CHALLENGE #2: TALL TOWER (EXPLORATORY)

YOUTH WILL BUILD A PAPER TOWER AS TALL AS THEY ARE

MATERIALS: Paper and tape.

VOCABULARY: **CONSTRAINT: CONSTRAINT** means "a limitation". For this project, the **CONSTRAINT** is the materials you may use to build your tower. You may only use paper and tape.

4-H LIFE SKILL: **PROBLEM SOLVING:** As you build the tower, you will encounter multiple problems. Figuring out a solution to each difficulty will help you to achieve your goal.

DO: YOUTH COMPLETE THE ACTIVITY

Watch the challenge: https://go.umd.edu/ptchallenge

Design and build a tower as tall as you using only paper and tape.

You may consider shaping your paper into cylinders or triangles to make the columns, and using the paper as platforms or supports for the levels of your tower.

CHALLENGE #2: TALL TOWER (GUIDED)

YOUTH WILL BUILD A PAPER TOWER AS TALL AS THEY ARE

MATERIALS: Paper and tape.

VOCABULARY: **CONSTRAINT: CONSTRAINT** means “a limitation”. For this project, the **CONSTRAINT** is the materials you may want to use to build your tower. You may only use paper and tape.

LIFE SKILLS

4-H LIFE SKILL: **PROBLEM SOLVING:** As you build the tower, you will encounter multiple problems. Figuring out a solution to each difficulty will help you to achieve your goal.

DO: YOUTH COMPLETE THE ACTIVITY

Watch the challenge: **https://go.umd.edu/ptchallenge**

then follow steps 1-5 on the following page.

CHALLENGE #2: TALL TOWER (GUIDED STEPS ONE THROUGH FIVE)

STEP 1. IDENTIFY THE PROBLEM

Design and build a tower as tall as you are using only paper and tape.

STEP 2. IMAGINE SOLUTIONS

Think about all of the possible ways you can make your tower. Do towers go straight up or do they have multiple levels and supports? How can you roll or fold paper so it can stand up?

STEP 3. PLAN POSSIBLE SOLUTIONS

Roll paper into cylinders and secure with tape. Does this seem like a good support for your tower? Can you fold paper in half to make different levels? Sketch out your design.

STEP 4. CREATE YOUR PAPER TOWER

1. Roll 4 pieces of paper and tape the edges to make cylinders. Stand them up next to each other.
2. Fold a sheet of paper in half and lay it across the top of the cylinders to complete the level. Tape it to the cylinders.
3. Roll 4 more pieces and tape them standing up on the story, and add a half sheet on top to complete the level.
4. Repeat until it is as tall as you or as tall as you would like.

STEP 5. IMPROVE YOUR DESIGN

Look at your tower. Is it standing straight without falling over? Do you need to change anything to make your tower stand taller?

You can go back to Step 1, and start the process again to make the changes for your next iteration to improve your tower.

CHALLENGE #2: TALL TOWER

REFLECT: GUIDE YOUTH THROUGH THE REFLECTION PROCESS

See a solution here: https://go.umd.edu/ptsolution

Was this challenge harder or easier than you predicted it to be?

What problems did you encounter while constructing your tower? How did you **SOLVE** each one?

What other materials would you have used if you were not limited by the materials **CONSTRAINT**?

APPLY: CHALLENGE THE YOUTH TO APPLY WHAT THEY'VE LEARNED TO OTHER PARTS OF THEIR LIVES

What might be examples of **CONSTRAINTS** that engineers face while working on their projects?

Why are **CONSTRAINTS** important?

Share a time in your life when you used **PROBLEM SOLVING** to overcome an obstacle.

REFERENCES:

D'Augustino, T. D. (2016, March 16). *4-H family engineering night engages youth in science.* Michigan State University. https://www.canr.msu.edu/news/4_h_family_engineering_night_engages_youth_in_science

Donelly, G. (n.d.). *Make it! DIY: home engineering.* Kid Museum. https://kid-museum.org/make-it/home-engineering/