



Anatomy Syllabus ~ Semester A / B

Grand Haven High School
Science Department



Anatomy/Physiology

Mr. DIEDERICHSEN

Classroom/v-mail: 850-6216

e-mail: diederichsent@ghaps.org

Syllabus:

- Although subject to schedule modifications, proposed sequence of concepts is:

Chapter 1: Body Overview

Chapter 5: Tissues & Membranes

Chapter 6: Integumentary System (Skin)

Chapter 7 & 8: Skeletal and Muscular Systems

Chapter 15: Digestion and Nutrition

Chapter 12: Blood

Chapter 13: Cardiovascular System

Chapter 16: Respiratory System

Chapter 9: Nervous System

Chapter 10: Special Senses

Chapter 17: Urinary/Ecretory System

CAT DISSECTION

Chapter 19 & 20: Reproductive System and Fetal Development

- This class is also a "Medical Terminology Course". Your knowledge of Latin prefixes and suffixes will increase your chances of success in future college science or medical courses like "Medical Terminology" at college. It will also allow you to make good, educated guesses about meanings of words while reading the book, magazines, newspapers, etc. You will have Latin quizzes every week this year including some slightly larger "Summary" quizzes.
- Your ability to note a textbook chapter is a very important to skill to have for college! You will be expected to note chapters and successfully complete hard copy "Open Note Quizzes" or online quiz assessments.

Objectives per Chapter:

- (***Note: Always review the Latin terms in each chapter as they are fair game on the test!***)

Chapter 1: Introduction to Human Anatomy:

1. Identify body structures in relation to other body structures using the appropriate terms.
2. Identify and proper use the body surface names.
3. Identify the 9 regions of the abdomen.

Ch.1 Continued:

4. Name membranes (pericardial, pleural, and peritoneal) and properly use *parietal* and *visceral*.
5. Properly name types of planes/cuts.
6. Identify where various cavities are located and list what is housed in them.
7. Name all regions of the body.
8. What is the anatomical position?
9. What is homeostasis? Describe Negative vs Positive feedback mechanisms. Examples?

Chapter 5: Tissues ::: (These goals will be separately throughout the year as needed)

1. Know that the 4 major types of tissues are Epithelial, Connective, Muscle and Nervous
2. Give the function and identify the types of Epithelial tissue discussed in class.
3. Give the function and identify the 8 types of Connective tissue.
4. Give the function and identify the 3 types of Muscle tissue and 1 type of nervous tissue.
5. Give the function and identify the 3 types of Glands.
6. You will be tested on your knowledge of #2-5 above mainly by identifying slides on the smart board, but also scope slides, pictures and word descriptions.

Chapter 6: Skin and Integumentary System

1. List the general functions of skin.
2. Identify the layers of skin and name all structures embedded in skin
3. Describe how skin functions in homeostasis.
4. Explain how the epidermis is formed and the role of keratin.
5. Contrast the stratum corneum and stratum basale (germinativum)
6. Describe the role of melanocytes and melanin.
7. Compare and Contrast the 4 types of tissues found in the body.
8. Compare and Contrast the 3 types of glands found in the body. What specific types of glands are found in the skin and what are their functions?
9. Compare and contrast apocrine and eccrine sweat glands in location and function.
10. Compare and contrast the skin of different races of people.
11. Skin cancer: Describe the A, B, C, D, E method is skin examination.

Chapter 7: Skeletal System:

1. Describe and identify the parts of bone.
2. Compare and contrast the axial and appendicular skeleton.
3. Name the 206 bones of the body by both common and scientific names and descriptions.
4. Identify the terms used in describing the many parts of the outer bone surface.
5. Compare and contrast osteocytes, osteoblasts, osteoclasts.
6. List the types of joints, where found and function in movement.
7. Describe the different parts and numbers of vertebrae in the vertebral column. Contrast cervical, thoracic and lumbar vertebrae. Name each vertebrae.
8. Describe the movements at joints and name the movement.

9. Identify each bone of the skull.

Chapter 8: Muscular System:

1. Differentiate between the three types of muscle tissue & describe where each would be found
2. Using a diagram provided, describe the anatomy of skeletal muscles from gross to microscopic levels.
3. Describe how skeletal muscles are affected by exercise. Use the following terms: tetanus, muscle fatigue, isotonic, isometric contractions, and muscle tone.
4. Explain the process of oxygen debt.
5. Define and be able to illustrate the following terms: origin, insertion, prime mover, antagonist, and synergist as they relate to muscles and their movement.
6. Demonstrate knowledge of muscle location by naming and locating the major muscles of the human body and state the action of each.

Chapter 15: Digestive System

1. Label the parts of the digestive system and describe what actions take place in each part.
2. List the enzymes discussed in class. Include where they are made and what they do.
3. Where in the system are carbohydrates, proteins and lipids digested and how?
4. Proteins are made up of individual units called _____. Draw the general formula for this unit:
5. What are the three parts of the small intestine? What is the function of a villus? What is the function of the lacteal?
6. Plants put glucose into chains of starch. The liver puts glucose into chains of _____.
7. Distinguish between a bolus, chyme, and feces.
8. What are the parts of the stomach? What are the parts of gastric juice? What cells in the stomach make what parts?
9. Know what St. Martin, Beaumont, and Pavlov did. What did we learn from them?
10. How do the hormones gastrin and CCK function?
11. Label the various parts of a tooth. What are the four types of teeth and their functions? Identify a tooth on a picture both by a common name and by its number or letter.
(Example: right lateral incisor = #7 in adult (secondary tooth) = "D" in child (primary tooth))
12. Complete the "Antacid Lab" and answer questions pertaining to it and acids/bases/buffers.

Chapter 12: Blood

1. If allowed to stand, blood separates into 3 layers. What are they? Give the 4 parts of blood and their purposes.
2. White blood cells are divided into 2 groups based on whether the cell has ____ or not. Be able to identify the 5 types of white blood cells based on their descriptions, %, functions, etc.
(For example: the WBC that is the highest % of WBC and has its nucleus divided in 2-5 lobes is what?)
3. What is the role of erythropoietin in blood cell production?
4. Be able to describe the steps of hemopoiesis including why it is done, where in the body the steps takes place, and what happens to old red blood cells. Follow the blood cell from formation to destruction.

Ch. 12 Continued:

5. Explain how a blood clot forms to stop the bleeding of a cut. (What word means to “stop bleeding”?)
6. Compare & contrast the following 4 words: Clot, scab, thrombus, embolus
7. What antigens and antibodies are found in each of the 4 blood types? In the US, what blood types are the most/least common?
8. Determine blood types of different blood samples and answer questions pertaining to the data.
7. Be able to determine which blood types are able to be transfused to other blood types, and what blood types are possible from the matings of certain parents.
8. If you have blood type A & your mom has blood type A, Could your father have blood type: A? B? AB? O? Explain your reasoning in each case and tell what your genotype would be in each case.
11. Describe Rh Disease. What is the problem?
12. Review the information from the “Blood Typing” Lab and the “Holly & Flu” Video.

Chapter 13: Cardiovascular System

1. Know the parts of the heart covered in class, including chambers, valves, layers of heart wall and pericardium, apex, vessels leading to and from the heart and the pathway of blood through the heart to the lungs and back to the heart (Pulmonary Circulation).
2. Memorize all arteries and veins discussed in class including their locations/functions.
3. Be able to outline the pathway of a blood cell from the **right atrium** to *somewhere in the body* and back to the right atrium.
4. Dissect a Beef Heart.
5. Describe how fetal circulation is different from adult circulation.
6. If your heart rate is 74 beats/min and your stroke volume is 80 ml, how many ml of blood does your heart pump in an hour? ***Calculator needed for blood volume question.**
7. Review the Organization of Systems @ end of chapter & the Circulatory system’s relationship to each system.
8. Review the information covered in the Heart Dissection, Blood Pressure & Micro Slide Labs.
9. Be able to take someone’s blood pressure. What is the difference between systolic and diastolic pressure?

Chapter 16: Respiratory System

1. List the parts of the respiratory system. Give the function of the part. Label the parts on pictures.
2. Identify and describe all air volumes of the lungs. What are their capacities? How are the air volumes actually used in breathing?
3. Describe the role of surfactant.
4. Describe Cystic Fibrosis.
5. Describe the diaphragm’s role in breathing. What other muscles are used in the mechanism of breathing?
6. Contrast internal and external respiration. Contrast inspiration and expiration.
7. The larynx is not one structure, it is a combination of various bones and cartilage. What are those parts?

8. Describe hyperventilation.

Chapter 9: Nervous System

1. Identify the 3 main parts of the brain
2. List the lobes of the cerebrum and their functions
3. Describe neuron structure. Compare & contrast the different types and functions
3. Describe a reflex arc and ID a picture of one
4. Explain how impulses travel down an axon using terms like: polarized, depolarized, resting potential, action potential, Na ions, K ions, threshold potential, sodium/potassium pump, concentration gradient
5. Identify the various parts of a reflex arc, spinal nerve & cross section of a spinal cord.
(See lecture board notes)
6. What are the meninges? What are their functions? What are the three types and their location?
7. What are the steps involved in getting the impulse across the synapse?
8. Contrast excitatory and inhibitory neurotransmitters.
9. How do pain medications work? (2 ways)
10. Compare and contrast convergence and divergence.
11. What is the function of the cerebellum?
12. What is the function of the corpus callosum?
13. What is the diencephalon? What are its 2 parts?
14. What are the three parts of the brainstem?
15. What are the 12 cranial nerves by name and Roman numeral and their functions?
16. What is the purpose of the ventricles?
17. What are the functions of the thalamus? Hypothalamus?
18. Divide the NERVOUS SYSTEM into all of its subparts and give the functions of each.
(See lecture board notes)
19. What is the function of the CNS, PNS, Somatic, ANS, Sympathetic & Parasympathetic?
20. What are the functions of the following neurotransmitters? Acetylcholine, Norepinephrine, Dopamine, Serotonin
21. Know info from labs (Neuron and MicroSlides)
22. 2 Videos: How does alcohol affect the brain in general? Specifically at the synapse or along the axon? What really makes you drunk? What are 2 causes for a hangover? What is the limbic system and its function? What specific part of the nervous system does the limbic system activate? How do all addictive drugs affect the brain?
How fast does nerve impulses travel? What is the difference between thin and thick nerves?

Chapter 10: Special Senses

1. List the five types of receptors.....discuss when/how they are stimulated, their locations and functions
2. Compare/contrast rods and cones.
3. Compare contrast chemical receptors of taste and smell.
4. Locate/label areas on tongue for taste sensations.
5. Give the pathway from outside to brain area for: (A) light/sight and (B) vibrations/hearing
6. Label the parts of the eye and ear. Study all diagrams given to you!!
7. How is perilymph used in both the cochlea and the semi-circular canals?

Chapter 19 & 20: Reproductive System & Pregnancy

1. What are all the parts of the male/female reproductive systems and the functions of each part? Identify all structures on the plastic models
2. What are the male/female sex hormones? Where in the body are they made/released? What are the functions of the individual hormones.
3. What are the functions of the various hormones in the menstrual cycle. Describe what happens during the Follicle phase, ovulation, Luteal phase, and menstration. (You will write an essay thoroughly explaining this process).
4. Describe several birth control methods, how they work and their relative effectiveness.
5. Describe the general symptoms of the STDs. Research 8 STDs.

Chapter 17: Urinary System

1. Describe the 3 main parts of the kidney.
2. Give the "functional unit" of the kidney.
3. Describe the process of urine formation. How does "reverse osmosis" work?
4. Properly identify the following: cortex, pyramid, medulla, renal pelvis, hilum, ureter, urinary bladder, urethra, minor calyx, major calyx, afferent arteriole, efferent arteriole, ascending loop, descending loop, Loop of Henle, proximal tubules, distal tubule, glomerulus, Bowman's capsule
5. Contrast the male and female urethra.
6. Describe the composition of urine.
7. Describe deamination.
8. Draw the urea molecule.
9. What is a diuretic?

Cat Dissection

1. Two week project: In groups of 2 or 3, you will dissect the neck & face, chest, arms, abdominal cavity, legs, reproductive organs.
2. As it is the culmination of the course, you will be expected to identify any structure in/on the body that was studied in any of the systems we covered this year.
3. The final grade will be a Cat Practical Exam.
4. Cat Project: In the time remaining before the end of the year, Seniors/Juniors may **CHOOSE** to do the project of removing ALL soft tissue from the body of the cat and reassemble the cat skeleton. Details later.