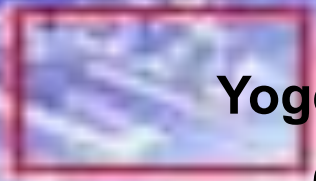
Design of solar lights

AuroDeep

at

Aurore,CSR

Auroville



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Work

I was involved in one project Design of solar lights for different sectors of market. This involved the study of present lantern ,market survey .Then followed by making the concepts for solar lights and work ended with four models of lights .

Something about Aurore and CSR

CSR -Centre of scientific Research

Auroville's Centre for Scientific Research CSR was founded in 1984, with an original focus on ferro-cement technologies: roofing channels, water tanks, doors, biogas tanks and other products.

Aurore-Auroville renewable energy

Aurore Projects and Services is a renewable energy service providing agency. It aims at progressively introducing renewable energy systems in India by interacting with product manufacturers, lease companies, subsidy givers and end users.

Project Schedule

W1:Study of present lantern, user & market survey

W2:Concept generation &presentation

W3:concept finalization and 3-dmodel.Thermocole models

W4:Final model making and visiting various activities in Auroville

Why I was appointed??

- The present lantern is not doing well in market
- The old image of kerosene lamp is copied as it is though the solar power is used .
- There is no designer for this lantern so no one knows about the present design
- They wanted new designs for different sectors of markets

Comparison

Old kerosene lantern

Present solar lantern.

Old kerosene lantern

Design process

- **Data collection**

  Magazines and pamphlets search
  www search
  User survey

- **Concepts generation**

  Discussion with Hemant
  Refinement
  Presentation

- **Trial models**

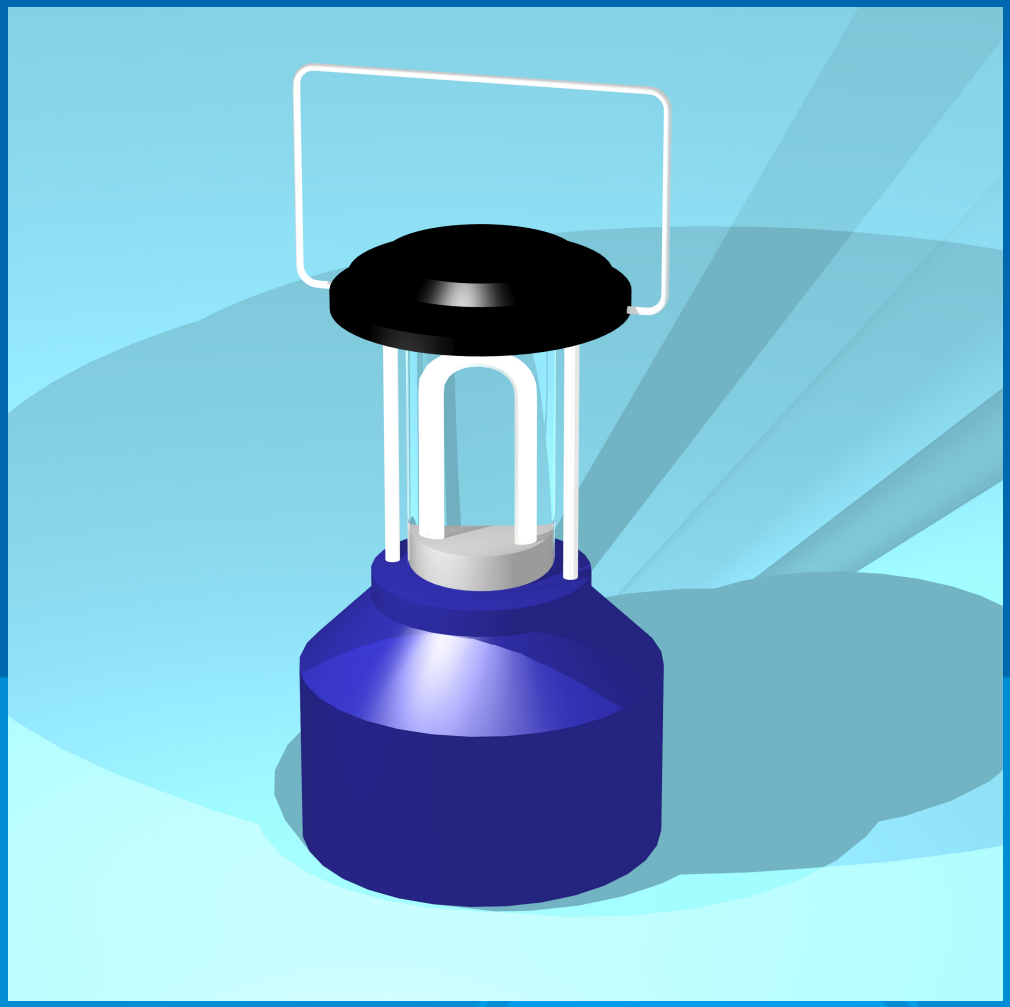
  3-d models
  Paper models
  Thermocole models

- **Final Models**

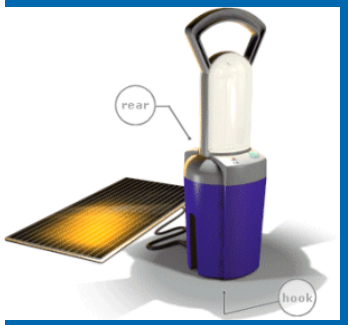
  Drawings
  Final models in sheet metal and brass

Problems in existing Design

1. The steel rods ,corrodes .
2. The handle is on the top
3. Replacement of bulb is difficult
4. No auxiliary power charging
5. The position of LED, switch is not grouped

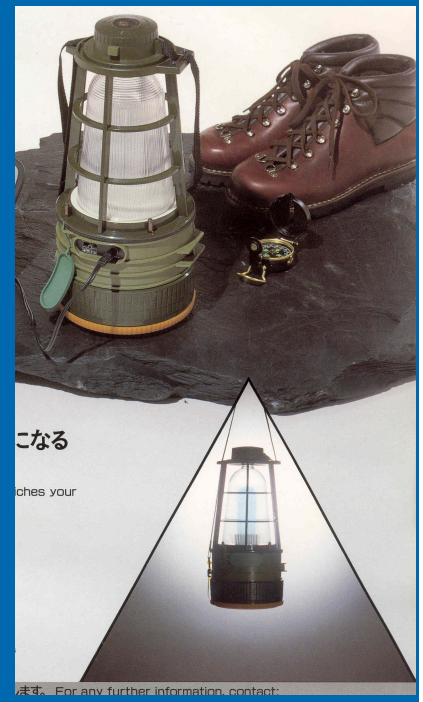


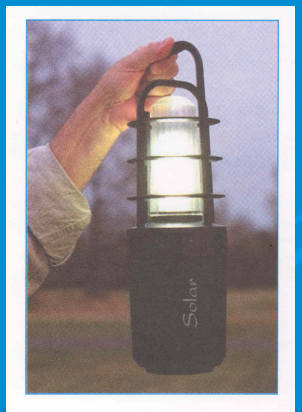
Magazines and Pamphlets search



Points out of this search

- Vertical battery placements makes the lantern compact
- The protection around chimney must be minimum.
- Protective cap around the input to battery
- Nylon belt can be used instead of handle.
- All of them have the image of old kerosene lantern.





WWW search

User survey (Done in Chennai)

Points came out through discussion with hawkers

(1) There is no protection to switch so sand goes inside

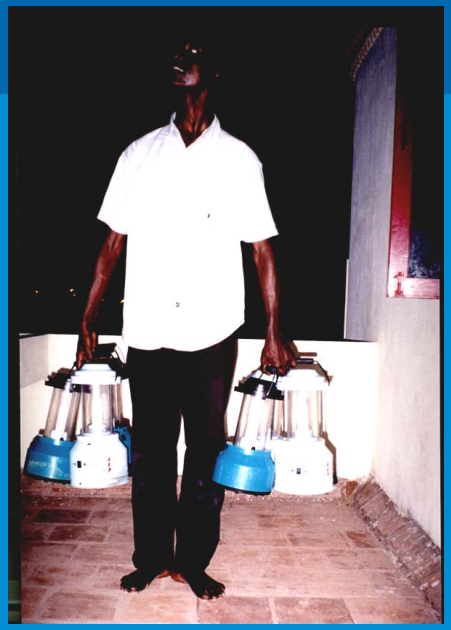
(2) The steel rods outside gets corroded .

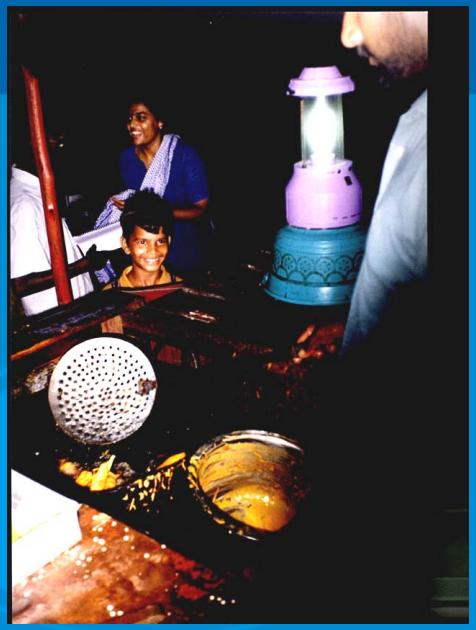
(3) Difficult to carry ,handle is too short .

(4) The inside detailing should be done carefully .

(5) SOC light should be provided

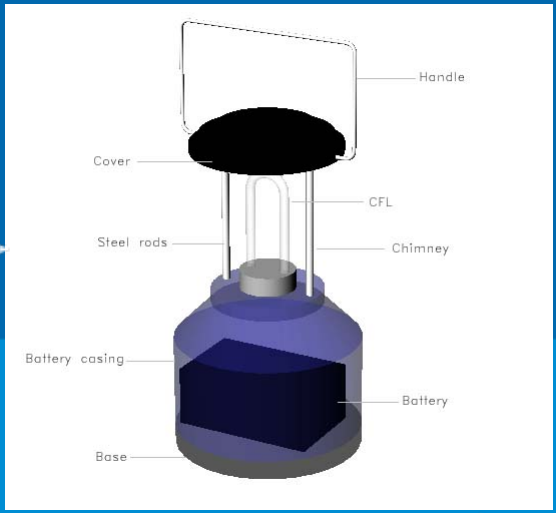
(6) The chimney material should carefully chosen



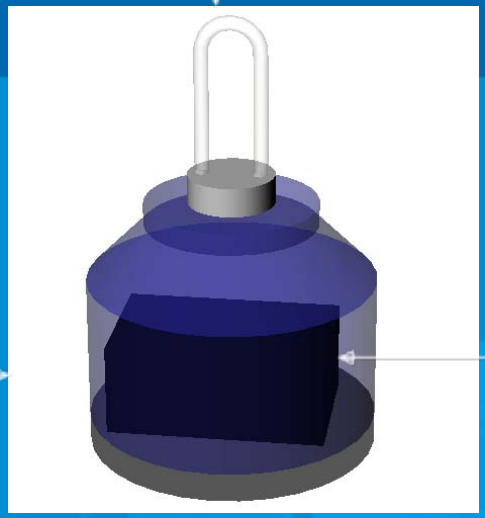


Product Analysis

Solar Panel



CFL Tube



Battery

Product specifications

Solar panel silicon photovoltaic cell -12 V DC ,price roughly 1200Rs

CFL(compact fluorescent tube)-12V DC ,7W,9W,11W

Battery: Lead acid battery 12V ,7Ah,size 150*94*63mm

Electronics called as charge controller

Two LED’s to show Battery charging on and condition of battery

Total cost of lantern is Rs.3500

Brief

Target user category

Market to be divided in three sectors like rural ,urban, shopkeepers

Each design will be according to the market sector

Creating a product range

General points to be considered

Maximize the efficiency of light

Easy to carry

Very simple, basic forms

Easy manufacturability

Cost some where around the existing lantern.

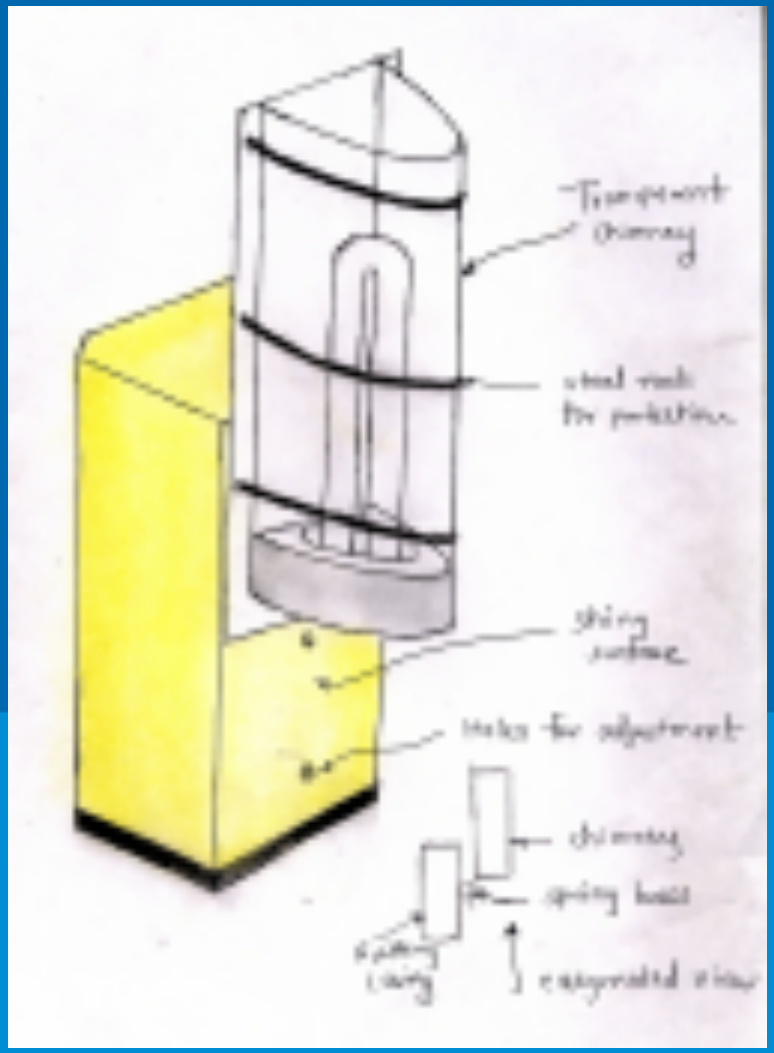
Product expectations according to their market

Urban market
fashionable
aesthetically pleasing
simple elegant forms

Shopkeepers
versatility in its use
portable
It can be hanged upside down.
The illumination should be 360 degrees.

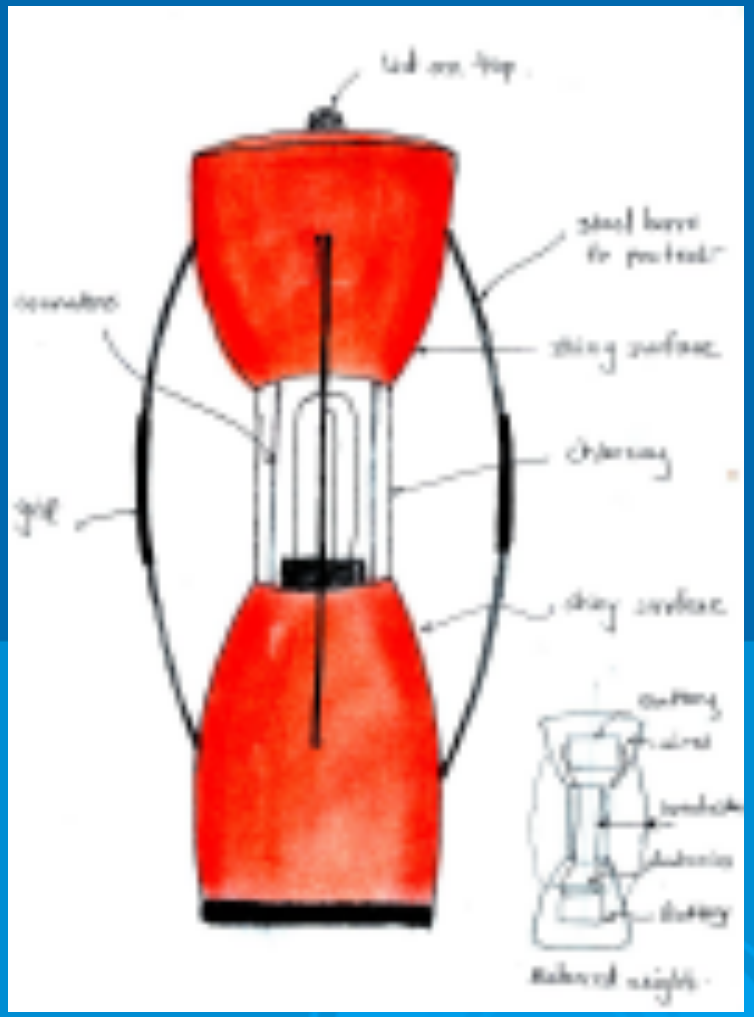
Rural market
rugged
portable
old image of lantern should be maintained.

Concepts



Sliding arrangement

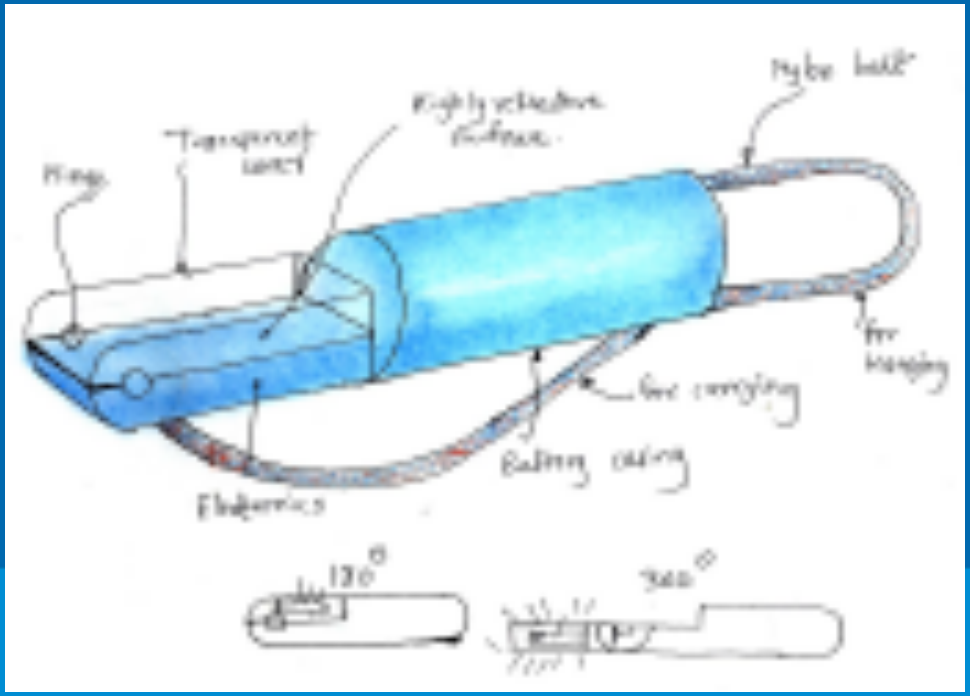
Shiny surface to increase the efficiency



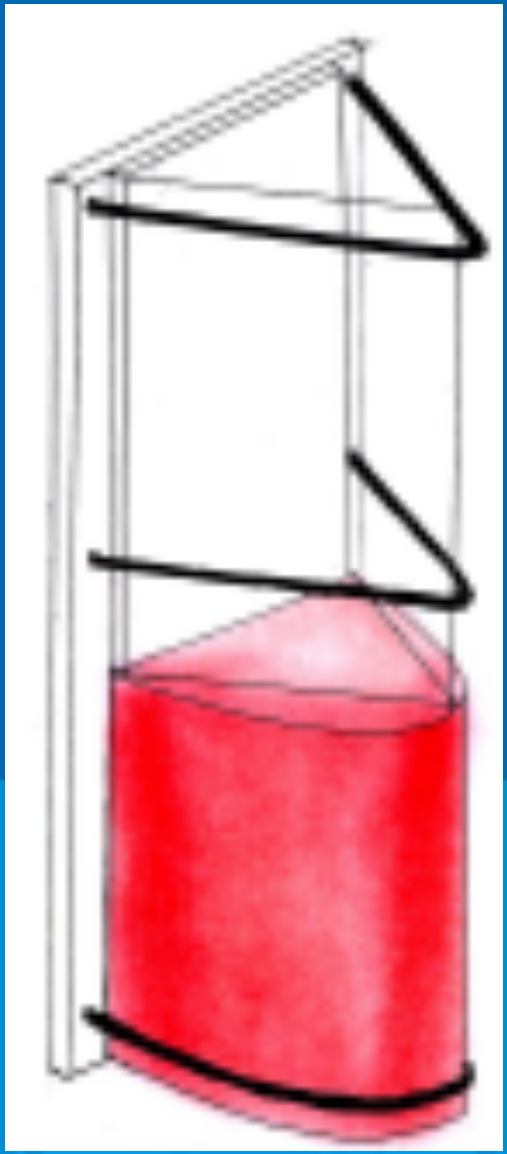
Chimney is always protected

Elements added for grip

Concepts



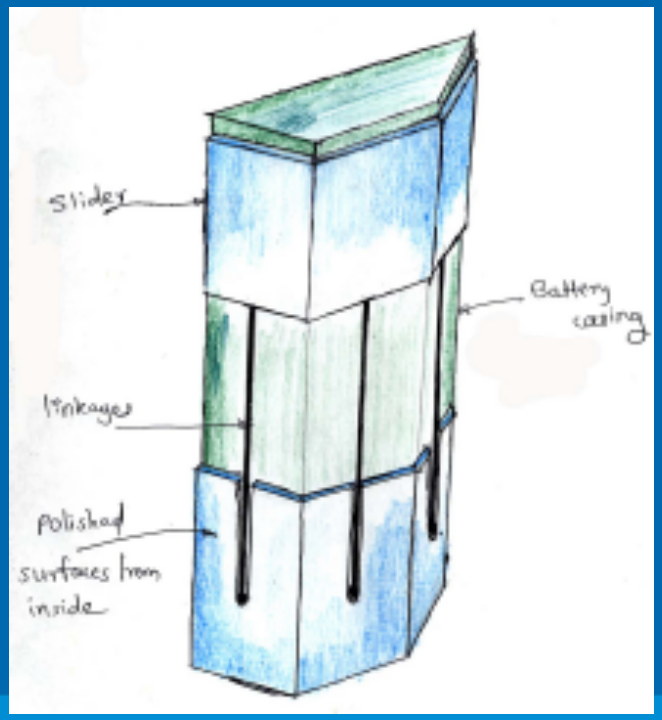
Hinge to facilitate the selective illumination

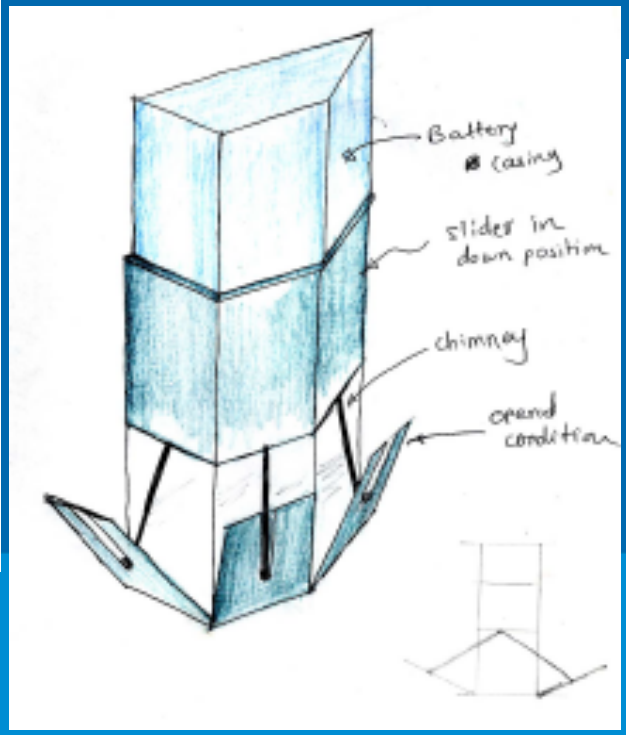


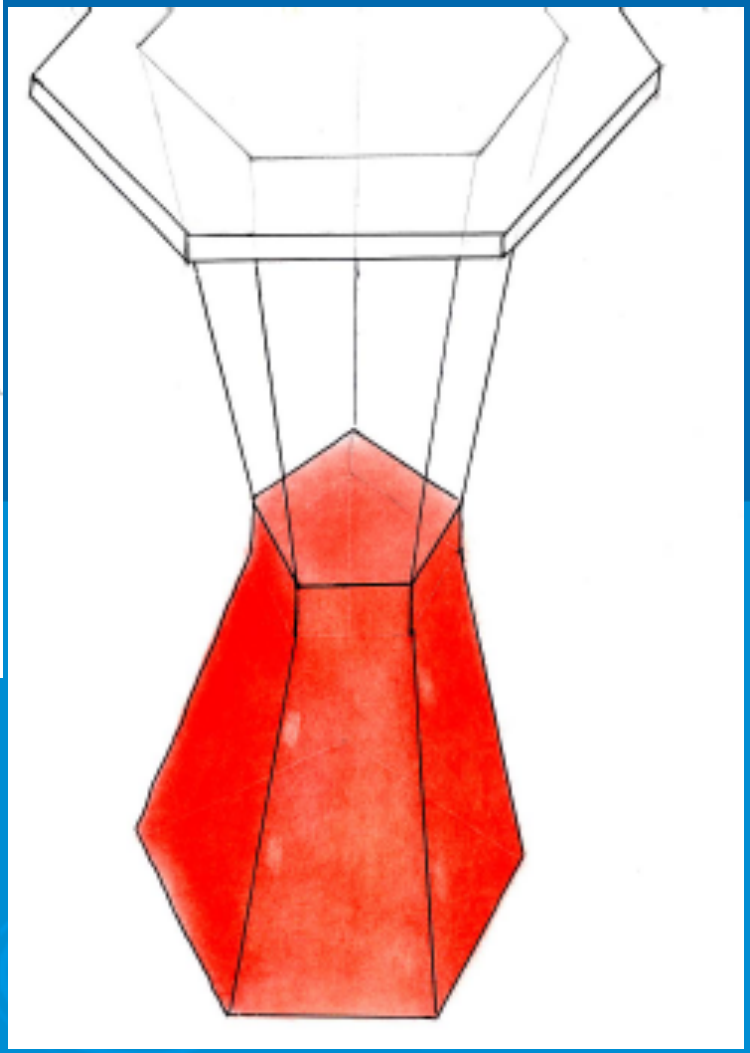
Vertical battery arrangement

Steel rods to protect the chimney

Concepts



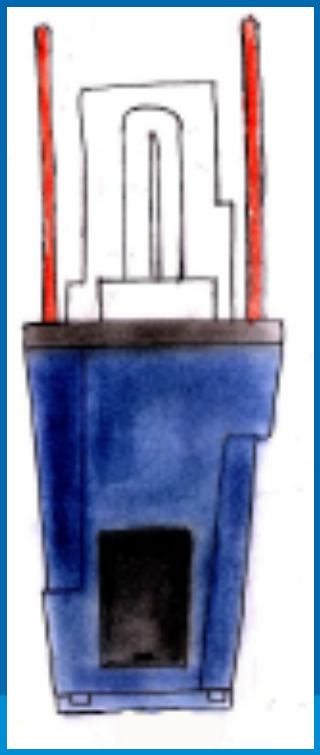


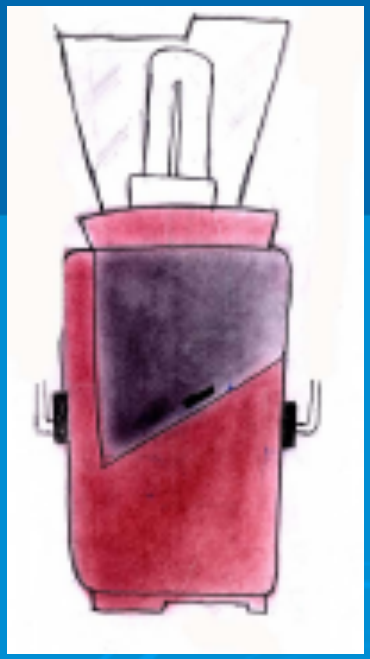


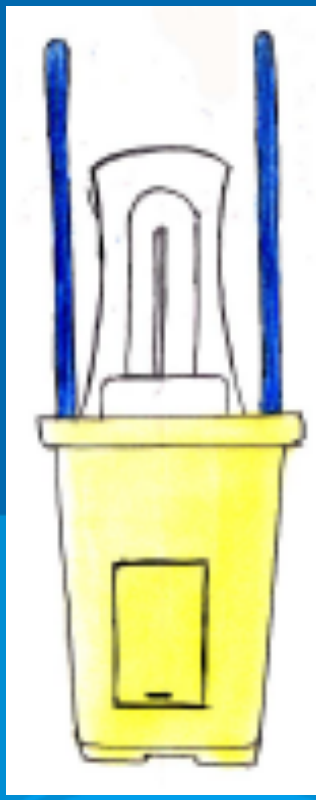
Selective illumination
180 or 360 degrees

Pentagon on Pentagon
creates interest

Concepts

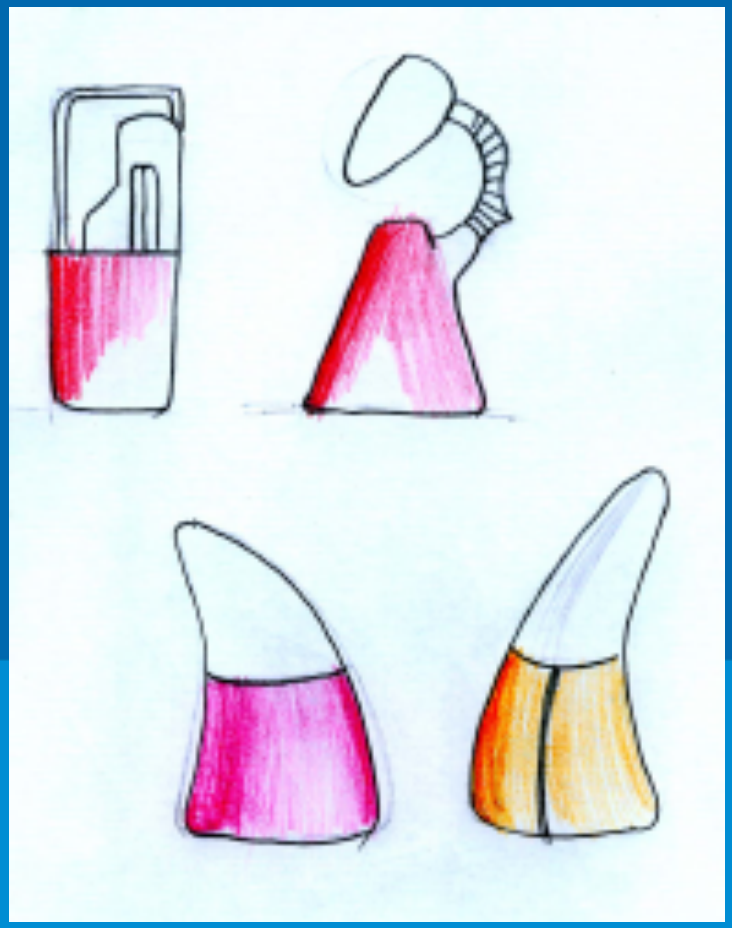


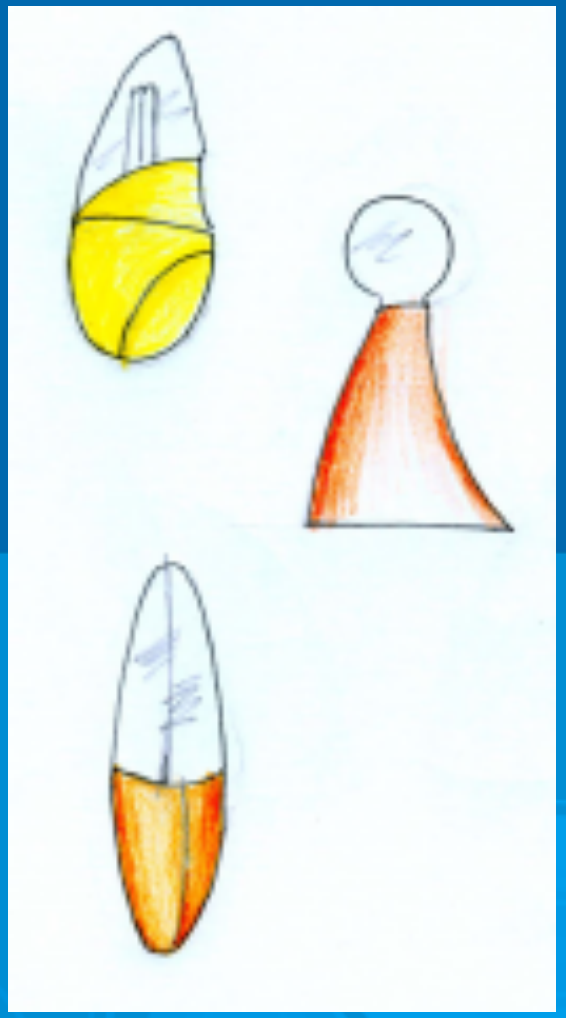




Some vertical forms tried

Concepts

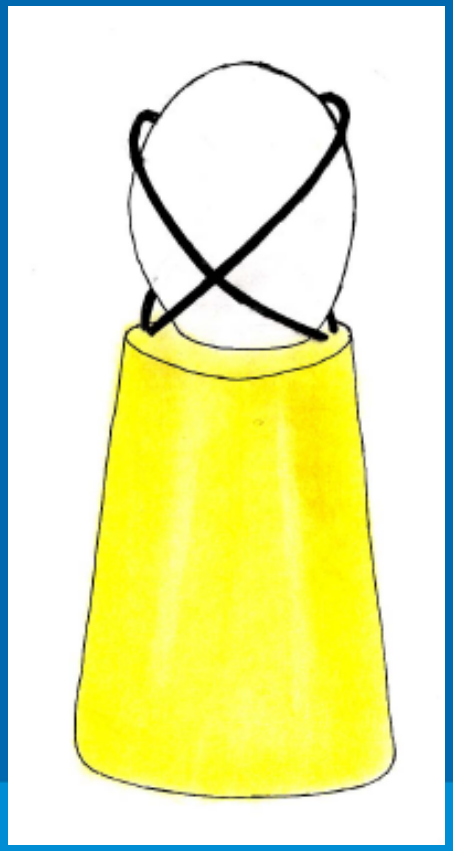


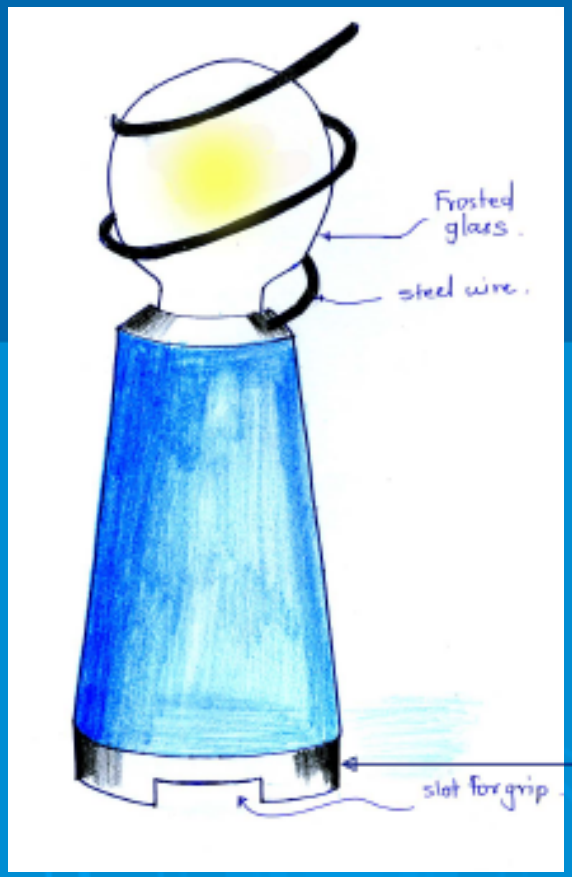


Form exploration

Refined concepts

Urban Market





Not portable

Elegant form

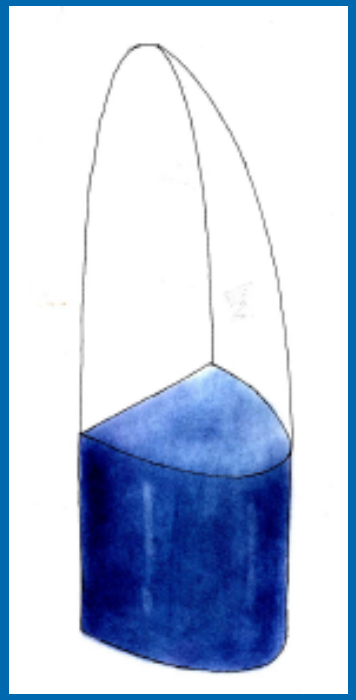
Metal finish

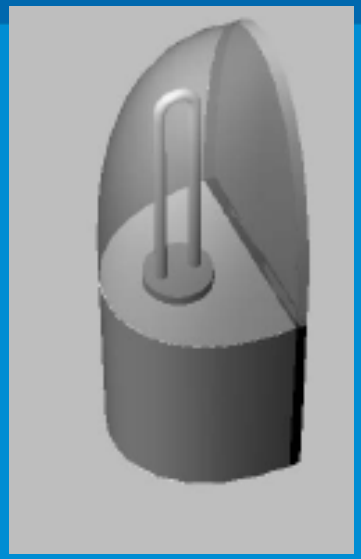
Frosted glass

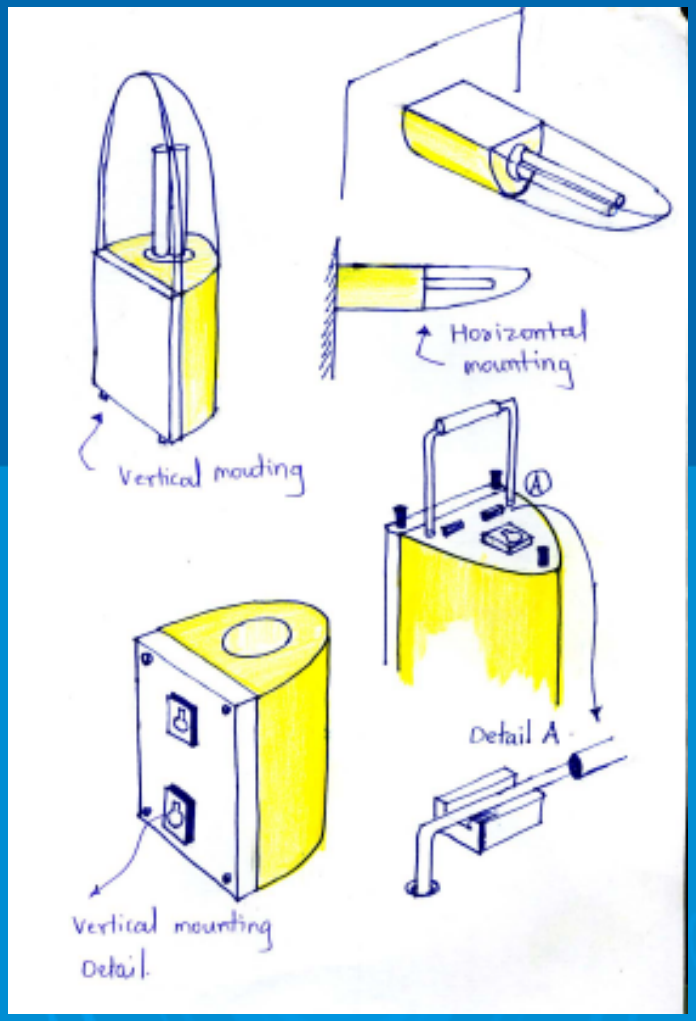
Space for interface

shopkeepers

Refined concepts



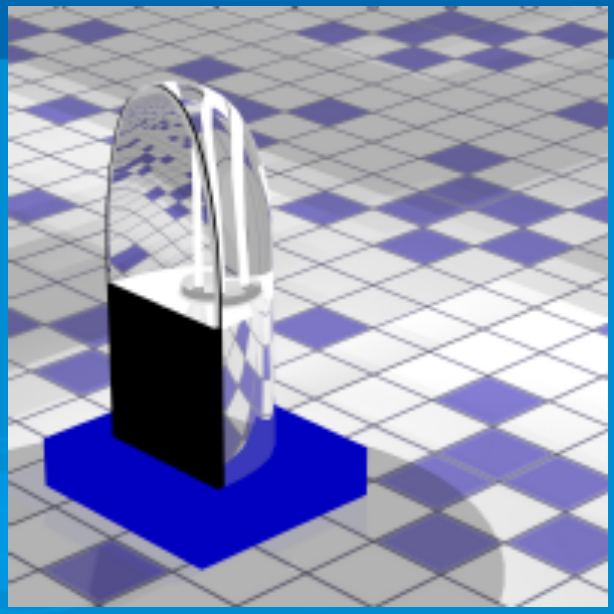




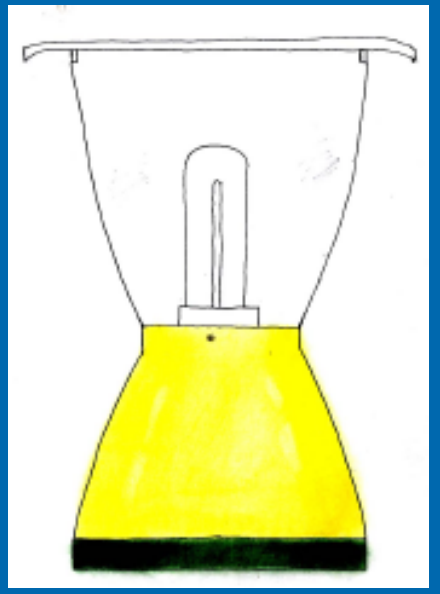
Versatile in it’s use

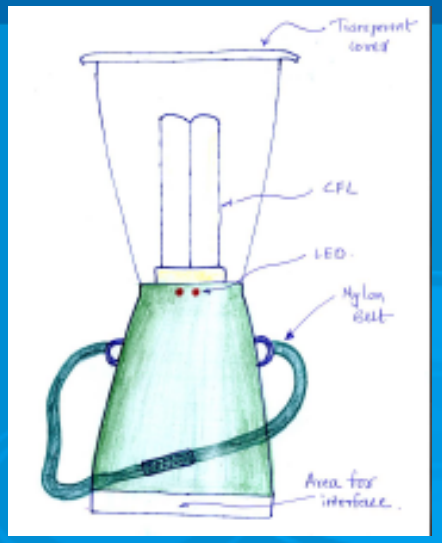
Hanged or carried

360 degree illumination



Refined concepts





Rugged

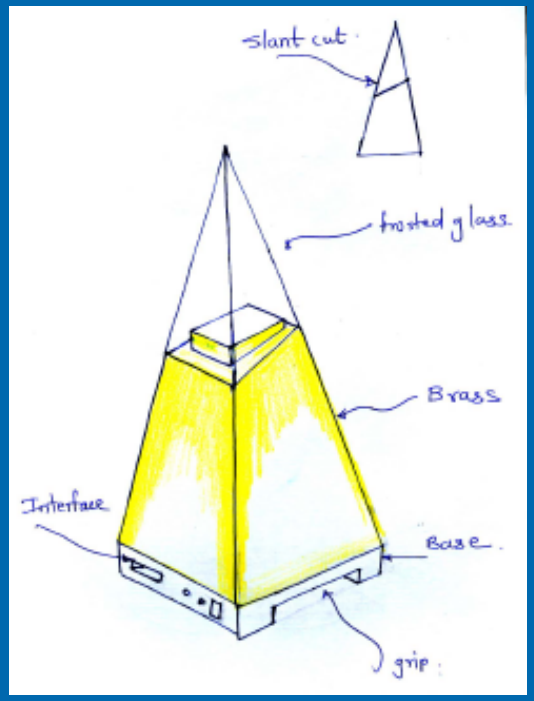
Portable-flexible nylon belt

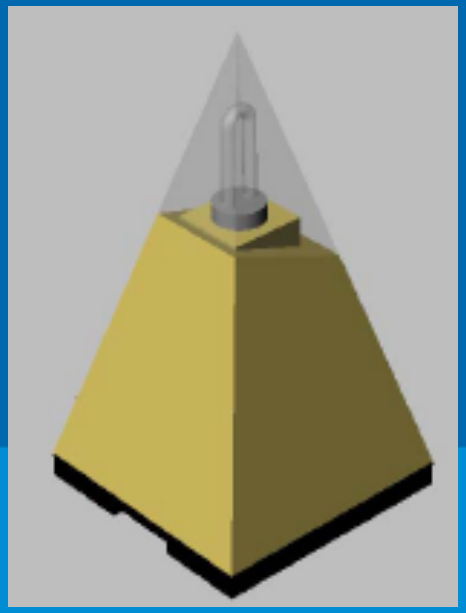
Directing light

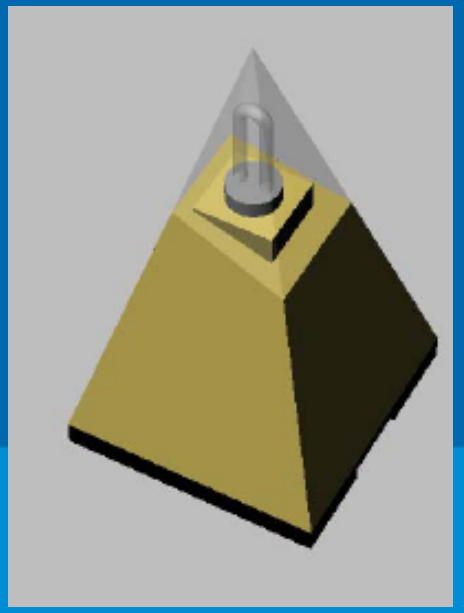
Can be hanged upside down

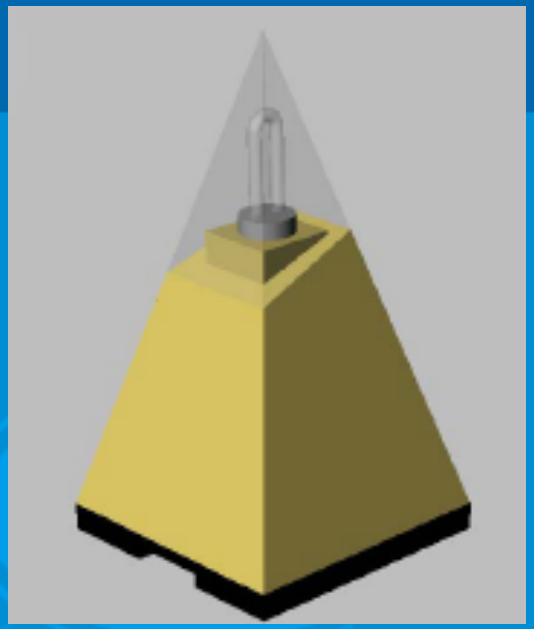
Urban Market

Refined concepts









Not portable

Brass -traditional look

Frosted glass top

Simple geometric shape

Slant cut to increase the visual interest

The places I visited …

Aureka :Metal workshop expert in making windmill structures and earth block compressing machines .

Flame pottery: Working on ceramic Mugs and flowerpots Lampshades

Earth unit of CSR: Working on compressed earth block and Ferro cement structures

Aurowaves: Specialized in making touch sensitive lamps.

Guy workshop: work on Brass lamps and paper lampshades

The places I visited …

Shri Aurobindo Swami ashram

Shri aurobindo Swami handmade paper Factory

Matrimandir : structure made for meditation .

Mahabalipuram :Ancients stone carvings and sculptures .

Visitors centre in Auroville: The shopping centre where all the craft work is put up for sale.

Compressed earth bricks

CSR building made up of Ferro cement channels slabs

Brass work

Mahabalipuram stone carvings

Visitors centre -Auroville

Aureka windmill

Matrimandir

What I learned ????

- Work with the local craftsman
- Market research for the components
- Model making in the SS and brass
- How to make changes in design so that it's easy to understand to local craftsman
- Solar technology
- Design process
- Communication through sketches
- Discussion with various people from different fields and countries
- Design under constraints of time and technical problems
- Techniques of communicating in conditions like language barrier.
- How to plan the project