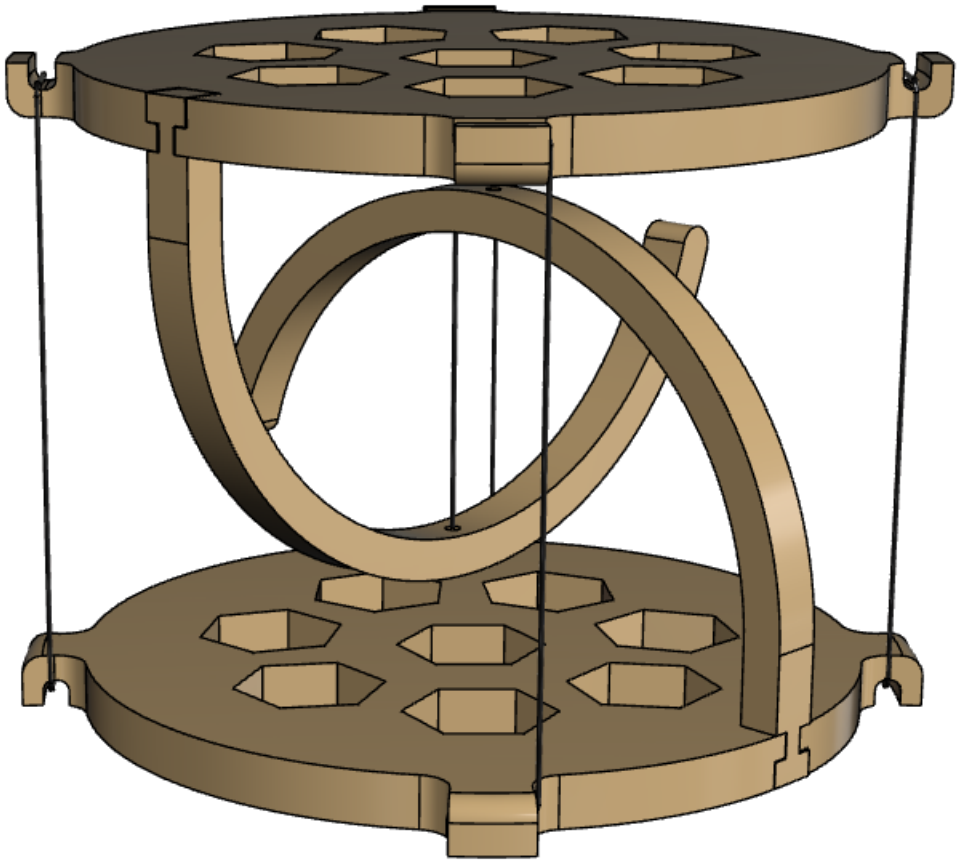
SOLIDWORKS

DESIGN PROJECTS

Student Guide

3DEXPERIENCE



TENSEGRITY TABLE

DASSAULT SYSTEMES

DESCRIPTION

Welcome to the Design Projects Student Guide! The focus of this project is a Tensegrity Table. Tensegrity is a structural principle based on isolated components under constant tension and compression.

This guide contains information regarding Design Intent, DFAM (Design for Additive Manufacturing), and Design Tips to keep in mind for each part.

You will use CAD to design each part, print the parts on a 3D printer, and assemble them to complete the table.

For a video demonstrating the design approach, detailed dimensions, and step-by-step instructions, see the links in the **Additional Resources** section below.

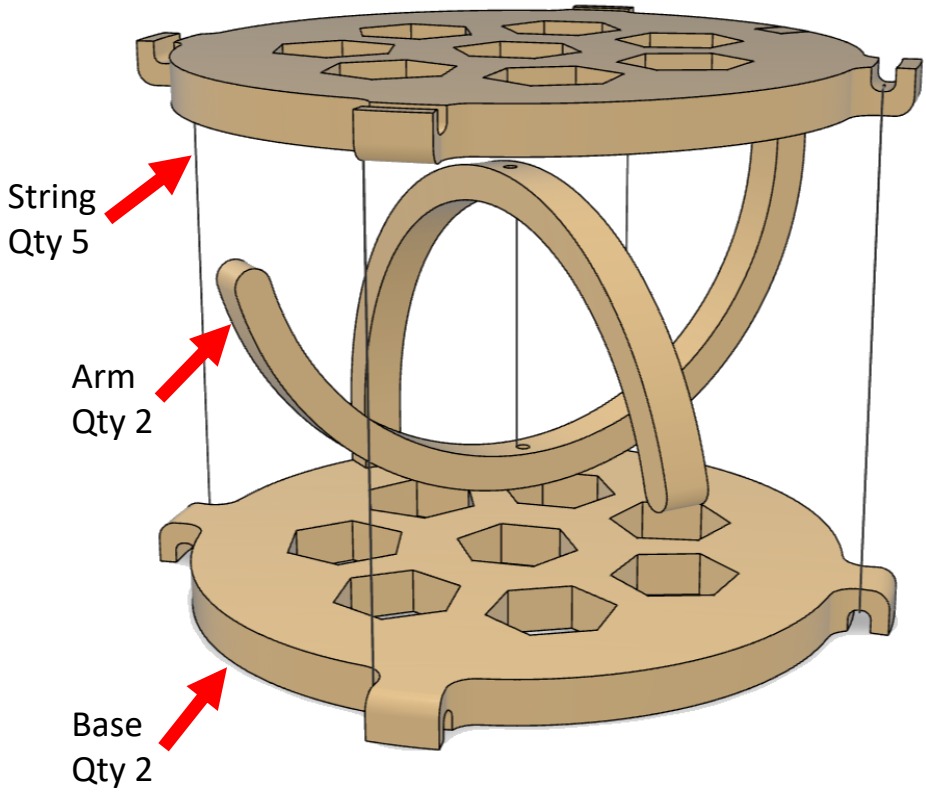
PROJECT TASKS

1. Create the following components in CAD:
    a) Base
    b) Arm
2. Create an assembly of the table in CAD.
3. Create a cutout in the Base to mount the Arm.
4. Print the physical components on a 3D printer.
5. Assemble the table.
6. Balance an object.

ADDITIONAL RESOURCES

LINK TO DOCUMENTS
LINK TO YOUTUBE VIDEO
LINK TO STEP-BY-STEP

TENSEGRITY TABLE COMPONENTS



BASE

DESIGN INTENT

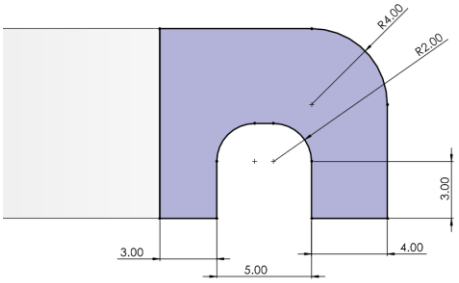
- Hooks are used for attaching the two subassemblies together with fishing line or other suitable alternative.
- The T slot cutout is designed using the assembled parts as a reference..

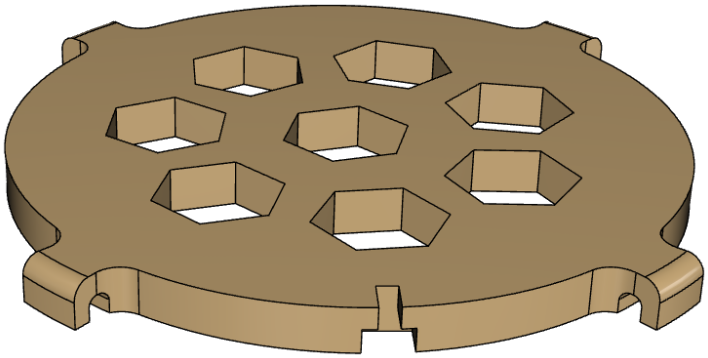
DFAM

- 3D Printed upside down to eliminate support material.

DESIGN TIPS:

- Auto transition between a line and arc by returning the cursor to the endpoint and moving away in a different direction, or by pressing the A key on the keyboard.
- After drawing the profile, add relations then dimensions.
- Use Convert Entities to create sketch entities based on existing geometry.





ARM

DESIGN INTENT

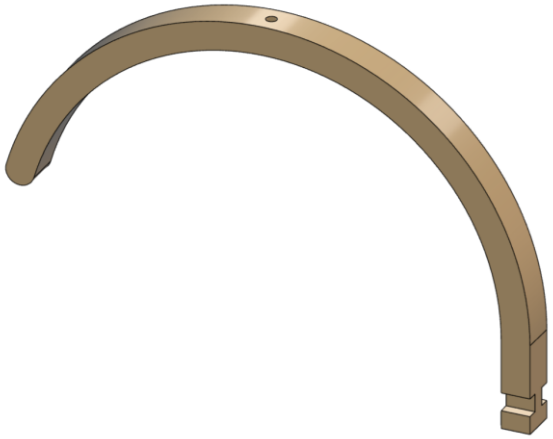
- The T slot drives the cutout in the Base.
- Overall size is to be smaller than the Base.

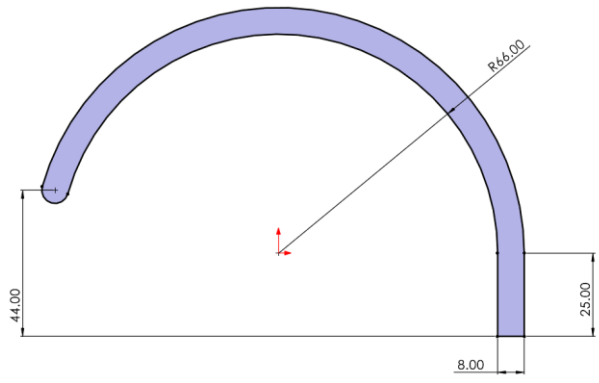
DFAM

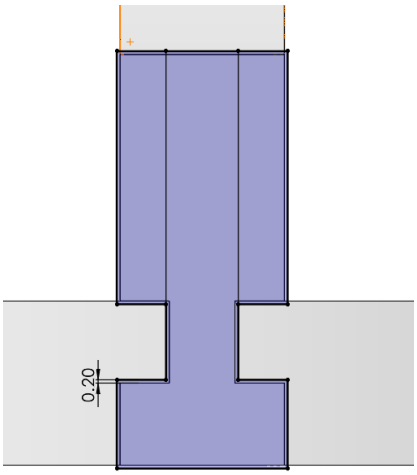
- 3D Printed on the side to minimize support material.

DESIGN TIPS:

- Auto transition between a line and arc by returning the cursor to the endpoint and moving away in a different direction, or by pressing the A key on the keyboard.
- After drawing the profile, add relations then dimensions.



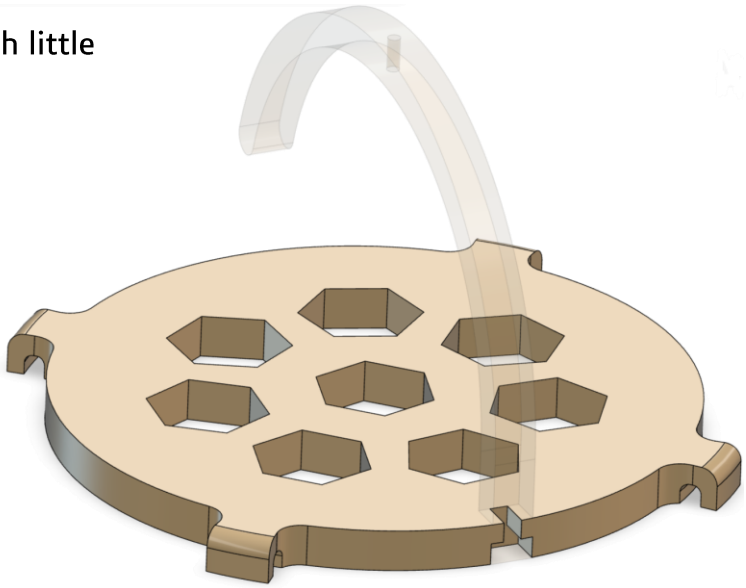




ASSEMBLY & IN-CONTEXT CUTOUT

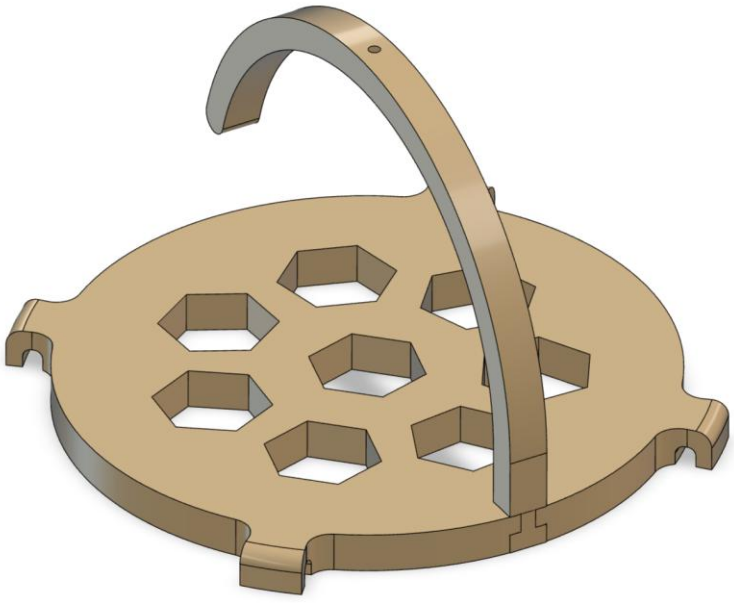
DESIGN INTENT

- Create T slot cutout after mating parts together.
- Assembly is a Press-fit design with little clearance between parts.



DESIGN TIPS:

- Use Coincident, Tangent and Angular mates to position parts.
- Use Offset Entities to create sketch entities offset off existing geometry.



3D PRINTING

- Save the parts as an STL file.
- Nest your parts to print many at one time.
- Orient the parts to minimize the use of support material, (see images below).

NESTING

