



Solar Power Rechargeable LED LAMP

TQ Systems

By:

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Overview

- The Problem
- Initial Designs
- Proposed Designs
- Issue Faced
- Costs
- Summary



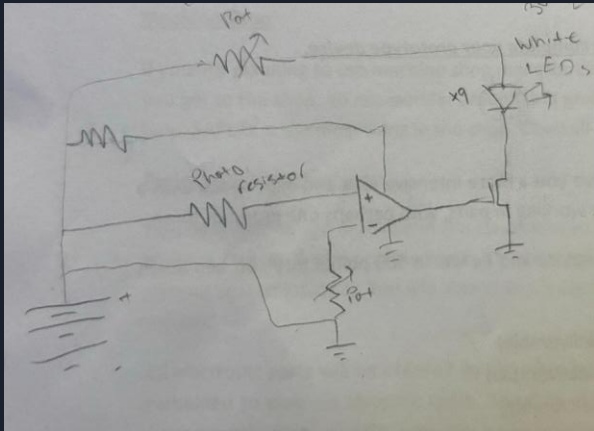
Problem:

- Small remote village with limited electricity
- Objective is to develop cleaner, safer portable lighting for the villagers
- Must be efficient, use rechargeable batteries, and low cost

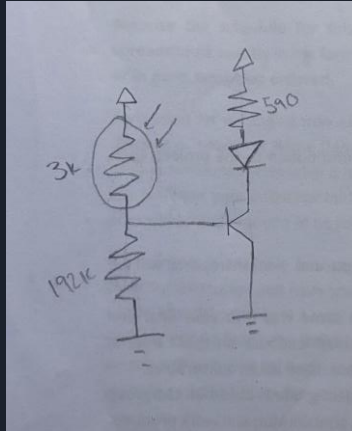
Initial Designs (Trade Studies)

- Op-amp into MOSFET (trade #1)
- Voltage divider into npn transistor (trade #2)
- Traditional desk lamp packaging

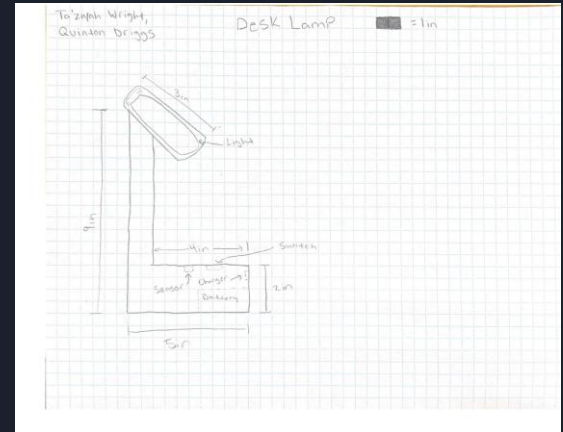
Trade #1



Trade #2



Lighting Enclosure

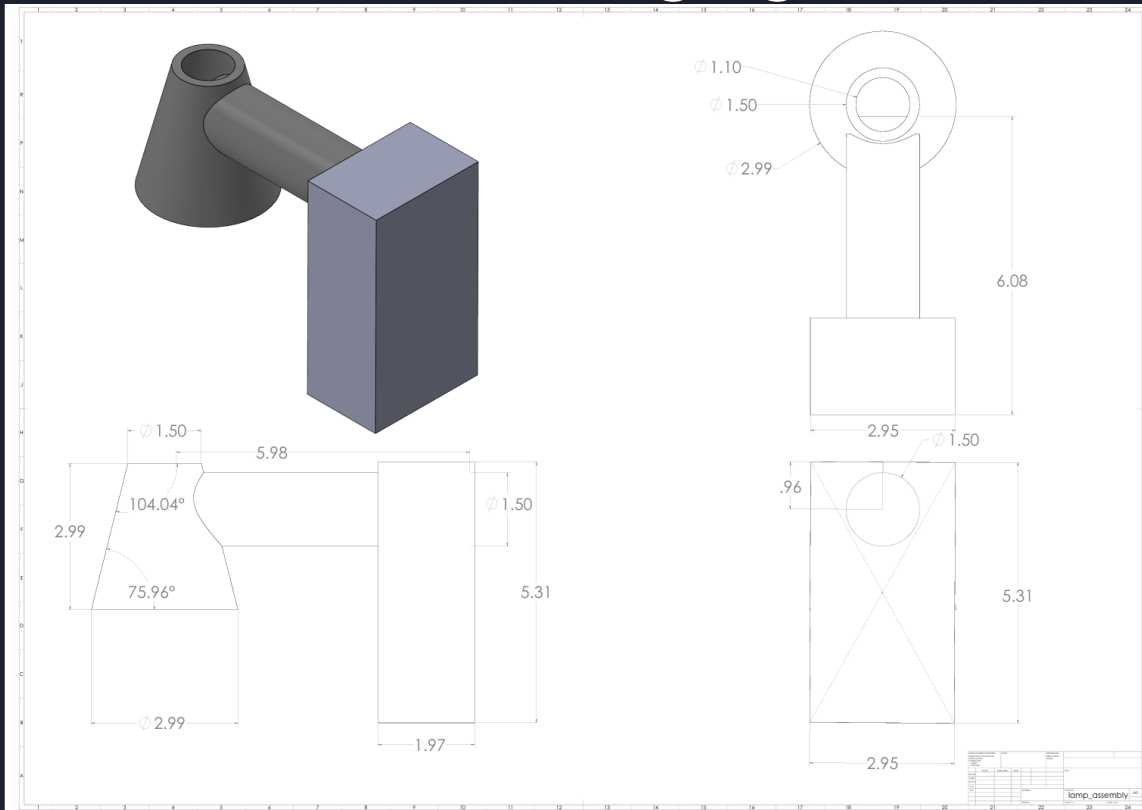




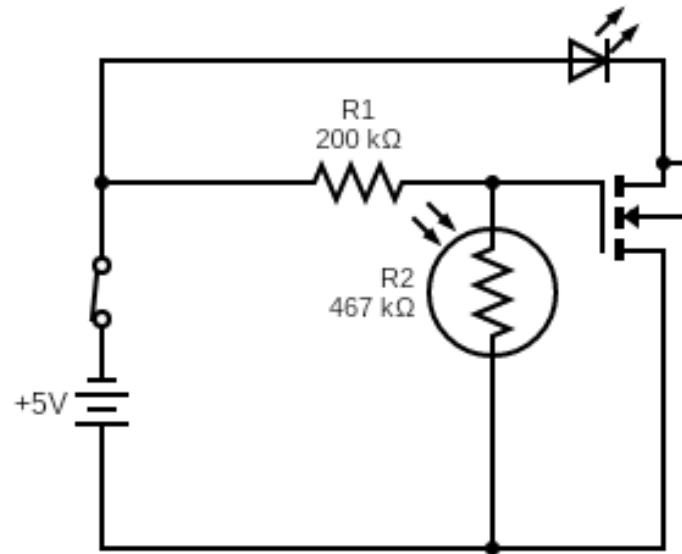
Difficulties

- Designing the circuit
- Making the circuit efficient
- Assembling the prototype

Proposal Design: Packaging



Proposed Design Electrical





LEDs and Batteries

- Cool White LED BA9s 1.2 W
- Batteries are 18650, 3.7 V, 9900mAh



Total: \$27.05

LEDs	1	\$3.99	\$3.99
Battery	2	\$5.50	\$11.00
Light Bulb Socket	1	\$1.80	\$1.80
SWITCH ROCKER	1	\$1.72	\$1.72
2x2 Protoboard	1	\$2.59	\$2.59
Box for Base	1	\$1.99	\$1.99
LDR 30-50k Ohm	1	\$2.78	\$2.78
3-D Printed Base	1	\$3.00	\$3.00



Prices for 1000 parts

- \$2.80 for full plastic mold each
- \$3.62 each for batteries
- \$22.98 total for each
- \$22,980 for 1000



Summary:

- Lasts up to 60 hours
- 96% efficient
- Safe and easy to use