Create a System to Lift a Weight onto a Chair

Lesson Overview: Students must create a system to lift a weight (a block, a bag of coins) onto a chair. Students are not allowed to touch the weight directly when lifting it to help solve the challenge.
Suggested Time: 30-60 minutes

Learning Objectives:
- To practice navigating collaboration when building a system
- To think about how individual components interact in a system

Materials:
- Cylinders (cans, paper towel rolls)
- String
- plastic bags (small)
- weights (e.g. blocks, coins, batteries)
- masking tape
- thin cardboard (e.g. cereal boxes)
- paper or plastic cups
- rubber bands
- paper clips

Directions:
1. Explain to the students that are going to build some type of system that will move the weights onto the seat of a chair.
2. Show the students the materials they can choose from.
3. Tell them they can alter the materials as needed for their designs.
4. Students can sketch their initial designs in their engineering journals. Once they have a sketch, they can begin building.
5. Have them test the first or second version of their design and lead a discussion of the designs to help think about how the drums sound. This can be a whole class discussion
6. Have students keep iterating, encouraging them to analyze and interpret after testing.
7. Be sure to leave time to have a final discussion with the class to talk about their design, but also the process they used and what role testing played.

Possible Discussion Topic:
- How did you manage building different parts in your group?
- Did other groups' ideas help you think about what you wanted to do?