

UTK Unit 4 We Are Engineers!

Lesson 10

 Phenomenon: Engineers can design bridges in many ways	 Question to Investigate: How do engineers design sturdy solutions?	 Lesson Objective: Students will explore how to make a sturdy bridge with Lego Duplo bricks.
 Success Criteria: I can design solutions to problems. 		

Launch	
	Engineers, do you remember this song? Let's get our brains ready to think about engineering by singing this song. Play video: You're An Engineer by Dan Crow. Encourage students to sing the chorus and clap along with the song.
	Now that our brains are ready to think like an engineer. For a deeper understanding about Civil Engineering, look at these pictures and think: What do you notice? What do you wonder? Possible student responses; I see bridges. I notice two red bridges. I notice a flat bridge. I wonder why that bridge has circles.
	You noticed and wondered a lot about bridges. Now, Turn and Talk with your partner, What do you know about bridges? Divide students into partnerships in their partnerships to turn and talk about the question.
	When students return from partnerships, build on prior knowledge and Invite students to share their knowledge about bridges. Facilitator questions could include: Interesting, can you tell us more? How do you know? Why do you think that? What else can you think of?
Explore	
	Our question to investigate is: How do engineers build strong and sturdy solutions? What does "strong" mean? What does "sturdy" mean? Allow time for students to respond and define these words for the class. "Strong: means that it can hold a lot of weight and "sturdy" means that it does not fall down. Can you show me "strong" with your body? Can you show me "sturdy" with your body? Today we are going to explore how engineers build strong and sturdy solutions.
	In the last lesson, we read to understand The Three Billy Goats Gruff. What was the problem in this story? Right, the goats needed a bridge to cross the river so they could eat. Today we are going to explore with Lego Duplos to solve this problem you found. How do engineers design strong and sturdy structures? Let's explore to find out. Give students 10-15 minutes to explore with Lego Duplos in constructing a strong and sturdy bridge across a blue strip of paper (water).
	Let's test our solutions to see if they are sturdy and strong. Students can use blocks, Lego animals, etc. to test the strength of their bridge.

	After students have had some time to explore with the Legos, stop their construction and ask them to reflect on their work. <i>You have had some time to explore how engineers build strong and sturdy solutions. How did you try to make your bridge strong and sturdy? Let's watch this SciShow Kids video about "What makes bridges so strong?" to see if we can improve our solutions, making them stronger and sturdier!</i> After watching the video, allow students to go back to their Lego Duplos to improve on their designs.
Reflect	
	<i>How did you try to make your bridge strong and sturdy ?</i> Allow time for students to reflect on their bridge construction and share their thinking. <i>Today we explored one solution to the problem in our story The Three Billy Goats Gruff. There are many ways to solve the Billy Goats Gruff problem and we will explore more of those solutions in our next STEAM lesson.</i>