make them useful in separating fragments of DNA?

1.3.3 Physical characteristics can be used to confirm or authenticate identity.

- How can the field of biometrics be used to verify and protect identity?
- Describe examples of biometric technologies.

UNIT 2: COMMUNICATION

Lesson 2.1: The Brain

Key terms:

- Brain stem
- Central nervous system
- Cerebrum
- Gyrus
- Limbic system
- Lobe
- Peripheral nervous system
- Phrenology
- Sulcus

2.1.2 The brain receives stimuli from the outside world, interprets information, and generates an appropriate response.
The two main subdivisions of the nervous system are the central nervous system (CNS), brain and spinal cord, and the peripheral nervous system (PNS), all nervous tissues outside the brain and spinal cord.

- What are the two main subdivisions of the nervous system?
- What areas of the body and what types of cells make up these two subdivisions?
- How do the central nervous system and the peripheral nervous system work together to control the body?

2.1.3 Each region within the brain helps control and regulate specific functions in the body.

- Identify the location of the main regions of the brain. (cerebrum, frontal lobe, parietal lobe, occipital lobe, temporal lobe, brainstem, cerebellum)
- What are the primary functions of the main regions of the brain?

Lesson 2.2: Electrical Communication

Key terms:

- Action potential
- Axon
- Dendrite
- Ion
- Myelin sheath
- Neurologist
- Neuron
- Neurotransmitter
- Reaction time
- Reflex
- Synapse

2.2.1 Specialized cells called neurons convey information using electrical and chemical signals. The nervous system relies neurons to pass signals to and from the brain and spinal cord.

- How does communication happen within the body?
- What is the basic structure and function of the neuron? Be able to name, locate, and understand the functions of the different parts of a neuron.
- How do the different types of neurons work together to send and receive signals?
- Describe directional pathways and types of neurons involved (motor neurons, interneurons (also called association neurons, sensory neurons.)

2.2.2 An action potential is an electrical signal that is generated by the movement of ions across the cell membrane of a neuron.

- Describe how the movement of ions across the cell membrane of a neuron generates an action potential and propagates electrical signals.
- How are electrical signals created and transmitted in the human body?
- What is an action potential?
- What are the stages of an action potential? What happens at each stage?
- Describe the roles of ions in creating electrical impulses in the human body.

2.2.3/2.2.4 The body's reaction time to reflex and voluntary actions is related to the degree of processing in the nervous system.

- How are voluntary and involuntary reactions different?
- How and why does reaction time differ in reflex and voluntary actions?

2.2.5 Errors in electrical communication can impact homeostasis in the human body.

- How do errors in communication impact homeostasis in the human body?

Lesson 2.3: Chemical Communication

Key terms:

- Endocrine gland
- Endocrine system
- Exocrine gland
- Gland
- Glucagon
- Hormone
- Hypothalamus
- Insulin
- Pituitary gland

2.3.1 The endocrine system helps the body communicate through the use of chemical signals called hormones.

- What is the difference between the exocrine system and the endocrine system?
- What is a hormone?
- How to hormones interact with target cells?

2.3.1/2.3.2 Hormones help maintain homeostasis through feedback loops. A hormone imbalance can lead to disease or dysfunction.

- How do feedback loops help regulate the action of hormones?
- Explain how the body decreases blood glucose levels if they are too high? too low?
- Explain how the body decreases thyroid hormone levels if they are too high? too low?
- How does a hormone imbalance lead to disease? Give three specific examples.

Lesson 4: Communication with the Outside World

Key terms:

- Accommodation
- Astigmatism
- Blind spot
- Cone
- Cornea
- Depth perception
- Hyperopia
- Iris
- Lens
- Myopia
- Optic nerve
- Pupil
- Refraction
- Retina
- Rod

2.4.1 The structures within the human eye work to focus and process light.

- How is light focused by the eye? What is the order of structures that light passes through in the eye?
- Understand the structure and function of the following parts of the eye: cornea, lens, retina, optic nerve, iris and pupil.
- What are cones and rods?
- What is a blind spot?

2.4.2 The eye allows perception of color, depth, brightness, and optical illusions.
Errors in the structure and function of the eye can lead to dysfunction or problems in acuity.

- How do the eye and brain work together to process what we see?
- Why is each of the following tests performed in a routine eye exam? Eye muscle movement test, cover test, external exam and pupillary reactions, visual acuity test and retinoscopy, slit-lamp examination, visual field test?
- What does it mean to have 20/20 vision?
- How does an error in the structure or function of the eye relate to disease or dysfunction?
- What is myopia? What is hyperopia? What is astigmatism?
- How can corrective lenses be used to refocus light and resolve myopia and hyperopia?

UNIT 3: POWER

Lesson 3.1: Introduction to Power

Key terms:

- Homeostasis
- Macromolecule
- Resource

3.1.1/ 3.1.2 Many human body systems work to create, process, and distribute the body's main resources- food, water, and oxygen.

- What role does food play in the human body?
- What role does water play in the human body?
- What role does oxygen play in the human body?
- What human body systems work to create, process, or distribute the body's main power sources?
- What are factors in the environment that may speed up or slow down the use of the 3 main resources: air, water, and food?
- What are factors unique to the individual that affect how a person uses the 3 main resources: air, water, food?

Lesson 3.2: Food

Key terms:

- Adenosine triphosphate (ATP)
- Anabolism
- Basal metabolic rate (BMR)
- Body mass index (BMI)
- Bolus
- Calorie
- Catabolism
- Catalyst
- Digestion

- Digestive system
- Enzyme
- Esophagus
- Gallbladder
- Gastrointestinal tract
- Large intestine
- Liver
- Metabolism
- Monomer
- Oral cavity
- Pancreas
- Peristalsis
- Pharynx
- Polymer
- Salivary amylase
- Salivary glands
- Small intestine
- Stomach
- Substrate

3.2.1/ 3.2.2 The digestive system consists of the gastrointestinal tract and the accessory digestive organs which function together to chemically and mechanically digest food, absorb water and nutrients, and remove wastes.

- What are the functions of the digestive system?
- How does the structure of each organ in the digestive system relate to its function?
- List the major organs of the digestive system in order. Next to each to each structure/organ, identify its function as one or more of the following: chemically digest food, mechanically digest food, absorb water and nutrients, and/or remove wastes.

3.2.3 Specific enzymes digest carbohydrates, fats and proteins at sites along the digestive tract.

- How do enzymes assist the process of digestion?
- Which enzymes digest carbohydrates, fats, and proteins?
- Identify the sites along the digestive tract that each macromolecule is broken down.

3.2.4 Metabolism, the sum of all chemical reactions that occur within the body, is required to maintain homeostasis.

- What are the health risks associated with being overweight or underweight?
- What body systems are affected when a person is overweight or underweight?

3.2.5 When a process in the body requires energy, ATP is broken down to liberate energy stored in its chemical bonds.

- What is ATP?
- Draw a diagram of the ATP molecule (does not need to include every atom, for example you can use a pentagon with one Oxygen to represent the ribose.) Label the three parts of the molecule.
- Where is the energy located in the ATP molecule? Indicate on your drawing above where the energy is being stored.
- What is the equation for the breakdown of ATP and the release of energy?
- How is energy released from ATP and used to do work in the body?
- How do the air you breathe and the food you eat relate directly to the production of energy in the form of ATP?

Lesson 3.3: Oxygen

Key terms:

- Abdominal cavity
- Alveoli
- Bronchi
- Diaphragm
- Intercostal muscle
- Thoracic cavity
- spirometer

3.3.1 The structure of the lungs and the close association between the lungs and the vessels of the cardiovascular system facilitate the transport of oxygen to all cells in the body.

- How does the oxygen we inhale get to all of our cells?
- Describe the structure of the respiratory system, especially the lungs, and the basic mechanics of breathing.
- Describe alveoli and bronchioles. What happens in these structures?
- What is each alveoli surrounded by?
- Explain the connection of the cardiovascular system to the respiratory system. Make sure you understand the function and location of the pulmonary arteries and pulmonary veins.
- Use the principles of diffusion to explain why oxygen molecules in the alveoli (in the lungs) go into the blood, and then in other tissues (elsewhere in the body) the oxygen molecules leave the blood.

3.3.2 During normal breathing, a healthy individual is using only a small percentage of the total capacity in his or her lungs.

- How do we measure lung capacity?

3.3.3/3.3.4 The amount of oxygen required by the cells in a body depends on the activity level of the cells.

- Why might some people be more efficient at capturing oxygen than others?
- How does asthma affect the respiratory system?
- How does a respiratory therapist assist patients respiratory conditions?

Lesson 3.4: Water

Key terms:

- Adrenal glands
- Aldosterone
- Antidiuretic Hormone (ADH)
- Excretion
- Filtration
- Glomerular filtration
- Glomerulus
- Kidney
- Nephron
- Ureter
- Urethra
- Urinalysis
- Urinary bladder
- Urinary system
- Urine

3.4.1/3.4.2

The urinary system helps maintain homeostasis in the body by filtering the blood, regulating water and electrolyte concentration, maintaining the pH balance of the blood by ridding the body of liquid wasted called urine.

- What are the functions of the urinary system?
- What are the main structures of the urinary system? What is the function of each of these structures?
- What is the general structure of the kidney and how does this structure relate to kidney function?
- In which sections or section of the kidney is the urine formed? What section of the kidney collects the urine? How does the urine move from the kidney out of the body?
- How does the kidney form urine?
- What is the relationship between blood and urine?
- Explain the connection between the circulatory system and the urinary system. How does the urinary system help maintain homeostasis in the body? (Think about fluid balance, ion balances, and the balance of other molecules)

3.4.3 Through filtration, reabsorption, and secretion, the nephron assists in maintaining normal values of water, electrolytes, pH and blood pressure in the body.

- What is the function of the nephron?
- How do filtration, secretion and reabsorption in the nephron help maintain a fluid and electrolyte balance in the body?
- Where do filtration, reabsorption and secretion happen in the nephron?
- What is the purpose of reabsorption in the nephron?
- What substances and molecules are filtered, reabsorbed, and secreted? What direction do the substances and molecules move during each step (filtration, reabsorption, and secretion)
- In what direction are substances moving during the process of secretion? Explain what these substances are and why they are excreted from the body.

3.4.4 The hormones aldosterone and antidiuretic hormone (ADH) both help regulate the amount of water in the body.

- How do the hormones ADH and aldosterone affect the nephron and the body's overall water balance?

3.4.5 Malfunctions in the body can be identified through noticeable changes in the composition of urine and these changes can be detected through urinalysis.

- What is urinalysis?
- What is analyzed in a macroscopic examination of a urinalysis? What can abnormal results indicate?
- What specific properties are analyzed in a chemical analysis of a urinalysis? What do the levels of these properties indicate?
- Explain the microscopic examination of a urinalysis. What can abnormal results indicate?

UNIT 4: MOVEMENT

Lesson 4.1: Joints

4.1.1 The types of joints found in the human body differ in both structure and function and are classified as such.

The skeletal system works with the muscular system to move the human body.

- What role do joints play in the body?
- Name the different classifications of joints: fibrous, cartilaginous, and synovial. Give an example of each. Explain the type of motion that each joint allows.

4.1.2 Range of motion describes a joint's possible movements as well as provides a measure of overall flexibility at a joint.

- How do you measure the range of motion of a particular joint movement?
- Explain the terms that describe the path of movement at a joint: abduction, adduction, flexion, extension, rotation, circumduction, plantar flexion, dorsiflexion.

Lesson 4.2: Muscles

Key terms: (4.1 and 4.2)

- Abduction
- Adduction
- Actin
- Ball-and-socket joint
- Cartilage
- Circumduction
- Dorsiflexion
- Extension
- Flexion
- Goniometer
- Hinge joint
- Hyaline cartilage
- Joint
- Ligament
- Myosin
- Plantar flexion
- Range of motion
- Rotation
- Synovial cavity
- Synovial fluid
- Synovial joint
- Tendon
- Troponin
- Tropomyosin

4.2.1 Through contraction and relaxation, the three different types of muscle tissue - skeletal, cardiac, and smooth - produce body movements, stabilize body position, move substances within the body and regulate heat.

- How do muscles assist with movement of the body and of substances around the body?
- How do the structure and function of the three types of muscle tissue compare?

4.2.2/ 4.2.3 The structure of the muscle and attachment of this muscle to bone directly relates to the function of each skeletal muscle.

- What do skeletal muscle structure and attachment to bones tell you about function?
- How are muscles named?
- What is the origin of a muscle? The insertion?

4.2.4 Calcium ions and ATP play a role in the contraction of muscle fibers.

- What are the requirements for muscle contraction?
- How are Calcium and ATP involved in the contraction of muscles? Describe the function of each molecule.

4.2.5 Muscles are composed of units called sarcomeres, which contract and shorten when exposed to electric stimuli.

- What is a sarcomere?
- How does a sarcomere contract and lengthen to cause muscle contraction?
- How is the condition rigor mortis related to muscle contraction?
- Explain the basic steps of the sliding filament theory. Include the terms: ATP, Calcium, troponin, tropomyosin, actin, and myosin.

4.2.6 Neurons are packed together in wiring called nerves, and these nerves take electrical messages from the brain to muscle.

- How do nerves interact with muscles?
- Understand the general structure and function of the nerves of the brachial plexus the muscles they innervate.

Lesson 4.3: Blood Flow

Key terms:

- Aorta
- Arteriole
- Artery
- Atrium
- Blood pressure
- Capillary
- Cardiac muscle
- Cardiac output
- Circulation
- Coronary artery
- Heart rate
- Peripheral artery disease
- Peripheral vascular disease
- Pulmonary circulation
- Pulse
- Smooth muscle
- Stroke volume
- Systemic circulation
- Valve
- Varicose vein
- Vein
- Ventricle
- Venule
- Arteriosclerosis: a chronic disease characterized by thickening and hardening of the arterial walls with resulting loss of elasticity
- Atherosclerosis: a cardiovascular disease in which growths called plaques develop on the inner walls of arteries, narrowing their inner diameters

4.3.1 The heart pumps blood to the lungs to pick up oxygen and to the body to deliver this oxygen.

- What types of muscle help move blood around the body?
- What is the relationship between the heart and the lungs?
- What is the pathway of blood in and out of the heart in pulmonary and systemic circulation?

4.3.2/ 4.3.3 The structure of arteries, veins, and capillaries relates directly to the function of each vessel and to the amount of pressure exerted on the vessel walls.

- How do the structure of arteries, veins and capillaries relate to their function in the body?
- What unique features of veins help move blood back to the heart?
- What are varicose veins?
- Why don't we ever hear about varicose arteries?
- What are the major arteries and veins in the body and which regions do they bring blood to/ from?
- Capillaries function in gas exchange. Describe at least two ways capillary structure is related to this function.
- Describe two ways blood is helped back to the heart in veins. Mention relevant body systems.

4.3.4 Changes in cardiac output, the amount of blood that is pumped out by the ventricles per minute, often signal diseases of the heart and these changes can impact the function of other body systems.

- What are some factors that can increase or decrease heart rate?
- How does heart rate relate to cardiac output?

- What is cardiac output?
- How does cardiac output help assess overall heart health?
- How does an increased or decreased cardiac output impact the body?

4.3.5 Increased blood pressure in vessels can indicate possible blockages and these blockages can interrupt blood flow to an organ or limb.

- What is blood pressure?
- How can the measurement of blood pressure in the legs be used to assess circulation?
- What is ABI? What does this value tell you about the risk of peripheral artery disease?
- What is PAD? Explain how PAD might impact other body systems.

Lesson 4.4: Energy and Motion- Exercise Physiology

Key terms:

- Aerobic
- Anaerobic
- Cellular respiration
- Creatine phosphate
- Glycogen
- Lactic acid

4.4.1/ 4.4.2 Exercise requires the coordinated effort of many human body systems, including the nervous system, the muscular system, the skeletal system, the cardiovascular system, and the respiratory system.

The body uses high energy molecules such as creatine phosphate, glycogen and glucose to supply ATP to working muscle.

- Provide at least two examples of the opposite effects of the sympathetic and parasympathetic divisions of the nervous system.
- Explain how the respiratory and the cardiovascular system work together to meet the demands of the working muscle.
- When you set out to jog five miles, your body first uses the ATP that is available in your skeletal muscles. Describe the energy systems that your body relies on for ATP after this point: phosphagen cycle, anaerobic respiration, and aerobic respiration.
- What body systems are involved with powering an athlete through a running race?

4.4.4 An athlete training for an intense physical event needs to consider diet, exercise, hydration, and injury prevention as well as track his or her progress ad modify the plan to meet the demands of exercise.

- What are areas to consider when designing a training plan for an athlete?

UNIT 5: PROTECTION

Lesson 5.1: Skin

Key terms:

- Collagen
- Connective tissue
- Dermis
- Elastin
- Endorphin
- Epidermis
- Epithelium
- Exocrine gland
- First-degree burn
- Keratin
- Melanin
- Pain
- Sebaceous gland
- Second-degree burn
- Third-degree burn

5.1.1 Skin is a dynamic organ that functions in protection, temperature regulation, sensation, excretion, and absorption in the human body.

- What are the functions of skin?
- What role do accessory organs such as sweat glands and sebaceous glands play in the skin?
- Describe the structure and function of skin parts. Describe the role of the different layers of the skin. Be able to list the layers in order from most superficial to deep.

5.1.2 Skin damage can impact numerous body functions and body systems.

Burn damage to skin can impact numerous body functions and body systems.

- What layers of skin are affected by 1st, 2nd, and 3rd degree burns? How does this relate to the function of the skin?
- What are the recommended treatments for individuals with 1st, 2nd and 3rd degree burns?
- Why are infections a major problem for individuals suffering from burns? What would be the best way to fight infections?
- How is inflammation related to blood vessels in the skin? Why is inflammation usually involved in the healing process of skin?
- Which layers of the skin are damaged in different types of burns?

5.1.3 Both the body's ability to sense pain and to suppress pain help protect the human body from injury and death.

- What role does pain play in the human body?
- Why would the inability to feel pain actually put the human body in danger?

Lesson 5.2: Bones

Key terms:

- Bone marrow
- Bone remodeling
- Calcitonin
- Cartilage
- Compact bone
- Fracture
- Osteoblast
- Osteoclast
- Osteocyte
- Parathyroid hormone
- Spongy (cancellous) bone

5.2.1 Bone is a living connective tissue composed of cells and protein fibers wrapped in hard mineral salts that can adapt and change to fit the needs of the person. Bones assist muscles with movement of the body and protect the internal organs from damage and injury.

- How does the skeletal system assist with protection in the body?
- What are the key structures of compact bone? What are the key structures of spongy bone?
- How does the overall structure of bone provide great strength and flexibility, but keep bone from being too bulky and heavy?

5.2.2 Damage to bone, through a sprain or a fracture, can impact the function of other body organs and systems.

- What are the different types of bone fractures and how are they identified on X-rays?
- How can damage to a bone affect other human body systems?

5.2.3 Osteoclasts and osteoblasts are specialized bone cells that function to break down old bone tissue and replace it with new.

Bone is constantly being broken down and reformed through the process of bone remodeling.

- What is bone remodeling?
- How do osteoblasts and osteoclasts assist with bone remodeling and overall bone homeostasis?
- What is the relationship between bone remodeling and blood calcium levels?
- How do the hormones calcitonin and parathyroid hormone (PTH) play a role in the regulation of calcium levels in the blood? What is the relationship between bone remodeling and calcium levels?
- What are the four main stages of healing that occur after a bone fracture?

Lesson 5.3: Lymph and Blood Cells

Key terms:

- Aggulation
- Alleles
- Antibody
- Antigen
- B lymphocyte (B cell)
- Blood type
- Immunity
- Lymph
- Lymph node
- Lymphocyte
- Macrophage
- Memory cell

- Pathogen
- Pedigree
- T lymphocyte (T cells)

5.3.1 The lymphatic and immune system functions to drain and distribute fluid in the body as well as protect the human body against specific invaders.

- How do the lymphatic and immune systems function to protect the human body?

5.3.2 Antibodies are proteins found in the blood or lymph that seek out and bind to specific antigens.

Blood type is determined by the antigens that are present on Red Blood Cells.

Only certain blood types are compatible with one another and can be safely transferred from person to person in a transfusion.

- What is an antigen?
- What is an antibody?
- How do circulating antibodies protect a person from receiving incompatible blood during a transfusion?
- What types of blood can donate/receive blood from other blood types? Explain why.

	Type A	Type B	Type AB	Type O
Red Blood Cell Surface Antigen				
Plasma Antibodies				
Can Receive Blood From…				
Possible Genotype				

5.3.3 Antibodies are produced in response to specific pathogens.

- What is specific immunity?
- How does the body respond to an infection?
- What cells are involved in an immune response?
- How does your body react the second time it is exposed to a particular antigen?

UNIT 6: HOMEOSTASIS

6.1

Key terms:

- Case study
- Homeostasis
- Identity
- Intervention

Factors in the external environment affect the body's internal environment and overall ability to maintain homeostasis.

Human body systems work together to defend against disease and injury and to maintain health and wellness.

Medical interventions, measures that improve health or alter the course of a disease, include preventative measures, diagnostic tests, treatments, and rehabilitation.

- How do the human body systems respond to changes in the external environment?
- What happens to the body if the systems are unable to maintain homeostasis?
- How do the systems of the body work together to defend against disease and injury and to maintain health and wellness?
- How do medical interventions help doctors and patients prevent, diagnose and treat disease?
- What factors influence personal identity?