

Kacey Legare
2nd Grade Elementary

Engineering CUP: How do engineers make choices about problems, solutions, and materials?
Rounds Sheet

Background:

This is the fourth lesson of my engineering unit regarding a bridge building project. Prior to this unit, students read Rosie Revere Engineer, Iggy Peck Architect, and Ada Twist Scientist picture books by Andrea Beaty. They have done work regarding “structure” and “function” with Project Lead the Way. We have also discussed what engineers do and defined the Engineering Design Process. Students then defined the problem (build a bridge made of paper between two dictionaries that can hold pennies) and brainstormed possible solutions. They then were assigned partners to plan and design models to test. Students practiced reflecting on strong models and good collaboration. Most recently, on Monday, students got to test out different materials for building their bridges including tin foil, wax paper, construction paper (which they had used before) and cardstock. Students will be using the information from that lesson as well as this lesson to improve their designs and make models that will be used for the final tests next week.

This lesson will help students engage as engineers by determining different ways to fold paper-like materials to build strong bridges through hands-on exposure and collaboration. This unit focuses on the Massachusetts Science and Technology/Engineering standards in the Technology/Engineering section under the Engineering Design subsection which states, “*2.K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs. Data can include observations and be either qualitative or quantitative.*” They will build upon this standard and should have a substantial feel around engineering at this point in the year and in the unit itself.

Focus:

I am particularly focused on how well my students can complete the given task within the time allowed through active collaboration and thoughtful actions as well as use the information from the video to inform their exploration. I want to know if students will collaborate and work together with their partners to try and determine which folding techniques are best for making strong bridges. I am also focusing on classroom management and how well I convey the expectations for the lesson and well my students internalize and execute the objective.

Today, the lesson will be determining the most effective ways to fold paper in order to make strong “bridges” that will hold a lot of pennies. We will be meeting on the rug and discussing our

expectations around the lesson, then watching a brief but crucial video showing the types of fold they will be testing out. Then, students will break into partners and get 4 sheets of paper to test with. They will be responsible for finding out which folds work better than the others. I will be running the testing table in the front of the room. Students will be logging which folds are best in their engineering packets.

Learning-Centered Questions

1. What evidence do you see of students applying prior knowledge of engineers/engineering in their exploration of folding techniques? (Using EDP, thinking about improvements for final tests, etc.)?

2. What evidence do you see of students learning and using new folding techniques from the video and referring to the image in their packets to improve their own designs and models? Are they considering applying this knowledge to improve their final designs?

Practice-Centered Questions

1. What evidence do you see of students using collaboration practices (sharing materials, taking turns, working together on one common goal, etc.) to test their folds?

2. What evidence do you see of students' understanding expectations and respecting the community of learners in response to clear instruction on my part? (or not clear instruction/confusion)?