A MAKERMEET.IE PROJECT

PROJECT TITLE
Paper Tower Challenge

OVERVIEW
Construct the tallest tower using just 10 sheets of paper.

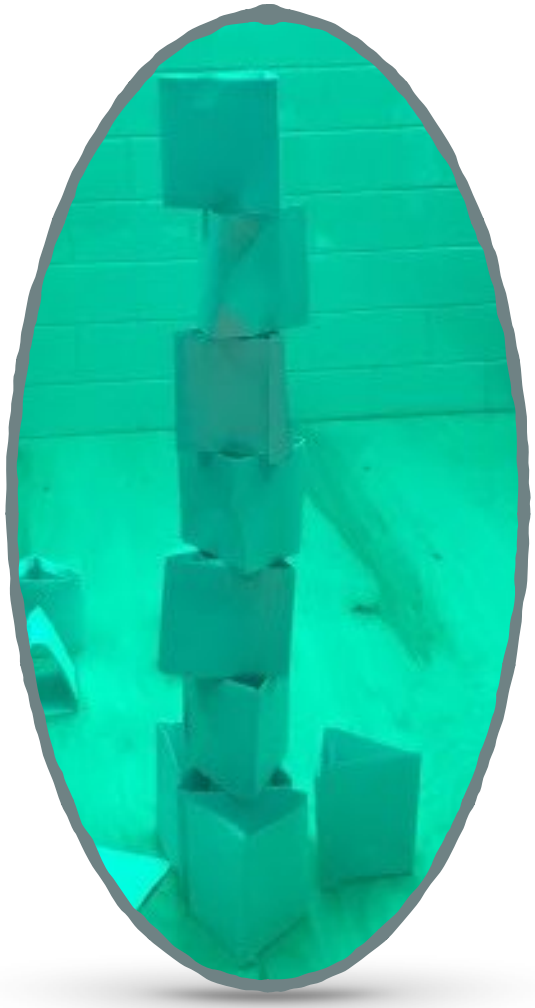
TIME (estimated)
Setup - 2 mins
Challenge - 15 mins.

MATERIALS
10 sheets A4 paper
100g weight (rice/pasta)

PEOPLE
Number: 1+
(can work in teams or individually)

DIFFICULTY

S.T.E.A.M.
- [x] Science
- [ ] Technology
- [x] Engineering
- [x] Arts
- [x] Maths



Paper Tower Challenge

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OVERVIEW

This project aims to develop the engineering and mathematics skills of students by allowing them to engage in a fun way with these concepts. It can also be used to foster teamwork as students can work together to construct the towers. Problem solving skills and creativity are to the fore in this activity as students will generally need to refine their initial designs to ensure the stability and strength of their final constructions.

NOTES

For the 100g weight - we recommend a bag of rice, but double-bag it as it can get torn easily.

This project is used across all levels of education, including 3rd level universities, such as University College Dublin. The School of Mechanical and Materials Engineering has a great video for more information: https://www.ucd.ie/teaching/showcase/papertowerchallenge/

INSTRUCTIONS

Step 1
Gather your materials. Any paper will do but having the same size paper at the start is probably best. (fig. 1)

Step 2
Fold the paper in different ways to make a tower. (fig. 2)

Step 3
Test your tower by placing the 100g weight on top. (fig. 3)

Step 4
Make any necessary changes to the tower to ensure that it will hold the weight for at least 30 seconds.


fig. 1

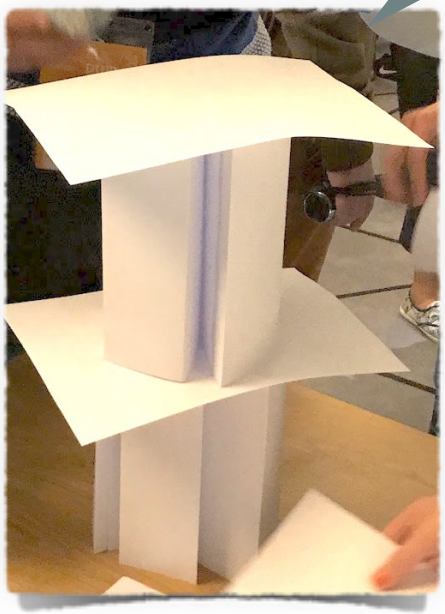
fig. 2

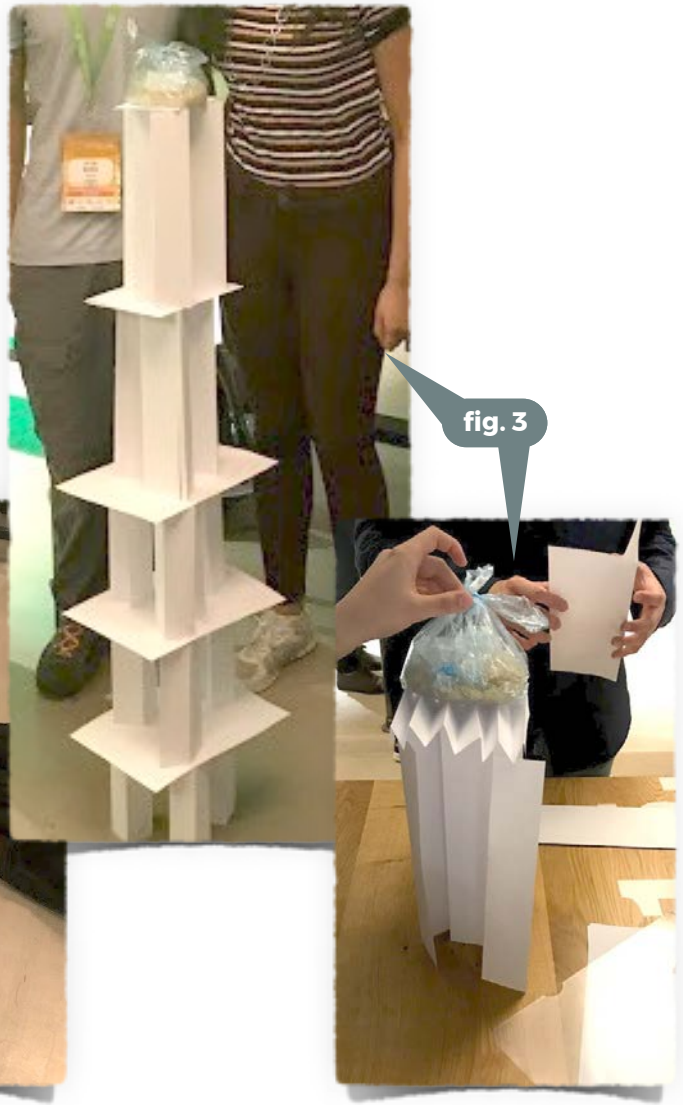
fig. 3

INFORMATION

Learning Outcomes

Students will work with engineering concepts when constructing these paper towers. They will also develop their problem solving and creative skills. If students work in groups to complete the challenge they will develop their interpersonal and teamwork skills.

Pre-Project Inquiries

How should the paper be folded to ensure the stability of the tower?

Will the type of paper used affect the tower? If so, how?

If you could use more paper would that make a difference?

Data Collection & Analysis

How tall was the finished tower?

Was it still standing after 30 seconds?

If you added a second 100g weight to the tower would it remain standing?

Evaluation

What was most difficult when making the tower?

Would you do anything differently?

What kind of shapes did you make with the paper when constructing the different levels of the tower?

Does the type of shape impact the strength of the resulting tower?

Could you make a taller tower with some additional paper?

Real-World Applications

Being able to create stable structures is an important concept for engineers. Using a seemingly weak material like paper you were able to create a stable tower that could hold a weight on top.

Careers

Engineer, Architect.