# HIMALAYAN MAKERS GUILD
# Solar Light Project

## THE PROBLEM – NON-RECHARGEABLE BATTERIES

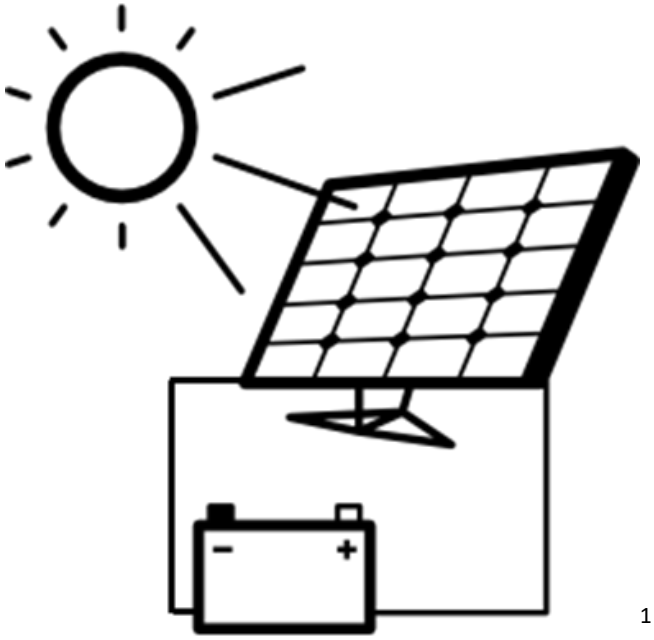
***Powering an LED light from a non-rechargeable battery is harmful to the environment and expensive to power for long periods.***

**How can we make an LED light more reusable, sustainable, and inexpensive to use for hundreds or thousands of hours?**

## THE SOLUTION – SOLAR POWERED RECHARGEABLE BATTERY

There are many possible solutions to the problem of non-rechargeable batteries, including powering the light directly from a wall plug or using rechargeable batteries. We've chosen to explore powering the LED light from a solar-powered rechargeable battery as a promising solution to the problem.

Solar panels can recharge a battery anywhere using the sun. They are portable, reliable, inexpensive, and widely accessible.



[1]

**We will be building an LED light powered by a small rechargeable battery and solar panel.**

[1] Solar icon modified from an icon by Freepik from www.flaticon.com is licensed by CC 3.0 BY

# NEEDS AND CONSTRAINTS

## NEEDS

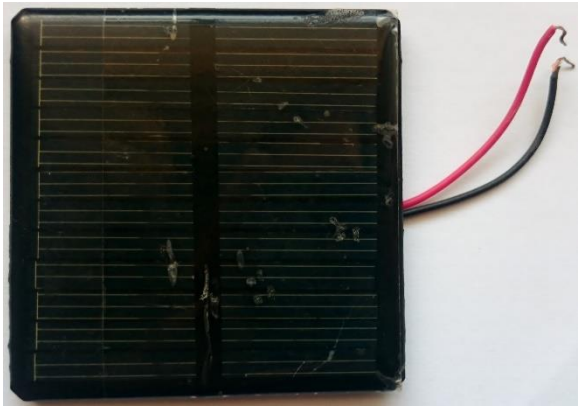
The light must:

1. Light one white LED (5mm) for 6 hours at full brightness (50mW).
2. Fully recharge in 6 hours under typical sunny conditions.

## CONSTRAINTS

Some limitations for our design include:

- Time: The light must be built in fewer than seven 1-hour activity sessions
- Materials:

| | | |
|---|---|---|
| 1x |  | Lead-Acid Battery (4V, 1Ah) |
| 1x |  [2] | 5mm LED (White) |
| 1x |  | Diode (1N4001) |
| 2x |  | Solar Panel (3V, 120mA, 6cm x 6cm) |

Basic electronic components (wires, resistors, capacitors, etc.), breadboards, and basic building supplies (cardboard, glue, tape, etc.) will also be available for building the light.

[2] Part Images from Fritzing