

Unit 8 Guide - Engineering is Reflective

Engineering Connection

What is the role of reflection in engineering?

What is engineering?

What does it mean to engineer?

What is my identity as an engineer?

How is engineering valuable to me?

Description/Summary

Students reflect on their designs, their identity, and the role of engineering in society. They revisit materials they created in the beginning of the course and have opportunities to convey their results to different audiences.

Unit Overview

Connect with Engineering

Students revisit concepts explored through the year such as their engineering identity, engineering ethics, and other topics. One key takeaway from Unit 8 is the chance to explore the progression of student perceptions.

Engineering in Society

Similar to the red thread, students have a culminating opportunity to explore the intersection of engineering and society, and present their final solutions to problems which they identified.

Engineering Professional Skills

Students will produce short videos, posters, and present in a showcase, affording them opportunities to use different communication media.

Learning Outcomes

Connect with Engineering

	CE.A	Iterate and evolve the definition of what it means to engineer and be an engineer.
	CE.B	Recognize the value of engineering for all regardless of one's potential career.
	CE.C	Explain and apply ethical considerations when exploring an engineering problem.

Engineering in Society

	ES.A	Explore the impacts of past engineering successes and failures on society as a whole.
	ES.B	Recognize and investigate the world's greatest challenges and the role that engineering plays in solving these challenges (e.g., Engineering Grand Challenges, UN sustainability goals, etc.).
	ES.C	Integrate diverse disciplinary thinking and expertise to inform design solutions that add value to society.
	ES.D	Identify and analyze issues when bringing a solution to scale.

Engineering Professional Skills

	PS.A	Use various engineering communication methods.
	PS.B	Collaborate effectively in a team.
	PS.C	Develop, implement, and adapt a project management plan.

Engineering Design

	ED.A	Identify and describe a problem that can be solved with a potentially new product or process.
	ED.B	Identify appropriate stakeholders and content experts and evaluate their input.
	ED.C	Plan and conduct research by gathering relevant and credible data, facts, and information.
	ED.D	Articulate appropriate STEM practices and principles in the design
	ED.E	Evaluate solution alternatives and select a final design by considering assumptions, tradeoffs, criteria, and constraints.
	ED.F	Create a prototype.
	ED.G	Create and implement a testing plan to evaluate the performance of design solutions.
	ED.H	Apply iteration to improve engineering designs.
	ED.I	Articulate and reflect on how an engineering design process could be applied to solving a problem.

Misconceptions

Unit 8 only applies if a class has completed Unit 7.

Unit 8 is not necessary if time runs out at the end of the school year.

Teaching Challenges

Time will likely be crunched at the end of the year. Take care to adapt the lessons while still maintaining time for iteration and reflection.

The Gallery Walk and Showcase may take logistical planning.

The final portfolio for assessment of the E4USA course may be due before the end of the school year.

Related Lessons and Activities and Unit Schedule

Lesson Name	Lesson Description	Activity
8.1 Reflecting on the Role of Engineering in Society [120 minutes]	Teams reflect on the role of engineering in society and share with the class through a gallery walk.	1.1.2 Think-Pair-Share 2.11.1 Gallery Walk
8.2 Myself as an Engineer [90 minutes]	Students debrief their experiences in this course, focusing on the self as an engineer.	1.1.2 Think-Pair-Share 8.2.1 Inspirational Videos
8.3 Share Out to the Larger School Community [120 - 150 minutes]	All members of the school community are invited to engage with the teams and learn about their final projects.	8.3.1 Sharing the Final Prototype