

Get your students ready for the Science Alive! **STEM Day Out Hold the Load Challenge.**

**You are going to be a Structural Engineer!** Structural engineers are a specialized type of civil engineer. They focus on designing strong buildings that can support their own weight and the weight of everything in them while also standing up to forces of wind, weather, temperature, and earthquakes.

### **At school activity**

The purpose of this activity is to give students the opportunity to practice their structural design techniques. They can do this by using design and engineering processes. Design a structure, test the design, analyse the results, make improvements and testing again.

This activity focuses on how engineers develop building structures to support heavy loads. Engineers must also work to a budget, so the students will be limited in the materials they can "purchase" and they will only have 10 mins to build as 'time is money!'

- Students work in teams to develop a structure that is at least 20cm tall.
- They have 10 minutes building time.
- They will only be able to 'purchase' 4 sheets of A4 paper, scissors and 20cm of sticky tape.
- The structure needs to hold a weight for at least 3 seconds. (the best weights to use are books as they are flat, well balanced and easy to place on top of a tower structure.
- The structure needs to be free standing (no taping to the table)

### **Objectives:**

- Work collaboratively in a group to design, create and test a building structure.
- Encourage creativity, critical thinking and problem solving
- Apply science inquiry skills
- Innovate (design, build and evolve your own unique solution)
- Develop an understanding of the properties of materials
- Develop an understanding of science as a human endeavour

### **What you will need:**

- 4 x A4 sheets of paper per team
- 20 cm of sticky tape per team
- A number of weights (books) to test the structure

### **Teacher materials:**

- For an extension to this activity see Teach Engineering Activity: [https://www.teachengineering.org/activities/view/ucd\\_strongholds\\_activity1](https://www.teachengineering.org/activities/view/ucd_strongholds_activity1)
- View the video <https://www.youtube.com/watch?v=lk41Fe1WK6Q> A class of 320 first year students of UCD Mechanical and Materials Engineering have been set a challenge to build a one metre tall paper tower that will hold one kilogram.

**Curriculum Links:**

**Science**

[Science Understanding - Year 4 Chemical sciences](#)

Natural and processed materials have a range of physical properties that can influence their use.

[Science Inquiry Skills - Years 4-6](#)

- Planning and conducting
- Processing and analysing data and information
- Evaluating
- Communicating

[Science as a Human Endeavour - Years 4-6](#)

- Use and Influence of Science

**Design and Technologies**

[Processes and Production Skills - Years 4-6](#)