

Eco-Lamp

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Introduction



What is the Eco-Light?

- Motion-sensor LED lamp
- Designed for American suburban homeowners aged 25-65 who want to save energy

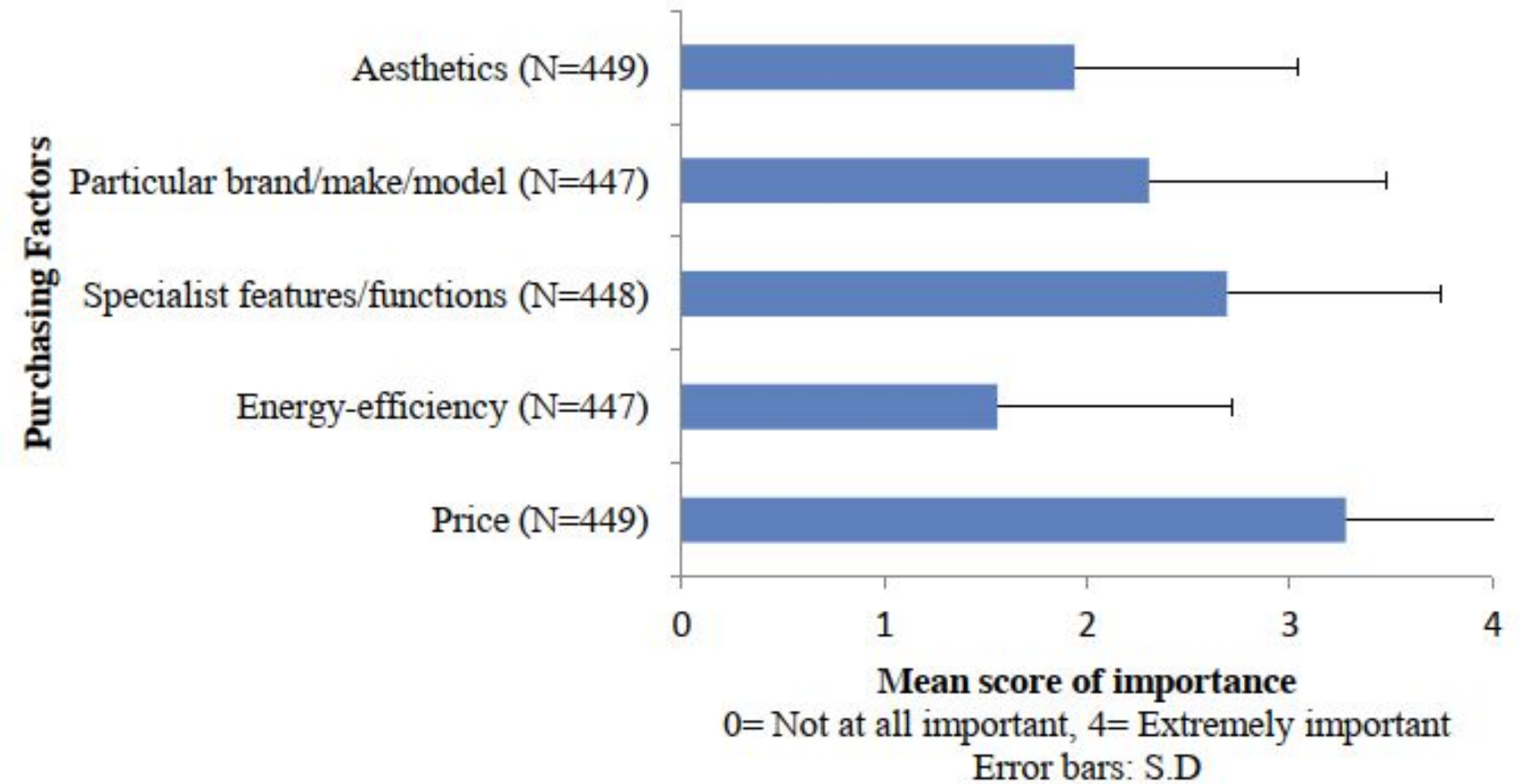
Who does it target?

Targets a wide audience:

- 52% of U.S. neighborhoods are suburban (U.S. HUD, 2017)
- Saving money is the most common reason to save energy (Leiserowitz et al., 2009, p. 34)

Human-Centered Needs

- cost-efficiency
- ease of use



Mean score of importance for purchasing factors of household appliances
(Cleaver et al., 2014)

Design Justifications



During the Design Process we targeted these points:



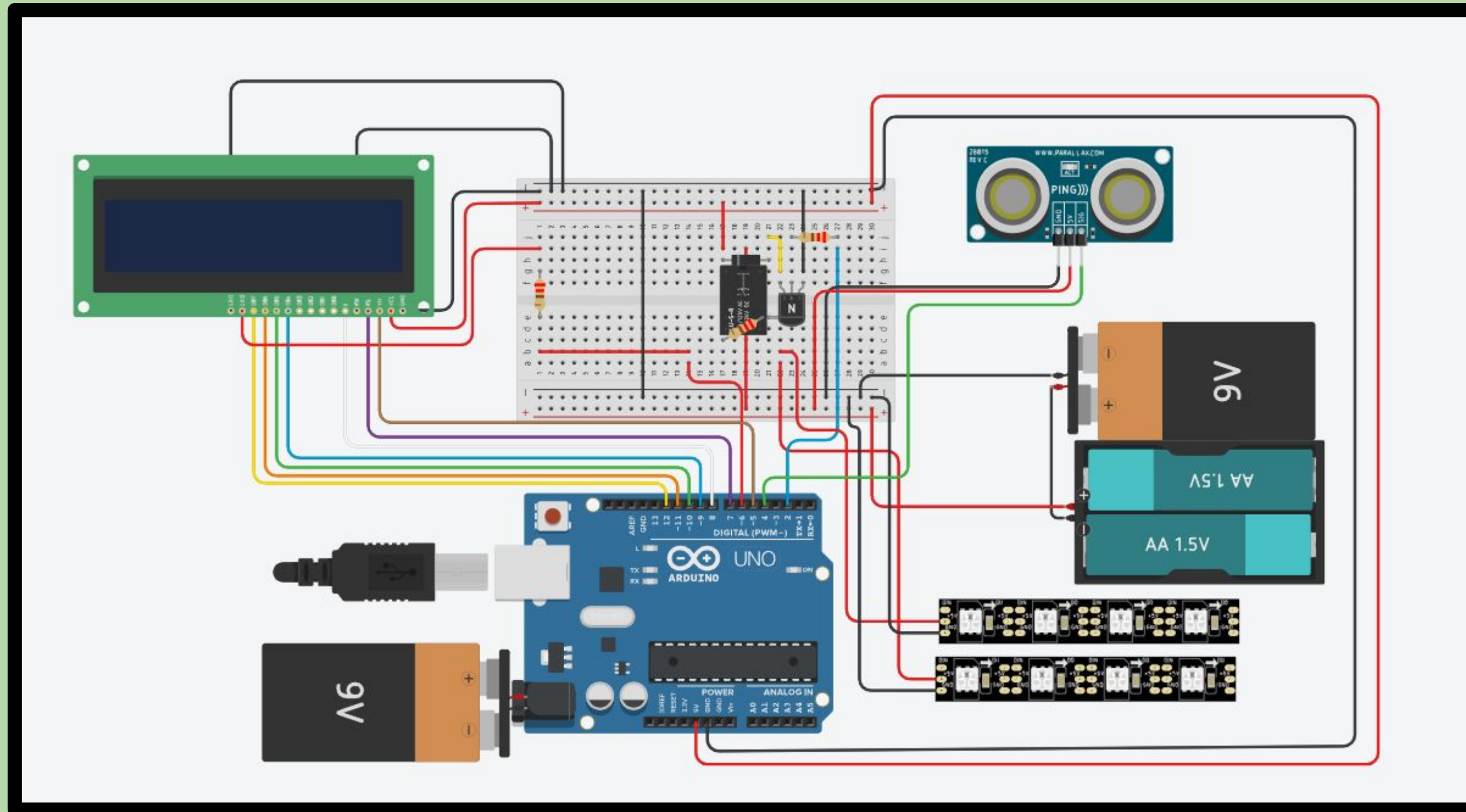
- Cost-Efficiency
- Ease of Use
- Coding/Modeling Difficulty
- Effectiveness
- Environmental Impact
- Time

Our Decision Matrix

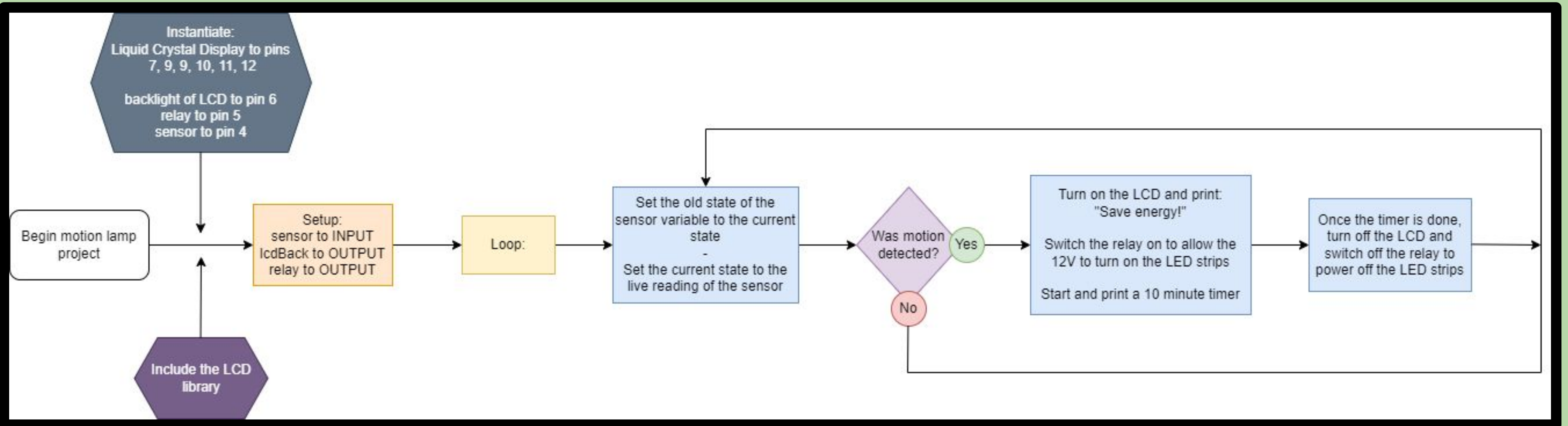
Attributes	Attributes Weights (sum should be 1)	Motion Sensor Lamp (out of 10)	<-- Design Weighted Score	Light Saver (out of 10)	<-- Design Weighted Score
Cost-Efficiency	0.1	8	0.8	9	0.9
Ease of Use by End User	0.25	9	2.25	10	2.5
Coding/Modeling Difficulty	0.1	6	0.6	3	0.3
Effectiveness	0.3	9	2.7	9	2.7
Environmental Impact	0.1	7	0.7	7	0.7
Time	0.15	5	0.75	3	0.45
Total	1		7.8		7.55



Tinkercad Circuits



Flowchart

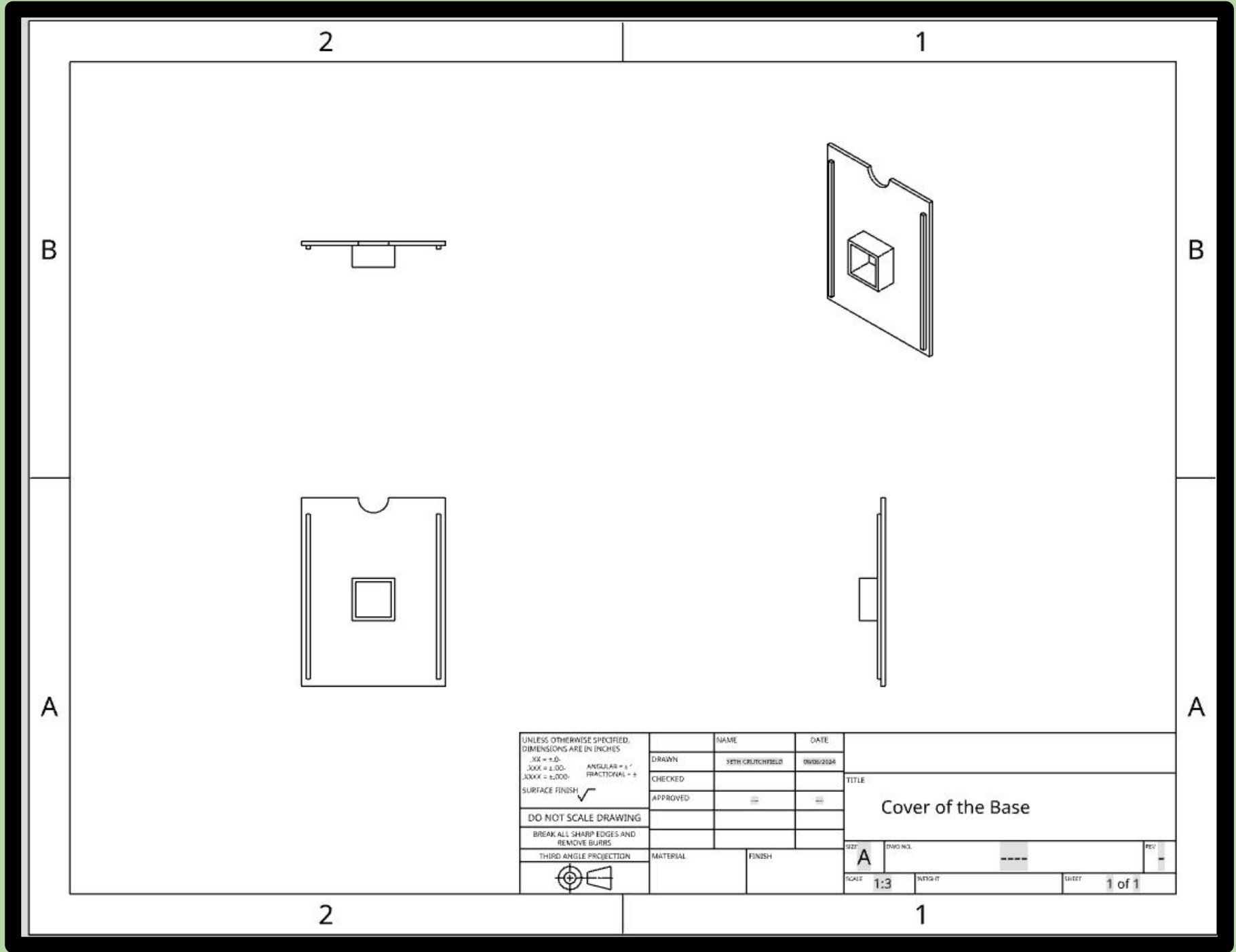
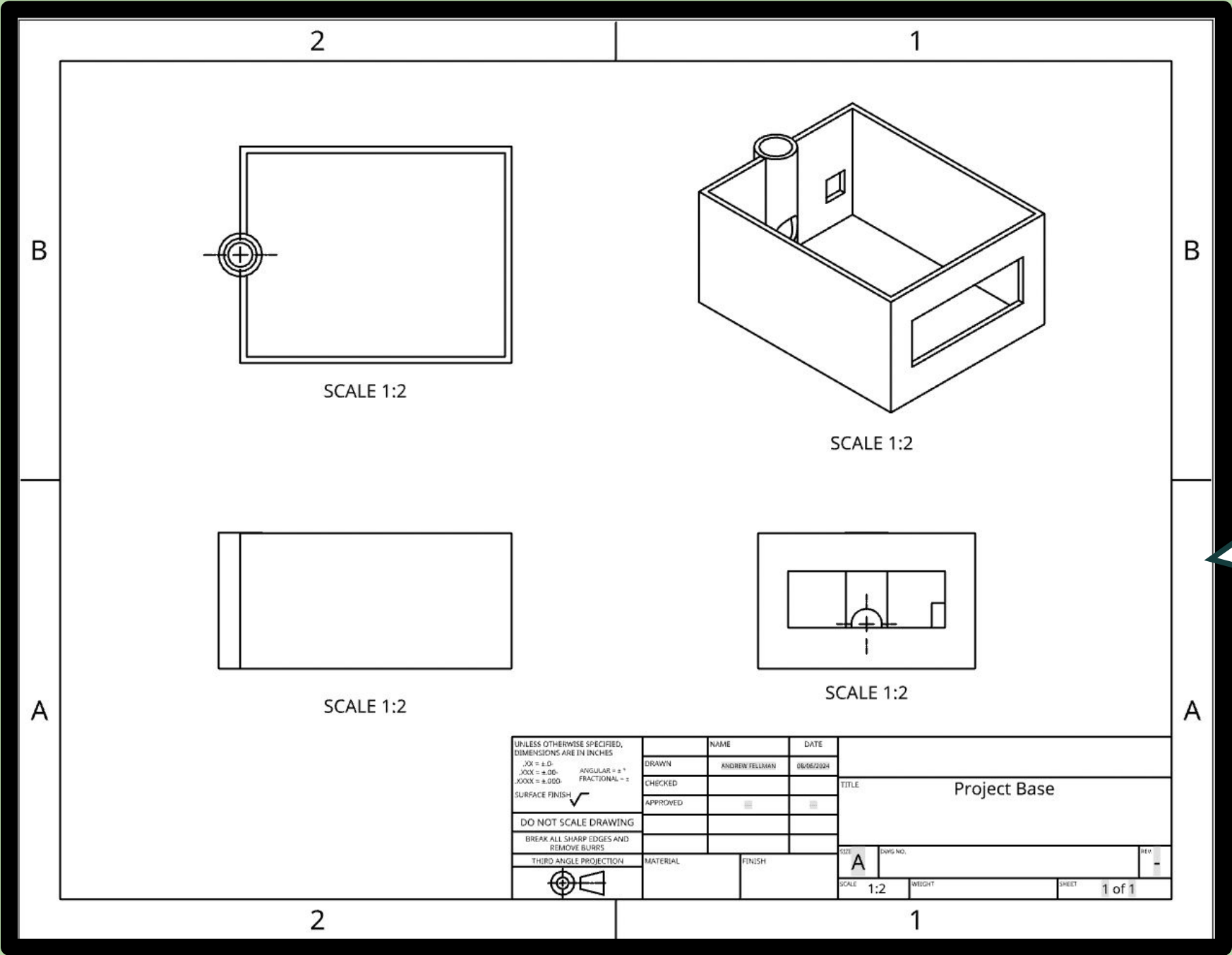


Modeled Parts



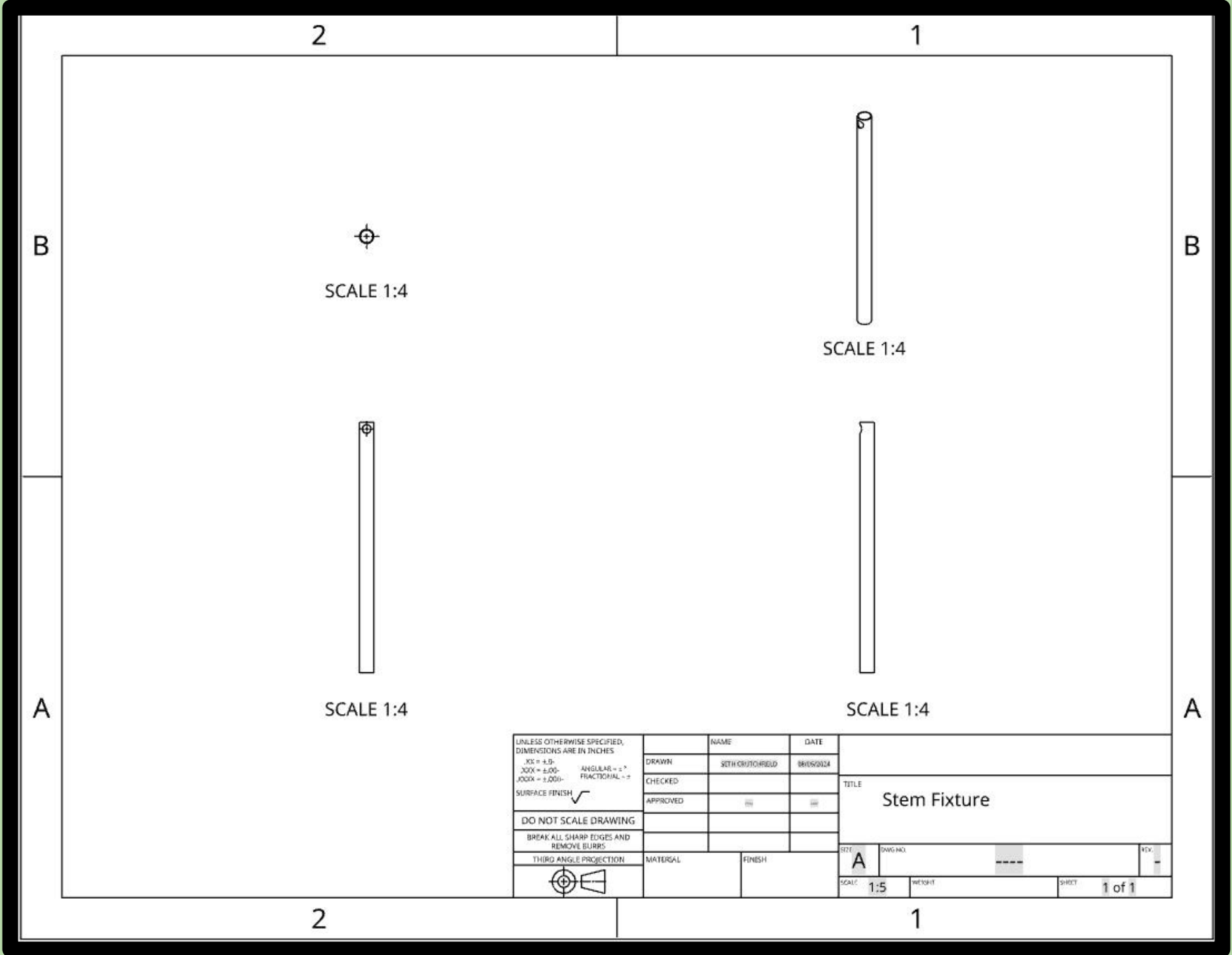
Cover Of the base

Base of the Lamp

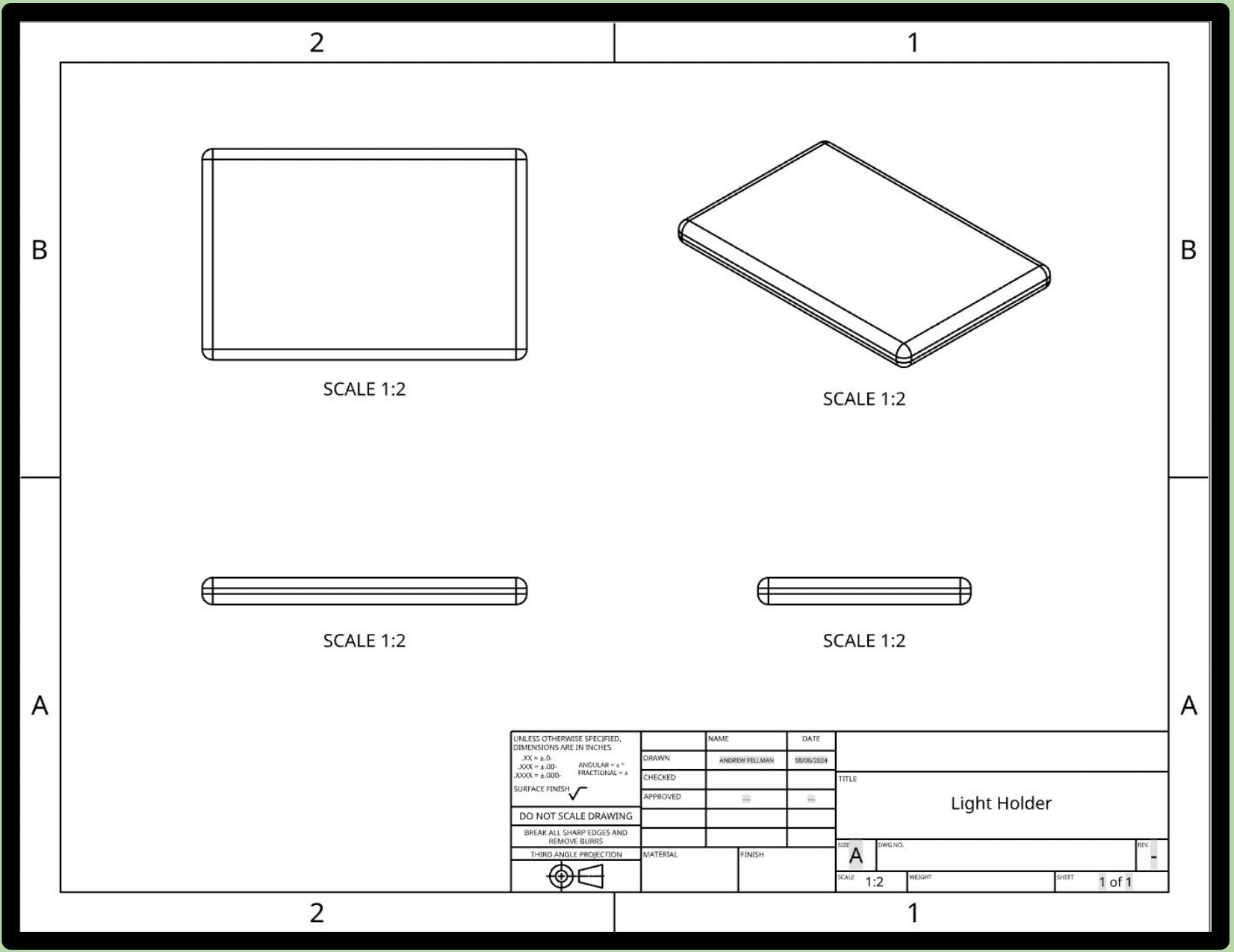


Modeled Parts

Stem of the lamp



Head of the lamp



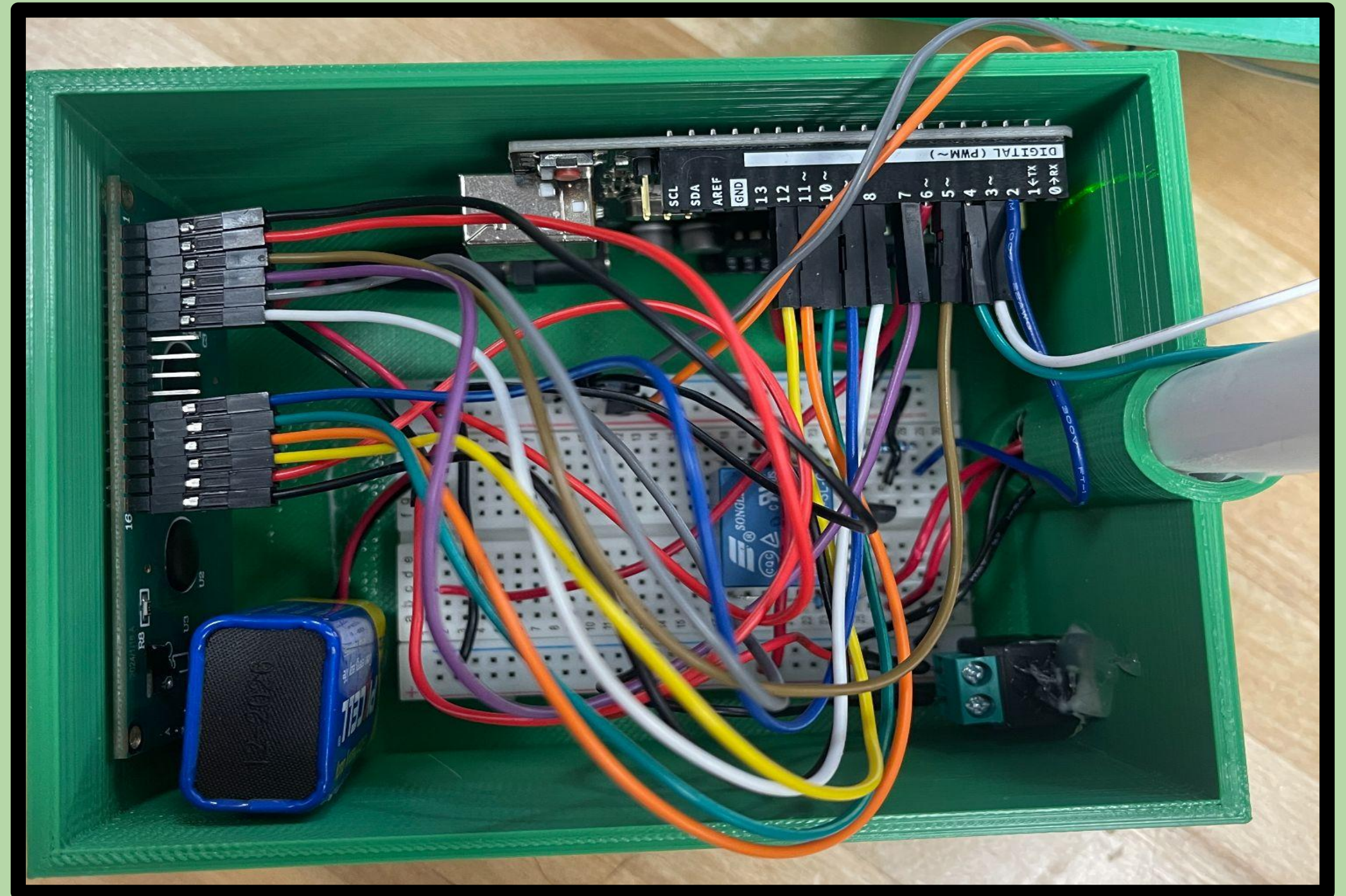
Reflection

SUCCESSSES:

- Functions as Intended
- Low Cost
- 3D printing

LIMITATIONS:

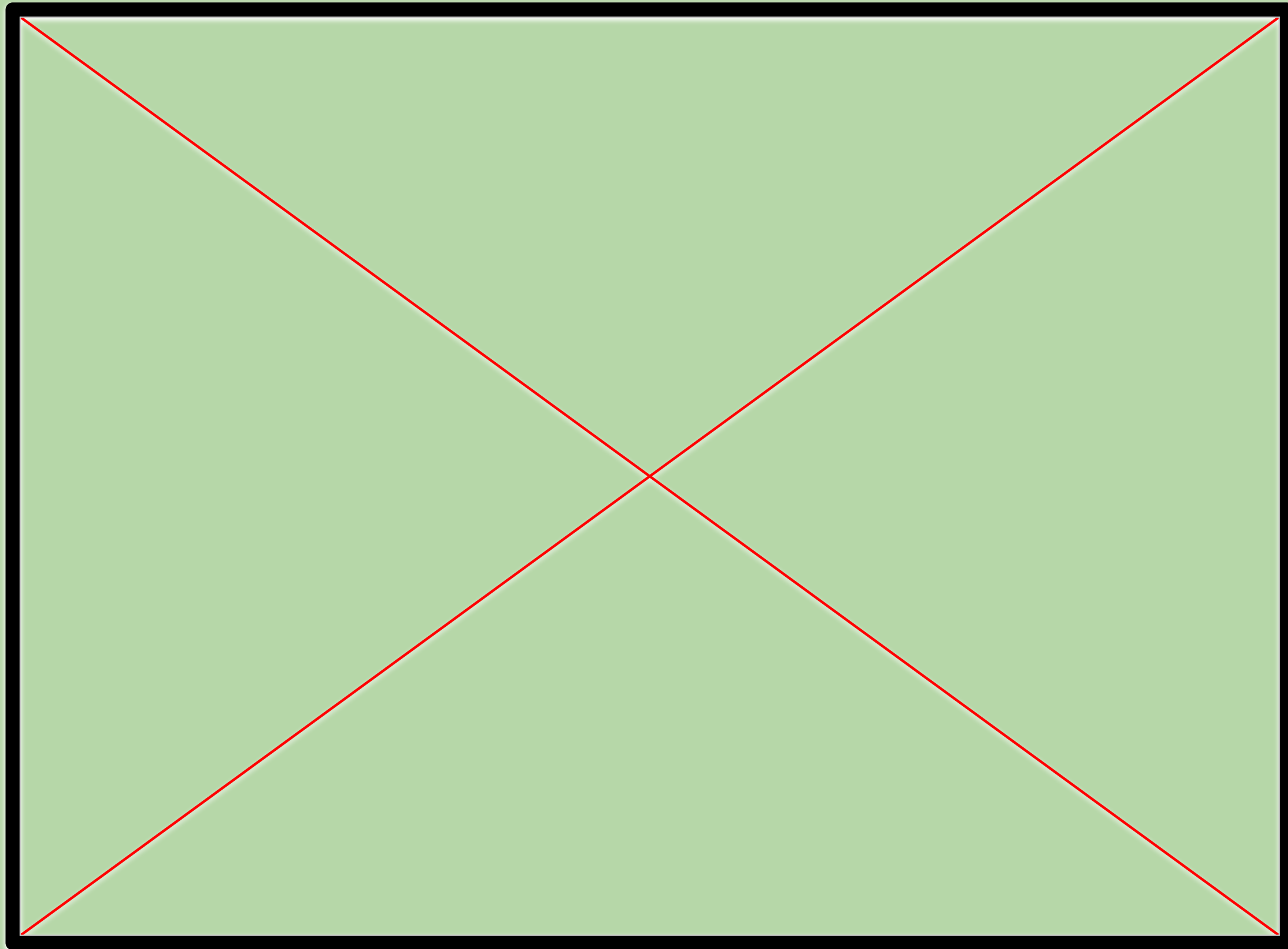
- Two Voltage Sources Required
- Non-Biodegradable Plastic
- Motion sensor issues



Final Prototype



Final Prototype



References

Cleaver, V., Pierron, X., & Williams, I. D. (2014). *The potential for recovering metals from small household appliances*. In *Second Symposium on Urban Mining*.

Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2009, February 14). *Saving energy at home and on the road: November, 2008*. Yale Project on Climate Change. <https://climatecommunication.yale.edu/publications/saving-energy-at-home-and-on-the-road/>

U.S. Department of Housing and Urban Development. (2017). *The 2017 AHS neighborhood description study*. HUD User. <https://www.huduser.gov/portal/AHS-neighborhood-description-study-2017.html#overview-tab>