Human Body Systems (PLTW) Curricular Document

Table of Contents

- Course Information
- Desired Results
    - Course Enduring Understandings
    - Course Essential Questions
    - Science Standards Grade Level Band and by Unit

Unit 1 : Road to Rehabilitation
- Model the skeletal and muscular systems, physical therapy patients at the outpatient center
- End of the Unit Test, and Project

Unit 2: Research Ready
- Development and aging effects on nervous and endocrine systems
- End of the Unit Test, and Project

Unit 3: Adventure Awaits
- Focus on the cardiovascular, respiratory, and immune systems
- End of the Unit Test, and Project

Unit 4: Patient Perspectives
- Focus on urinary and digestive systems and features
- End of the Unit Test, and Project

Human Body Systems Course Information	
CURRICULUM/CONTENT AREA	**COURSE LENGTH**
Science	1 Semester
GRADE LEVEL	**DATE LAST REVIEWED**
9-12	2017 Approved Curricular Docs 2023 Evaluation of Program
PREREQUISITE(s) ***if applicable***	**BOARD APPROVAL DATE**
NA	*December 2024*
PRIMARY RESOURCE ***if applicable***	
Project Lead the Way Biomedical Science: Human Body Systems	
Industry Certifications Opportunities:	

As students progress through the PLTW Biomedical Science program and think about their future, including education, and career paths, opportunities for industry certifications will arise. Certifications provide an assessment of student skills and knowledge of technical content and can provide credit or advanced standing in degree programs, or open the door for internships or other employment opportunities.

Students may consider engaging in the following Industry Certifications:

- Biotechnician Assistant Credentialing Exam Certification (BACE)
- National Health Science Certification (NCHSE)
- National Occupational Competency Testing Institute Certifications (NOCTI)
- First Aid, CPR, and AED Certifications
- Pharmacy Technician Certification
- STOP THE BLEED® Certification
- National Healthcareer Association
- Wilderness First Aid Training

Desired Results

COURSE DESCRIPTION

The HBS course provides foundational knowledge and skills in anatomy and physiology, clinical medicine, and laboratory research. The course engages students in how this content can be applied to real-world situations, cases, and problems. The HBS course includes interviews, challenges, and testimonials from biomedical professionals in a variety of settings—clinical, research, and public health.

This course will help prepare you for a career in medicine or health care and will challenge you to solve real-world problems. You will practice how to think creatively and critically to innovate in science and gain practical experience tackling challenges that biomedical professionals face in the field. You will work through real-world situations, cases, and problems, such as designing a rehabilitation plan for a patient, and helping travelers safely navigate extreme adventures.

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
Patterns: Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them. **Cause and Effect:** Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering. **Scale, Proportion, and Quantity:** In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change. **Systems and Models:** A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems. **Energy and Matter:** Tracking energy and matter flows, into, and out of, and within systems helps one understand their system's behavior. **Structure and Function:** The way an object is shaped	**Unit 1:** • How do different body systems work together to complete specific functions, such as movement and communication? • What is the advantage of using regional and directional terms when discussing location in the body? • How does the structure of specific human tissue relate to its function in the human body? • How does the overall structure of bone provide strength and flexibility but keep bone from being too bulky and heavy? • How does the structure of a joint provide information about its function? • How do bones, muscles, and joints work together to enable movement and locomotion for the human body? • How do specific cells and hormones assist with bone remodeling in the human body? • What tests or technology can be used to diagnose and treat injury to a bone, ligament or joint? • Why would medical professionals measure the range of motion at a joint? • How are we able to overcome muscle fatigue? • What do skeletal muscle structure and attachment to bones indicate about function? **UNIT 2:** •What are the consequences of miscommunication within a body system or between body systems? • How does understanding the structure and function of the human brain help with the diagnosis of disease? • How can neurological diseases affect overall function in other human body systems? • What would happen in the body if the action of neurotransmitters was impaired?

or structured determines many of its properties and functions. **Stability and Change:** For both designed and natural systems, conditions that affect stability and factors that control the rates of change are critical elements to consider and understand.	• Why does reaction time typically differ in reflex and voluntary actions? • How do hormones and feedback mechanisms maintain homeostasis in the human body? • How can improper levels of a hormone lead to disease or dysfunction in the human body? • What are the roles of the endocrine and reproductive systems in human development? • How does the body's reaction to the external environment impact the internal environment? • How are model organisms useful in research? • How do organisms interact with their environment and what are the effects of these interactions? • How does genetic variation among organisms affect survival? UNIT 3 •How do the eye and the brain work together to process what we see? • How does an error in the structure or function of the eye relate to disease or dysfunction? • How do the cardiovascular and respiratory systems work together to maintain homeostasis in the human body? • How does the structure of arteries, veins, and capillaries relate to their function in the body? • What medical interventions are available to improve circulation in impaired blood vessels? • How do EKG tracings show the heart's electrical activity and assist health professionals in making medical decisions? • How do the systems of the human body work together to facilitate gas exchange? • How can analysis of lung capacity be used to diagnose or treat a patient? • How can an individual improve or damage their lung function? • How do the skin and accessory organs of the skin help maintain homeostasis in the human body? • How do the lymphatic and immune systems work together to help maintain homeostasis in the human body? • How do different types of pathogens cause infectious diseases? • How do the cellular components of the human immune system fight disease? • How does the body react when exposed to an antigen for the second time? UNIT 4 • How does the nephron function to maintain fluid and electrolyte balance in the human body? • How can the composition of urine provide clues about problems in human body systems?

	• How can molecular biology techniques be used to diagnose genetic diseases? • How do doctors determine compatible donors and recipients for organ donations? • How does the body obtain and use energy from food? • How do enzymes assist the function of the digestive system? • How is the food you eat broken down to provide energy for the body? • How are digestive diseases diagnosed and treated? • How does the microbiome of the gut play important roles in the body? • How do medical interventions help medical professionals and patients prevent, diagnose, and treat disease?

3 Dimensional Standards



Cross Cutting Concepts BY GRADE BAND AND UNIT	Unit 1	Unit 2	Unit 3	Unit 4
Standard SCI.CC6 - Structure and Function Students investigate systems by examining the properties of different materials, the structures of different components, and their interconnections to reveal the system's function and solve a problem. They infer the functions and properties of natural and designed objects and systems from their overall structure, the way their components are shaped and used, and the molecular substructures of their various materials.	X	X	X	X
Standard SCI.CC7 - Stability and Change	X	X	X	X

Students understand much of science deals with constructing explanations of how things change and how they remain stable. They quantify and model changes in systems over very short or very long periods of time. They see some changes are irreversible, and negative feedback can stabilize a system, while positive feedback can destabilize it. They recognize systems can be designed for greater or lesser stability.				

Science and Engineering Practices by GRADE BAND and UNIT	Unit 1	Unit 2	Unit 3	Unit 4
standard SCI.SEP1 - **A.Asking Questions** Students ask questions to formulate, refine, and evaluate empirically testable questions. This includes the following: • Ask questions that arise from careful observation of phenomena, or unexpected results, to clarify and seek additional information. • Ask questions that arise from examining models or theories to clarify and seek additional information and relationships. • Ask questions to determine relationships, including quantitative relationships, between independent and dependent variables. • Ask questions to clarify and refine a model or an explanation • Evaluate a question to determine if it is testable and relevant. • Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory. • Ask and evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of the design. **B.Defining Problems** Students formulate, refine, and evaluate design problems using models and simulations. This includes the following: • Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and environmental considerations. • Clarify and refine an engineering problem.	X	X		X
Standard SCI.SEP2 - Developing and Using Models Students use, synthesize, and develop models to predict and show relationships among variables and between systems and their components in the natural and designed world. This includes the following: • Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism, or system in order to select or revise a model that best fits the evidence or design criteria. • Design a test of a model to ascertain its reliability. • Develop, revise, and use models based on evidence to illustrate and predict the relationships between systems or between components of a system. • Develop and use multiple types of models to provide mechanistic accounts and predict phenomena. Move flexibly between these model types based on merits and limitations. Develop a complex model that allows for manipulation and testing of a proposed process or system. • Develop and use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and solve problems.	X	X	X	
Standard SCI.SEP3 - Planning and Conducting Investigations Students plan and carry out investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models: This includes the following: • Individually and collaboratively plan an investigation or test a design to produce data that can serve as evidence to build and revise models, support explanations for phenomena, and refine solutions to problems. Consider possible variables or effects and evaluate the investigation's design to ensure variables are controlled. • Individually and collaboratively plan and conduct an investigation to produce data to serve as the basis for evidence.	X	X		X

• In the design, decide on types, how much, and accuracy of data needed to produce reliable measurements. Consider limitations on the precision of the data (e.g., number of trials, cost, risk, time) and refine the design accordingly. • Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts. • Select appropriate tools to collect, record, analyze, and evaluate data. • Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated. • Manipulate variables and collect data about a complex model of a proposed process or system to identify failure points, or to improve performance relative to criteria for success.				
Standard SCI.SEP8 - Obtain, evaluate, and Communication Information Students evaluate the validity and reliability of claims, methods, and designs. This includes the following: • Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions, and to obtain scientific and technical information. • Summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. • Compare, integrate, and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively, or text-based) in order to address a scientific question or solve a problem. • Gather, read, and evaluate scientific and technical information from multiple authoritative sources, assessing the evidence and usefulness of each source. • Synthesize and evaluate the validity and reliability of multiple claims, methods, or designs that appear in scientific and technical texts or media reports. Verify the data when possible. • Communicate scientific and technical information in multiple formats, including orally, graphically, textually, and mathematically. Examples of information could include ideas about phenomena or the design and performance of a proposed process or system.	X	X	X	X

Disciplinary Core Ideas by GRADE BAND and UNIT				
LIFE SCIENCE				
Standard SCI.LS1				
A. STRUCTURE & FUNCTION: Systems of specialized cells within organisms help perform essential functions of life. Any one system in an organism is made up of numerous parts. Feedback mechanisms maintain an organism's internal conditions within certain limits and mediate behaviors.	X		X	X
D. INFORMATION PROCESSING: Organisms can process and store a variety of information through specific chemicals and interconnected networks.	X	X	X	X
ENGINEERING AND TECHNICAL SCIENCE				
Standard SCI.ETS1				
A. **DEFINING AND DELIMITING ENGINEERING PROBLEMS:** Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.	X	X	X	
B. DEVELOPING POSSIBLE SOLUTIONS: When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of			X	

purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical. They are also useful in making a persuasive presentation to a client about how a given design will meet his or her needs.				

UNIT 1: *Road to Rehabilitation*

In this unit, you will join the team of physical therapists at the Garcia-Newgard Memorial Hospital Outpatient Center. Working with a cohort of five patients, you learn about and model the skeletal and muscular systems as you explore the patients' conditions. Along the way, you meet other physical therapy patients at the outpatient center, help diagnose their conditions, and provide treatment and relief.

In the problem, you apply your knowledge and skills to develop a comprehensive plan to address your cohort patient's condition and get them back to the activities they love and the quality of life they want.

UNIT 1 DESIRED RESULTS

ESSENTIAL QUESTION:

- How do different body systems work together to complete specific functions, such as movement and communication?
- What is the advantage of using regional and directional terms when discussing location in the body?
- How does the structure of specific human tissue relate to its function in the human body?
- How does the overall structure of bone provide strength and flexibility but keep bone from being too bulky and heavy?
- How does the structure of a joint provide information about its function?
- How do bones, muscles, and joints work together to enable movement and locomotion for the human body?
- How do specific cells and hormones assist with bone remodeling in the human body?
- What tests or technology can be used to diagnose and treat injury to a bone, ligament or joint?
- Why would medical professionals measure the range of motion at a joint?
- How are we able to overcome muscle fatigue?
- What do skeletal muscle structure and attachment to bones indicate about function?

UNIT PRIORITY STANDARDS: *Students will know and be able to…*

Cross Cutting Concepts	*Science & Engineering Practices (SEP)*	*Disciplinary Core Idea (DCI)*
➔ Structure and Function • The way an object is shaped or structured determines many of its properties and functions. ➔ Stability and Change	Practice 1: ➔ Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and,	➔ **Structure and Function** • Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

• Feedback (negative or positive) can stabilize or destabilize a system.	when appropriate, frame a hypothesis based on a model or theory. Practice 2: ➔ Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria. ➔ Design a test of a model to ascertain its reliability. Practice 3: ➔ Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled. ➔ Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated. Practice 8: ➔ Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. ➔ Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source. ➔ Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally,	• Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3) ➔ **Engineering Design: Defining and Delimiting Engineering Problems** • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3) ➔ **Engineering Design: Developing Possible Solutions** • When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (HSETS1-3)

	graphically, textually, mathematically).	

LEARNING TARGETS

Career Readiness:

CAR-A Describe the diverse set of careers in the biomedical sciences and the societal impacts of their work.

CAR-B Describe the societal impact of biomedical science professionals.

Critical and Creative Problem-Solving

CCP-A Devise and execute a plan to solve a problem.

CCP-B Use data and evidence to evaluate and justify decisions.

CCP-C Apply an iterative design process to creatively address a need or solve a problem.

CCP-D Explain the value of diverse perspectives in the problem-solving process.

CCP-E Explain how scientists use calculated risks to increase scientific knowledge.

Experimental Design:

EXD- A Design and carry out an experiment that investigates a research question.

EXD-B Collect and analyze experimental data to draw conclusions.

Ethical Reasoning and Mindset:

ERM-A Apply professional standards such as: creativity, perseverance, honesty, integrity, and accountability that should be exhibited by biomedical professionals.

Communication:

COM-A Communicate effectively with a specific audience.

COM-B Evaluate ethical and moral issues related to various medical interventions.

Collaboration:

COL-A Create an effective team environment to promote successful goal attainment.

General Laboratory Practices:

GLP-A Demonstrate mastery of general laboratory practice common to many biomedical science fields.

Clinical Medicine

CME-A Document patient information

CME-B Synthesize complex medical information to diagnose a disease, disorder, or injury to determine cause of death.

CME-C Respond to patient and/or community needs and propose treatment strategies for disease, disorder, injury, or the prevention thereof.

CME-D Explain clinical tests that are used to diagnose malfunctioning organ systems.

Analysis of Disease:

AOD-A Describe how imbalances in the body system can result in diseases.

Microbiology

MIB-A Explain how the composition, structure, and activities of cells build functional systems in the human body.

Anatomy and Physiology:

ANP-A Explain the connection between structure and function in biology

ANP-B Describe how the systems of the body work together to maintain homeostasis.

ANP-C Describe the structures and functions of the skeletal system.

ANP-D Describe the structures and functions of the muscular system.

UNIT 1 ASSESSMENT EVIDENCE

Performance is evaluated in terms of… Students will show their learning by…

Performance Task Description(s):

- ➔ Activity "Meet the Patients": Students are welcomed to the outpatient center and meet the five patients who have been placed in their care. They familiarize themselves with their assigned case by reviewing data in an interactive patient portal. They also complete an introductory puzzle to assess what they know about the systems of the human body.
- ➔ Activity "Looking Inside the Bone": Students explore the structure and function of bone through microscopy and the construction of a physical model.
- ➔ Project "Break a Leg": Students investigate the case of Carmen, a gymnast who experienced a femur break. Students investigate the types of bone fractures by completing a fracture puzzle and explore possible repair techniques using a physical model. They will apply what they learn to design a fracture repair for Carmen and discuss physical therapy options, post-surgery.
- ➔ Activity: "Building Muscle": To help their assigned cohort patient, students investigate the muscles affected by the condition. Students then build muscles specific to their cohort patient, independently on their MANIKEN®.
- ➔ Project "Restoring ROM": To help Koa, a BMX rider with a knee injury, students measure and analyze the range of motion of joints, perform diagnostic tests on a dynamic knee model, and practice kinesiology taping techniques guided by an athletic trainer.
- ➔ Problem "Personalized Plans": To create a personalized care and rehabilitation plan for their cohort patient, their caregivers, and future healthcare providers, students analyze the patient's medical data they have collected in the unit, research applicable exercises that address the patient's condition, and identify other specialists and interventions. As students create the plan, they will consider and demonstrate the importance of empathy and respect in patient care. They will design a plan to help the patient manage their condition, progress forward, and maintain the activities and lifestyle they love

Success Criteria Rubrics

- ➔ Standards-aligned rubrics are used for communicating the success criteria, goal setting, reflecting during & after the unit learning, and feedback.

Key Feedback & Assessment Strategies *(What are different ways students can demonstrate their learning?)**:***

- ◆ *Conferring/Strategy Groups: Use current evidence of standards & learning targets, feedback is scaffolded based on student strengths, needs, and goals.*
- ◆ *Assessment of Unit Skills- Examples for Targeted Data Collection*
  - *Driving Question Board to gather background knowledge and activate prior knowledge*
  - *Student evidence notebooks: focus notes, CER argument writing, model & model revisions*
  - *Checks for understanding (exit slips, quickwrites, etc.) aligned to unit guiding questions*
  - *Lab analysis questions and write-ups*
  - *Assess unit vocabulary terms*
  - *Evaluate student investigation tasks*
  - *Assess key unit concepts (Unit summative assessment)*
- ➔ *Extensions & College/Career Readiness may include:*

- All lessons: Remove scaffolds provided with Science and Engineering Practices as a way to give students more independent work with the elements of these practices.

The above is not an exhaustive list but shows the possible strategies & tasks that provide meaningful student evidence of learning.

STAGE 3: UNIT LEARNING PLAN (under construction- note: this section does not require board approval) *Planned learning experiences and instruction: Learner Readiness, Key vocab, materials & resources unique to the unit*			
Plan & Prep for the Unit Stage:			
Review Learners' Attributes and needs: ● Review 504s & IEP at a Glance ● Review current classroom data (by standard) ● Review any ACT, screening, or diagnostic data ● Other?		Send Family Unit Communication ☐ *ADD example link*	Review any previous student exemplars Proficient ☐ *ADD LINK* Advanced/Excellent ☐ *ADD LINK*
Implementation Stage:			
Key Unit Vocabulary/ Root words:			
Recommended Pacing for Lesson/ Week	**Learning Target (s)**	**Differentiation**	**Teacher Resources:**
LESSON 1, WEEK 1 *Add more rows as needed*		Multiple Means for Students to Access Content: ● . ● . Multiple Modes for Students to Express Understanding ●	●
LESSON 2, WEEK 2 *Add more rows as needed*		Multiple Means for Students to Access Content: ● . ● . Multiple Modes for Students to Express Understanding	●
End of Unit Reflection:			

- What successes did we have with students learning our desired results (Enduring Understandings, Essential Questions, Priority Standards)? How do we know? (summative results? Progress monitoring data?)
- What opportunities do we have to leverage desired results (Enduring Understandings, Essential Questions, Priority Standards, Anchor Phenomenon) in the future?
- How are we celebrating with students and as a team?

24/25	•
25/26	•
26/27	•
27/28	•

UNIT 2: *Research Ready*

In this unit, you'll work as an intern at the Development and Aging Research Center to explore content related to the nervous and endocrine systems. The Lab Leads Challenges—projects proposed by the center's principal investigators—will ask you to apply your knowledge and skills to solve case studies.

In the problem, you will have the opportunity to complete an open-ended research experiment with a model organism, C. elegans, to see how different substances affect the nervous and endocrine systems.

UNIT 2 DESIRED RESULTS

ESSENTIAL QUESTION:

•What are the consequences of miscommunication within a body system or between body systems?
• How does understanding the structure and function of the human brain help with the diagnosis of disease?
• How can neurological diseases affect overall function in other human body systems?
• What would happen in the body if the action of neurotransmitters was impaired?
• Why does reaction time typically differ in reflex and voluntary actions?
• How do hormones and feedback mechanisms maintain homeostasis in the human body?

• How can improper levels of a hormone lead to disease or dysfunction in the human body? • What are the roles of the endocrine and reproductive systems in human development? • How does the body's reaction to the external environment impact the internal environment? • How are model organisms useful in research? • How do organisms interact with their environment and what are the effects of these interactions? • How does genetic variation among organisms affect survival?

Cross Cutting Concepts	*Science & Engineering Practices (SEP)*	*Disciplinary Core Idea (DCI)*
➔ Structure and Function • The way an object is shaped or structured determines many of its properties and functions. ➔ Stability and Change • Feedback (negative or positive) can stabilize or destabilize a system.	Practice 1: ➔ Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory. Practice 2: ➔ Design a test of a model to ascertain its reliability. Practice 3: ➔ Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled. ➔ Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated. Practice 8: ➔ Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	➔ **Structure and Function** • Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3) ➔ **Engineering Design: Defining and Delimiting Engineering Problems** • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3)

	➔ Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source. ➔ Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).	

LEARNING TARGETS

Career Readiness:

CAR-A Describe the diverse set of careers in the biomedical sciences and the societal impacts of their work.

CAR-B Describe the societal impact of biomedical science professionals.

Critical and Creative Problem-Solving

CCP-A Devise and execute a plan to solve a problem.

CCP-B Use data and evidence to evaluate and justify decisions.

CCP-C Apply an iterative design process to creatively address a need or solve a problem.

CCP-E Explain how scientists use calculated risks to increase scientific knowledge.

Experimental Design:

EXD- A Design and carry out an experiment that investigates a research question.

EXD-B Collect and analyze experimental data to draw conclusions.

Ethical Reasoning and Mindset:

ERM-A Apply professional standards such as: creativity, perseverance, honesty, integrity, and accountability that should be exhibited by biomedical professionals.

Communication:

COM-A Communicate effectively with a specific audience.

COM-B Evaluate ethical and moral issues related to various medical interventions.

Collaboration:

COL-A Create an effective team environment to promote successful goal attainment.

General Laboratory Practices:

GLP-A Demonstrate mastery of general laboratory practice common to many biomedical science fields.

Clinical Medicine

CME-A Document patient information

CME-B Synthesize complex medical information to diagnose a disease, disorder, or injury to determine cause of death.

CME-C Respond to patient and/or community needs and propose treatment strategies for disease, disorder, injury, or the prevention thereof.

CME-D Explain clinical tests that are used to diagnose malfunctioning organ systems.

Analysis of Disease:

AOD-A Describe how imbalances in the body system can result in diseases.

Microbiology

MIB-A Explain how the composition, structure, and activities of cells build functional systems in the human body.

Anatomy and Physiology:

ANP-A Explain the connection between structure and function in biology

ANP-B Describe how the systems of the body work together to maintain homeostasis.

ANP-G Describe the structures and functions of the nervous system.

ANP-J Describe the structures and functions of the endocrine system.

ANP-N Describe the structures and functions of the reproductive system.

UNIT 2 ASSESSMENT EVIDENCE

Performance is evaluated in terms of... Students will show their learning by...

Performance Task Description(s):

- ***Activity "Mind Matters":*** *Students are introduced to the Development and Aging Research Center as they tour the virtual facility. They learn about the structure and function of the nervous system as they build organs and structures on their MANIKEN®.*

- ***Activity "Neuropharmacology":*** *Students work alongside pharmacology researchers to investigate how chemical substances impact neuron communication. They complete a virtual lab to monitor action potential output when model organisms are exposed to nicotine and MSG.*

- ***Project "Neurology Challenge":*** *Students apply what they have learned about the nervous system to tackle the first of two Lab Leads Challenges. They work together to diagnose a patient and create a model to demonstrate how the illness or condition is related to an error in communication.*

- ***Activity "The Endocrine System":*** *To examine feedback loops and how the endocrine system helps the body maintain homeostasis, students stimulate hormone action in a role-play game. Students map hormone function using feedback loops and a body system graphic organizer.*

- ***Activity "Mazing Worms":*** *Students design mazes to study the impact of hormones on the behavior of the model organism, C. elegans, and run a laboratory experiment to test their hypothesis. Students also begin learning how to digest scientific literature.*

- ***Activity "Reproductive Regulation":*** *Students investigate the role of the endocrine and reproductive systems in human development. They analyze data sets to track trends in hormone action over the human lifespan and use this information to create an informative infographic. Students also investigate the impact of endocrine disruptors on human development as they*

review published journal articles.

- ➔ *Project "Endocrinology Challenge": Students apply what they have learned about the endocrine system and hormones to tackle the second Lab Leads Challenge. They work in teams to develop an initial diagnosis and order laboratory tests, clinical evaluations, and imaging, to confirm their diagnosis. Students then design a treatment plan for their patient.*

- ➔ *Problem "Toxic Relationships": Students design and complete an experiment that tests the impacts of heavy metals and pesticides on C. elegans to better understand how a person's genetics and environment interact to determine the biological consequences of toxic exposure. Students communicate their results to their peers.*

Success Criteria Rubrics

➔ Standards-aligned rubrics are used for communicating the success criteria, goal setting, reflecting during & after the unit learning, and feedback.

Key Feedback & Assessment Strategies *(What are different ways students can demonstrate their learning?)**:***

- ◆ *Conferring/Strategy Groups: Use current evidence of standards & learning targets, feedback is scaffolded based on student strengths, needs, and goals.*
- ◆ *Assessment of Unit Skills- Examples for Targeted Data Collection*
  - *Driving Question Board to gather background knowledge and activate prior knowledge*
  - *Student evidence notebooks: focus notes, CER argument writing, model & model revisions*
  - *Checks for understanding (exit slips, quickwrites, etc.) aligned to unit guiding questions*
  - *Lab analysis questions and write-ups*
  - *Assess unit vocabulary terms*
  - *Evaluate student investigation tasks*
  - *Assess key unit concepts (Unit summative assessment)*

➔ *Extensions & College/Career Readiness may include:*

- ◆ All lessons: Remove scaffolds provided with Science and Engineering Practices as a way to give students more independent work with the elements of these practices.

The above is not an exhaustive list but shows the possible strategies & tasks that provide meaningful student evidence of learning.

STAGE 3: UNIT LEARNING PLAN (under construction- note: this section does not require board approval)

Planned learning experiences and instruction: Learner Readiness, Key vocab, materials & resources unique to the unit

Plan & Prep for the Unit Stage:

Review Learners' Attributes and needs: • Review 504s & IEP at a Glance • Review current classroom data (by standard) • Review any ACT, screening, or diagnostic data • Other?	Send Family Unit Communication ☐ *ADD example link*	Review any previous student exemplars Proficient ☐ *ADD LINK* Advanced/Excellent ☐ *ADD LINK*

Implementation Stage:			
Key Unit Vocabulary/ Root words:			
Recommended Pacing for Lesson/ Week	**Learning Target (s)**	**Differentiation**	**Teacher Resources:**
LESSON 1, WEEK 1 *Add more rows as needed*		Multiple Means for Students to Access Content: • . • . Multiple Modes for Students to Express Understanding •	• *Example- Africa Storyline Calendar w/key videos, data sets & activities*
LESSON 2, WEEK 2 *Add more rows as needed*		Multiple Means for Students to Access Content: • . • . Multiple Modes for Students to Express Understanding	•

End of Unit Reflection:

- What successes did we have with students learning our desired results (Enduring Understandings, Essential Questions, Priority Standards)? How do we know? (summative results? Progress monitoring data?)
- What opportunities do we have to leverage desired results (Enduring Understandings, Essential Questions, Priority Standards, Anchor Phenomenon) in the future?
- How are we celebrating with students and as a team?

24/25	•
25/26	•
26/27	•
27/28	•

UNIT 3: *Adventure Awaits*

In this unit, you will take on the role of expedition leaders who escort adventure travelers through a series of activities and events in extreme or remote environments. You are tasked with assuring the health and wellness of the group—focusing on the cardiovascular, respiratory, and immune systems—as you identify and address health risks or challenges travelers may encounter in these environments. You will also investigate pathogens native to the location and interventions to prevent and treat those pathogens.

In the problem, you will use what you have learned to work together to respond to an emergency medical incident that happens on an adventure trip, presented in an interactive simulation.

UNIT 3 DESIRED RESULTS

ESSENTIAL QUESTION:

- How do the eye and the brain work together to process what we see?
- How does an error in the structure or function of the eye relate to disease or dysfunction?
- How do the cardiovascular and respiratory systems work together to maintain homeostasis in the human body?
- How does the structure of arteries, veins, and capillaries relate to their function in the body?
- What medical interventions are available to improve circulation in impaired blood vessels?
- How do EKG tracings show the heart's electrical activity and assist health professionals in making medical decisions?
- How do the systems of the human body work together to facilitate gas exchange?
- How can analysis of lung capacity be used to diagnose or treat a patient?
- How can an individual improve or damage their lung function?
- How do the skin and accessory organs of the skin help maintain homeostasis in the human body?
- How do the lymphatic and immune systems work together to help maintain homeostasis in the human body?
- How do different types of pathogens cause infectious diseases?
- How do the cellular components of the human immune system fight disease?
- How does the body react when exposed to an antigen for the second time?

Cross Cutting Concepts	*Science & Engineering Practices (SEP)*	*Disciplinary Core Idea (DCI)*
➔ Structure and Function	Practice 2: ➔ Evaluate merits and limitations of two different models of the same proposed tool,	➔ **Structure and Function** • Multicellular organisms have a hierarchical structural organization, in which any one system is

• The way an object is shaped or structured determines many of its properties and functions. ➔ Stability and Change • Feedback (negative or positive) can stabilize or destabilize a system.	process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria. ➔ Design a test of a model to ascertain its reliability. Practice 8: ➔ Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. ➔ Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source. ➔ Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).	made up of numerous parts and is itself a component of the next level. (HS-LS1-2) • Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3) ➔ **Engineering Design: Defining and Delimiting Engineering Problems** • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3) ➔ **Engineering Design: Developing Possible Solutions** • When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (HSETS1-3)

LEARNING TARGETS

Career Readiness:

CAR-A Describe the diverse set of careers in the biomedical sciences and the societal impacts of their work.

CAR-B Describe the societal impact of biomedical science professionals.

Critical and Creative Problem-Solving

CCP-A Devise and execute a plan to solve a problem.

CCP-B Use data and evidence to evaluate and justify decisions.

CCP-C Apply an iterative design process to creatively address a need or solve a problem.

CCP-D Explain the value of diverse perspectives in the problem-solving process.

Experimental Design:

EXD- A Design and carry out an experiment that investigates a research question.

EXD-B Collect and analyze experimental data to draw conclusions.

Ethical Reasoning and Mindset:

ERM-A Apply professional standards such as: creativity, perseverance, honesty, integrity, and accountability that should be exhibited by biomedical

professionals.

Communication:

COM-A Communicate effectively with a specific audience.

COM-B Evaluate ethical and moral issues related to various medical interventions.

Collaboration:

COL-A Create an effective team environment to promote successful goal attainment.

General Laboratory Practices:

GLP-A Demonstrate mastery of general laboratory practice common to many biomedical science fields.

Clinical Medicine

CME-A Document patient information

CME-B Synthesize complex medical information to diagnose a disease, disorder, or injury to determine cause of death.

CME-C Respond to patient and/or community needs and propose treatment strategies for disease, disorder, injury, or the prevention thereof.

CME-D Explain clinical tests that are used to diagnose malfunctioning organ systems.

Analysis of Disease:

AOD-A Describe how imbalances in the body system can result in diseases.

Molecular Biology and Genetics:

MBD-D Select and use appropriate tools, techniques, and/or technologies to analyze genetic information and diagnose disease.

Microbiology

MIB-A Explain how the composition, structure, and activities of cells build functional systems in the human body.

Anatomy and Physiology:

ANP-A Explain the connection between structure and function in biology

ANP-B Describe how the systems of the body work together to maintain homeostasis.

ANP-E Describe the structures and functions of the integumentary system.

ANP-F Describe the structures and functions of the cardiovascular system.

ANP-G Describe the structures and functions of the nervous system.

ANP-H Describe the structures and functions of the lymphatic and immune systems.

ANP-I Describe the structures and functions of the respiratory system.

ANP-J Describe the structures and functions of the endocrine system.

UNIT 3 ASSESSMENT EVIDENCE

Performance is evaluated in terms of... Students will show their learning by...

Performance Task Description(s):

- ➔ Activity "With the Flow": Students are introduced to their role with the adventure company Scenic Edge. They will explore an interactive journal throughout the unit—stories from an uncle that help introduce medical content and clinical tests. They learn about the structure and function of the cardiovascular system as they build a model of the heart and vessels to their MANIKEN
- ➔ Activity "Stayin' Alive": Students investigate the conduction system of the heart and relate the parts of an EKG tracing to the movement of electrical signals in the muscle. They use physiological sensors to capture their own EKG and data acquisition software to analyze heart rate. Students explore how irregular heartbeats (arrhythmias) relate to the use of automatic external

defibrillators (AEDs).

- ➔ Activity "We Be-lung Together": Students investigate connections between the heart and lungs as they dissect a sheep pluck. They also run additional experiments to investigate the structure and function of lung tissue.
- ➔ Project "Cleared to Climb": Students apply all they have learned and practiced to analyze the cardiovascular and respiratory data of fictional clients and then make a recommendation as to whether they should be cleared for a climbing expedition.
- ➔ Activity "Immune Defense": Students investigate agents of disease and how the human body works to fight against invaders. They play PLTW Pathogen Patrol™ on Roblox, to learn how the cells of the immune system work to target both viral and bacterial infections. Students also analyze graphs to describe the immune response.
- ➔ Activity "Going Un-Viral": Students complete a laboratory test called a plaque assay to quantify viruses and evaluate the effectiveness of antiviral medicines. Students also map modes of disease transmission to discuss prevention opportunities.
- ➔ Project "More than Meets the Eye": Students dissect a cow eye to investigate possible conditions that can be an issue on adventure expeditions. They will map the light path through the eye and demonstrate how an eye condition impacts function.
- ➔ Problem "The Expedition": Students design an expedition, choose the destinations and activities, and then prepare a guide to help keep travelers healthy on this journey. They must identify and address the health risks of the extreme environment, as well as the risks related to pathogens native to the chosen location. Through an interactive experience, student teams face an emergency on their trip. Using the guide they created, they work together to apply what they have learned to help their clients through the emergency and maintain the health and well-being of all adventurers on the expedition.

Success Criteria Rubrics

- ➔ Standards-aligned rubrics are used for communicating the success criteria, goal setting, reflecting during & after the unit learning, and feedback.

Key Feedback & Assessment Strategies *(What are different ways students can demonstrate their learning?)**:***

- ◆ *Conferring/Strategy Groups: Use current evidence of standards & learning targets, feedback is scaffolded based on student strengths, needs, and goals.*
- ◆ *Assessment of Unit Skills- Examples for Targeted Data Collection*
  - *Driving Question Board to gather background knowledge and activate prior knowledge*
  - *Student evidence notebooks: focus notes, CER argument writing, model & model revisions*
  - *Checks for understanding (exit slips, quickwrites, etc.) aligned to unit guiding questions*
  - *Lab analysis questions and write-ups*
  - *Assess unit vocabulary terms*
  - *Evaluate student investigation tasks*
  - *Assess key unit concepts (Unit summative assessment)*

- ➔ *Extensions & College/Career Readiness may include:*
  - ◆ All lessons: Remove scaffolds provided with Science and Engineering Practices as a way to give students more independent work with the elements of these practices.

The above is not an exhaustive list but shows the possible strategies & tasks that provide meaningful student evidence of learning.

STAGE 3: UNIT LEARNING PLAN (under construction- note: this section does not require board approval)

Planned learning experiences and instruction: Learner Readiness, Key vocab, materials & resources unique to the unit

Plan & Prep for the Unit Stage:

Review Learners' Attributes and needs: ● Review 504s & IEP at a Glance ● Review current classroom data (by standard) ● Review any ACT, screening, or diagnostic data ● Other?	Send Family Unit Communication ☐ *ADD example link*	Review any previous student exemplars Proficient ☐ *ADD LINK* Advanced/Excellent ☐ *ADD LINK*

Implementation Stage:

Key Unit Vocabulary/ Root words:			
Recommended Pacing for Lesson/ Week	**Learning Target (s)**	**Differentiation**	**Teacher Resources:**
LESSON 1, WEEK 1 *Add more rows as needed*		Multiple Means for Students to Access Content: ● . ● . Multiple Modes for Students to Express Understanding ●	● *Example- Africa Storyline Calendar w/key videos, data sets & activities*
LESSON 2, WEEK 2 *Add more rows as needed*		Multiple Means for Students to Access Content: ● . ● . Multiple Modes for Students to Express Understanding	●

End of Unit Reflection:

- What successes did we have with students learning our desired results (Enduring Understandings, Essential Questions, Priority Standards)? How do we know? (summative results? Progress monitoring data?)
- What opportunities do we have to leverage desired results (Enduring Understandings, Essential Questions, Priority Standards, Anchor Phenomenon) in the future?

- How are we celebrating with students and as a team?

24/25	•
25/26	•
26/27	•
27/28	•

UNIT 4: Patient Perspectives

In this unit, you will work as a team of biomedical science advisors on an interactive exhibit called Ins and Outs of the Body: Patient Perspectives. The exhibit combines art and storytelling to spotlight the urinary and digestive systems and features the unique perspectives of real patients. Kevin, the Director of Exhibit Design and Production, will guide you through specific tasks as you help develop engaging material for the exhibit.

In the problem, you will apply all that you have learned about the urinary and digestive systems to design a unique product as a culminating experience for exhibit visitors.

UNIT 4 DESIRED RESULTS

ESSENTIAL QUESTION:

- How does the nephron function to maintain fluid and electrolyte balance in the human body?
- How can the composition of urine provide clues about problems in human body systems?
- How can molecular biology techniques be used to diagnose genetic diseases?
- How do doctors determine compatible donors and recipients for organ donations?
- How does the body obtain and use energy from food?
- How do enzymes assist the function of the digestive system?
- How is the food you eat broken down to provide energy for the body?
- How are digestive diseases diagnosed and treated?
- How does the microbiome of the gut play important roles in the body?
- How do medical interventions help medical professionals and patients prevent, diagnose, and treat disease?

Cross Cutting Concepts	*Science & Engineering Practices (SEP)*	*Disciplinary Core Idea (DCI)*
➔ Structure and Function • The way an object is shaped or structured determines many of its properties and functions. ➔ Stability and Change • Feedback (negative or positive) can stabilize or destabilize a system.	Practice 1: ➔ Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory. Practice 3: ➔ Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled. Practice 8: ➔ Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. ➔ Gather, read, and evaluate scientific and/or technical information from multiple	➔ **Structure and Function** • Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) • Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

	➔ authoritative sources, assessing the evidence and usefulness of each source. Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).	

LEARNING TARGETS

Career Readiness:

CAR-A Describe the diverse set of careers in the biomedical sciences and the societal impacts of their work.

CAR-B Describe the societal impact of biomedical science professionals.

Critical and Creative Problem-Solving

CCP-A Devise and execute a plan to solve a problem.

CCP-B Use data and evidence to evaluate and justify decisions..

Experimental Design:

EXD- A Design and carry out an experiment that investigates a research question.

EXD-B Collect and analyze experimental data to draw conclusions.

Ethical Reasoning and Mindset:

ERM-A Apply professional standards such as: creativity, perseverance, honesty, integrity, and accountability that should be exhibited by biomedical professionals.

Communication:

COM-A Communicate effectively with a specific audience.

Collaboration:

COL-A Create an effective team environment to promote successful goal attainment.

General Laboratory Practices:

GLP-A Demonstrate mastery of general laboratory practice common to many biomedical science fields.

Clinical Medicine

CME-A Document patient information

CME-B Synthesize complex medical information to diagnose a disease, disorder, or injury to determine cause of death.

CME-C Respond to patient and/or community needs and propose treatment strategies for disease, disorder, injury, or the prevention thereof.

CME-D Explain clinical tests that are used to diagnose malfunctioning organ systems.

Analysis of Disease:

AOD-A Describe how imbalances in the body system can result in diseases.

Molecular Biology and Genetics:

MBD-D Select and use appropriate tools, techniques, and/or technologies to analyze genetic information and diagnose disease.

Microbiology

MIB-A Explain how the composition, structure, and activities of cells build functional systems in the human body.

Anatomy and Physiology:

ANP-A Explain the connection between structure and function in biology

ANP-B Describe how the systems of the body work together to maintain homeostasis.

ANP-K Describe the structures and functions of the digestive system.

ANP-L Describe the structures and functions of the urinary system.

UNIT 4 ASSESSMENT EVIDENCE

Performance is evaluated in terms of… Students will show their learning by…

Performance Task Description(s):

- ➔ Activity "The Ultimate Collector": Students create two models. One model is lab-based using simulated blood and dialysis tubing, to construct a model representing the interaction of the circulatory and urinary systems. The other model is a 3D manipulative to help students visualize how the structures of the nephron function to secrete, absorb, and filter substances for your body.
- ➔ Activity "Value-Based Care": Students investigate data from 11 patient files as they assess various GFR calculations used to evaluate kidney function. Students gain an appreciation for how changes in clinical algorithms and medical evaluation criteria highlight the push for equitable care for all patients.
- ➔ Activity "Time to Digest": Students experience the real-life story of Macey, a young woman who had a full digestive system transplant. As they follow her case and hear about her journey, students model the digestive system on their MANIKEN® model.
- ➔ Activity "Gut Health": Students investigate the diagnostic tests used to evaluate the digestive function and design a plan to showcase the diagnosis of a specific disorder in the exhibit. They investigate the gut microbiome and play a card game to investigate how to maintain gut health.
- ➔ Activity "Microscopic Mucosa": Students view various tissues of the digestive system under the microscope and then use all they have learned to identify differences in the diseased tissue versus the healthy tissue.
- ➔ Project "Break It Down": Students complete laboratory tests to investigate how enzymes function in the breakdown of food and relate the results of these experiments to digestive conditions.
- ➔ Project "Exit Strategy": Student teams are challenged to design and storyboard an interactive element for the exhibit that allows visitors to apply their knowledge of biomedical science to investigate a medical story. They are tasked with providing a new patient story to showcase key science and using art and media to engage their audience.

Success Criteria Rubrics

- ➔ Standards-aligned rubrics are used for communicating the success criteria, goal setting, reflecting during & after the unit learning, and feedback.

Key Feedback & Assessment Strategies *(What are different ways students can demonstrate their learning?)**:***

- ◆ *Conferring/Strategy Groups: Use current evidence of standards & learning targets, feedback is scaffolded based on student strengths, needs, and goals.*

- *Assessment of Unit Skills- Examples for Targeted Data Collection*
  - *Driving Question Board to gather background knowledge and activate prior knowledge*
  - *Student evidence notebooks: focus notes, CER argument writing, model & model revisions*
  - *Checks for understanding (exit slips, quickwrites, etc.) aligned to unit guiding questions*
  - *Lab analysis questions and write-ups*
  - *Assess unit vocabulary terms*
  - *Evaluate student investigation tasks*
  - *Assess key unit concepts (Unit summative assessment)*

➔ *Extensions & College/Career Readiness may include:*

- All lessons: Remove scaffolds provided with Science and Engineering Practices as a way to give students more independent work with the elements of these practices.

The above is not an exhaustive list but shows the possible strategies & tasks that provide meaningful student evidence of learning.

STAGE 3: UNIT LEARNING PLAN (under construction- note: this section does not require board approval)

Planned learning experiences and instruction: Learner Readiness, Key vocab, materials & resources unique to the unit

Plan & Prep for the Unit Stage:

Review Learners' Attributes and needs: • Review 504s & IEP at a Glance • Review current classroom data (by standard) • Review any ACT, screening, or diagnostic data • Other?	Send Family Unit Communication ☐ *ADD example link*	Review any previous student exemplars Proficient ☐ *ADD LINK* Advanced/Excellent ☐ *ADD LINK*

Implementation Stage:

Key Unit Vocabulary/ Root words:			
Recommended Pacing for Lesson/ Week	**Learning Target (s)**	**Differentiation**	**Teacher Resources:**
LESSON 1, WEEK 1 *Add more rows as needed*		Multiple Means for Students to Access Content: • . • . Multiple Modes for Students to Express Understanding •	• *Example- Africa Storyline Calendar w/key videos, data sets & activities*

LESSON 2, WEEK 2 *Add more rows as needed*		Multiple Means for Students to Access Content: • . • . Multiple Modes for Students to Express Understanding	•

End of Unit Reflection:

- What successes did we have with students learning our desired results (Enduring Understandings, Essential Questions, Priority Standards)? How do we know? (summative results? Progress monitoring data?)
- What opportunities do we have to leverage desired results (Enduring Understandings, Essential Questions, Priority Standards, Anchor Phenomenon) in the future?
- How are we celebrating with students and as a team?

24/25	•
25/26	•
26/27	•
27/28	•