



Curiosity Guide #207

Bridges

Accompanies Curious Crew, Season 2, Episode 7 (#207)

Human Cable-Stayed Bridge

Investigation #5

Description

Turn your friend into a human bridge to learn about a newer kind of bridge. Tell her, "It's all in the name of science!"

Materials

- Wide ribbon or bathrobe sash
- Scissors
- Hardhat
- Tape

Procedure

- 1) Ask a friend to stand up and hold his or her arms out to the sides.
- 2) How long can your friend hold his or her arms there?
- 3) Now cut the wide ribbon into a 4-foot, a 5-foot, and a 6-foot length.
- 4) Have your friend put on a fitted helmet or hardhat.
- 5) Find the center of each length of ribbon. Tape the center of each ribbon to the top of the helmet so the ribbons hang down on each side.
- 6) Carefully tie the ends of the longest length of the ribbon on each of your friend's wrists.
- 7) Tie the next-longest ribbon near your friend's elbows.
- 8) The shortest ribbon goes on your friend's upper arms.
- 9) Have your friend hold his or her arms out to the sides, this time with the ribbon supports.

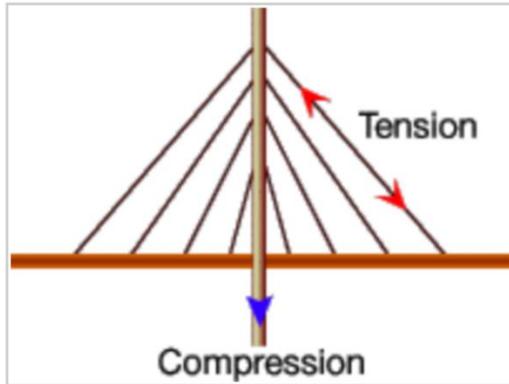
- 10) You may need to adjust the placement of the ribbons to keep them taut.
- 11) Ask your friend, "How do the ribbons on your arms feel? Describe how the support point feels on your head."

Something else to try: Hold a contest between two people, one whose arms are supported and one whose arms are not. Who can hold up their arms the longest?

My Results

Explanation

Adding the ribbon to support the person's arms relieves the muscles from having to work against gravity. Instead, the weight from the arms is transferred back along to the ribbon to the top of the head. The person should feel compression pressure down on the top of his or her head through the now-weighted hat.



Your friend has just become an example of an "A"-Cable-Stayed suspension bridge design. This cable-stayed design, which appears to form a capital A, typically has a series of cables that branch off from the towers at different heights. The cables angle down to support the bridge deck. These cables transfer the tension back to the towers, which accommodate for the compression force on the bridge.

Something else to see: On the internet, search for "cable-stayed bridge." Click on Images. Can you find a really interesting one?

Cable-Stayed bridges are newer versions of the suspension-bridge design. What makes these bridges really special is how artistic they are becoming. Not only are they really strong; they are also really pretty!

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