Semester 2 Plan- *Human Anatomy and Physiology*
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The Second Semester will be divided into the following units with a 2 week Rat dissection that will encompass all information learned in Semester 1 Units and Semester 2 Units.

Unit 1: Special Senses

- **Ch. 8- The Special Senses:**

Ch. 8- The Special Senses will discuss the 3 special senses (4 senses total but touch is considered a general sense since it is distributed in multiple layers over the body by multiple neuron types): Sight, Sound and Taste. Ch. 8 Pre-reading Guide, Ch. 8 Objective Checklist and Ch. 8 CCD will be completed prior to unit. Sight will be covered with an introduction to the anatomy of the eye with a demonstration or visual aide of a diagram of near and far point accommodation that students will copy into their notebooks. 6 muscles of the eye; inferior rectus, medial rectus, superior rectus, lateral rectus, inferior oblique, and superior oblique, will be discussed and identified from chapter 8 (project eye- identify muscles and function)- 1 day. Anatomy of eye will be discussed and students will identify the 3 major tunics of the eye (sclera, choroid membrane and the retina). Ch. 8 PowerPoint lecture notes will follow- 1 day. Sheep brain pre-lab will be completed before dissection of sheep eye lab- 2 days. Convergence due to muscular contractions lecture notes. Myopia (near-sighted: eye is too long-image converges *before* retina: correction diverging lens-concave), Hyperopia (far-sighted: eye is too short-images converges *past* retina: correction converging lens-convex), Presbyopia (degeneration of the ciliary bodies resulting in far-sightedness: correction reading glasses), and Emmetropia (normal 20/20 vision). Focal Distance: the distance from the point in which the lens focuses incoming parallel light waves into a single point and the center of the lens. The closer the image the greater the focal distance- refer to Martini Essentials p. 309. Image resolution is dependent on the focal distance equaling the distance between the center of lens and the retina. Accommodation: lens compensates for variations in the distance between the eye and the object in view by changing its shape. Close objects, the ciliary muscle contracts, and the suspensory ligaments allow the lens to round up. Distant viewing, the ciliary muscle relaxes, and the suspensory ligaments pull against the margins of the lens and flatten it. Close- Round Lens, Far- Flat lens. Visual acuity, accommodation and color blindness will be taught through the use of a hands-on 2 day lab, Visual Test Acuity Lab.

Unit 2: The Cardiovascular System *Time Frame-2.5 weeks*

- **Ch. 11- The Heart:**

Ch. 11- The Heart will introduce the student to the heart and its subsequent responsibilities. Students will learn and demonstrate their knowledge of the 4 chambers of the heart and the 2 circulation systems of the heart; the pulmonary and systemic circulations, by diagramming the heart and presenting their findings to the class by demonstrating the chambers and circulation systems on the heart model, day 1. Day 2, students will take Ch. 11 PowerPoint lecture notes on the anatomical divisions and structures of the heart. Day 3 & 4 will be spent in the lab working on a circulation worksheet. Day 5 this worksheet will be reviewed and the Sheep heart lab will begin, 2 days. Heart valves will be discussed through lecture notes and heart sounds video- 1 day. Notes on the conductivity of the heart (2 types of cells that do not contract- nodal cells: establish rate of cardiac

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contraction- located at sinoatrial (SA) and atrioventricular (AV) nodes), and conducting cells (distribute the contractile stimulus to the general myocardium- AV bundle, bundle branches (left and right), and Purkinje fibers)- 1 day, p. 400 Martini essentials. Show video of defibrillation of heart- 1 day. Blood pressure and ECG (electrocardiogram) lab- 2 days. Review cardiac output and perform practice calculations on varying situations. Cardiac Output CO ml/min = SV (stroke volume) X HR (heart rate). 3 factors that influence CO- blood volume reflexes, autonomic innervation, and hormones.

CO= 80 ml/beat X 70 bpm= 5600 ml/min (5.6 L/min)

Students will then learn the anatomy and physiology of blood vessels through Ch. 11 Lecture notes/ blood vessels. Goldfish lab will demonstrate to students the flow of blood from veins-venules-capillaries-arterioles-arteries. Essay assignment: Students will compose an original essay by describing the activity of the heart using the following words:

1. right atrium,
2. left atrium,
3. right ventricle,
4. left ventricle,
5. bicuspid valve
6. Action Potential
7. Depolarization
8. Atrial contraction
9. Ventricular contraction
10. ECG or EKG
11. tricuspid valve
12. aortic semilunar valve
13. pulmonary semilunar valve
14. pulmonary artery
15. pulmonary vein
16. aorta
17. superior vena cava
18. inferior vena cava
19. SA Node
20. AV Node

11 Practice test will be completed in groups of 2 to prepare for the exam. Ch. 11 Exam.

Unit 3: Blood

Time span-1.5 weeks

- **Ch. 10- Blood**

Ch.10- Blood will introduce the students to the components of blood, health issues related to blood, blood types, transfusion problems, blood formation and blood cells. Ch. 10 Pre-reading guide, Ch. 10 Objective checklist, and Ch. 10 CCD will be completed before lecture notes begin. Ch. 10 PowerPoint lecture notes will be given day 2. Blood components CCD will be used as a pre-lab for the blood smearing lab. Pre-lab will take 2 days, 1 day for notes and Formed Elements CCD, day 2 for hematopoieisis and components of blood. Blood smearing lab is for 3 days. Day 1 procedures are reviewed and techniques for staining and mounting slides. Lab- 2 days. Blood clot formation notes follow blood smearing lab. CCD Blood types precedes blood type notes. CCD will highlight the 8 blood types- A+, A-, B+, B-, AB+, AB-, O+, O-, due to the three antigens: A, B and D (Rh factor).

CCD Format: Blood type Antigen Present Ab Present Diagram

Blood typing lab-1 day. Follow technical notes procedure and lab write-up. Ch. 10 PowerPoint Lecture Notes on blood disorders, 1 day. Why is urine yellow?

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notes, 1 day. Group review activity for test preparation. Hwk. Packet due. Ch. 10 test.

Unit 3: Digestive System *Time span-1 week*

- **Ch. 14- The Digestive System**

Ch. 14- The Digestive System will introduce students to the structures that make-up the digestive system, the ingestion and digestion of food items, and the defecation of food items. Ch.14 Pre-reading guide, Ch. 14 Objective checklist and Ch. 14 CCD will be completed before Ch. 14 PowerPoint lecture notes begin. Coloring plate will be completed. Oral cavity examination will be performed by groups.

Unit 4: Reproductive System

- **Ch. - The Reproductive System** *Time span 1.5 weeks*

This chapter will introduce the students to the reproductive systems of the male and female body. Permission slips must be sent home and signed by parents before unit begins. Students who do not bring in permission slips will work on Ch. Overview, pre-reading guide, chapter objectives and CCD for the respiratory system. All other students will do the same for the reproductive system chapter. Virtual lab will be done showing the fertilization of sea urchin eggs by sperm along with cornell notes, activity sheets, group discussions- Socratic seminars, coloring plates, microscopic analysis of cat ovaries and testis.

Unit 5: Nutrition *Time span- 2 weeks*

- **Nutrition and cellular metabolism Ch. 2**

Students will learn the micro and macro nutrients responsible for cellular respiration. Cornell notes and a CCD will be utilized for this unit. Objectives will be assorted from ch. 2 and the digestive system chapter. A food label reading project will be performed allowing students the opportunity to understand and to analyze common food items that they consume. Nutrition project will be the culmination for this project. Refer to technical manual for project details.

Unit 6: Rat Dissection- Refer to technical manual for the directions.

Time span- 3 weeks

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