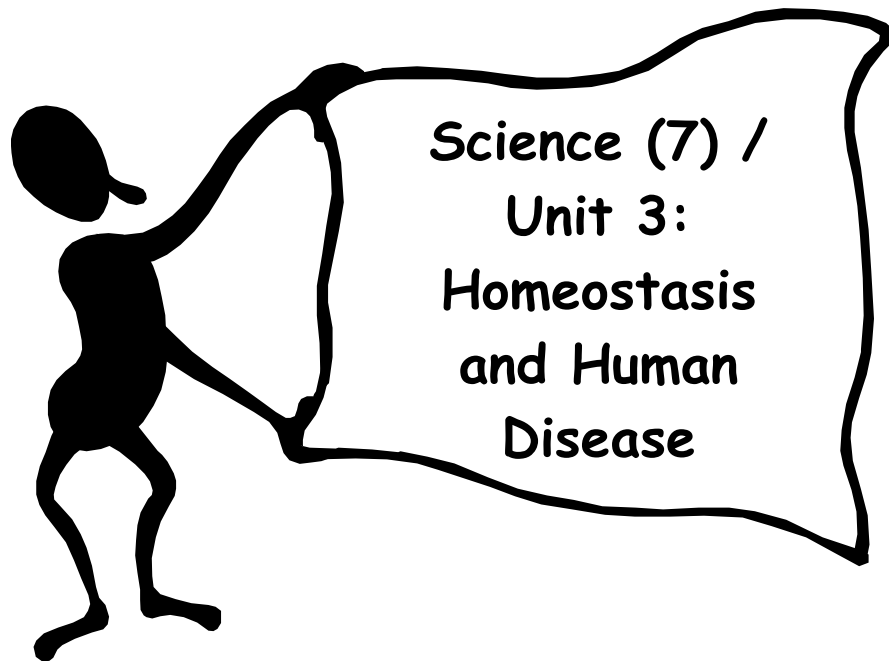


New York City Department of Education Magnet Program District 25 & 28

JHS 185 (Edward Bleeker)
Vowinkel



Essential Question: How do different organ systems work together to keep us alive?

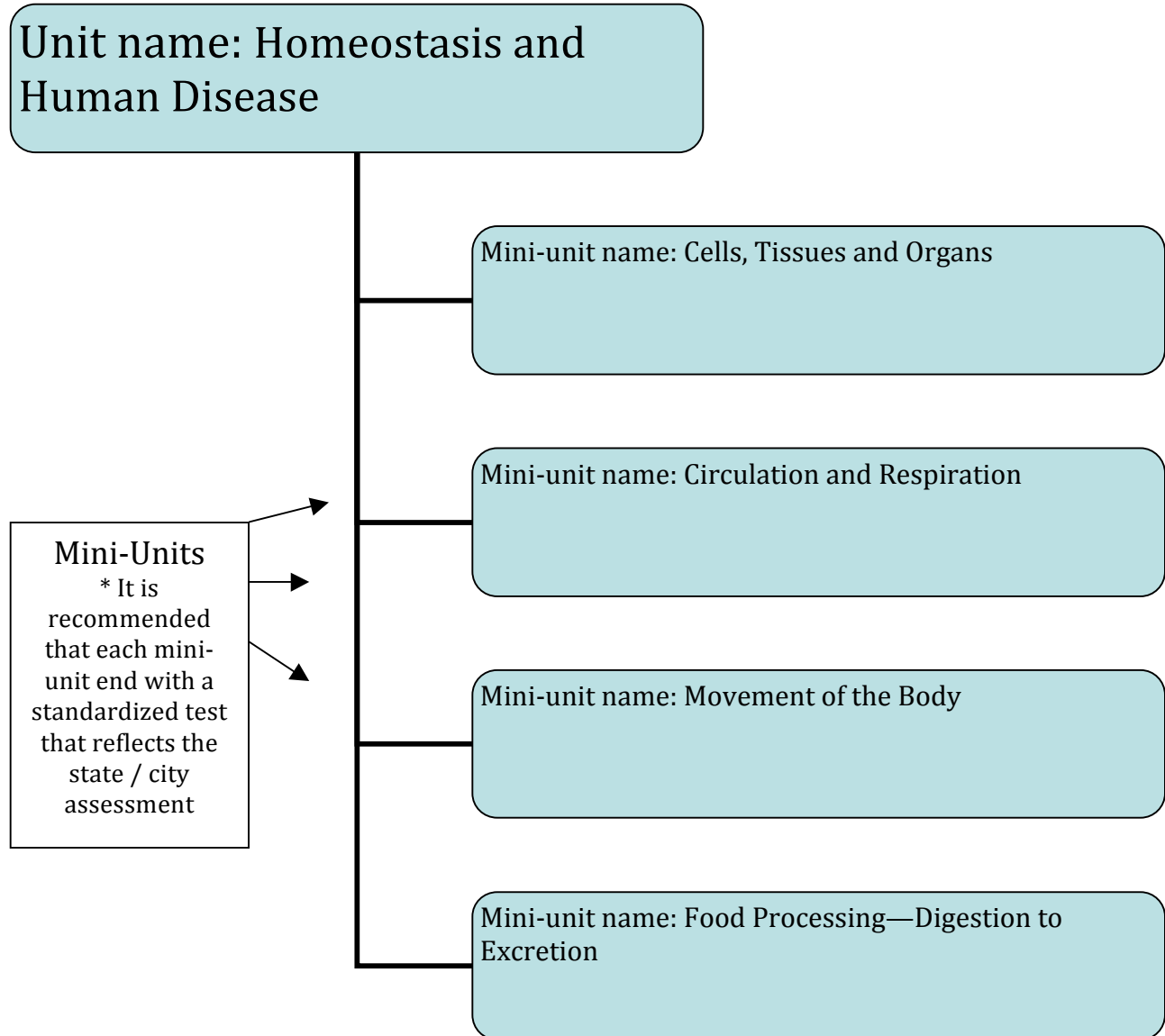
Suggested Time Frame: 7-8 weeks

Theme: Medicine

Graphic Overview of Unit

Suggested Time Frame:

Essential Question:



Unit's Culminating Project: (briefly explain in 2-3 sentences):

Students will be posing as medical doctors producing a pamphlet for those caring for a loved one with a multiple organ disease. The pamphlet will be didactic to those who care for the sick individual, describing the individual's disease at the level of outward symptoms, as well as discussing the scientific causes of the disease. They will emphasize the importance of balance in the body, explaining how the balance has been disrupted, and offer suggestions of treatments that would be best suited for restoring this balance.

Stage 1- Desired Results

Standards-Based Learning Goals:

LE: 1.1a, 1.1b, 1.1c, 1.1d, 1.1e, 1.1f, 1.1g, 1.2a, 1.2b, 1.2c, 1.2d, 1.2e, 1.2f, 1.2g, 1.2h, 1.2j, 5.1a, 5.2b, 5.2d, 5.2e, 5.2f

Living Environment Standards

- 1.1a Living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Cells are usually microscopic in size.
- 1.1b The way in which cells function is similar in all living things. Cells grow and divide, producing more cells. Cells take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs.
- 1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts. Many cells have a nucleus.
- 1.1d Some organisms are single cells; others, including humans, are multicellular.
- 1.1e Cells are organized for more effective functioning in multicellular organisms. Levels of organization for structure and function of a multicellular organism include cells, tissues, organs, and organ systems.
- 1.1f Many plants have roots, stems, leaves, and reproductive structures. These organized groups of tissues are responsible for a plant's life activities.
- 1.1g Multicellular animals often have similar organs and specialized systems for carrying out major life activities.
- 1.2a Each system is composed of organs and tissues which perform specific functions and interact with each other, e.g., digestion, gas exchange, excretion, circulation, locomotion, control, coordination, reproduction, and protection from disease.
- 1.2b Tissues, organs, and organ systems help to provide all cells with nutrients, oxygen, and waste removal.
- 1.2c The digestive system consists of organs that are responsible for the mechanical and chemical breakdown of food. The breakdown process results in molecules that can be absorbed and transported to cells.
- 1.2d During respiration, cells use oxygen to release the energy stored in food. The respiratory system supplies oxygen and removes carbon dioxide (gas exchange).
- 1.2e The excretory system functions in the disposal of dissolved waste molecules, the elimination of liquid and gaseous wastes, and the removal of excess heat energy.
- 1.2f The circulatory system moves substances to and from cells, where they are needed or produced, responding to changing demands.
- 1.2g Locomotion, necessary to escape danger, obtain food and shelter, and reproduce, is accomplished by the interaction of the skeletal and muscular systems, and coordinated by the nervous system.
- 1.2h The nervous and endocrine systems interact to control and coordinate the body's responses to changes in the environment, and to regulate growth, development, and reproduction. Hormones are chemicals produced by the endocrine system; hormones regulate many body functions.
- 1.2j Disease breaks down the structures or functions of an organism. Some diseases are the result of failures of the system. Other diseases are the result of damage by infection

Standards-Based Learning Goals:

LE: 1.1a, 1.1b, 1.1c, 1.1d, 1.1e, 1.1f, 1.1g, 1.2a, 1.2b, 1.2c, 1.2d, 1.2e, 1.2f, 1.2g, 1.2h, 1.2j, 5.1a, 5.2b, 5.2d, 5.2e, 5.2f

Living Environment Standards

- 1.1a Living things are composed of cells. Cells provide structure and carry on major

Concepts	
<p>Big Ideas for this Unit</p> <p>Homeostasis</p> <p>Structure of Organisms</p> <p>Organ interdependence</p>	<p>Magnet School Theme:</p> <p>Medicine</p> <p>How does the Big Idea in your unit connect to your theme?</p> <p>Without our body's ability to respond and adapt to our environment, we would be unable to live. Certain medical advances may be able to substitute for failures of homeostasis.</p>
<p>Enduring Understandings</p> <p>The failure of a body system can lead to disease.</p> <p>Body systems are interdependent.</p> <p>Food is a form of energy that must be processed and delivered to our cells to keep them alive.</p> <p>The structure of an organism is arranged in a hierarchical manner: organism → organ systems → organs → tissues → cells → organelles</p> <p>Different cells perform different functions</p>	<p>Overarching Essential Question: (this question should connect to your school theme)</p> <p>How do different organs and body systems keep us alive?</p> <p>Why are the brain, lungs and heart all useless without each other?</p> <p>How does medicine restore deficits in homeostasis?</p> <p>How does eating food keep us alive?</p>
Content and Skills	
<p>Content Students will know...</p> <p><u>Homeostasis</u></p> <p><u>Organelles</u> Cell Membrane, Cytoplasm, Nucleus, Vacuole, Mitochondrion, Endoplasmic Reticulum, Golgi Apparatus</p> <p><u>Hierarchy of Organism</u></p>	<p>Skills Students will be able to...</p> <p>-Explain the role of homeostasis in responding to the environment and sustaining life</p> <p>-Recognize that all living things are made of cells</p> <p>-Draw a picture of the cell and describe the functions of the organelles within it</p>
<p>Content Students will know...</p> <p><u>Homeostasis</u></p> <p><u>Organelles</u></p>	<p>Skills Students will be able to...</p> <p>-Explain the role of homeostasis in responding to the environment and</p>

Stage 2- Summative Assessment Evidence

If students understand, know and are able to do the items in Stage 1, they should be able to show their understanding by completing an authentic task found in the world beyond the classroom.

- Design the Culminating/Summative Task:
- Please note: The Essential Question and the Grasp are interconnected. The GRASP is a way for students to demonstrate their knowledge and understanding unit by answer of the Essential Question. Or you can say, they are answering the essential question through their GRASP.

G- (goal)

Your goal is to create a medical pamphlet on a disease that affects multiple body systems. This pamphlet will be published and used by people who are caretakers of those with the disease that you describe. This pamphlet will describe the body systems that are affected, the deficits in homeostasis that led to or caused the disease (the problem) and potential treatments, as well as their drawbacks. Additionally, since family members may be at risk of developing the disease, you want to be sure to include possible precautions and preventions.

R- (role)

You work for a hospital as a renowned medical doctor who specializes in a specific disease. Your hospital administrator has asked that you publish a pamphlet on the disease about which you are an expert.

A- (audience)

There are many individuals who cannot afford a full-time nurse, yet they must care for loved ones who are afflicted by complex diseases. The pamphlet you publish will be available nationwide to those who come into the hospital and have loved ones who are affected by the disease.

S- (situation)

Those with loved ones affected by the disease need access to information that can give them sufficient information to deal with the disease, yet it needs to be broken down in clear terminology and be concise enough for them to navigate through (unlike the barrage of pieces of information on the internet).

P- (purpose and product)

You want to produce a stand-alone pamphlet of information. It needs to be complete, but still accessible. Besides the medical causes (failures of homeostasis) and effects (the symptoms of the disease), those who will be using the pamphlet could benefit

tremendously from understanding the historical development of the disease and realizing ahead of time how the disease will progress. It will be a taxing struggle for both the patient and the patient's loved ones. Thus, this is more than a strict medical guide. Remember, you have experience working with this disease and understand it better than almost anyone on the planet. Include information you would want to know about if you had a loved one with the disease.

S- (standards for performance)

As with nearly all published scientific work, your information will be peer reviewed. Two other medical staff members (students in your class) will examine the information that you intend to publish. One will be another expert in your field who will focus on the quality and accuracy of information. The other will be another staff member who has expertise in a separate area and will focus more on the clarity of the information for those who do not have specialized knowledge of the disease you are working on.

Student Task

In the space below, write the task exactly as students will see it. You should give this task to them on the first day of the unit. This way they know where they are going.

You are a world-renowned medical doctor, specializing in diseases of the human body. Your particular expertise is in _____, which affects several body systems. Working at a hospital, your Chief of Medicine asks you to create a pamphlet about the disease that you specialize in. This pamphlet will be published and given to those who have loved ones who are affected by this disease.

There are many individuals who cannot afford a full-time nurse, yet they must care for loved ones who are afflicted by complex diseases. The pamphlet you publish will be available nationwide to those who come into the hospital and have loved ones who are affected by the disease. Those with loved ones affected by the disease need access to information that can give them sufficient information to deal with the disease, yet it needs to be broken down in clear terminology and be concise enough for them to navigate through (unlike the barrage of pieces of information on the internet).

You want to produce a stand-alone pamphlet of information. It needs to be complete, but still accessible. Thus, it should include a variety of pieces of information. Suggestions:

Background Information

- What is the disease?
- When was the disease discovered?
- Are there any famous cases involving this disease?
- How well is this disease understood by the medical community?
- Is the disease curable? If not, are people generally able to live with the disease (if it is treated correctly) do they typically die from it?

Symptom Information

- Which organs and body parts are either involved or affected by the disease?
- Which of these organs is the cause, and which organs or body parts are simply affected by the disease? It is important to notice the difference between which organs are causing the disease (where the problem is) and which organs or body parts have problems working correctly AS A RESULT of the faulty organ.
- What are the outward symptoms? That is, what does the patient feel? What would someone who is looking at the patient see?

Homeostasis: This should be your longest and most developed section!

(It would be a good idea to include diagrams and illustrations from this section)

- **Which organ or body part is causing the disease?**
- **What is the function of this organ or body part (why do we have it)?**
- **What is homeostasis and why is it important for survival?**

- **How does this organ or body part usually maintain homeostasis? That is, what types of things usually throw off the normal balance and how is this organ supposed to respond to these environmental changes?**
- **What happened to this organ so that it cannot respond to its environment the way that it should?**
- **In this specific disease, what problems with homeostasis arise? That is, what isn't working that should be working, thus, causing an imbalance that leads to disease. Discuss this question at both the cellular level and the organ level.**
- **How do the affected organs or body parts usually work with each other? (Diagram or Illustration!)**
- **How do these organs or body parts depend on each other? What would happen to one if it lost the other?**
- **In this specific disease, what is happening between the organ (the one that is not working now) and the other affected organs and body parts? That is, how does the one organ disrupt another organ or body system's homeostasis?**

Restoring Homeostasis (Diagrams and illustrations recommended for this section)

- There are a variety of potential treatments of this disease. Generally, these fall under three categories: a) ones that use medical drugs, b) ones that use medical therapy (not drugs, but procedures done by a doctor or specialist and c) ones that involve natural healing process (e.g., herbal remedies, vitamins, activities (such as exercise)).
- Make sure for each of the treatments that you discuss that you state whether the treatment is intended to treat the symptoms (organs or body parts affected) or the cause. That is, if the lungs aren't working properly because of a weak heart, the symptoms are breathing (lungs) and the cause is the amount of blood a heart pumps.
- What treatments are available using medical drugs? How do they work? How do they restore homeostasis? What are the potential side effects?
- What treatments are available using medical therapy? How does this process work? How does this process correct the problem or restore homeostasis? What are the potential risks?
- What treatments are available using natural healing processes? How do they work? How do they restore homeostasis, or correct the problem? What are the potential risks?
- You should also be sure to mention which is the most commonly used treatment, responding to why one is used more often and others are often not.
- What is your recommendation for treatment and why?

Living with the Disease

- What are some of the hardest obstacles (besides the symptoms) that a person living with the disease might face?
- What are some of the problems a family member might encounter when caring for their loved one?
- Would you recommend counseling? Why or why not?
- What are some other options to help the sick and their loved ones deal with this issue?

Prevention

- Very often, family members of a loved one with a specific disease are also at risk. This is because they share the same genes and (often) similar lifestyle habits. Thus, it is important that

family members know what types of things (e.g., eating habits, habits, activities, exposure to certain chemicals) put them at risk. What risks are associated with this disease?

- Describe why each of the major risks puts a person at risk. What do these risks do that could potentially lead to a disruption in homeostasis?
- What are some forms of prevention? (Note: this is different than just avoiding risks. For example, sunbathing too often puts a person at risk for skin cancer, but using suntan lotion is a form of prevention).
- How do these forms of prevention help a person's body avoid the disease (and disruption to homeostasis)?

As with nearly all published scientific work, your information will be peer reviewed. Two other medical staff members (students in your class) will examine the information that you intend to publish. One will be another expert in your field (student working on the same disease) who will focus on the quality and accuracy of information. The other will be another staff member who has expertise in a separate area (student working on a different disease) and will focus more on the clarity of the information for those who do not have specialized knowledge of the disease you are working on.

Your options are: (List of diseases)

At the end, you and other classmates working on similar projects will present the most important aspects of your disease to the class, in a five minute presentation.

Rubric for Culminating Project

www.rubistar.com

Project Component	1	2	3	4
Accuracy of Information	There are numerous major scientific errors— student does not demonstrate an understanding of underlying concepts.	There are 1-2 statements that contain major scientific errors, but student demonstrates knowledge of underlying concepts	There are 1-2 statements that contain minor scientific errors, but as a whole, it is in accord with scientific theory.	All information is in accord with scientific theory
Detail	Some sections are incomplete or 5+ questions or objectives are responded to with insufficient support.	Each section is attempted. 3-4 questions or objectives are responded to with insufficient information or support.	Each section is complete and all questions are answered. 1-2 questions or objectives require more support.	Each section is complete and all questions are answered and supported in several sentences.
Clarity and Usefulness	The reader has a difficult time seeing why the content is relevant to the assigned project.	Overall, a reader can learn from the content presented, but there are several portions that seem either misplaced or insignificant.	Content is presented clearly. There may be 1-2 sentences of which are difficult for the reader to understand the significance.	Content is presented clearly and readers can understand why the information is important and how it can be used.
Diagrams and Illustrations	Diagrams are either inaccurate or messy, rarely adding to the reader's understanding of the topic.	Diagrams and illustrations are fairly neat and accurate, sometimes adding to the reader's understanding of the topic.	Diagrams are accurate and fairly neat, helping the reader understand more about the topic.	Diagrams and illustrations are neat, accurate and add value to the reader's understanding of the topic.
Sources	Insufficient number of sources used.	3 or more sources are used, but are not referred to or cited.	3 or more sources are used, but one is either not referred to or cited.	3 or more sources are used, referred to and cited.
Overall Appearance	The pamphlet's appearance does not appeal to the reader and is generally not very well-organized.	The pamphlet is fairly attractive and the information is organized.	The pamphlet is attractive and entices a reader to look through it. The information is well-organized.	The pamphlet is attractive and entices a reader to look through it. The information is exceptionally well-organized.