



Engineering Experiment: Trampoline Challenge

Project: Models, Design, Material Science, Recycling

Supplies:

- Colander (1 per group)
- Rubber Bands (20-40 per group, differing sizes and elasticity)
- Toothpicks (50-80 per group)
- Binder Clips (5-10 per group, small size)
- Material or Fabric (can also use aluminum foil, plastic wrap, simple paper, wrapping paper, etc.)
- Ball (1-2 per group, differing sizes and materials. Ping pong and smaller, safer balls recommended.)
- Masking Tape

**Prior to activity, use masking tape to measure out a "ruler" behind the trampoline to see how high each ball bounces. Can also use to tape off highest jump and other markers.*

Objective: Design and build a trampoline that springs a ball as high in the air as possible*

Time: 30 minutes

What to Do:

1. Thread one end of rubber band through a colander hold. Secure with a toothpick and start stretching the rubber band across the colander. Push the other end of the rubber band through another colander hold and secure with a toothpick.
 - a. FYI - This requires fairly advanced fine motor control.
2. Let the groups determine the placing of their rubber bands, the types of bands they use, and how many (or few) they choose to use.
3. Once the rubber bands are in place, groups can cover them with material, paper, fabric, etc. Use the small binder clips to make sure your covering is securely clipped to the bands.
4. Drop each ball (from the same height) over the trampoline and see how high it bounces back up.
5. If time allows, let each group make changes to their design in order for their ball to bounce as high as possible.
6. *If time allows, change the objective or goal of the trampoline. (Bounce back the least/lowest; bounce into a bin to the left/right of the trampoline, etc.)

Reflect:

1. How many rubber bands did you use for your trampoline? How high did your ball end up bouncing?
2. How did changing your design affect how much the ball bounces? What changes made it bounce more? Bounce less? Bounce to one side or the other?

Apply:

1. Can you think of any other supplies you might have used to make your trampoline?
2. Why is it important to know how high (or low) a load bounces on certain surfaces? What are the real-world connections?

Some safety, rescue missions using trampolines or safety cloths for people to jump into, bounce softly, and land safely. They must make sure they hold the edges correct, with the right amount of "give" in order for the load/passenger to land safely and softly.

Source: STEM Activities for Kids www.stemactivitiesforkids.com