TITLE OF POSTER TEMPLATE

Cassie Wallace, David Shapiro, TJ Picanco, Katelyn Carrette

Northeastern University

CAPSULE Capstone Unique Learning Experience

Museum of Science

NSF

FOCUS On Children Boston Public Schools

"Dejeuner Gratuit'

Our inspiration…

PROJECT MISSION

To design a luxurious, beautiful, durable and sturdy bookcase that brings a little piece of the "city of love" into your home.

PROJECT GOALS

DESIGN A BOOKCASE THAT:

- ❑ HAS STABILITY
- ❑ EST TRES BELLE
- ❑ HAS "HULK" LIKE STRENGTH
- ❑ USES LITTLE MATERIAL
- ❑ USES A SUSTAINABLE DESIGN
- ❑ HAS A LOW CENTER OF GRAVITY

Prof. Zeid' challenged us with the design expectations and the time constraints..

CALCULATE:

- ❑ FACTOR OF SAFETY OF THE SHELF

SKILLS NEEDED

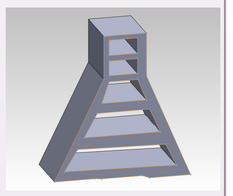
KNOWLEDGE OF SOLID WORKS
MASTERY OF BASIC FORCE CONCEPTS AND GEOMETRY (TO DETERMINE ANGLES AND OTHER CALCULATIONS)

OBSTACLES

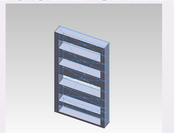
The eiffel tower design requires angles and we are not sure how the angling would work with pegs or notching.
The group has a good understanding of how to extrude parts on SolidWorks but we are less confident in assembly.
In order to do an assembly we would have had to determine the dimensions of each part separately before making them in CAD. This would have taken a lot of time!

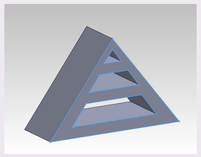
POSSIBLE SOLUTIONS

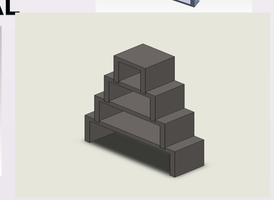
OVERALL DESIGN IDEAS:
BOX WITH PEGGED SHELVES
TRIANGLE SHAPED BOX WITH PEGGED SHELVES
EIFFEL TOWER SHAPED

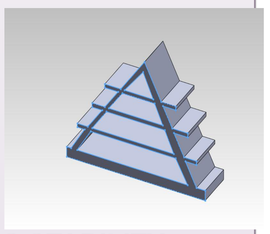


SIDES OF THE BOOKSHELF:
FULL PIECES OF MATERIAL
POSTS







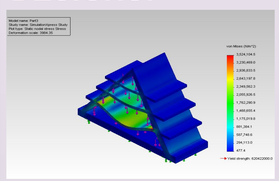


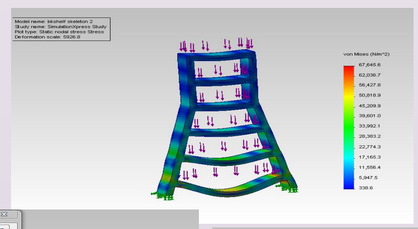
SHELVES:
HANGING THE SHELVES OFF THE SIDES
CONSIDERATION: WOULD THIS PROVIDE LESS STABILITY ONCE THE BOOKS WERE PLACED ON THE SHELVES?
KEEP THE SHELVES WITHIN THE TRIANGLE OR HAVE A TOWER OF STRAIGHT SHELVES ON THE TOP

POSTS FOR SHELVES:
OUTSIDE OR INSIDE??

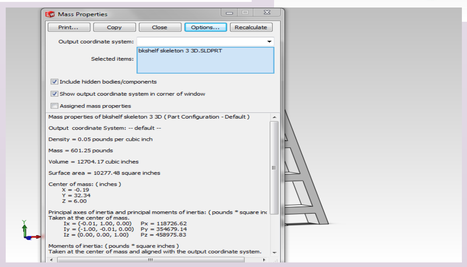
TESTING

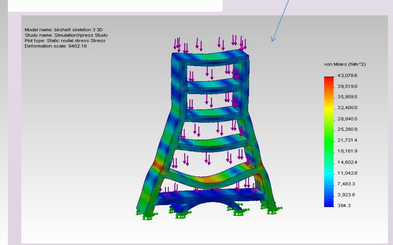
WE ATTEMPTED TO TEST A NUMBER OF DIFFERENT DESIGNS:





Believe it or not this test yields better results!





FINAL SOLUTION?

Time to Retest?

LESSONS LEARNED

ASSEMBLY: WE WOULD HAVE LIKED TO HAVE MADE THIS DESIGN IN PARTS RATHER THAN ONE SOLID EXTRUDED PART

❑ WE WOULD HAVE USED THE SAME OVER ARCHING DESIGN BUT WOULD HAVE MATED THE PARTS TOGETHER USING PEGS OR NOTCHING

MATERIAL: WE WOULD HAVE LOVED TO GO GREEN, BUT UNFORTUNATELY FOR US, TODAY, IT WASN'T POSSIBLE
ALSO, WE WANTED TO USE WOOD BUT SOLID WORKS WOULDN'T LET US ;)

MANUFACTURING: REALISTICALLY HOW WOULD A COMPANY MANUFACTURE A SOLID EXTRUDED PIECE THAT IS 6FT TALL!

TAKE AWAYS

WE HAVE LEARNED TO APPRECIATE CAD AND APPRECIATE THE CHALLENGES THAT OUR STUDENTS FACE WHEN PRESENTED WITH TASKS LIKE THIS.

WE HAVE LEARNED FROM THE TRIAL AND ERROR PROCESS DURING THE DESIGN ATTEMPT . WE ALL AGREE THAT WE ARE MORE CONFIDENT NOW AFTER DOING THIS PROJECT.

In the Classroom we hope to:
Apply CAD or Goggleskethcup in lessons where we know that we do not have the resources to build but would like our students to test the structure.