

Background and context

This is the 4th lesson in our unit on engineering in second grade. Our overall goals of the unit are to learn what it means to be an engineer, discover the importance of the design cycle, and also what materials serve different purposes. In this lesson we are on the “Build and Create” part of our design cycle which we created as a class in our first engineering lesson. Today you will see students working in small groups on a boat made out of recycled materials from a sketch that they worked on in the last lesson. Earlier this morning we had two mini-lessons also relating to today’s main activity of building. We had a conversation around group work including a discussion on the importance of compromising, as well as a read aloud of Rosie Revere Engineer to remind us of the importance of failure in the design process. Rosie’s aunt is adamant about learning from mistakes and honoring your “brilliant flops”!

We have discussed the importance of choosing materials purposefully, but but part of this unit is *discovering that purpose*, so you may notice that some of their reasoning for choosing certain materials is not very sound yet. It is my intention that as we move on to build our second model after we test this first one, we will discuss in more depth the qualities of certain materials that make them fit for certain purposes.

Throughout this unit we are also practicing self-reflection and group-reflection as a way of assessment. At the end of the lesson you will see students filling out a self- and group- reflection which they have done in a group, but not independently yet.

Learning Focus

The purpose of this three-part lesson (of which you are seeing the last part) is to practice skills of group-work as well as design a boat that can float and hold weight. Students are following the engineering design process as we move throughout this project of designing a boat that not only floats, but holds the most number of plastic bears. This lesson focuses on skills of distinguishing roles in a group setting, picking materials that are best fit to the purpose of the boat, and using critical thinking skills to problem solve as a team.

Learning-Centered Goals

- a. SWBAT work collaboratively in their teams and practice team-building qualities of engineers (they listen, they build off other people’s ideas, they wait until everyone has spoken to start building or drawing).
- b. Students will choose materials that make sense for the purpose of their boat.
- c. Students will follow their group Plan and Sketch plans from their Engineering Journals to create one boat.
- d. Students will be able to partake in a group discussion of what it means to be a team-builder.
- e. Students will understand the importance of beautiful flops (just like Rosie Revere).

Practice-Centered Goals

- a. I will be clear with my expectations for students. Before I give out any pieces of paper, I will deliberately guide them through what I expect so there are no surprises.
- b. I will follow my own protocol of relieving group-stress by asking them to fill out the “Team Roles” sheet if I notice they cannot do it on their own without writing down roles.
- c. I will bring out and reference to the anchor charts from the morning to guide our practice of team-builders and engineers who are willing to fail beautifully.
- d. For students who I anticipate having a hard time in their groups, I will be clear with how I see them doing in the group, and conference with them independently if need be (Prince, Chino, Keziah).

Learning Centered Inquiry

Were there instances of students using the phrases we went over in the morning to facilitate listening and ease in a group setting?

Was there evidence of students choosing materials intentionally?

Was there evidence of students working out problems together?

Was there evidence of students focusing on the *purpose* of the boat (to float and to hold weight)? (As opposed to the finer details which are not as pressing).

Practice-Centered Inquiry

Did the anchor charts in the front aid group conversations for students?

Were my expectations explicit enough that student's were clear on their task?

Did I situate myself in the classroom (physically) in a way that was conducive to keeping an eye out for the whole class while simultaneously focusing on the group at hand?