



Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Tensegrity Table

Finalist's Name: XANDER SKUL

School and City: D60 Online Middle School - PUEBLO

Sponsor's Name: Charles Carmichael

Category: Engineering

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

The purpose of this research is to determine if steel chain provides the most stability on a tensegrity table. A table was built using plywood, metal pipes for center pieces that only touch one piece of the table, & hooks to attach the various stabilizing materials.

While the term tensegrity has been around for decades little to no research has been done on the stability of materials used. www.smarttextiles.com define tensegrity as "Coined from the term tensional integrity, tensegrity is a structural principle that leverages a unique balance between tension and compression elements to create stable, yet dynamic formations."

Examples of tensegrity are beautiful, functional and stable, such as spiderwebs, bridges, and jewelry utilizing tension and compression as gemstone settings. Though tensegrity items are everywhere, I was unable to find any research conducted in modern engineering.

Once the table was assembled, I attached the steel chain to the hooks, placed 1 cup of water in a cup. I then swung a basketball from a metal bar and hit the edge of the table. I measured the remaining water in the cup. I repeated these steps with plastic chain, cotton rope, and paracord. I determined that steel chain did provide the most stability to the tensegrity table.

However, steel chain may not always be the best material to use in tensegrity projects. There is opportunity in the engineering world to test tensegrity and stabilizer. Could a bridge under a lot of stress from natural elements like hurricane winds, be built with a material that allows the bridge to move slightly, rather something rigid that would break under the strain.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**