

Distributing Household Supplies on a Shelf

Introduction

Bradley owns a small store that sells household supplies. This year, he planned to redecorate the store by installing a new shelving system that can help him better display the household supplies. For this purpose, Bradley hired a shelving company that can design a shelving system for his store.

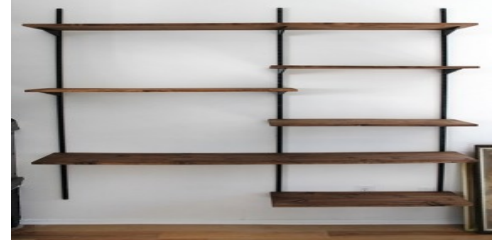


Figure 1. Shelves





The Problem

While installing the shelving system in Bradley's store, Bradley told one of the shelf engineers that he wants to display three books and a radio on one of the installed shelves. Bradley asked the engineer for his recommendation regarding the distribution of these supplies on the shelf so that it does not bend or break.

Your Task

As a team, your job is to use the *Supplementary Material* and *Tools* to discuss issues and perform calculations that can help you come up with *one recommended distribution* and *one prohibited distribution* of the three books and the radio on the shelf in Bradley's store. You also need to be able to explain why you recommended one distribution and prohibited the other one.

Supplementary Material [Sheet 1]

Household Supply	Weight (N)	Dimensions
Book 1	4	 <p>0.1m</p> <p>0.04m</p>
Book 2	12	 <p>0.16m</p> <p>0.06m</p>
Book 3	16	 <p>0.2m</p> <p>0.08m</p>
Radio	30	 <p>0.1m</p> <p>0.30m</p>

Supplementary Material [Sheet 2]

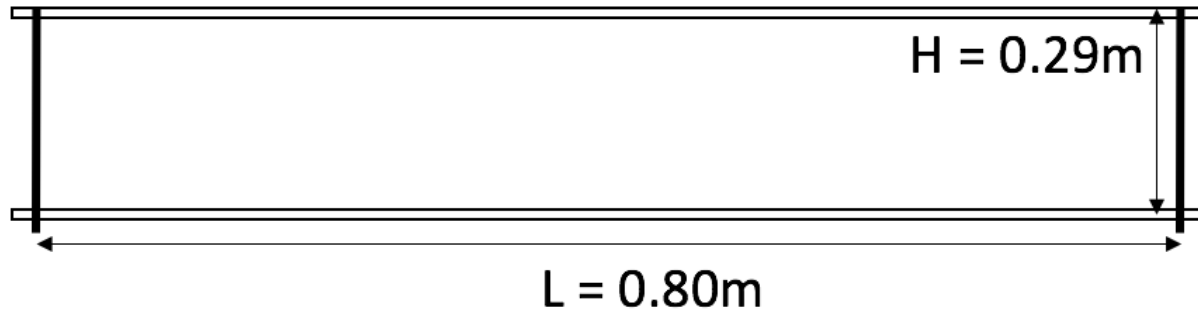


Figure 2. A picture of the shelf

General Information about the Shelf

Maximum Internal Force	50N
Maximum Internal Moment	15Nm
In case your team decided to stack the objects on top of each other, you may only stack smaller objects on top of bigger ones.	

Tools [Sheet 1]

In the table below, you may want to write your plan. The plan is simply a set of steps that your team will execute in order to complete the task. Think about any underlying assumption that allows you to take a step.

[illegible]

Tools [Sheet 2]

You can use the space below to draw one sketch of the shelf with your recommended distribution of the three books and the radio and another sketch for a prohibited distribution of the three books and the radio that will break or bend the shelf.