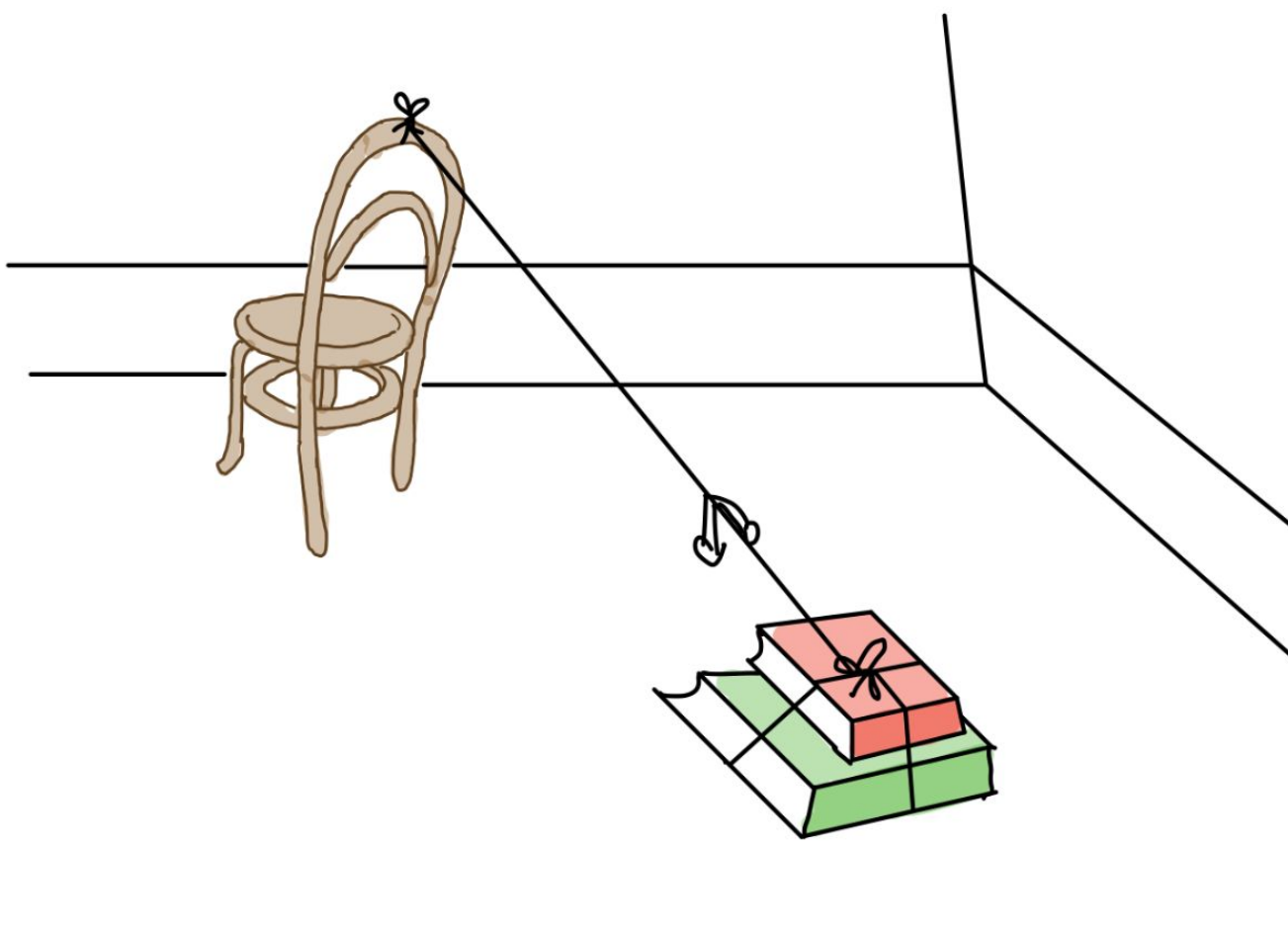
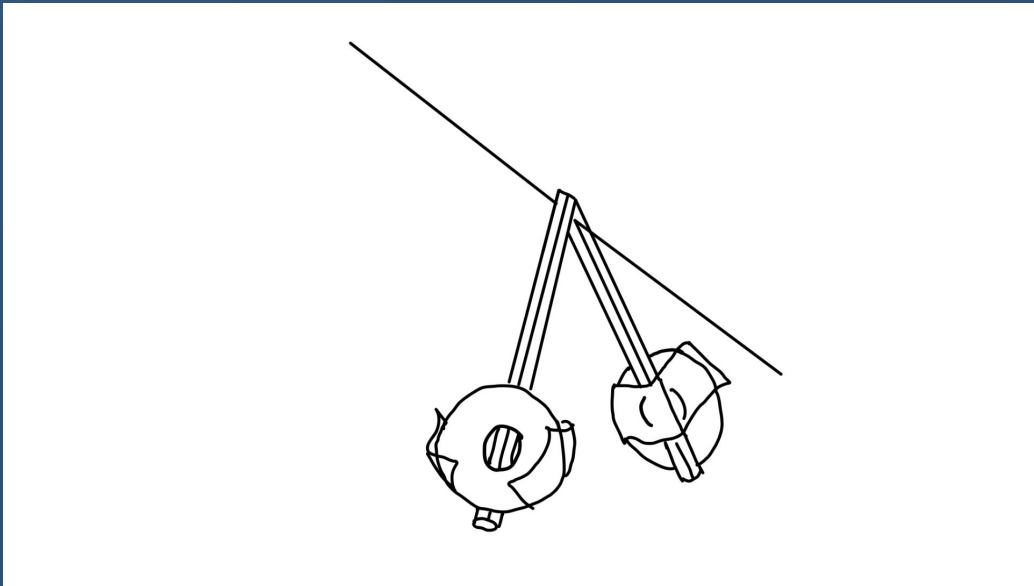


# Connecticut Governor's STEM Challenge



**Y**  **IEEE**



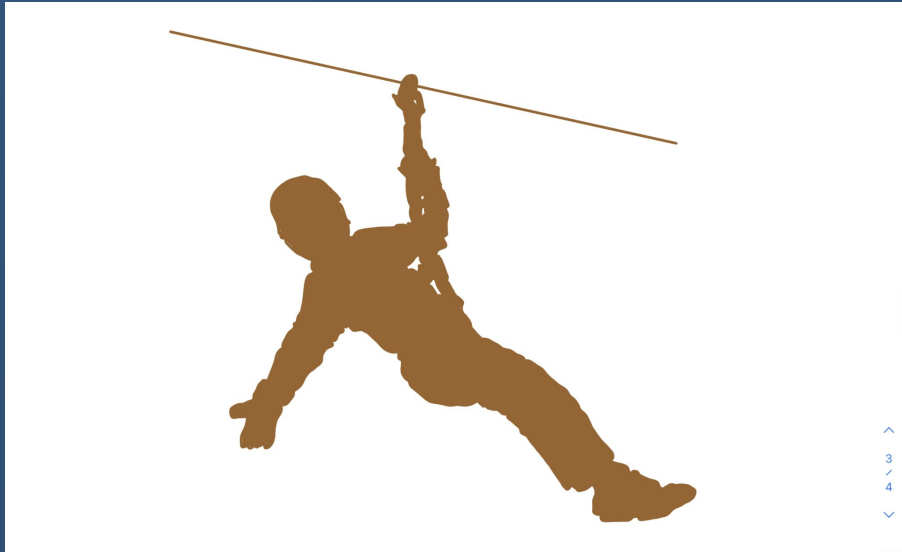
## —🌀— CHALLENGE INTRODUCTION —🌀—

Have you ever wondered how ziplines work? It's because of gravity! When an object goes from a high altitude to a low altitude, it is being pulled down by gravity. However, there's another force involved in the zipline: friction. An object must be attached to the zipline, and that point of contact causes friction against the zipline. In this challenge, we want you to balance the forces of friction and gravity to create the longest zipline possible to carry a small load of a couple coins.

## —🌀— CHALLENGE OBJECTIVE —🌀—

Design the longest possible zipline. The longer it is, the better. The zipline you design must hold a load of 5 quarters, so make sure to design a carrier to attach to the zipline as well.

Make sure to look at the challenge specifications to see if you are adhering to the design restrictions.



## — MATERIALS —

The zipline may only be constructed from:

- string
- twine
- straws
- paper or plastic cups
- dental floss
- 5 quarters (this will be the load)
- a suitable amount of tape to secure the load

## — DESIGN TIPS —

1. Be creative!
2. Test out different materials for your zipline. Different materials have different amounts of friction.
3. Make sure there is nothing blocking the carrier when it touches the line
4. If it doesn't balance well, adjust the weight to change the center of gravity of the carrier



## — DESIGN RESTRICTIONS —

- The carrier of the zipline may not completely enclose the load (the quarters)
- The maximum angle of the zipline is 45 degrees
- The zipline must be anchored at its highest and lowest points. Any method can be used to anchor the zipline.

## — CONTENT REQUIRED FOR SUBMISSION —

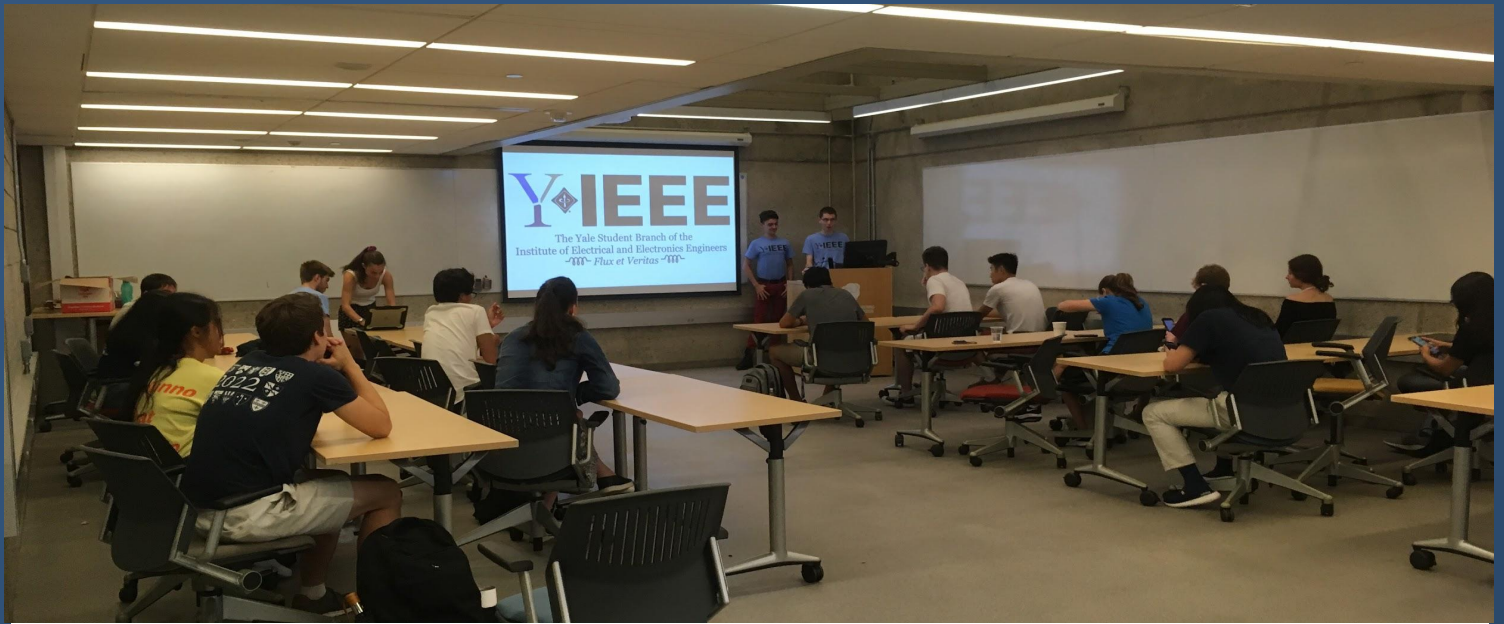
Required - Documentation of the design process including a description of the final design (with sizing included), any testing you did or iterations you made and how you selected a final design

Required - Video of the zipline with the load going down the entire length of the zipline.

## — HOW WILL WINNERS BE SELECTED? —

Judges will review the submissions and decide the winner based on the following factors:

- Length of the zipline (the longer, the better)
- Angle of zipline to the floor (the smaller, the better)
- Video and documentation quality



## — SUBMISSION PROCESS —

Upload all required documentation to the website.

# HAPPY DESIGNING!

	4	3	2	1
Length of the zipline All ziplines will be ranked according to length.	Top 25%	25-50%	50-75%	75-100%
Angle of the zipline to the floor	<5 degrees	5-10 degrees	10-15 degrees	15-20 degrees
Video and Documentation Quality	Videos and documentation cover all required elements clearly.	Videos and documentation are present, but do not contain some requested elements.	Video and documentation are present, but many elements are missing.	No video or documentation are present.