



CARDBOARD CHALLENGE

Learning engineering and creative problem solving through a fun and open ended cardboard construction activity.

Project Type: Engineering

Group/Individual: Either

Lesson Plan Audience: Maker

Time: 5min - 1 hour

Hard Skills: Measurements and calculation, physics, engineering

Soft Skills: Design concepts, Collaboration, Resilience and patience, Creative problem solving

Ideal # of Participants: 2 - 20

Age Group: 6 +

Ideas for Taking it Further:

The cardboard challenge is very flexible, and can be altered and tweaked to meet various goals. A couple of examples:

You could ask students to focus on building a structure that can support a certain amount of weight, instead of the primary objective being height. You could give students a limited amount of cardboard to work with, and make them figure out how to make a minimal amount of materials stretch to the greatest height.

You can also add a literacy/ communications component if desired. See step #7.

Library Resources: [Shapes in math, science and nature : squares, triangles and circles](#) (Book)

The Cardboard Challenge is a fun open ended activity that anyone can do. All you need is 2 or more people, some cardboard, and something to cut the cardboard with.

For more inspiration and facilitation ideas you can go to <http://cardboardchallenge.com/>.



Materials: Cardboard, scissors or cardboard cutters

Steps:

- (1) Lay out cardboard and cutters.
- (2) Participants can work as individuals or in teams.
- (3) Explain the rules of the challenge to the group. The goal is to see who can build the tallest cardboard structure. You can set any time limit you want. Participants are allowed to use only the cardboard to build the structure. No glue, tape, etc is allowed. The only tool available is scissors or cardboard cutters.
- (4) Let participants get to work on their structure.
- (5) When time is up, the person or group with the tallest structure wins!
- (6) Have each group/ person explain the technique they used to build, and why they decided to do the build in that way. After each group/ person talks about the structure they made, have a group discussion about why participants think some techniques worked better than others. If they had to do it again, what would they do differently to make their structure more stable?
- (7) If you'd like to take the activity a step further, have participants take photos or make sketches of their creations. Ask them to write a paragraph about how they build their structure, and why it was able to stand. With words and images, have them illustrate why and how their structure worked. Compile the illustrated explanation into a "Builders Guide Book".

Why do This Activity?:

Having participants build without the help of adhesive forces them to think about balance, design, and shape when attempting to create something with structural integrity. Participants are also forced to think on their feet and use creative problem solving to come up with a solution to the problem of building without adhesive. The "challenge" aspect of the activity adds some fun competition and makes it into the game. Having a clear goal, like height, allows the activity to be open ended, without being so abstract as to feel overwhelming or dull.

If you try out step number 7, asking students to create an illustrated and written explanation of their engineering triumphs will reinforce their understanding of the activity. By asking them to explain their process in a way that will make sense to others, and they will have to think through their building decisions and successes in a systematic way. This part of the activity is also a great exercise for enhancing literacy and communication skills. The resulting guide can be used for later reference if someone encounters an engineering challenge that they become stuck on.

