Educational Epiphany ™
Districtwide PLC Protocol for **Science**

Overton HS
2023-2024 SYR
Science Lesson Plans

Teacher/Teacher Team: Dr. Pani
Grade: 12
Date: 02/26-03/08/2024

Lesson Plans should be posted by 3PM each Friday.

#	Planning Question	Teacher/Teacher Team Response
1	Which **state standard** is your lesson progression addressing?	HAP.LS1.15 Prepare and/or use a model of a human heart to explain systole and diastole and the heart's internal and external control mechanisms involved in producing the heartbeat. HAP.LS1.16 Explain blood pressure in terms of systole and diastole. Describe the factors affecting blood pressure and blood pressure's role in homeostasis. HAP.LS1.14 Describe, in terms of structure and function, the systemic and pulmonary paths of the cardiovascular system. **HAP.LS1. 22 Analyze ABO and Rh Blood groups as a basis for blood transfusion and infant incompatibility reactions.**
2	What **scientific concepts or phenomena** are embedded in the state standard?	•Blood Donation Blood donors' leftover immune cells reveal secrets of antibody affinity. Researchers have gained crucial insights into how natural killer cells circulating in the human body differ from those typically studied in the lab. https://www.sciencedaily.com/releases/2018/03/180309142350.html • A Case Study: Aluminum: More Harmful Than Helpful?, pp. 344-345 Evaluate • Chapter 9 Concept Check, pp. 306, 309, 312, 317, 322, 330, 336, 338 • Chapter 9 Study Guide, pp. 342-34 do not need to be concerned about them. Although osteoporosis, a disease in which bone density
3	What teacher **knowledge, reminders, and misconceptions** are assumed in the standard?	Explanation and Support of Standard(s) The Cardiovascular System: The heart and circulatory system make up your cardiovascular system. Your heart works as a pump that pushes blood to the organs, tissues, and cells of your body. Blood delivers oxygen and nutrients to every cell and removes the carbon dioxide and waste products made by those cells. Blood is carried from your heart to the rest of your body through a complex network of arteries, arterioles, and capillaries. Blood is returned to your heart through venules and veins. If all the vessels of this network were laid end to end, they would extend for about 60,000 miles (more than 96,500 kilometers), which is far enough to circle the planet Earth more than twice! The one-way system carries blood to all parts of your body. This process of blood flow within your body is called circulation. Arteries carry oxygen-rich blood away from your heart, and veins carry oxygen-poor blood back to your heart.

		In pulmonary circulation, though, the roles are switched. It is the pulmonary artery that brings oxygen-poor blood into your lungs and the pulmonary vein that brings oxygen-rich blood back to your heart. Describe the composition and volume of whole blood. • A Case Study: Aluminum: More Harmful Than Helpful? pp. 344-345 Evaluate • Chapter 9 Concept Check, pp. 306, 309, 312, 317, 322, 330, 336, 338 • Chapter 9 Study Guide, pp. 342-34do not need to be concerned about them. Although osteoporosis, a disease in which bone density
4	What **objective(s)** must be taught? In what order? Why?	**SWBAT analyze the Blood Types IOT evaluate the mechanisms of <u>HOMEOSTASIS</u> in human**
5	What is your **resource plan for each of the 5 Es** of inquiry-based science instruction? 1. Engage 2. Explore 3. Explain	•Describe the composition and volume of whole blood. • Describe the composition of plasma and discuss its importance in the body. Elaborate • A Case Study: Aluminum: More Harmful Than Helpful, pp. 344-345 Evaluate •Chapter 9 Concept Check, pp. 306, 309, 312, 317, 322, 330. •Chapter 9 Study Guide, pp. 342-34 Describe the function and physiology of red and white blood. •Explain how blood cells form. • Understand ABO and Rh blood grouping

	4. Elaborate 5. Evaluate	• Blood Donation Facts, p. 431 • Science and Social Ethics, p. 432 • Polluted Blood, p. 435 • Related Research-Blood Substitutes, p. 441 • Autism from Vaccines, p. 446 • Fear of Blood, p. 447 Suggested Activities Engage • A&P Interlude: True Blood • Phlebotomy • Crash Course-True Blood, Part I • Crash Course-There Will Be Blood, Part 2 Explore EMC AA&P Workbook &Laboratory Manual: Chapter 12: The Lymphatic System and The Blood, pp. 221-225 • Laboratory Activity 1: Pathology of the Blood and Lymphatic System; pp.235 Explain • Case Study Investigation #12, pp. 422,452 Elaborate • A Case Study: Environmental Immunization, pp. 458-459 Evaluate • Chapter 12 The Lymphatic system and The Blood-Concept Check pp. 425, 429, 435
6	What **academic language** must be taught **before and after the explain phase**? How will the academic language be **taught and assessed**?	blood pressure, blood vessels, circulatory system, heart, pulse, arteries, hydrostatic pressure, lymphatic vessels, veins, constriction, dilation, vasoconstriction, vasodilation, arteriole, cardiac infarction, coronary arteries, coronary veins, endocardium, epicardium, fibrous pericardium, myocardium, pericardium, pulmonary circulation, serous pericardium, systemic circulation, aorta, aortic valve, Atrioventricular (AV) valves, Atrioventricular (AV) nodes, atrium, bicuspid valve, Bundle of His, chambers, chordae tendineae, inferior vena cava, mitral valve, pulmonary artery, pulmonary valve, pulmonary veins, cardiac cycle, cardiac output, diastole, heart rate, stroke volume, systole, Centrifuge, hematocrit, packed cell volume, plasma, ABO blood group system, blood type, complete blood count (CBC), erythroblast, erythrocytes, hemoglobin, red blood cells (RBCs), reticulocyte, Rh factor, transfusion, B lymphocyte, basophil, eosinophil, leukocytes, lymphocyte, monocyte, mononuclear white blood cell, neutrophil, T lymphocyte, white blood cell (WBC), platelet, thrombocyte, acute, antibiotic, Kupffer cell, macrophage, mast cell, phagocytosis, clotting factors, thrombin, bilirubin
7	What is your plan to ensure that assessment of instruction on this standard is not solely characterized by remembering or **regurgitating factual information**?	How does blood help maintain homeostasis within the human body? Curricular Resources Textbook: Applied Anatomy & Physiology: A Case Study Approach Chapter 12: The Lymphatic system and The Blood, pp. 422-436 • Tree Man, p. 427

8	What **literacy concept** can be intertwined with instruction on this scientific concept or phenomenon?	Including the content lecture, students will learn dissection of heart, brain, rats, piglets' systems that are similar as human structure and function. Compare between skin types, and the genetics info behind the Integumentary system.
9	How will instruction be impacted by the Cross Cutting Concepts and the Science & Engineering Practices?	This is a premed course. This study will help them to prepare for nursing schools, medical colleges, pharmacy institutes, pharmacology labs, and the graduate school scientific careers.