

PROJECT MISSION

To design a durable and sturdy book base using minimal and environmentally friendly materials

PROJECT GOALS

- Work as a team to plan and create a unique, stable bookcase design using CAD
- Work within specific design constraints
- Use material that is made from 50% recyclable materials
- Create a design capable of holding other objects in addition to books

PROJECT EVALUATION

The project will be considered a success if the following criteria are met:

- Work as a team to research and design plans
- Book case falls within the design constraints
- Bookcase constructed from 50% recyclable materials
- Bookcase tested for safety factor which does not exceed 1

PROJECT PLAN

Research and brainstorm ideas for a bookcase
Research materials for bookcase
Customized materials on SolidWorks (Trex 50% recyclable plastics and 50% wood)
Use CAD sketch and model team's ideas

POSSIBLE SOLUTIONS

Team discussed several ideas :

- Two-sided room divider bookcase
- Step design with tiered shelving
- Standard rectangular shape
- Ying Yang circular design
- Rotated cube (triangles) or Quad shelf



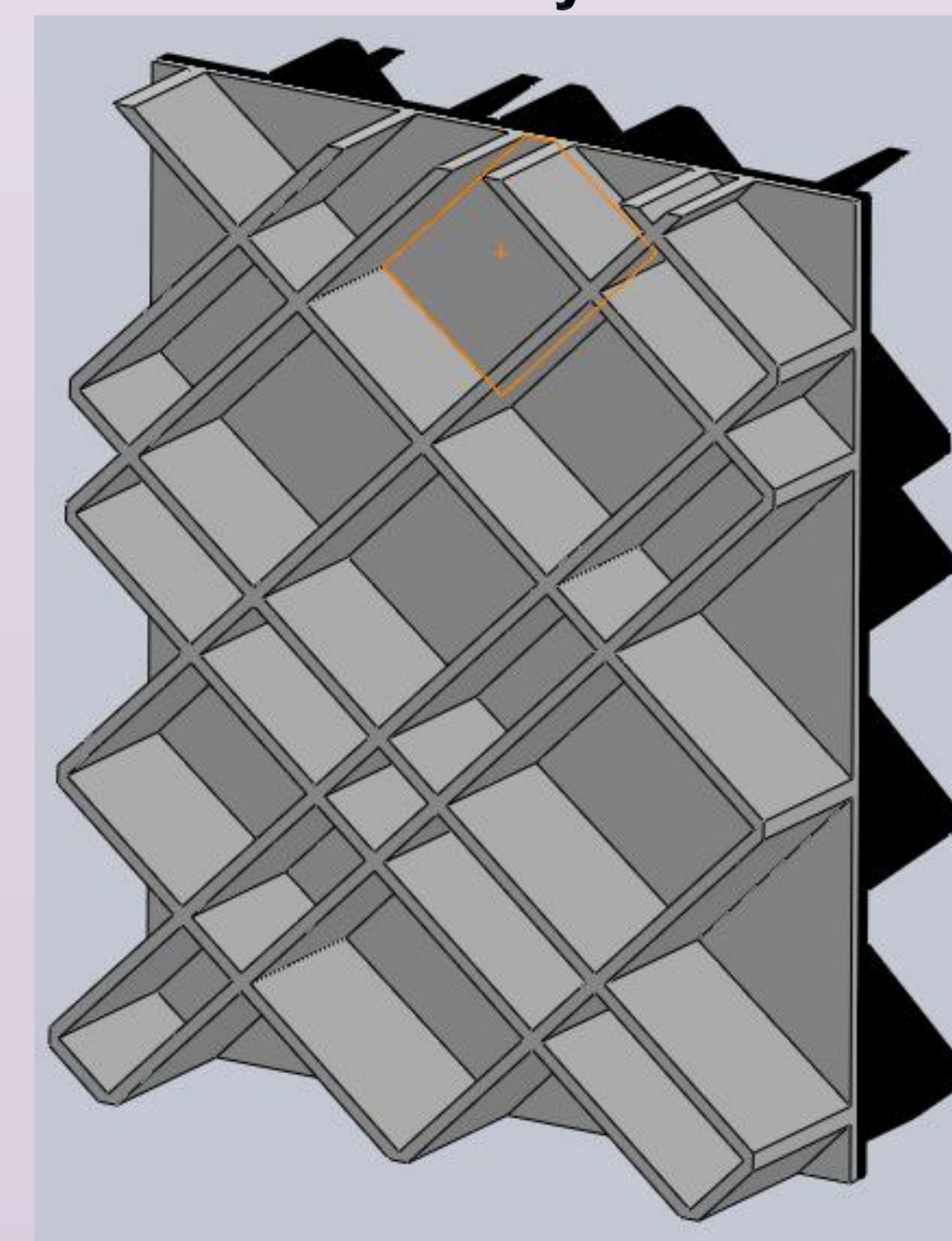
FINAL SOLUTION

The team selected a modified version of Quad shelf for strength, esthetics, versatility and unique design.

Quad design



Versatility



LESSONS LEARNED

- CAD skills
- Cooperation and perseverance are keys to success
- Intersecting lines cannot be extruded
- In using custom materials (Trex) we needed to define the properties such as tensile strength, density, perpendicular compression
- Collaboration among team members led to many new ideas

TAKE AWAYS

- The process takes much longer than originally anticipated
- The collaboration between team members led to new ideas
- When learning how to use a new program, such as CAD, it is a better idea to start with a simple idea at the expense of uniqueness.
- Fully investigate material properties (mass)