Tensegrity Medical Device – 100% Update

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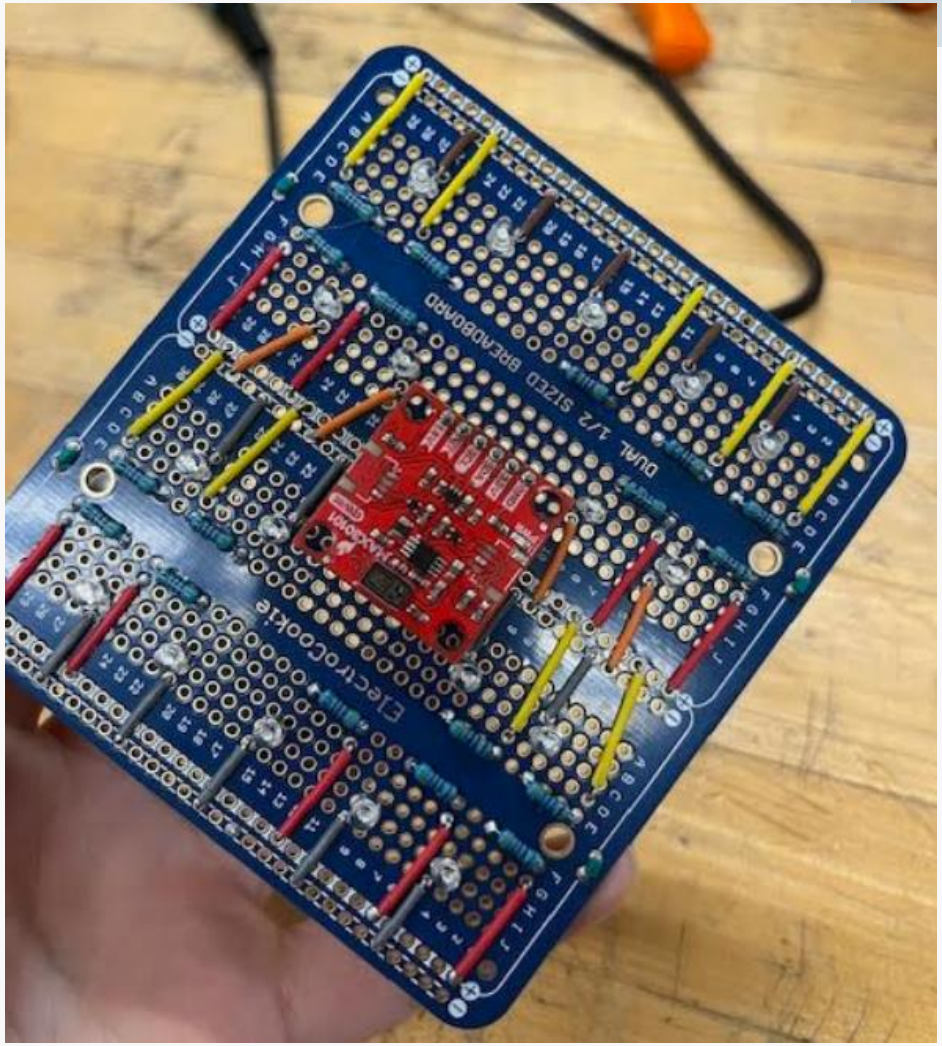
Project Description

- Utilize photo biomodulation (PBM) technology
- Red LED lights, infrared sensors, & rechargeable battery
- Design a cutting-edge tool that monitors blood flow & oxygen circulation
- Offers a non-invasive solution for cardiovascular health monitoring

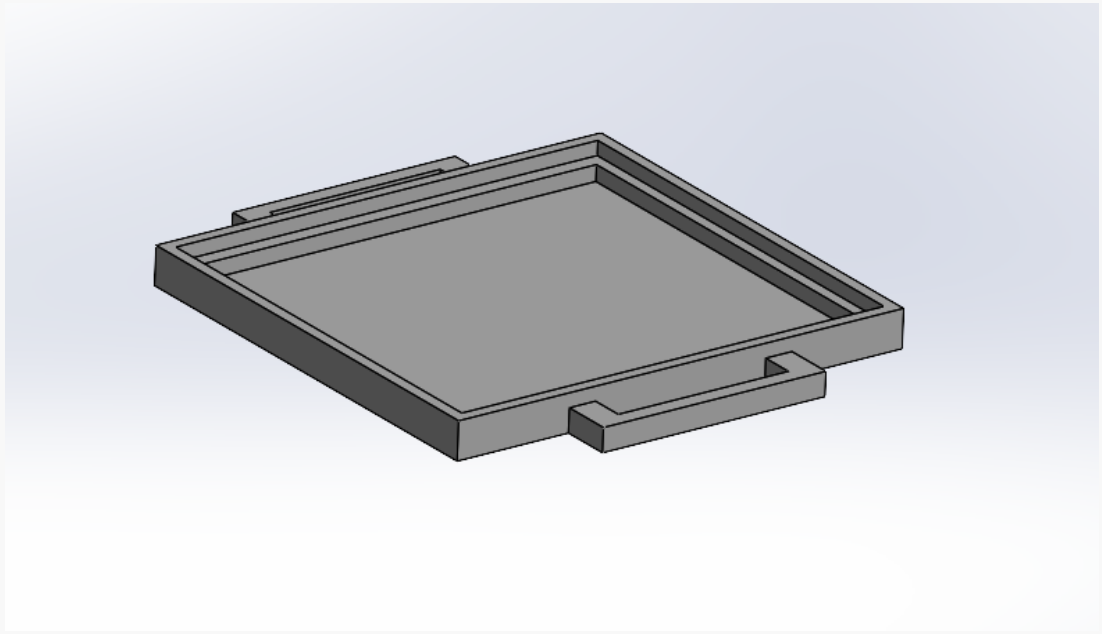
- Enhances cellular function, promotes tissue repair, and reduces inflammation
- Applicable to medical institutions, rehab centers, military, and sports teams
- Partnering with EE & CS Capstone to enhance teamwork skills
- Jesslynn Armstrong, President, Light Matter Solutions, LLC

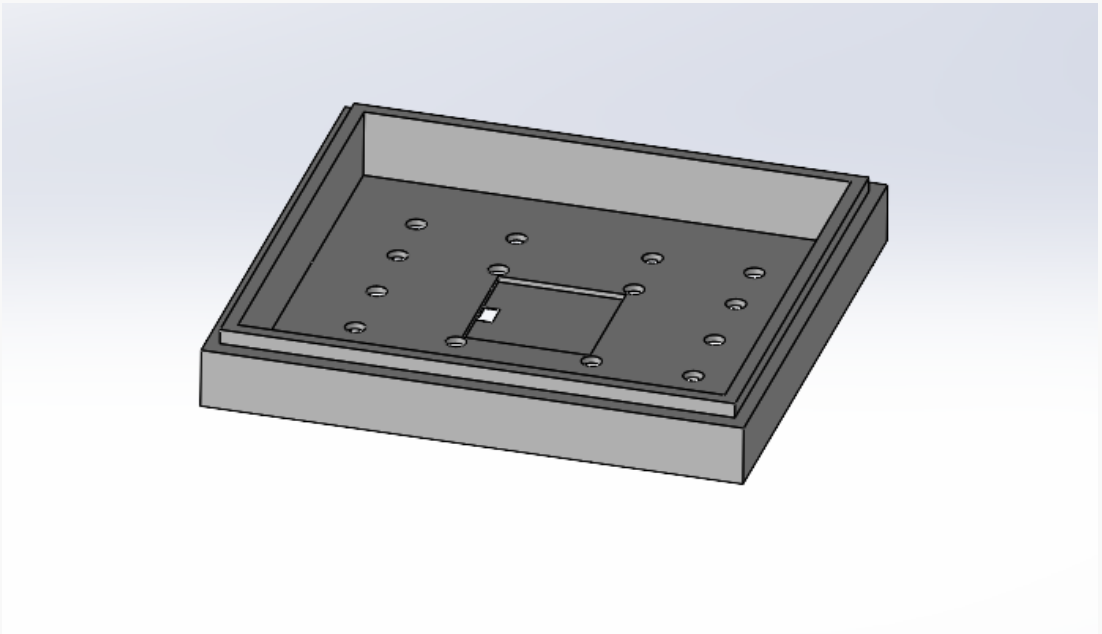
Overview

- All outer components are printed and pieced together
- All inner components are soldered into the breadboard: feather board, sensor, battery, LEDs, etc.
- Straps were incorporated (harness style) to strap to wearer (dog patient)

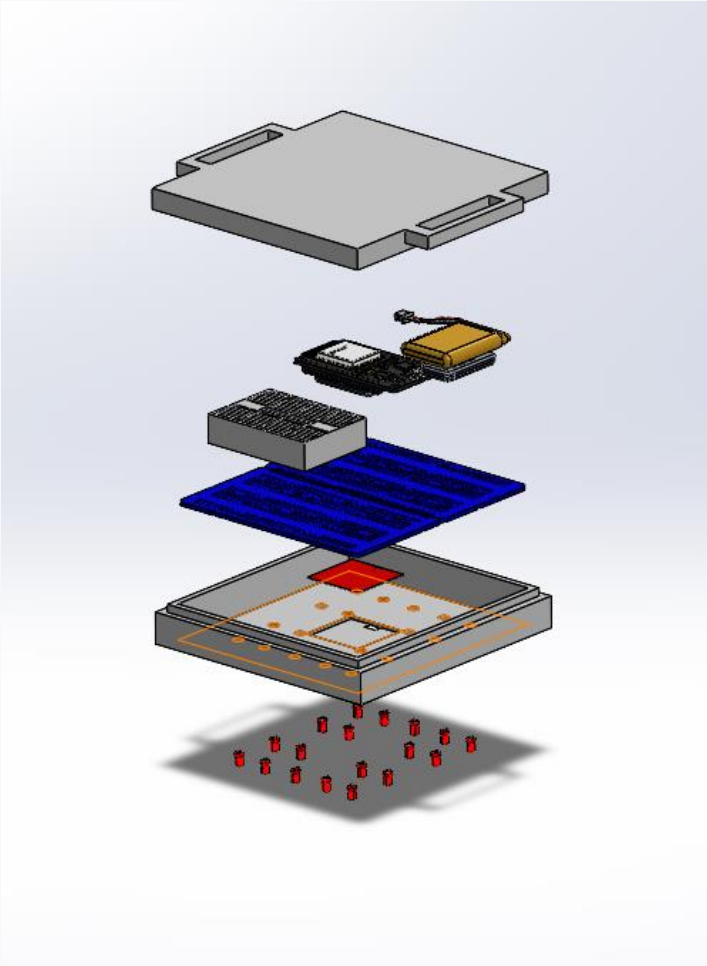


Case Design – CAD Part



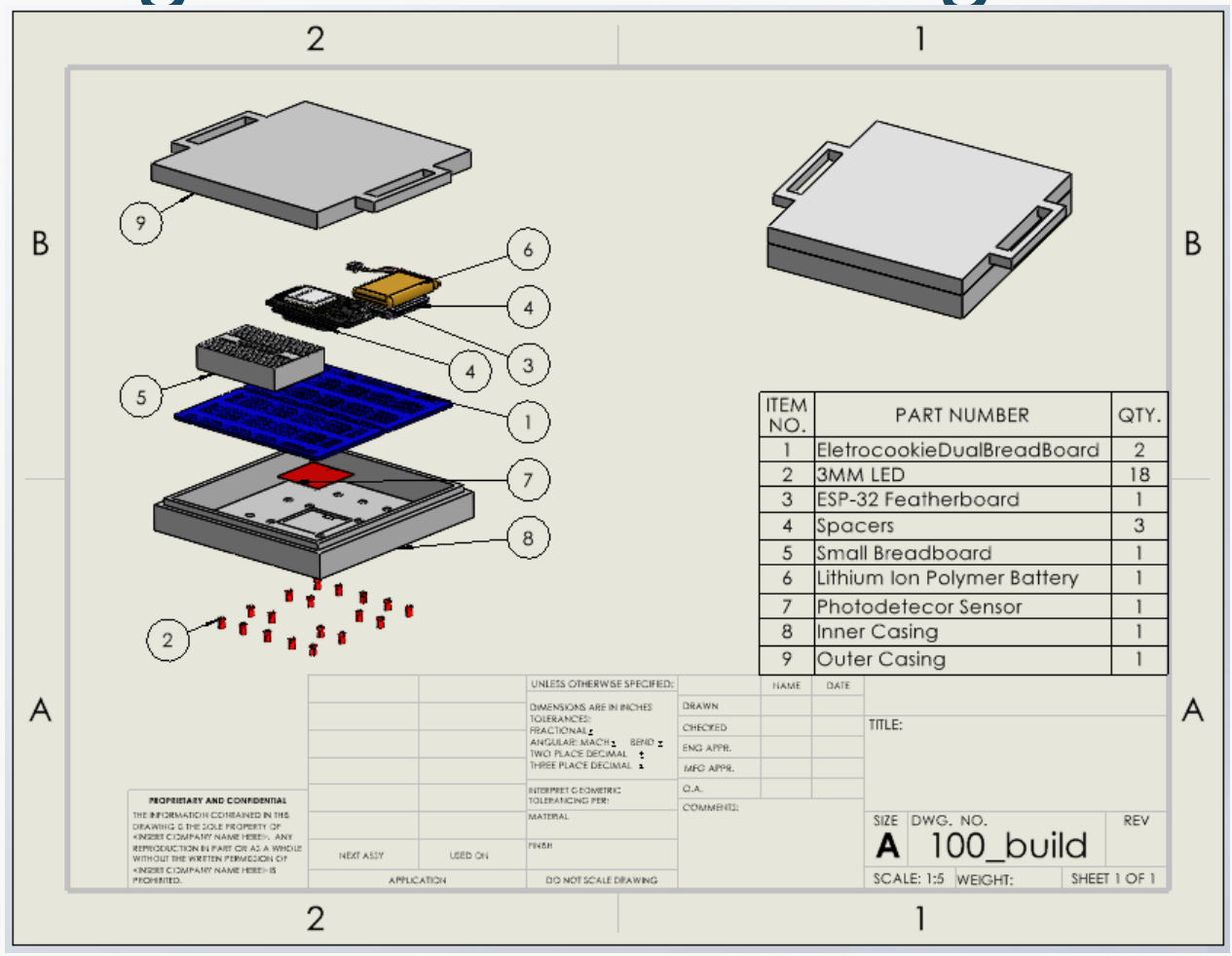


Device Design – CAD Exploded View



- All casing components are 3D printed using thermoplastic polyurethane (TPU)
- All inner components are soldered into the breadboard: feather board, sensor, battery, LEDs, etc.
- Straps were incorporated (harness style) to strap to wearer (dog patient)

Device Design – CAD Drawing



ITEM NO.	PART NUMBER	QTY.
1	EletrocookieDualBreadBoard	2
2	3MM LED	18
3	ESP-32 Featherboard	1
4	Spacers	3
5	Small Breadboard	1
6	Lithium Ion Polymer Battery	1
7	Photodetecor Sensor	1
8	Inner Casing	1
9	Outer Casing	1

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <INSERT COMPANY NAME HERE>. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <INSERT COMPANY NAME HERE> IS PROHIBITED.

TITLE:

SIZE	DWG. NO.	REV
A	100_build	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

Purchasing Plan

#	Part Name	Quantity Needed	Purchase Quantity	Quantity Arrived	Price	Total Unit Price	Ordered (Y/N)	Notes
1	3mm Red LEDs (Pack of 100)	1	1	1	$6.99	$6.99	Y	Amazon
1.5	470 Ohm Resistors (Pack of 100)	1	1	1	-	-	Y	Amazon
2	PPG Sensor	1	1	1	$15.90	$15.90	Y	
3	HUZZAH32 - ESP32 Feather Board	2	2	2	$24.50	$49.00	Y	
4	Lithium Ion Polymer Battery	1	1	1	$9.99	$9.99	Y	
5	TPU 95A HF	1	1	1	$41.99	$41.99	Y	
6	Electrocookie Breadboard	1 (pack of 3)	1	1	$11.99	$11.99	Y	Amazon
7	Breadboard Jumper Wires	1	1	1	$8.99	$8.99	Y	Amazon
8	Straps	1 (pack of 2)	1	1	$6.51	$6.51	Y	Home Depot
		Percent Purchase	100.00%	%	Total Spent	$151.36	Total on Hand	100.00%
		Budget Spent	3.0272	%	Total Budget	$5,000.00		

Manufacturing Plan

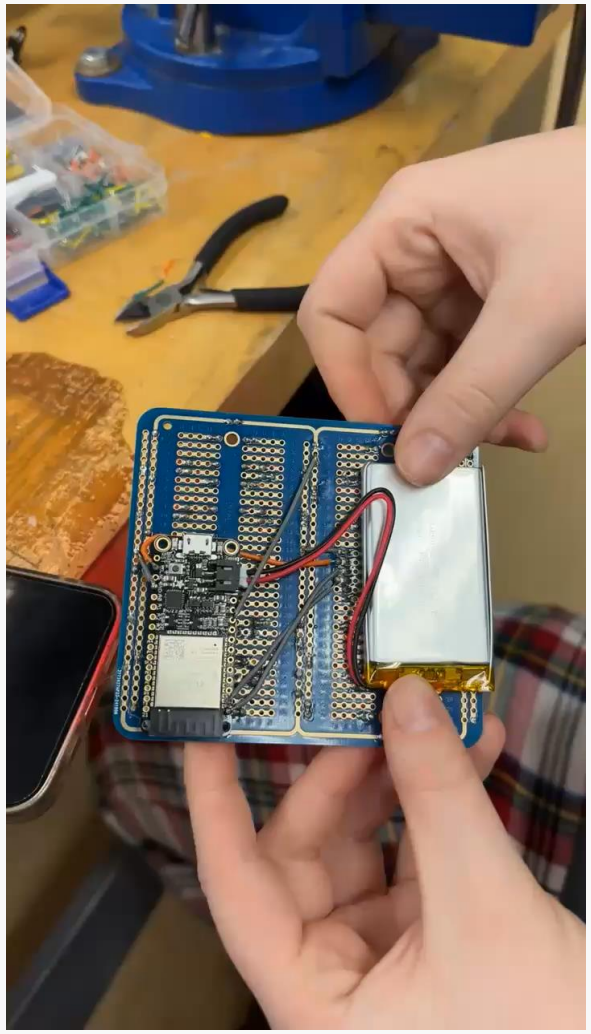
- ME portion – 100%

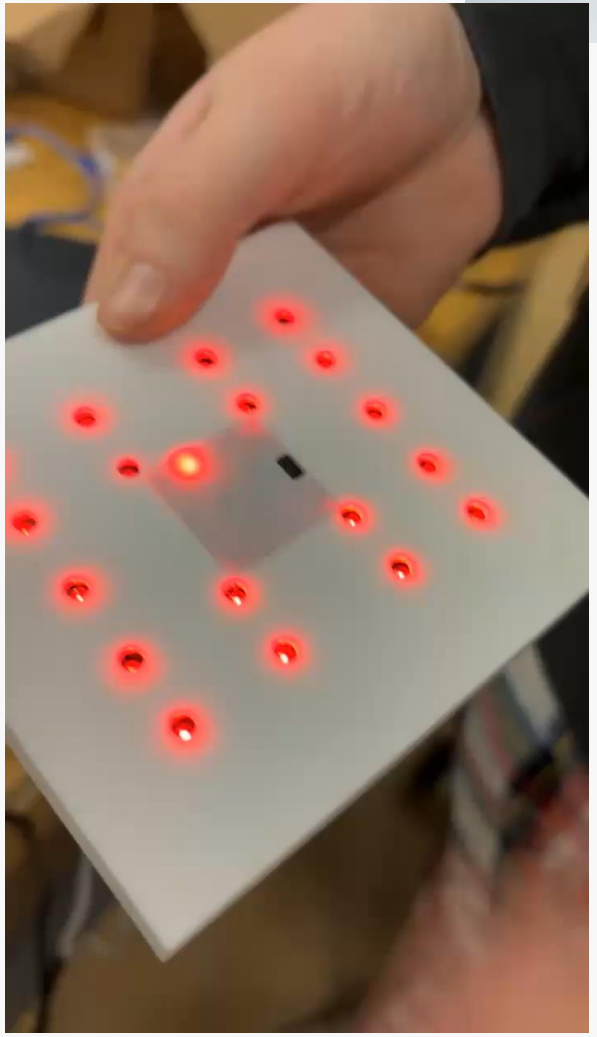
Part	Time [hours]	Manufacturing Method	Quantity	Progress %
Dual ½ Sized Breadboard	2	Electro Cookie (Purchased From)	19	100% Design & Manufactured
Wiring Components	5	Soldering Kit	38	100%
LED Components	3	Manufactured w/ PCB	18	100%
Casing - inner	~ 8	3D Printed	3	100%
Casing - outer	~ 18	3D Printed	3	100%

- Casing has been designed to best fit the design of the inner components
- Implementing an in-circuit system configured in series instead of parallel
- Enabling Bluetooth integration with the designated app for the device

Demonstration

- Final demonstration in videos
- All lights now work, sensor works through app, battery works at powering device
- We will also demonstrate now for you

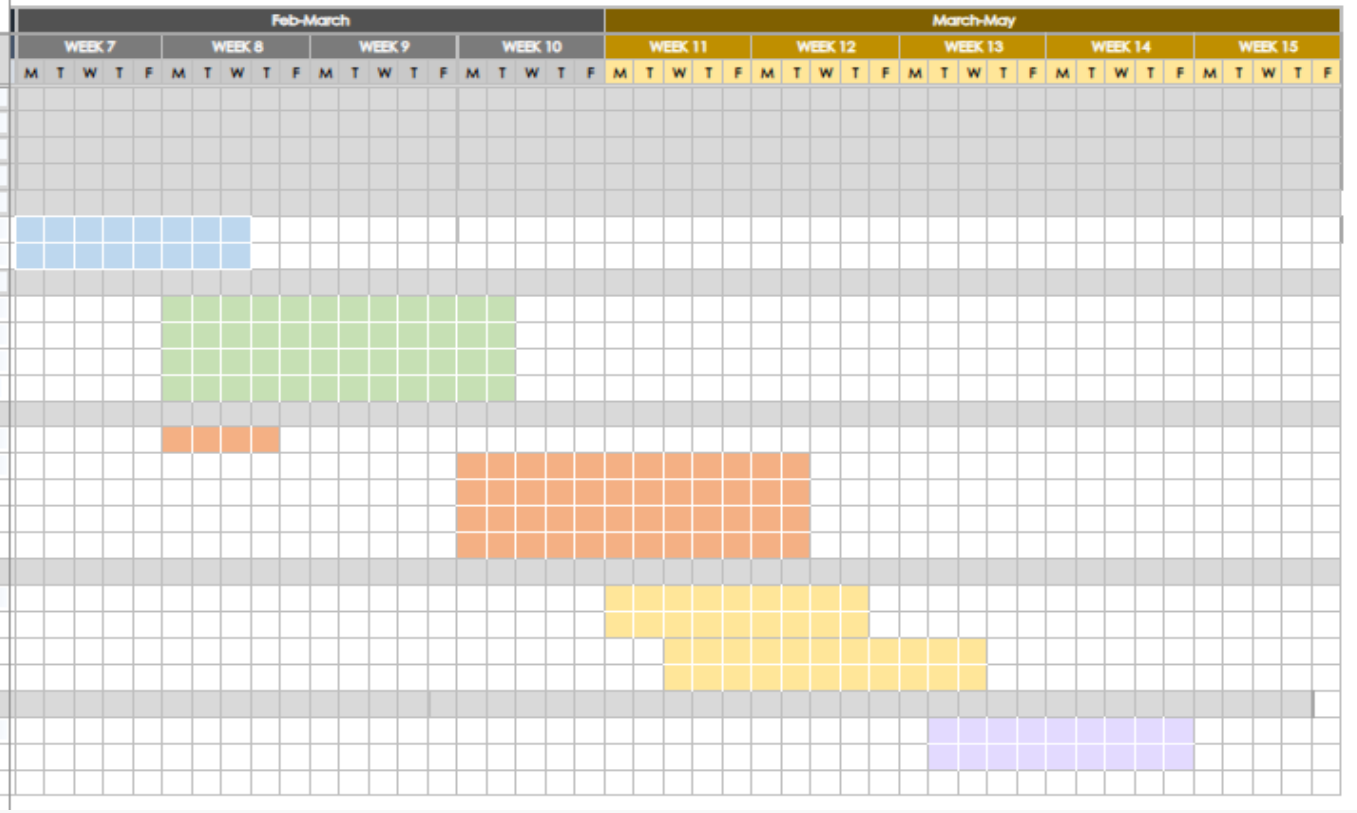




Gantt Chart

PROJECT TITLE	Tensegrity Medical
PROJECT MANAGER	Norma
DATE	Tuesday, March 25, 2025

TASK ID	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION IN DAYS	PCT OF TASK COMPLETE
1	Kickoff Meetings					100%
2	Hardware Status Update (33%)					100%
3	Hardware Status Update (67%)					100%
4	Website Check 2					100%
5	Product Testing Plan					100%
5.1	Draft Testing Plan	All				100%
5.2	Finalize Testing Plan	All				100%
6	Hardware Status Update (100%)					100%
6.1	Circuit Design	Claire				100%
6.2	Soldering	Alicia				100%
6.3	3D Print Casing	Norma				100%
6.4	Code For lights/button	CS				96%
7	Draft of Poster					
7.1	Abstract	All	03/03/25	03/06/25	3	100%
7.2	CAD Model	Norma	03/17/25	03/25/25	7	100%
7.3	Circuit Model	Claire	03/25/25	03/28/25	3	0%
7.4	Conclusion/References	All	03/25/25	03/28/25	3	25%
7.5	Remaining/Proffesionalism	All	03/27/25	03/28/25	1	0%
8	Device Testing					
8.1	Testing Plan	All	03/17/25	03/21/25	4	100%
8.2	Data Collection	Claire	TBD	TBD		0%
8.3	Data Analysis	Alicia	TBD	TBD		0%
8.3	Results	Norma	TBD	TBD		0%
9	UGRADS					60%
9.1	Registration	Norma	03/06/25	03/06/25	1	100%
	Presentation	All	TBD	04/25/25	1	



Thank You, Questions?