Innovators in STEM
Grade 7
Unit 1 Plan

acher(s)	
rm	

Unit Overview

Unit Title	Healthcare Innovations
Unit Length	30 days; 15 periods; 42-minute periods
Performance Task	***Healthcare Innovations*** Through problem-based learning, students develop an understanding of an issue related to medicine and health in order to design a solution to support equitable wellbeing for all. Students articulate their solutions by creating a VR experience that others can learn about through a VR headset such as walking through the sections of an organ or a vegetable garden that highlights the benefits of food on the body and illness. ***Learning Process:*** *Problem-Based Learning*
Essential Questions	How can science and nature inform our collective understanding of health and well-being for all?
Enduring Understandings	We can utilize inquiry to develop an understanding of the relationship between science, nature, and healthcare to determine how we can promote long and healthy lives for all.
Pacing Guide	Link to unit pacing guide.

Goals

STEM Program Goals *By the end of the 7th grade…*		**Unit Goal** *By the end of this unit…*
Communication	Students will be able to **analyze the**	Students will be able to comprehend and

	main idea of a piece of work(s) and determine how the point of view(s) **impacts their solutions**.	analyze challenges impacting the health and well-being of humans.
Collaboration	Students will be able to work together to **build consensus** on an approach or solution by determining a goal and considering design constraints and possibilities.	Students will be able to determine how their solution relates to the solutions of others to create a collective approach or meet a common goal.
Creativity	Students will be able to **provide a new or different perspective** on how to solve a problem by rethinking the constraints, materials, approach, or desired outcome.	Students will be able to consider the relationship between science, nature, and health in a new or different way to address issues of healthcare.
Critical Thinking	Students will be able to **use data to analyze** the **cause and effect** of a problem to determine **ways in which the problem can be addressed** or solved.	Students will be able to determine the potential cause and effect between nature, industry, and human well-being by using data.

Connections

Discipline	Connected Standards
Science (2020 NJSLS)	**From Molecules to Organisms: Structures and Processes MS.LS1.5** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
	Ecosystems: Interactions, Energy, and Dynamics MS.LS2.4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
	Biological Evolution: Unity and Diversity MS.LS4.5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
Computer Science and Design Thinking (2020 NJSLS)	**Engineering Design 8.2.8.ED.2** Identify the steps in the design process that could be used to solve a problem.
	Engineering Design 8.2.8.ED.7 Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).

English Language Arts (2020 NJSLSA)	**Reading Anchor R10** Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
	Writing Anchor W6 Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
	Speaking and Listening Anchor SL4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
	Language Anchor Standard L6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
Technology (ISTE Standards for Students)	**Knowledge Constructor 1.3.c** Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
	Creative Communicator 1.6.c Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
UN Sustainable Development Goals	**Goal 2: Zero Hunger** ● End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
	Goal 3: Good Health and Wellbeing ● Ensure healthy lives and promote well-being for all at all ages.
	Goal 4: Quality Education ● Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
	Goal 12: Responsible Consumption and Production ● Ensure sustainable consumption and production patterns.

Learning Process and Check Points

Assessment Type	Learning Phase	Student Product	Description	Goal Assessed
Formative	Launch	An identified topic and rationale for why it is worth inquiry.	Identify a topic related to human wellbeing, healthcare, and/or medicine.	Communication
Formative	Inquire	A research log of relevant sources, main ideas, and significance to the inquiry question.	Research the challenge, the relevance of the challenge in aiding human wellbeing, and what has been done to address the challenge thus far.	Communication Collaboration
Formative	Plan	An identified solution to the healthcare problem.	Determine a solution to the problem.	Communication Collaboration
		Discussion notes of feedback and additional ideas.	Discuss your problem and solutions with others, determining the extent to which your work informs theirs and vice versa.	Collaboration
Formative	Create	A storyboard of the VR experience.	Storyboard your VR experience to plan how you will design the presentation.	Creativity Critical Thinking
		An iteration of your solution and/or presentation based on feedback.	Solicit feedback to iterate on your solution and how to present it through VR.	Collaboration Creativity Critical Thinking
Summative	Present	A virtual reality experience.	Create the VR experience.	Communication Collaboration Creativity Critical Thinking
Summative	Reflect	A reflection form completed by those who experienced your virtual reality	Have others experience your findings through virtual reality.	Communication Collaboration Creativity Critical Thinking

		experience.		
		Unit reflection journal.	Reflect on the problem-based learning experience.	Communication Collaboration Creativity Critical Thinking

Resources

Type	Purpose/Description	Access the Resource
VR Creation Software	Students create use this software to create the digital experience loaded into VR headsets	*Recommendation:* VR Create
360° Cameras	Students take photos that can be loaded into the VR software to create VR experiences	*Recommendation:* TBD
VR Headsets	Students present information to others by creating an experience that can be viewed through VR	*Recommendation:* Veative
UN Sustainable Development Goals	Students draw connections between their designs and real-world problems/goals	https://sdgs.un.org/goals
***Optional:* Student Design Log**	Students record their learning and reflection as part of the design process	Create a digital or physical resource for students.

Vocabulary

Academic Vocabulary *(Tier 2 Words)*	Subject-Specific Vocabulary *(Tier 3 Words)*
• Innovation • Analyze • Justify • Extent • Impact	• Virtual reality • Anatomy • Epidemiologist • Medical scientist • Healthcare • Human wellbeing

Differentiation

Type *The type of differentiation strategy.*	Strategy *The specific differentiation strategy.*	Implementation *When, how, or why the strategy is implemented.*

Modification *A change to the learning objective.*	Set individualized and relevant learning goals based on the performance task rubric.	For students who are working on developing their skills but below grade level expectations, use the performance task rubric to identify which criteria levels the students will meet. (ie. some students will have a goal of achieving level 4 whereas others might have a goal of achieving level 2.
Scaffold *A support to aid access, learning, and mastery of an objective. May result in a change in the time, input, output, or size of learning experiences.*	Structured choice of topics.	Students research or explore a curated list of topics related to the task. This provides student choice but with a structured/limited list to narrow topic selection.
	Group roles - some roles might include: *researcher lead, storyboard lead, VR lead, project manager*	Utilize intentional group roles to support student collaboration.
	Provide a learning process checklist.	Provide the steps of the problem-based learning process to remind students of the process and move autonomously through it.
	Provide or co-create sample or exemplar VR experiences.	Sample VR experiences and storyboards to provide a model.
	Provide a specific template for how to structure the learning experience/storyboard.	Provide information to students as to what would go first, second, third, etc. to create a coherent learning experience.
Enrichment *A way to provide students personalized, in depth learning.*	Student choice of topics.	Students can have as little as or as much choice in the topic of their solution. Some students benefit from a concrete list of structured choice whereas others may benefit from open ended choice and can work through the abstract.
Extension *A way of extending the learning of a unit, objective, or lesson.*	Students enter their solutions into the New Jersey STEAM Tank competition.	Students, with the support of an educator, can enter their design solutions into the STEAM Tank competition to share publicly and iterate their ideas with the support of mentors from the field.

Unit Preparation

Technology Set Up	1. **Complete the next section, "Unit Considerations," and reflect on student strengths, areas of anticipated challenges, and appreciate differentiation strategies.** 2. **Review the sample Pacing Guide and modify it to accommodate your learning schedule.** 3. Virtual Reality Tools: Download software, update hardware, ensure headsets are charged.
Unit Considerations *Teacher Reflection*	*Think about students' current skills and knowledge, what they may struggle with, where differentiation might be appropriate, and how this unit can be customized for your classroom. Write your reflections below:*

Pacing Guide

The learning phases and project checkpoints are outlined below. Complete, revise, and/or expand upon the pacing guide for your classroom.

Day/Class Period	Phase	Aim / Activity *What is the learning objective? What will students do?*	Assessment *How will you assess learning?*
Day 1	Launch		
Day 2		Students will be able to identify a topic related to human wellbeing, healthcare, and/or medicine.	Students will document an identified topic and rationale for why the topic is worth inquiry.
Day 3	Inquire		
Day 4			
Day 5		Students will be able to research the challenge, the relevance of the challenge in aiding human wellbeing, and what has been done to address the challenge thus far.	Students will record a research log of relevant sources, main ideas, and significance to the inquiry question.
Day 6	Plan		
Day 7		Students will be able to determine a solution to the problem.	Students will identify a solution to the healthcare problem.

Day 8		Students will be able to discuss their problems and solutions with others, determining the extent to which your work informs theirs and vice versa.	Students will capture discussion notes of feedback and additional ideas.
Day 9	Create		
Day 10			
Day 11		Students will be able to storyboard their VR experience to plan how they will design the presentation.	Students will design a storyboard of the VR experience
Day 12		Students will be able to solicit feedback to iterate on their solution and how to present it through VR.	Students will document iterations of their solution and/or presentation based on feedback.
Day 13		Students will be able to create the VR experience.	Students will create a virtual reality experience.
Day 14	Present	Students will be able to have others experience their findings through virtual reality.	Students will provide and collect feedback through a reflection form completed by those who experienced your virtual reality experience.
Day 15	Reflect	Students will be able to reflect on your problem-based learning experience.	Students will journal their reflection of the learning experience.