

Introduction to UN Sustainable Goals / Problem Identification and Solution Development

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for the STEM Education Center at WPI's Summer 2022 Research Experience for Teachers program

Subject: STEM

Grade Level: 6-8

United Nations Sustainable Development Goals:

Students will be introduced to the purpose of the 17 UN Sustainable Development Goals (UN SDG) and the intent of each individual goal. They will follow the Engineering Design Process to do the following: choose one of the seventeen UN SDGs, identify a specific problem related to that goal, do additional research, think of two different solutions, choose one solution, and then describe in detail their final solution.

Overview

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Of course, the underlying problems of the 17 Goals are enormous and require people at all levels from leaders of countries to the youth of the world to work together to solve them.

The United States did not make much progress towards the UN SDG between 2017 - 2020. However, the President of the United States is now looking for ideas from everyone to promote a sustainable future. You are researchers responsible for thinking of ideas to solve problems related to these goals. Your assignment is to choose a problem, identify the possible criteria and constraints, to do research and to develop at least three solutions to the problem. You and your group will summarize your research and possible solutions in Google Slides.

Standards & Learning Targets

6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.

Vocabulary	Tier 1	Tier 2	Tier 3
	Solution Design Problem	Criteria Constraints Precision	Ensure Impacts



What do students need to KNOW ?	<ol style="list-style-type: none"> 1. Students will be able to use the following vocabulary words in context: (problem, criteria, constraints) 2. Students will be able to explain how engineers use the engineering design process to solve problems.
What do students need to DO ?	<ol style="list-style-type: none"> 1. Students will accurately identify the problem, criteria and constraints of the design problem. 2. Students will describe how the potential solution solves the problem, criteria, and constraints of the design problem. 3. Students will describe how the potential solution impacts people and the natural environment.
What will students CREATE ?	<ol style="list-style-type: none"> 1. Students will write the problem, criteria, and constraints of the design problem in the planning documents. 2. Students will write a list of the impacts on people and the natural environment.

ELA Standard: Grade 8 Writing Standards - Production and Distribution of Writing			
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.			
Vocabulary	Tier 1	Tier 2	Tier 3
	Clear Style	Writing Produce Development Organization	Coherent
What do students need to KNOW ?	1. Students will be able to use the following vocabulary words in context: coherent		
What do students need to DO ?	<ol style="list-style-type: none"> 1. Students will identify the different types of vocabulary and grammar used in communicating with different audiences. 2. Students will create a presentation that utilizes content specific vocabulary, grammar, and punctuation. 		
What will students CREATE ?	<ol style="list-style-type: none"> 1. Students, in a group, will answer questions in a planning document 2. Students, in a group, will write and share a presentation that summarizes the results of their solution development. 		

Prior Knowledge

Students need to know the definitions of Criteria and Constraints.

Materials/Resources

Chromebooks



Timeline of Activities

Duration	Activity	Instructions	Product
1 class	Introduction	Discuss research at a University Watch video(s) about "UN SDG"	
3-4 classes	Learn about the UN SDGs	Answer 5 questions about each UN SDG <ul style="list-style-type: none"> • What is the goal? • Why does it matter? • Identify 3 outcomes • How does this goal affect you directly or indirectly? How does it affect Ashland / community? • What ideas do you have to solve this problem? 	UN SDG Research
4 classes	Research/ Solution Development	Complete the planning document to help you and your partner: identify and solve a problem Create a Google Slide presentation to summarize research	Complete planning document Create Google Slide presentation
1 class	Presentation/ Feedback	Share research, problem, solution with other students in class	Deliver presentations

Culturally Responsive Teaching Strategies

Translate documents (scaffolding)	Slides and handouts will be translated to a student's native language (as long as it is available via Google Translate) and in English.
Students choose the problem they want to research/solve	Students will be able to choose the UN SDG they want to focus on. They will also choose the problem they will research and develop solutions for.

Career Connections

The many different missions of the United Nations requires a vast array of skills, knowledge, and experiences. Students will assume the role of a "researcher" for a UN SDG category with the task of identifying a problem, conducting research, and developing several solutions. I will identify several career titles and descriptions for each UN SDG, some of which are STEM focused.



Assessment

Students will...

- 1) answer questions in the planning document.
- 2) summarize their problem/research/solution in Google slides.

[Project Rubric](#)

