



# INTRODUCTION TO MEDICAL LABORATORY & HEALTH SCIENCES

**2022-2023**

**Grades: 9-10**

Prerequisite(s): None

## Course Description

**Description:** Scholars will engage in fundamental concepts of Medical Laboratory & Health Sciences. This survey course will begin with an exploration of the many careers in medicine and health care, which are organized into five career pathways. Scholars will then examine each of the human body systems, including both structure and function with the emphasis on the emergence of diseases and disorders. To complete the course, scholars study skills to maintain health and wellness.

## Course Units/Skills & Knowledge

This course is broken into 4 units:

<a href="#"><u>UNIT 1: INTRO TO MEDICAL LABORATORY &amp; HEALTH SCIENCES</u></a>
<a href="#"><u>UNIT 2: BASIC HUMAN ANATOMY &amp; PHYSIOLOGY</u></a>
<a href="#"><u>UNIT 3: DISEASES AND DISORDERS OF THE HUMAN BODY</u></a>
<a href="#"><u>UNIT 4: HEALTH MAINTENANCE PRACTICES &amp; THERAPIES</u></a>

SEP	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE
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<p><a href="#"><u>Unit 1</u></a> Intro to Medical Laboratory &amp; Health Sciences</p>	<p><a href="#"><u>Unit 2</u></a> Basic Human Anatomy &amp; Physiology</p>	<p><a href="#"><u>Unit 3</u></a> Diseases and Disorders of the Human Body</p>	<p><a href="#"><u>Unit 4</u></a> Health Maintenance Practices</p>
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## UNIT 1: INTRO TO MEDICAL LABORATORY & HEALTH SCIENCES

### UNIT 1 UNDERSTANDINGS:

**U1** Healthcare is a fundamental human service because it affects our ability to pursue life goals, reduces pain and suffering, helps prevent premature loss of life, and provides information needed to plan for a healthy life.

**U2** There are many careers in medicine and health care, which are organized into five career pathways that vary greatly in education requirement, salary, and responsibility.

Knowledge	Skills
<p><i>What knowledge will students learn as part of this unit? <b>Students will know...</b></i></p> <ul style="list-style-type: none"> <li>● Definition of healthcare as efforts made to maintain or restore physical, mental, or emotional well-being by trained and licensed professionals via the prevention, diagnosis, treatment, or cure of disease, illness, injury, and other physical and mental impairments in people</li> <li>● Key facts about the demands and future outlook of careers related to the medical and health sciences field</li> <li>● Similarities and differences among careers within the medical and health sciences pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research &amp; development)</li> <li>● What careers are best suited for them based on their understanding of their personal strengths and weaknesses</li> <li>● Pertinent information on various careers (at least 5) in the Medical &amp; Health Sciences Career Cluster, including the education/training required to pursue such career</li> </ul>	<p><i>What skills will students learn as part of this unit? <b>Students will be skilled at...</b></i></p> <ul style="list-style-type: none"> <li>● Identify the importance of health care at a personal, family, community and societal level</li> <li>● Describe the role and responsibilities of a healthcare provider</li> <li>● Explain who provides healthcare and the advantages of having a healthcare provider</li> <li>● Identifying the types of careers that make up the medical and health sciences field</li> <li>● Analyzing their personal strengths and weaknesses to find careers that meet their needs and interests</li> <li>● Evaluating the benefits and drawbacks for various career options within the Medical and Health Sciences Career Cluster</li> <li>● Evaluating personal traits, characteristics, and goals to determine fit for potential jobs/career</li> </ul>



## UNIT 1: PERFORMANCE TASK:

**PERFORMANCE TASK:** *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Criteria to assess understanding: *(This is used to build the scoring tool.)* “Look Fors”

### Product:

- Display provides an exceptional representation of the career with accurate and current information balanced with creative visuals that enhance the information
- Articulates basic information about a medical or health science career that includes, but is not limited to, overall job description, job outlook, average salary, skills, required education/training/certification, and typical working environments
- Clearly connects the job skills, tasks, and responsibilities to the career’s medical & health science focus pathway
- Rationalizes the relationship between the job description, including the skills, tasks, and responsibilities, and personal qualities important for success
- Makes connections between the demands of the career and at least 3 rewards and 3 challenges someone in the career might face
- Thoughtfully uses quote/information from local medical & health science professionals as supporting evidence
- Thoroughly explains, using relevant but concise details, the personal fit of the job based on their own interests, traits, and goals

### Self-Knowledge & Reflection:

- Compares and contrasts other careers in order to shape their potential career goals and aspirations
- Fully articulates the thinking and learning processes and analyzes the value of the learning experience

### Performance Task focused on Transfer:

[HOSA- Health Career Display](#) (External Exemplar)

- [Example 1](#)
- [Example 2](#)

**Goal:** Your goal is to further explore and interpret a particular career in the Medical and Health Sciences Career Cluster that best fits your interests, strengths, and aspirations answering the EQ: **What is the place for me in the medical and health sciences field?**

**Role:** You have just landed your dream job! The HR director has asked you to inspire the next generation by presenting a Medical & Healthcare Career fair.

**Audience:** Your audience will be your peers and scholars in the lower school.

**Situation:** The Medical and Health Sciences Career Cluster is an ever expanding career field. We need to help young scholars realize the vast opportunities that our local Rochester medical facilities have to offer.

**Product:** **Working with available materials, you will need to develop a Health Career Display.**



## UNIT 2: BASIC HUMAN ANATOMY & PHYSIOLOGY

### UNIT 2 UNDERSTANDINGS:

**U1** The human body consists of trillions of cells that are organized in a hierarchy of structural levels that interact.

**U2** The functions of biological organs systems can be inferred from their overall structure, the way their components are shaped, and the connections of their parts.

**U3** Standard medical terminology and anatomical language is utilized by professionals in the Medical and Health Science fields.

Knowledge	Skills
<p><i>What knowledge will students learn as part of this unit? <b>Students will know...</b></i></p> <ul style="list-style-type: none"> <li>● The relationship among cells, tissues, organs, and systems</li> <li>● The structures and functions of the body systems related to support, transportation, regulation, maintenance, and reproduction</li> <li>● Anatomical language including body planes, directional terms, quadrants and cavities</li> </ul>	<p><i>What skills will students learn as part of this unit? <b>Students will be skilled at...</b></i></p> <ul style="list-style-type: none"> <li>● Using medical terminology and anatomical language</li> <li>● Analyzing the complex human structure to determine how it functions</li> <li>● Evaluating a body system for efficiency, functionality, and vulnerability to disease</li> <li>● Demonstrating procedures for measuring and recording vital signs</li> </ul>



## UNIT 2 PERFORMANCE TASK:

**PERFORMANCE TASK:** *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

Criteria to assess understanding: *(This is used to build the scoring tool.)* “Look Fors”

Product:

- Thoroughly articulates the anatomical structure along with the physiological function of the selected system and its main organs and parts
- Clearly identifies the relationship between the structure and function of the organs in the selected system
- Insightful analysis of the selected system to define a problem within the system and develop a solution to optimize the efficiency and effectiveness of that part, body system, and the whole living body
- Implementation of redesign plan is thorough and clear, using both written description and diagrams, demonstrating how the new design might lead to more desirable results
- Carefully assesses the proposed enhancement and predicted outcomes to rationalize that the redesign is an impactful solution- better and more efficient for achieving its main intended functional purpose
- Uses relevant and well chosen medical vocabulary and scientific information to support redesign pitch and answer questions posed by the audience
- Creates a well organized and engaging talk, integrating technology, to present their redesign and the rationale behind it

Self-Knowledge & Reflection:

- Thoughtfully reflects on the decision made by the committee of patent judges
- Fully articulates the thinking and learning processes and analyzes the value of the learning experience

### **Performance Task focused on Transfer:**

Based on: [Redesigning Human Body Systems: Effective Pedagogical Strategy for Promoting Active Learning and STEM Education](#)

Goal: Your goal is to understand the purpose of design, the relationship of design and function, and how altering the design of a given part, organ, or body system could affect the efficiency of that particular part as well as the entire system and the whole living body.

Role: You are a biological engineer who has been asked to enhance one body system in order to optimize the efficiency of the anatomical structure, physiological functions, and/or the aesthetic and functional morphology.

Audience: Your audience will be a team of patent judges who will determine the winning design along with other biological engineers who are also presenting their redesigns.

Situation: Biological design plays vital roles in the survival of the living body and the maintenance of homeostasis throughout the life of the individual (and possibly a role in the survival of the species). The human body is a remarkable biological machine that is supported and maintained by well-structured and interdependent body systems and their unique organs, all contributing in different ways to the biological, physical, mental, and emotional health of a human being. However, while thousands of years of evolution have adapted the human body to life on Earth, questions have been raised regarding whether or not the human body could be improved upon to meet, for example, the new challenges of the consequences of our current environment and lifestyles. Your team of biological engineers will compete for a prestigious patent award based on your suggested redesign to improve the human body.

Product: **Oral redesign pitch for an audience that includes patent judges (school staff) and other bioengineers (peers).**



## UNIT 3: DISEASES AND DISORDERS OF THE HUMAN BODY

### UNIT 3 UNDERSTANDINGS:

**U1** Noncommunicable diseases, the leading cause of death and disability globally, are medical conditions that are not infectious and non-transmissible among people.

**U2** Infectious diseases are disorders caused by pathogens, such as bacteria, viruses, fungi, or parasites, and can be passed to humans either through direct or indirect contact.

**U3** An important part of clinical reasoning is generating a differential diagnosis; developing a list of possible conditions that might produce a patient's symptoms and signs to enable appropriate testing to rule out possibilities and confirm a final diagnosis.

Knowledge	Skills
<p><i>What knowledge will students learn as part of this unit? <b>Students will know...</b></i></p> <ul style="list-style-type: none"> <li>● Key facts about common diseases and disorders, including etiology, pathology, diagnosis, treatment, prognosis, and prevention</li> <li>● How body systems are impacted when disrupted by diseases and disorders, including typical signs and symptoms of common conditions</li> <li>● Common medical practices used to diagnose and treat diseases and disorders of the human body</li> </ul>	<p><i>What skills will students learn as part of this unit? <b>Students will be skilled at...</b></i></p> <ul style="list-style-type: none"> <li>● Analyzing body system changes in light of common diseases and disorders</li> <li>● Describing the etiology, pathology, diagnosis, treatment, prognosis, and prevention of common diseases and disorders</li> <li>● Classifying pathogens, identifying the mode of transmission, and recognizing the chain of infection</li> <li>● Developing a differential diagnosis to provide a conclusion of diagnosis and treatment plan</li> <li>● Collecting information about signs and symptoms from both patients and diagnostic tests</li> </ul>



### UNIT 3: PERFORMANCE TASK:

**PERFORMANCE TASK:** *How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)*

<p>Criteria to assess understanding: <i>(This is used to build the scoring tool.)</i> “Look Fors”</p> <p>Product:</p> <ul style="list-style-type: none"> <li>● Thoroughly articulates the patient’s comprehensive background information and current symptoms based on the patient interview</li> <li>● Compares and contrasts the possible diseases and disorders with a differential diagnosis</li> <li>● Insightful analysis of the patient’s symptoms and test results to defend a final diagnosis with treatment plan</li> <li>● Carefully assess symptoms and final diagnosis to provide a thoughtful and thorough description answering the EQ (What are the consequences, especially unforeseen, of your life choices in terms of health and wellness and how does having a disease or disorder impact your lifestyle?)</li> <li>● Clearly connects the diagnosis with the community of Rochester and thoughtfully provides a means of prevention and/or reduction of risk factors</li> <li>● Creates a well-organized professional presentation utilizing relevant information and graphics to enhance understanding</li> </ul> <p>Self-Knowledge &amp; Reflection:</p> <ul style="list-style-type: none"> <li>● Thoughtfully reflects on the professionalism and performance of the group</li> <li>● Fully articulates the thinking and learning processes and analyzes the value of the learning experience</li> </ul>	<p><b>Performance Task focused on Transfer:</b></p> <p><u>Goal:</u> Your goal is to work as part of a medical team to gather sufficient information in order to confirm a patient’s diagnosis and describe the potential implications this could have for the individual.</p> <p><u>Role:</u> You are a recent college graduate with a Bachelor’s in Biomedical and Health Sciences trying to secure your spot into the URM’s Diseases and Disorders Fellowship Training Program for Post-Baccalaureates.</p> <p><u>Audience:</u> Your audience will first be the patient your team is diagnosing then you will be presenting to current medical students as well as other professionals in the medical and healthcare field.</p> <p><u>Situation:</u> You have applied to the URM’s Diseases and Disorders Fellowship Training Program for Post-Baccalaureates. You meet all the qualifications for eligibility and have completed the initial interview sessions for the fellowship. You have been selected as a top candidate, however, before final decisions are made, the Board of Directors of the fellowship program would like feedback from medical students and healthcare professionals on your performance and presentation of a differential diagnosis of an unknown patient and the possible impact this patient could have in our community.</p> <p><b><u>Product:</u> Professional presentation that could be, but is not limited to, PowerPoint, Prezi, or Poster.</b></p>
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## UNIT 4: HEALTH MAINTENANCE PRACTICES & THERAPIES

### UNIT 4 UNDERSTANDINGS:

**U1** An individual's health is dependent on heredity, environmental factors, social determinants of health, and lifestyle choices.

**U2** To maintain a healthier lifestyle, an individual should apply behaviors that promote physical, mental, and social wellness and use practices that foster the prevention of disease and injury.

Knowledge	Skills
<p><i>What knowledge will students learn as part of this unit? <b>Students will know...</b></i></p> <ul style="list-style-type: none"> <li>● Key facts about the parts of health, factors that adversely impact health, and skills that promote wellness</li> <li>● Impact of social determinants of health, specifically in an urban environment</li> <li>● How various strategies and behaviors promote health and foster the prevention of disease and injury</li> </ul>	<p><i>What skills will students learn as part of this unit? <b>Students will be skilled at...</b></i></p> <ul style="list-style-type: none"> <li>● Differentiate methods of controlling the spread and growth of pathogens</li> <li>● Collecting information and data about family history (heredity), environmental factors, and lifestyle choices</li> <li>● Analyzing the impact of factors that affect their personal health and wellness</li> <li>● Describing how their perceptions of health maintenance are influenced</li> <li>● Creating goals that are specific, measurable, achievable, relevant, and time-bound</li> <li>● Describe strategies for prevention of disease and identify community resources that could be utilized by them or their family</li> </ul>





## UNIT 4 PERFORMANCE TASK:

**PERFORMANCE TASK:** (How will students demonstrate their understanding (meaning-making and transfer) through a complex performance task?)

Criteria to assess understanding: (This is used to build the scoring tool.) “Look Fors”

**Product:**

- Thoroughly collects and provides insightful analysis of personalized information and data about factors and habits that impact health
- Insightful description about how their family, peers, and society influence their perception of health maintenance
- Determines at least 3 SMART goals, one from each major category of health, to improve or maintain health which are clearly connected to their analysis of wellness factors
- Compares and contrasts the various medical practices they could use, including complementary and alternative, to promote wellness and disease prevention and/or achieve SMART goals
- Clearly identifies community resources that they could utilize, either now or in the future
- Creates a well-organized digital portfolio utilizing relevant information and graphics to enhance understanding

**Self-Knowledge & Reflection:**

- Thoughtfully reflects on the importance of a lifelong wellness plan
- Fully articulates the thinking and learning processes and analyzes the value of the learning experience

**Performance Task focused on Transfer:**

Goal: Your goal is to gather, assess, and analyze the factors that impact your health and wellness to determine possible present and future health risks. Then reflect on preventive measures, including lifestyle choices for lowering the risk of developing a disease or disorder.

Role: You are YOU!

Audience: Your audience will be your family members and yourself.

Situation: Being aware of factors that adversely affect your health is an important part of a lifelong wellness plan. Identifying and understanding behaviors that promote health and wellness is even more significant. Although it is not always possible to maintain optimal health, working with family members, community resources, and healthcare professionals can significantly reduce your risk of developing health issues and help in maintaining wellness.

Product: **Digital Personal Health and Wellness Profile**