



# LED Light Stand

sustainable design

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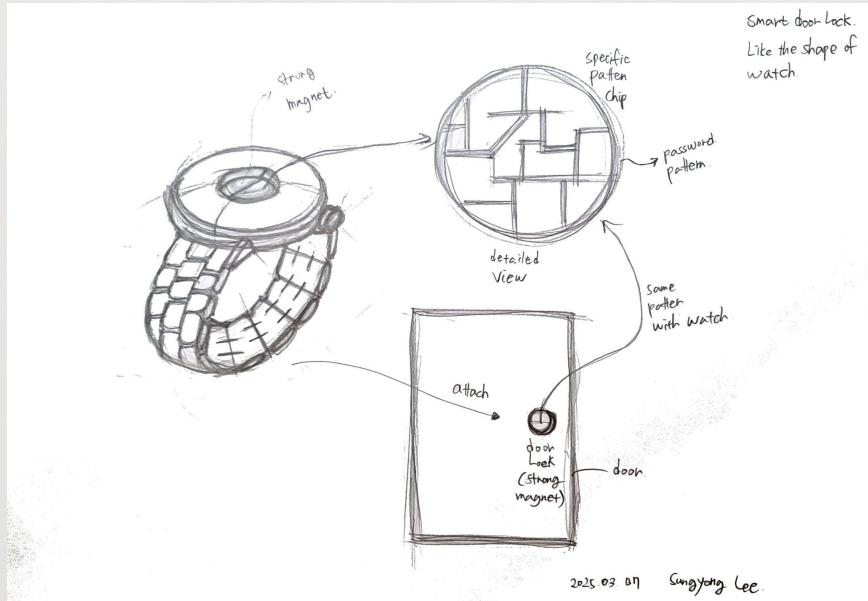




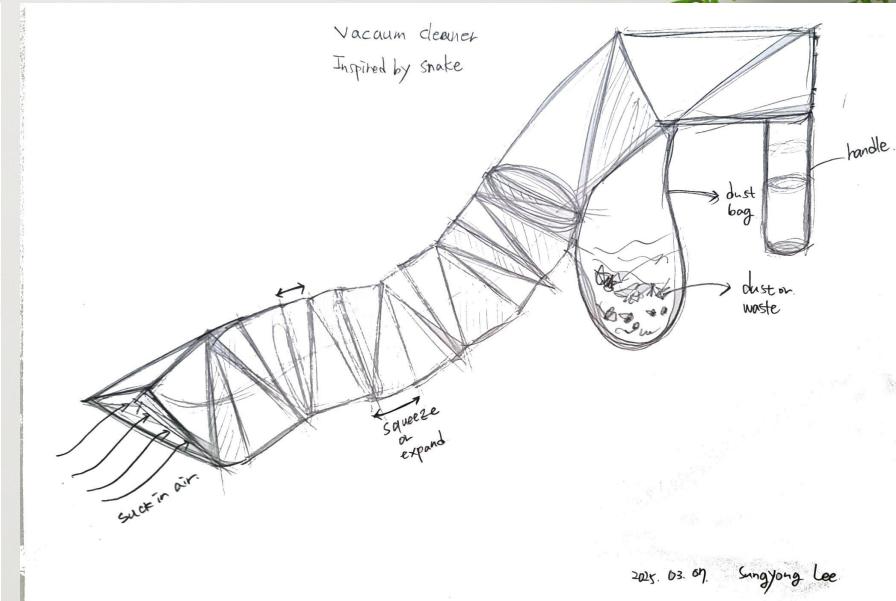
# Mind map



# General Sketches (1 / 5)

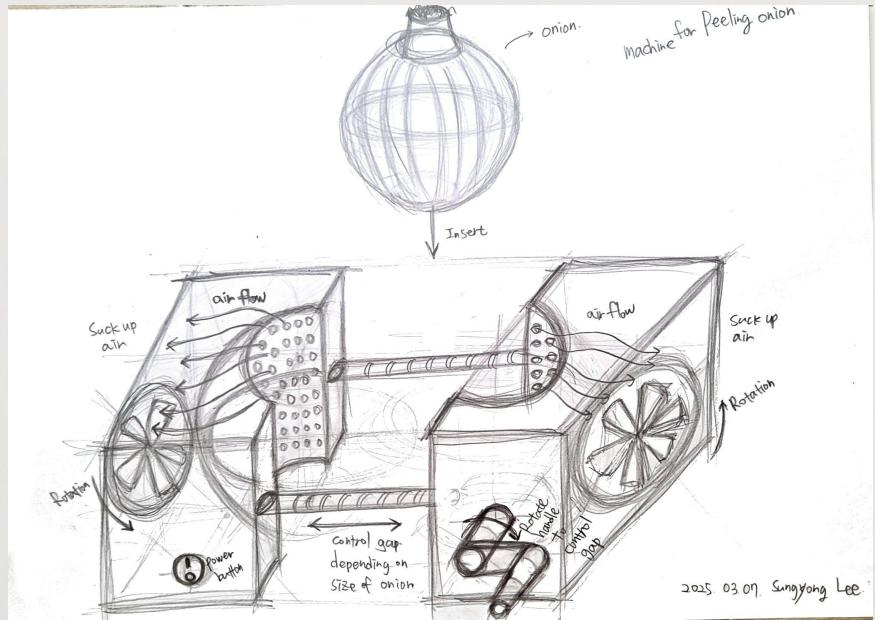


Smart Door Lock

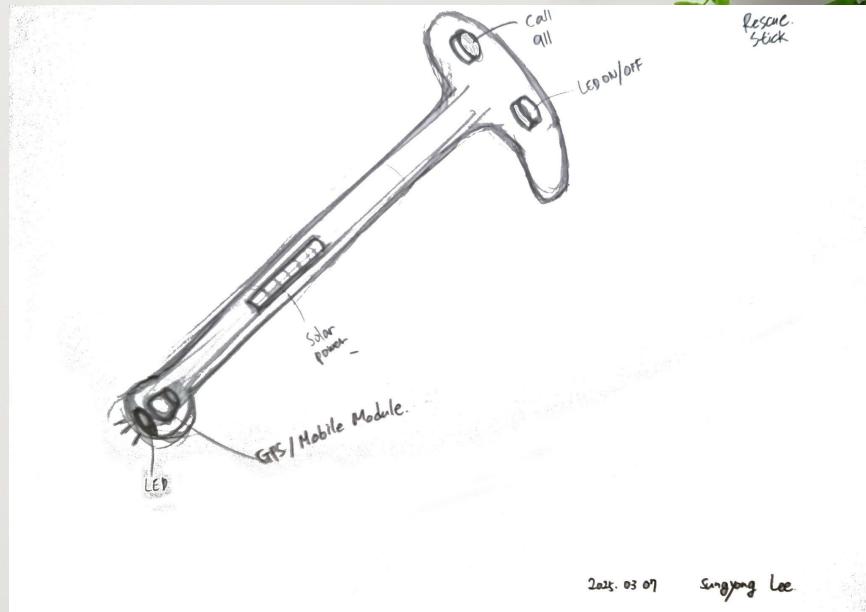


Vacuum Cleaner (Snake)

# General Sketches (2 / 5)



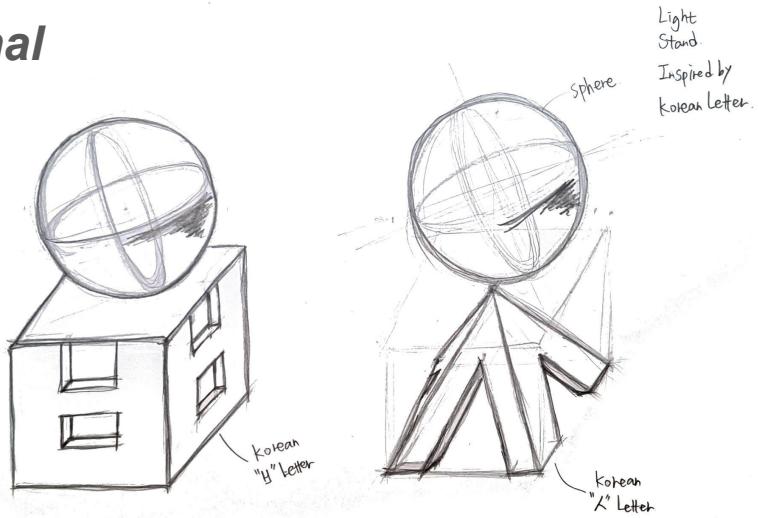
Machine for peeling onion



Rescue Stick

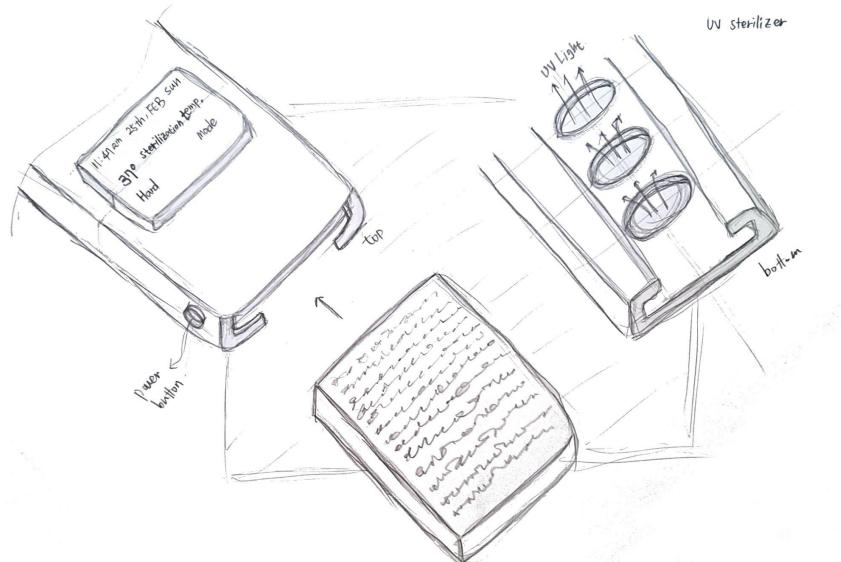
# General Sketches (3 / 5)

*Final*



2025 03 07. Sungyong Lee.

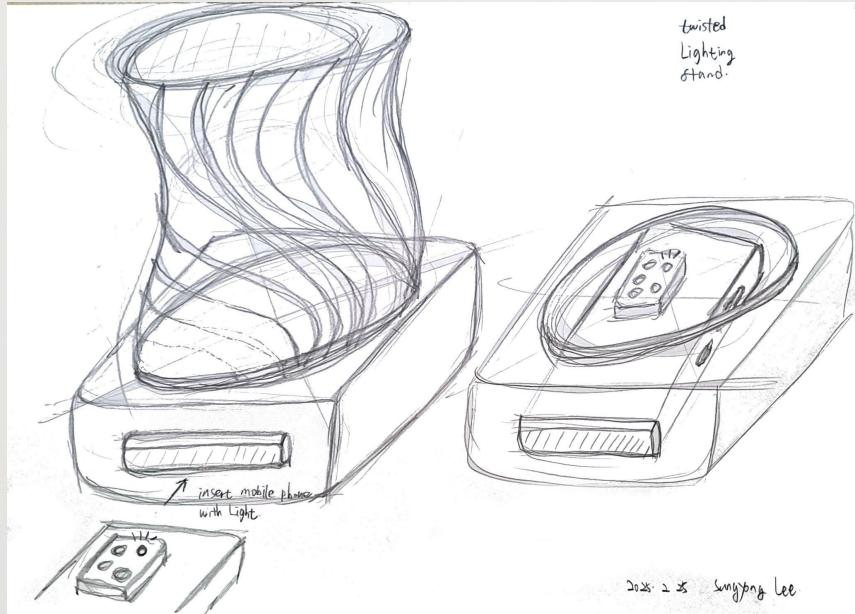
Light Stand (Korean Letter)



2025 2 25 Sungyong Lee

UV Sterilizer

# General Sketches (4 / 5)



Twisted Lighting Stand  
(Mobile Phone)

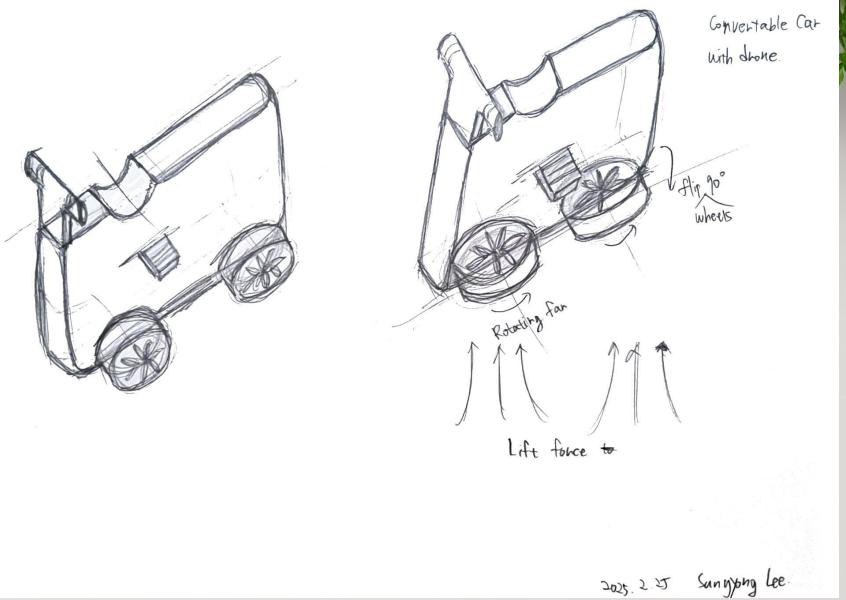


EMP Gun

# General Sketches (5 / 5)

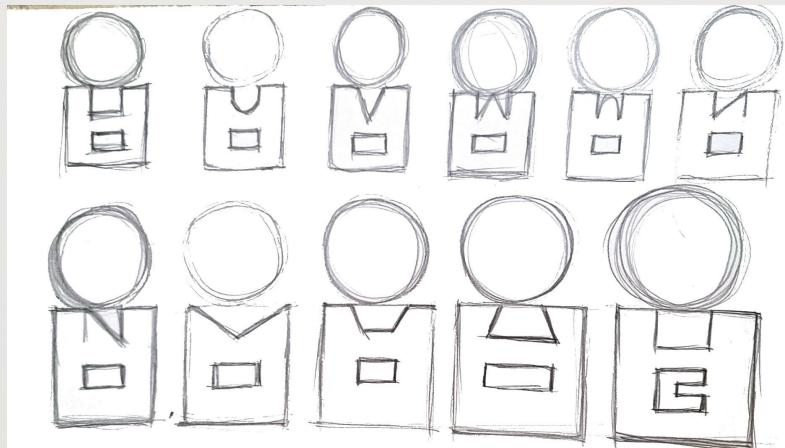


3D Printer Controlled By phone

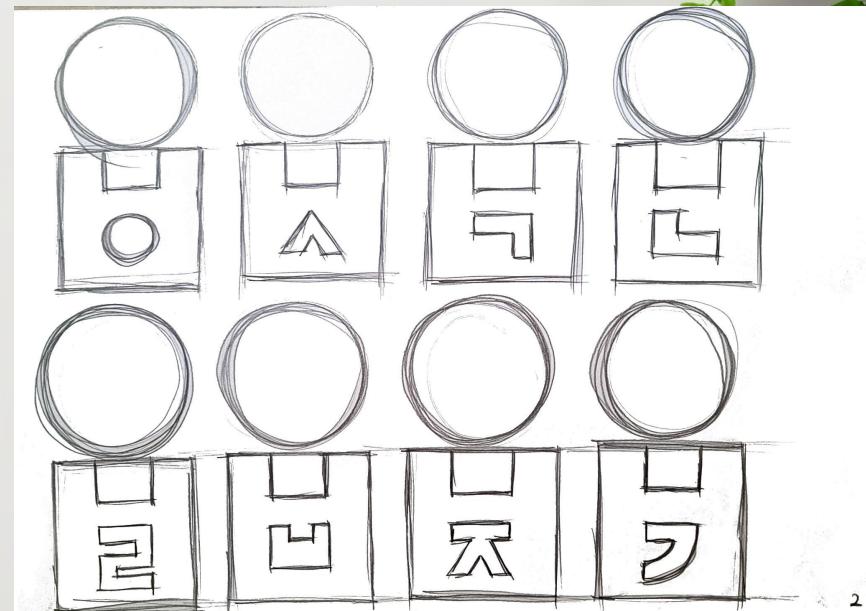


Convertible Scooter (Car & Drone)

# Sketch Development (1 / 5)



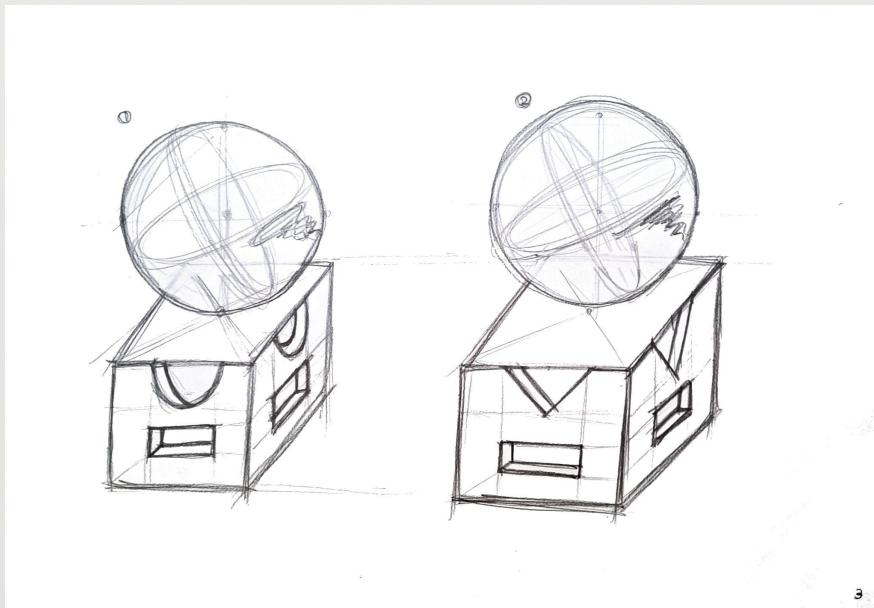
form variation 1



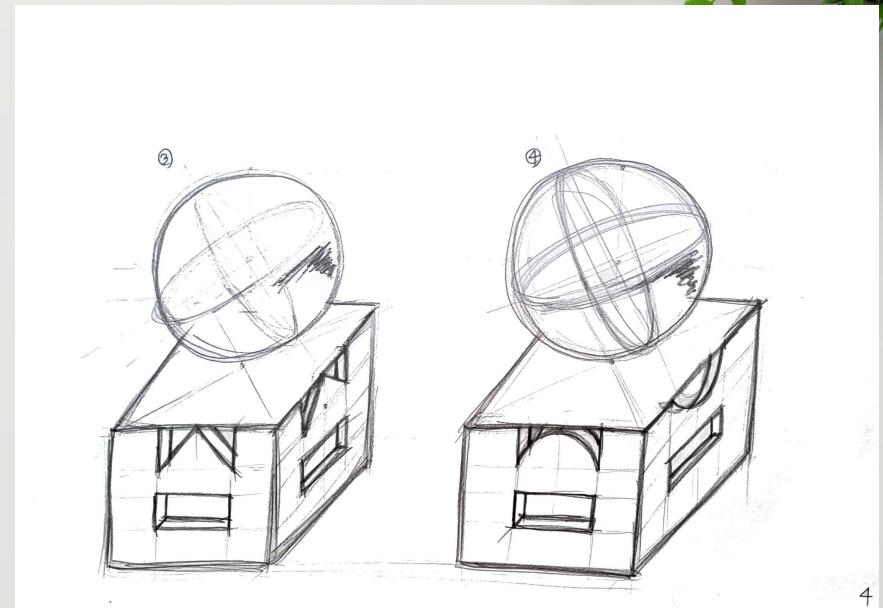
form variation 2



# Sketch Development (2 / 5)



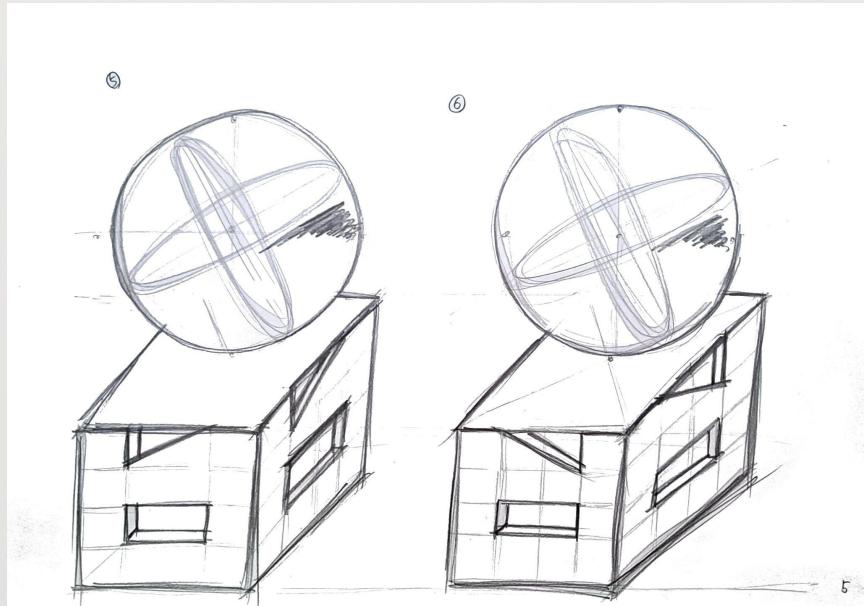
3D Development (1)



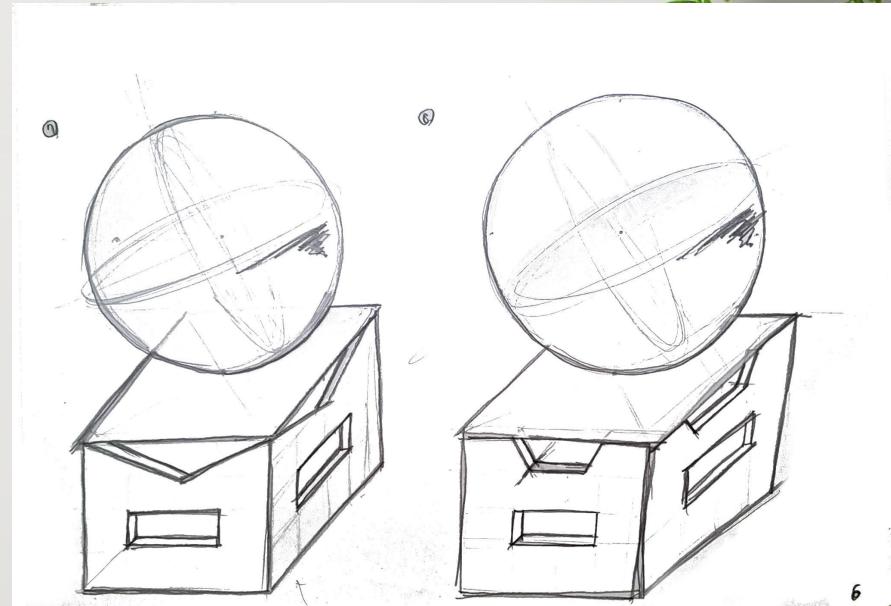
3D Development (2)



# Sketch Development (3 / 5)



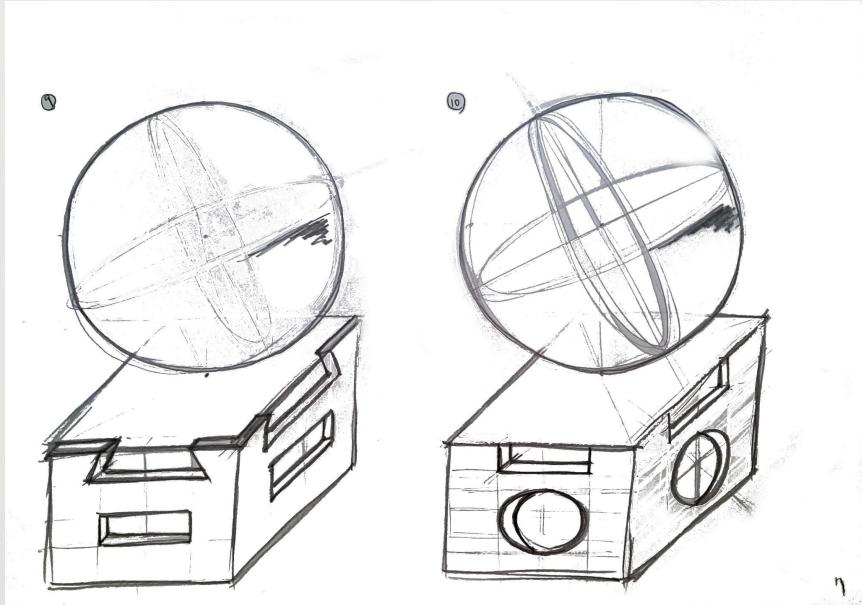
3D Development (3)



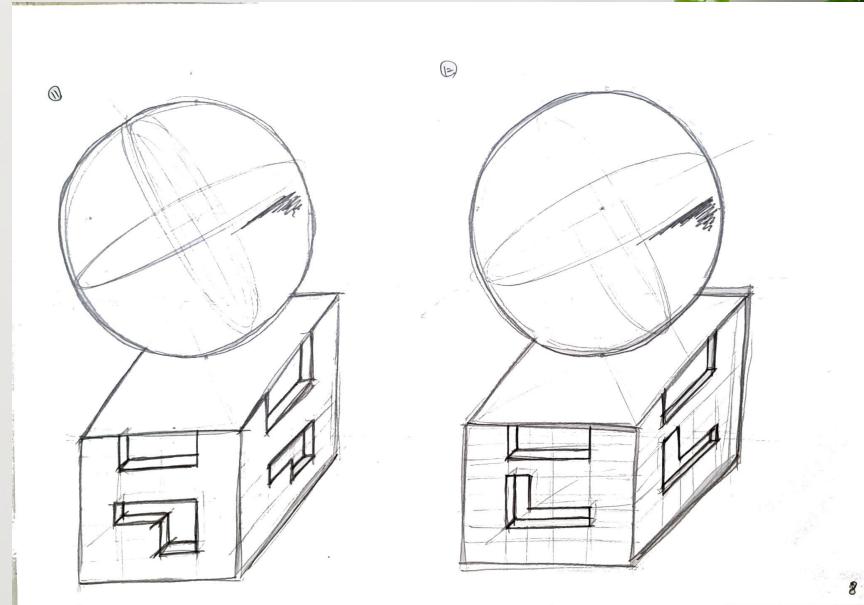
3D Development (4)



# Sketch Development (4 / 5)



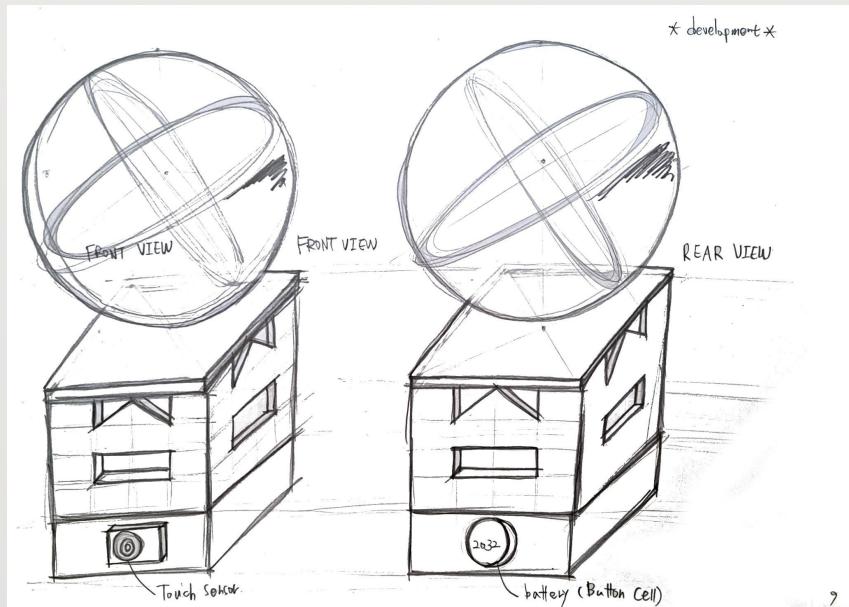
3D Development (5)



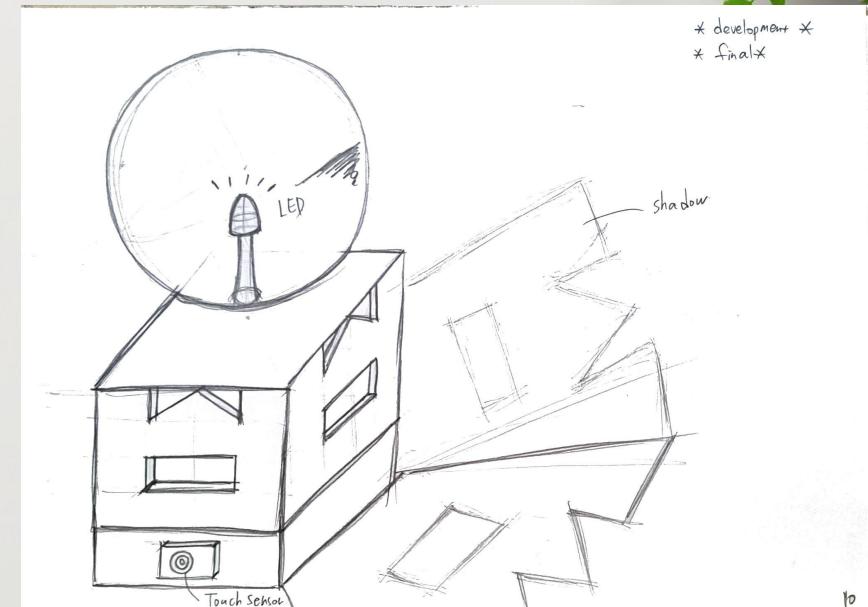
3D Development (6)



# Sketch Development (5 / 5)



Final Design (1)



Final Design (2)

# Mockup - Stand framework (1 / 2)



Measuring



Cutting

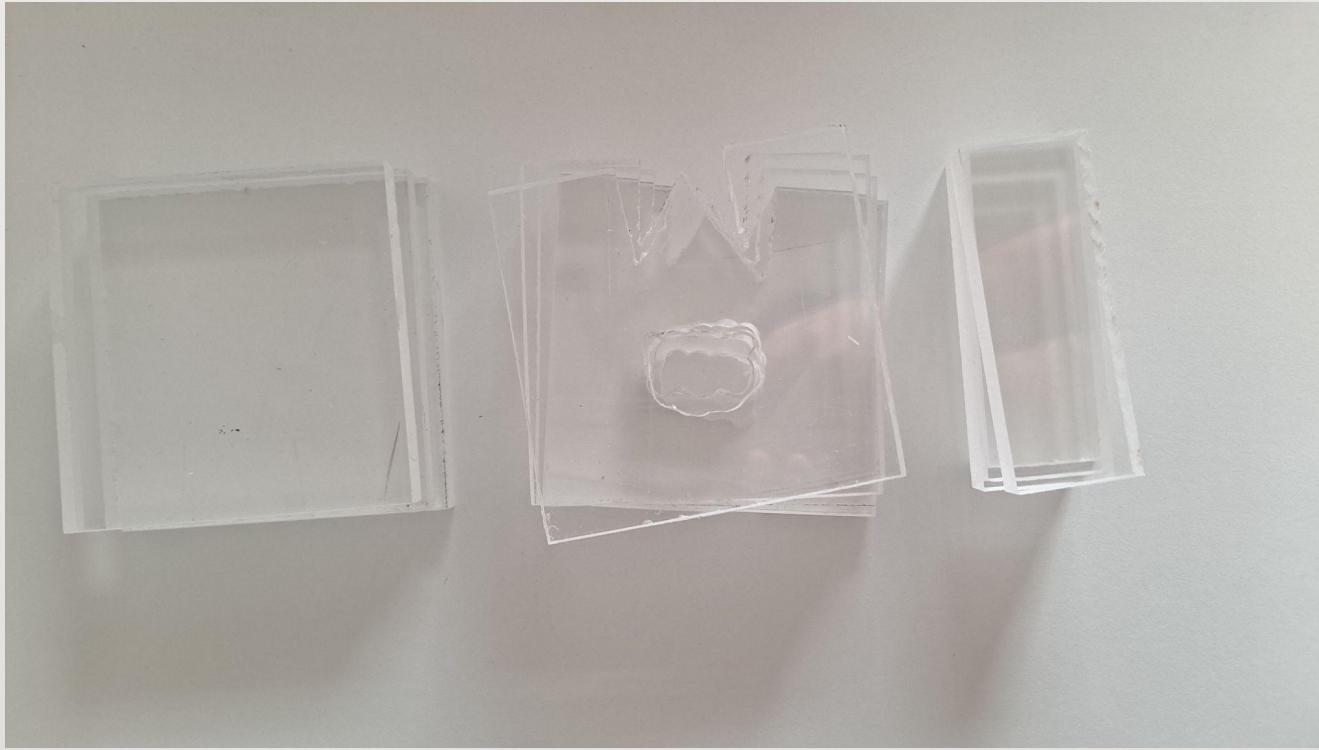


Drilling



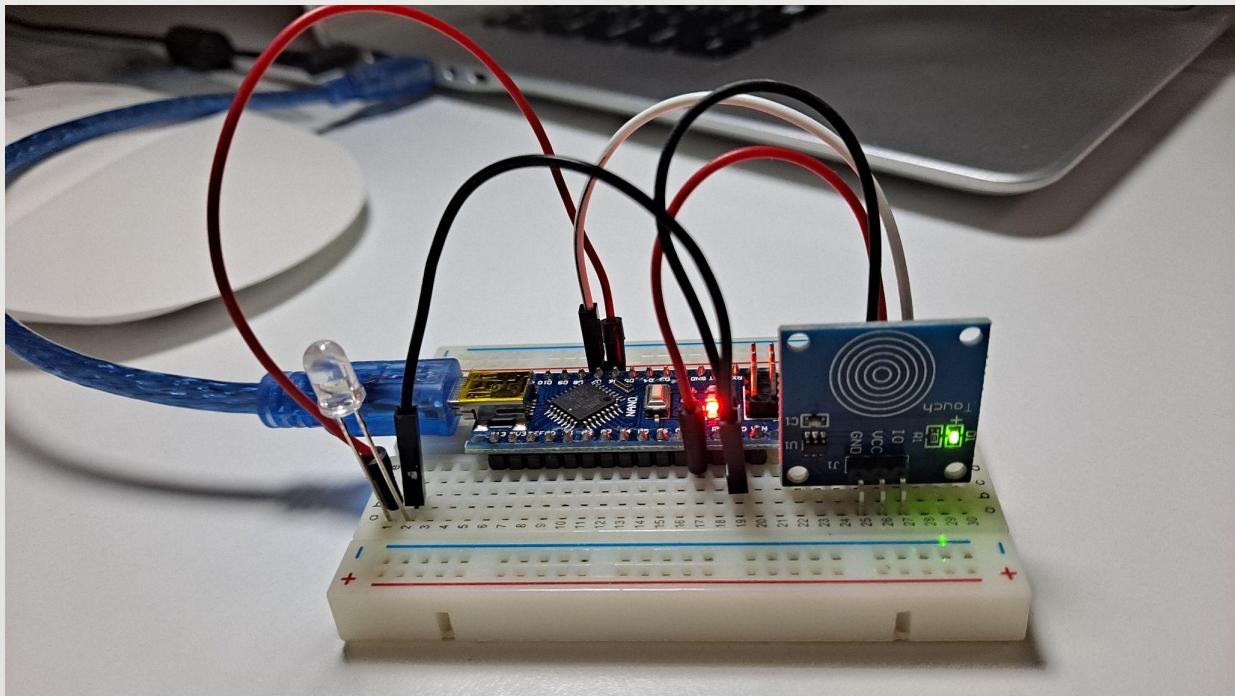
Smoothing

# Mockup - Stand framework (2 / 2)



Framework ready

# Mockup - Electronic circuit (1 / 6)



Circuit design



# Mockup - Electronic circuit (2 / 6)



```
const int touchsensor = 1;
const int LED = 2;
const int SPEAKER = 4;
int state = 0;
int sound = 311;
boolean Flag_TouchON = false;

int tones[ ] = {262, 294, 330};

void setup() {
// Serial.begin (9600);
pinMode (touchsensor, INPUT);
pinMode (LED, OUTPUT);
pinMode(SPEAKER, OUTPUT);
}

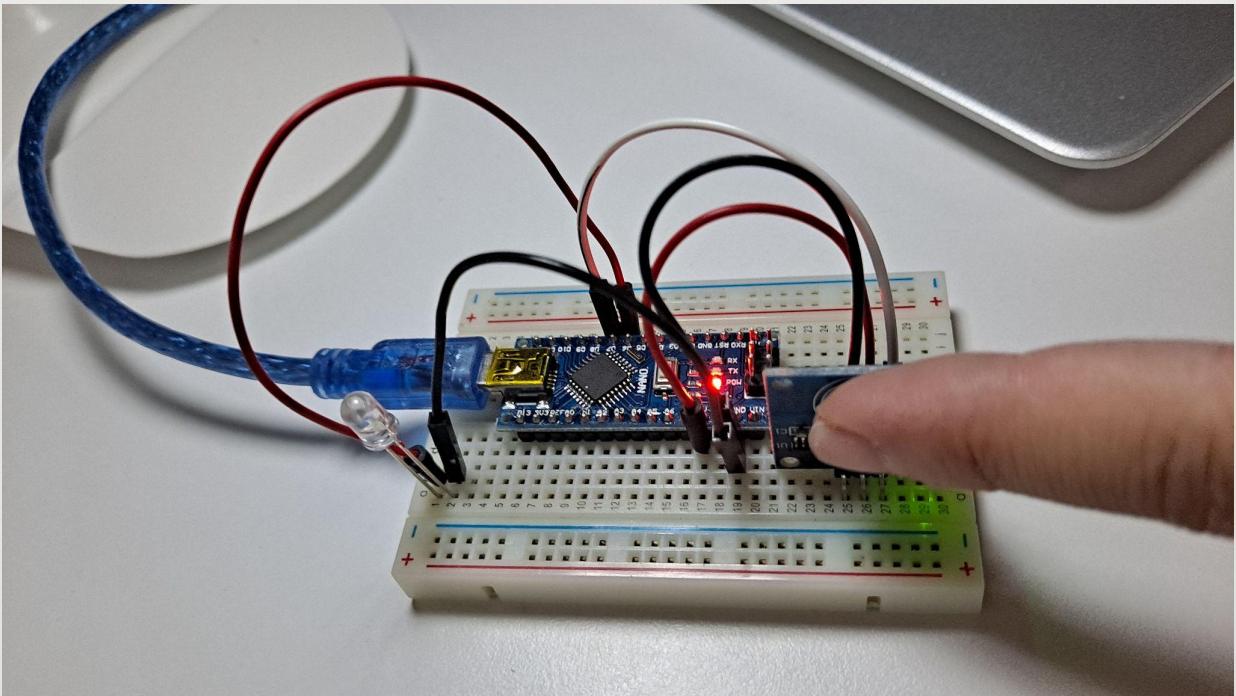
void loop() {
state = digitalRead (touchsensor);
if (state == HIGH) { // state = HIGH when touching
// Serial.println(state);
Flag_TouchON = !Flag_TouchON; // flip flag value

if(Flag_TouchON){
// Serial.println("Touch On");
digitalWrite(LED, HIGH);
for(int note = 0; note < sizeof(tones)/sizeof(int); note++){
tone(SPEAKER, tones[note]);
delay(150);
}

noTone(SPEAKER);
} else{
// Serial.println("Touch Off");
digitalWrite(LED, LOW);
}
}
delay(500);
}
```

Arduino Code

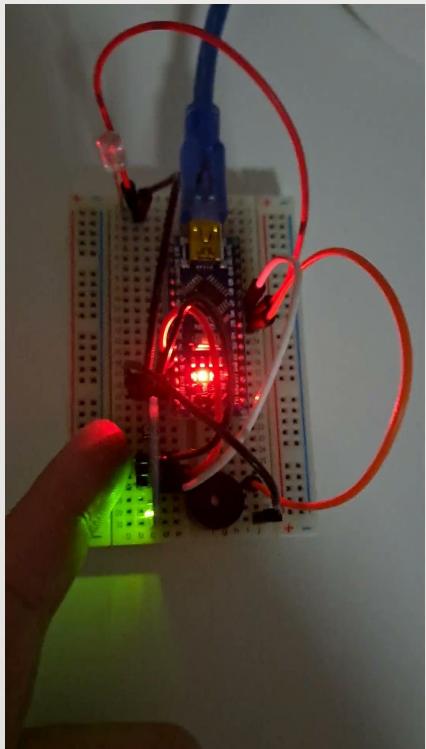
# Mockup - Electronic circuit (3 / 6)



Circuit test



# Mockup - Electronic circuit (4 / 6)

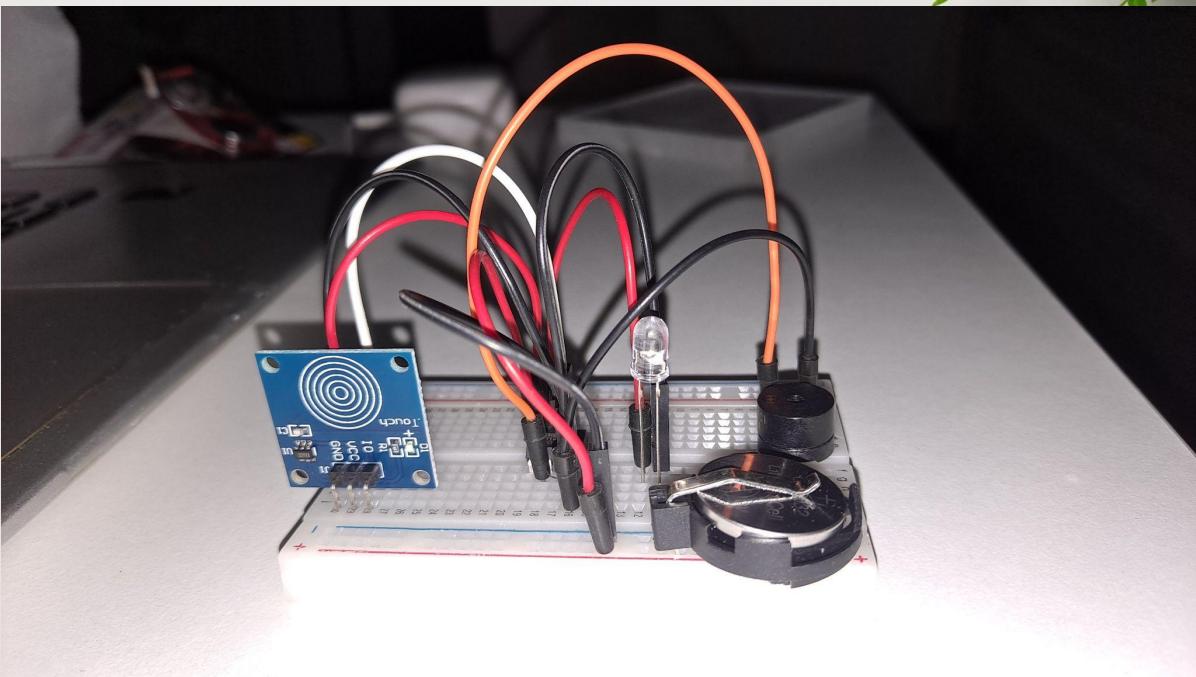
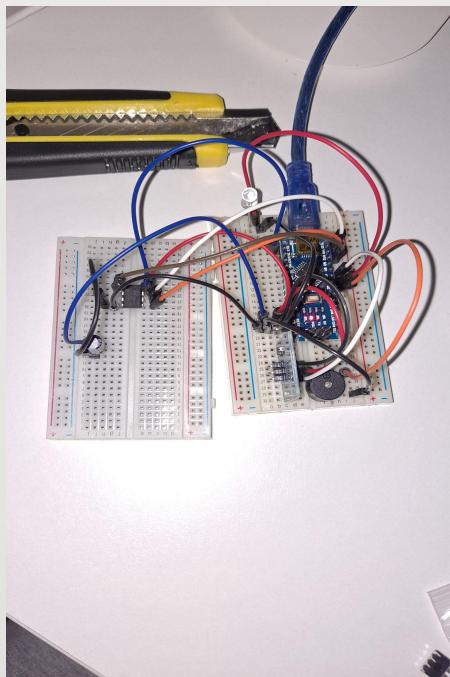


[https://drive.google.com/file/d/1wS-OVRc6v4v25k\\_ZI\\_o1kY1oc1M6DomCM/view?resourcekey](https://drive.google.com/file/d/1wS-OVRc6v4v25k_ZI_o1kY1oc1M6DomCM/view?resourcekey)

Circuit test (demo video)

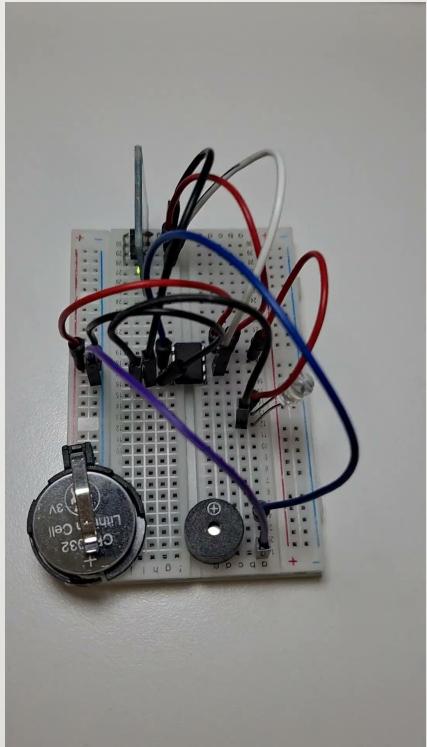


# Mockup - Electronic circuit (5 / 6)



Transferring code to smaller MCU

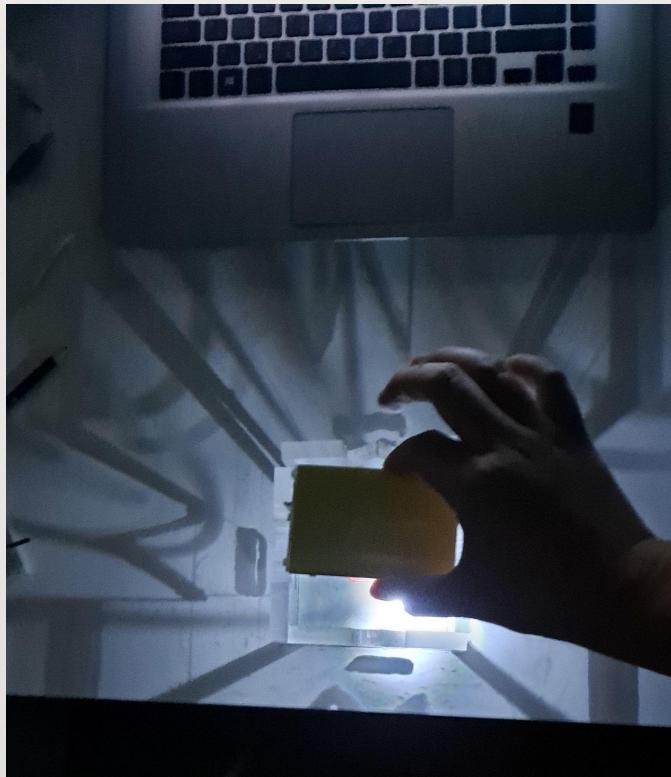
# Mockup - Electronic circuit (6 / 6)



<https://drive.google.com/file/d/1xCIa1bYojvWBF9sLZ66sTVju1EDst/view?resourcekey>

Circuit test after transferring code (demo video)

# Mockup - LED layout test



To determine where LED should be located



# Mockup - Assembling Framework (1 / 7)



Product set

# Mockup - Assembling Framework (2 / 7)



Assemble

LED Light Stand



Main body

Sungyong Lee



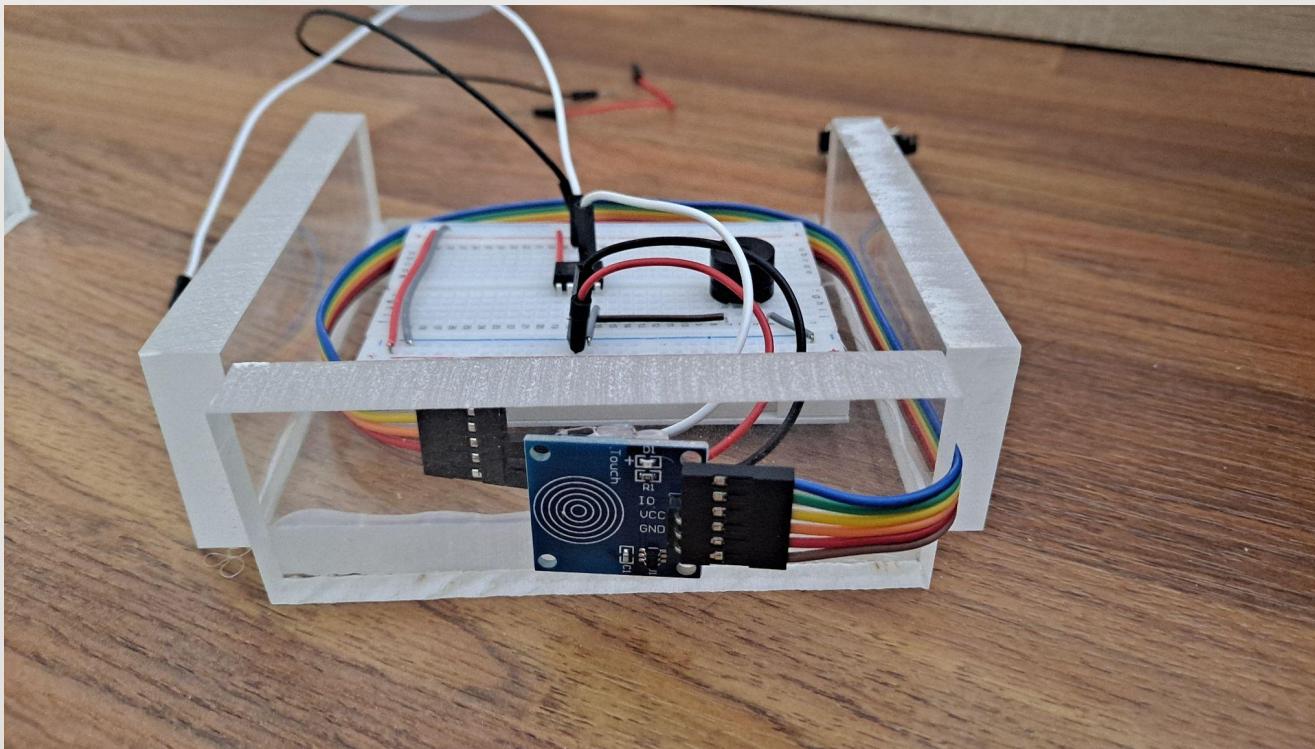
Attach circuit

sunrise.in.my.dream@gmail.com



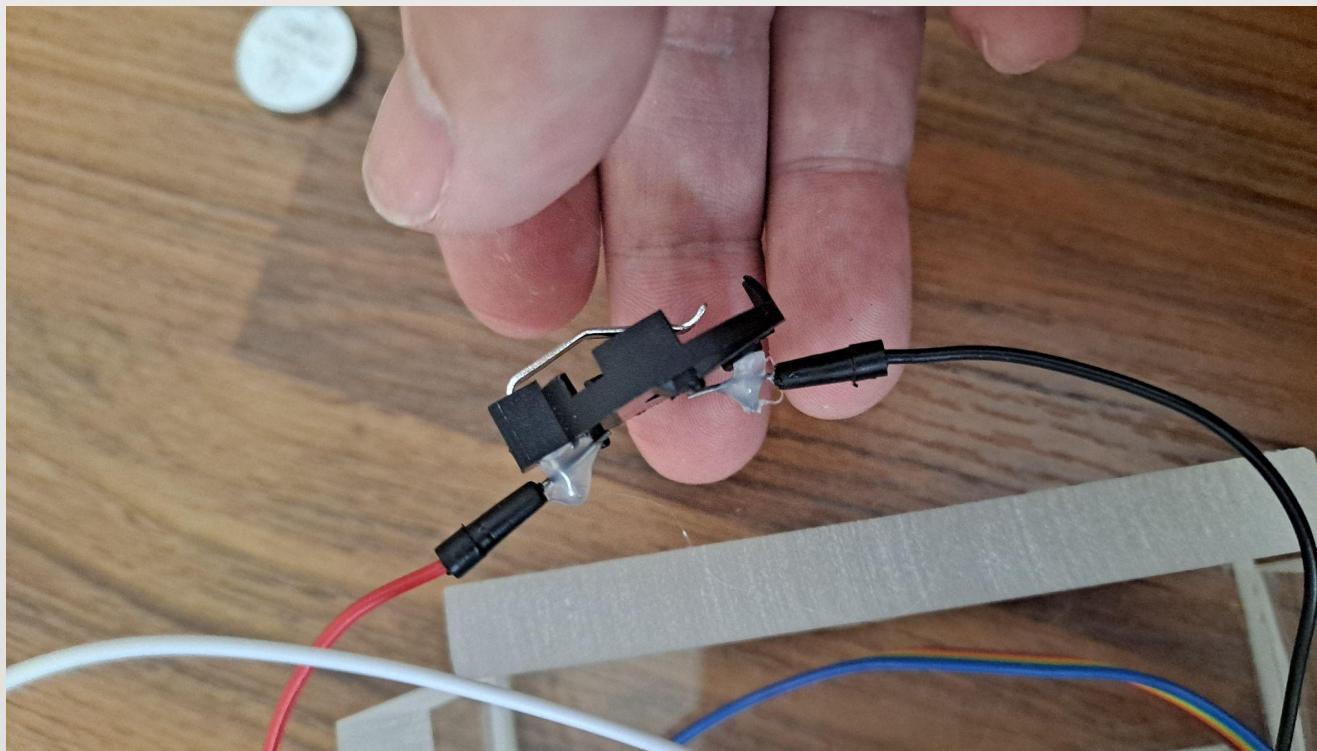
On the bottom

# Mockup - Assembling Framework (3 / 7)



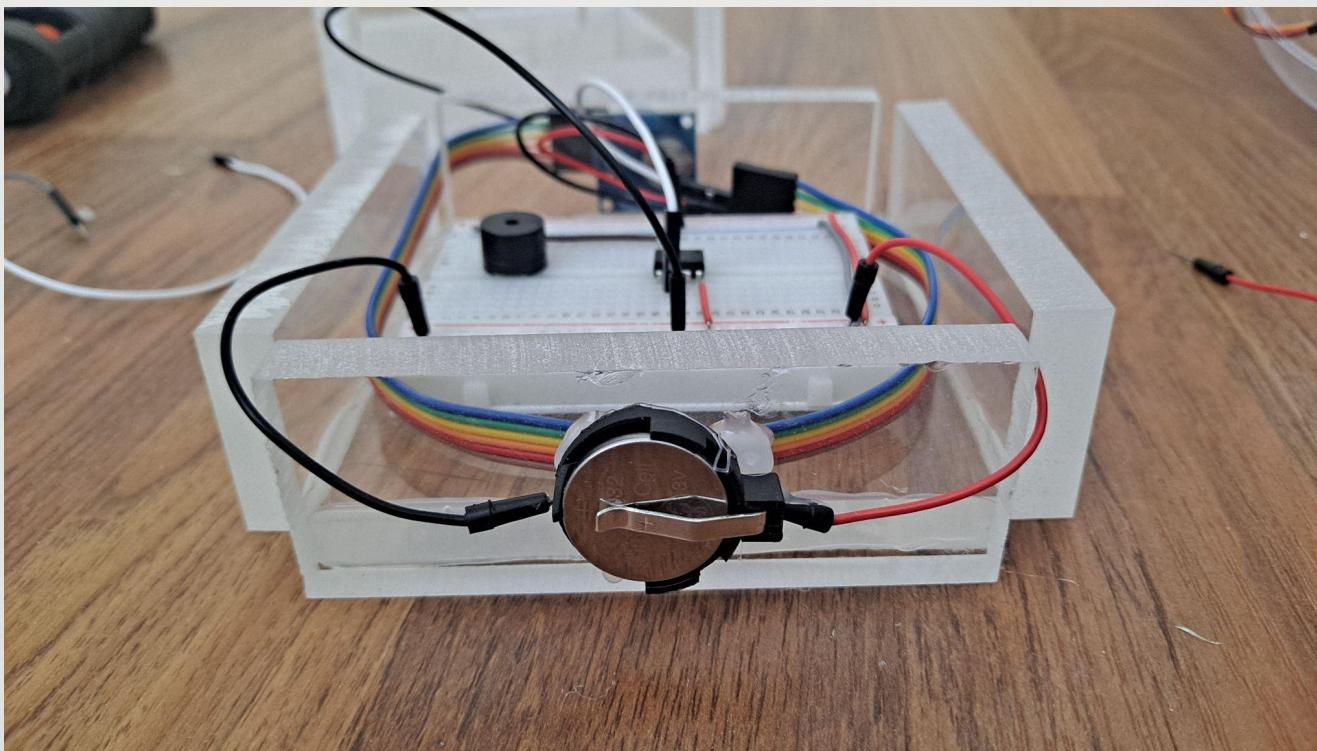
Attach touch  
sensor

# Mockup - Assembling Framework (4 / 7)



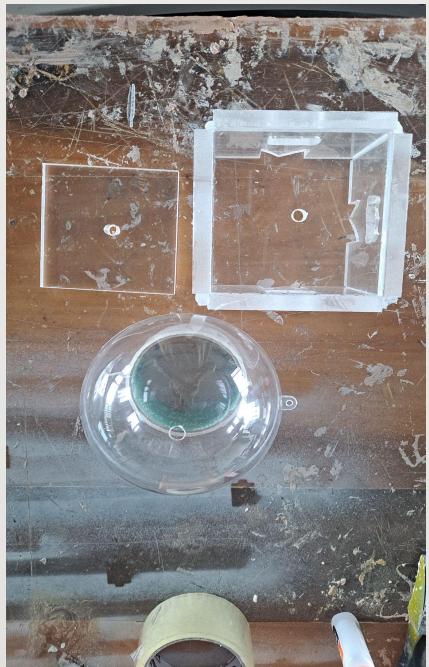
Attach coin  
cell battery

# Mockup - Assembling Framework (5 / 7)



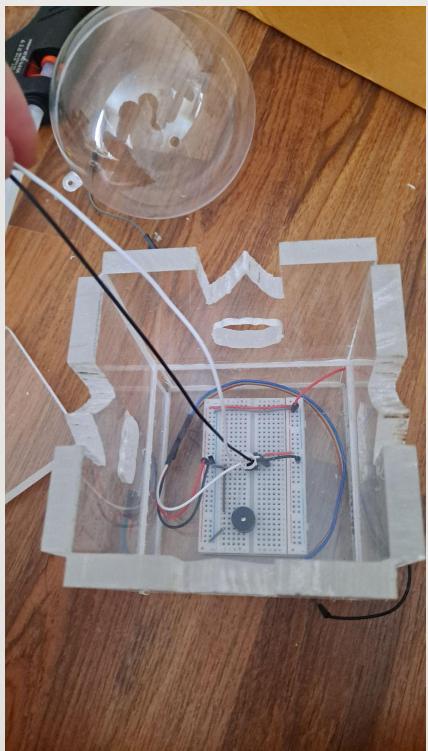
Completion of  
Bottom part

# Mockup - Assembling Framework (6 / 7)



Perforate for electric wire going through into framework

# Mockup - Assembling Framework (7 / 7)



Connect LED with wire and test

# Mockup - Final Product



LED Light Stand



Sungyong Lee

Test lightning in the dark  
to see shadow on the floor

sunrise.in.my.dream@gmail.com <sup>30</sup>

# Material Selection (1 / 2) - PET / PETE



- water bottle / beverage bottle
- Transparent / Lightweight
- Stronger than glass bottles
- Recyclable / Reusable
- Ideal for portable containers



Polyethylene Terephthalate

# Material Selection (2 / 2) - HDPE



High Density Polyethylene

- water bottle cap / detergent bottles / shampoo containers
- High density and strength
- resistant to external impacts
- chemical resistance
- weather resistance
- heat resistance ( $90^{\circ}\text{C} \sim 120^{\circ}\text{C}$ )
- No harmful chemicals
- Good for toys and baby bottles
- Recyclable / Reusable

# Cost Estimates - Research (1 / 3) IKEA



<b>Product size</b>  Maximum : 6 watts Width : 10 cm. Height : 22 cm. Cable length : 1.5 m.  	<b>Packaging</b>  <b>GRÖNÖ เกรนเออ</b> Table lamp  Product code <b>203.732.25</b>  <b>Width :</b> 11 cm. <b>Height :</b> 11 cm. <b>Length :</b> 23 cm. <b>Weight :</b> 1.15 kg. <b>Box :</b> 1	<b>material</b>  Amino resin color, glass  	<b>Better value at a reduced price</b> <b>GRÖNÖ เกรนเออ</b> โคมไฟตั้งโต๊ะ, กระดาษฟ้า ขาว, 22 ซม. <b>199 บาท</b> Original price: 249 บาท  ★★★★★ (3)  ⓘ Bulbs sold separately. We recommend using E14 bulbs.
		<b>Must be used in conjunction with</b>   <b>SOLHETTA โซลเหต้า</b> หลอดไฟ LED E14 470 ลumen 99 บาท/2 ชิ้น	<b>How to receive products</b>   <b>Shipping</b> Available Find all options at checkout   <b>Buy at the store</b> Check stock at the store

[https://www.ikea.com/th/th/p/groenoe-table-lamp-frosted-glass-white-20373225/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feed&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&qad\\_source=4&qclid=Cj0KCQIA8q-BhDiARIsAP9tKI2T8wmN7W7nop32FgM8eS0RlxzbeP-ibzOEH2QzPAR9JYxNvbsRDPOaAtuiEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/groenoe-table-lamp-frosted-glass-white-20373225/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feed&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&qad_source=4&qclid=Cj0KCQIA8q-BhDiARIsAP9tKI2T8wmN7W7nop32FgM8eS0RlxzbeP-ibzOEH2QzPAR9JYxNvbsRDPOaAtuiEALw_wcB&qclsrc=aw.ds)

# Cost Estimates - Research (2 / 3) IKEA



## Product size

Maximum : 40 watts  
Height : 29 cm.  
Base diameter : 13 cm.  
Lampshade diameter : 19 cm.  
Cable length : 130 cm.



## Packaging

### LAMPAN ลัมปัน

Table lamp

Product code

200.469.88

Length : 16 cm.

Weight : 0.32 kg.

Diameter : 20 cm.

Box : 1



LAMPAN ลัมปัน  
โคมไฟตั้งโต๊ะ, ขาว, 29 ซม.  
**279 ฿**  
★★★★★ (8)  
 ⓘ Bulbs sold separately. We recommend using E14 LED bulbs, frosted glass bulbs, white.

Choose a color  
white

SOLHETTA โซลเหต้า  
หลอดไฟ LED E14 470 ลูเมน  
99 หน่วย/2 ชิ้น

How to receive products

Shipping Available  
Find all options at checkout

Buy at the store  
Check stock at the store

[https://www.ikea.com/th/th/p/lampan-table-lamp-white-20046988/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feed&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&gad\\_source=4&gclid=Cj0KCQiA8q--BhDiARIsAP9tKI283JE-R8jYz80zkbi3Mh7KZihQqOR2DlrlBQfl2aijRlluFGeO6VkaAroMEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/lampan-table-lamp-white-20046988/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feed&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&gad_source=4&gclid=Cj0KCQiA8q--BhDiARIsAP9tKI283JE-R8jYz80zkbi3Mh7KZihQqOR2DlrlBQfl2aijRlluFGeO6VkaAroMEALw_wcB&qclsrc=aw.ds)

# Cost Estimates - Research (3 / 3) IKEA



**Packaging**

**SVALLET สวัลเล็ต**  
Desk lamp

Product code  
**703.584.87**

Width : 16 cm.  
Height : 14 cm.  
Length : 26 cm.  
**Weight : 0.32 kg.**  
Box : 1

**material**

Polypropylene plastic (at least 20% recycled)



[https://www.ikea.com/th/th/p/svallet-work-lamp-dark-grey-white-70358487/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feder&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&qad\\_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tKI0uPwcz\\_GdxoXNv-GePpk6rFwRrS8NssJcSHdzgnlFBx4Dhm7TgsaAoqsEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/svallet-work-lamp-dark-grey-white-70358487/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feder&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&qad_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tKI0uPwcz_GdxoXNv-GePpk6rFwRrS8NssJcSHdzgnlFBx4Dhm7TgsaAoqsEALw_wcB&qclsrc=aw.ds)

# Cost Estimates - LED Light Stand

The screenshot shows a product page on Alibaba.com for "Plastic Bottle for Carbonated Soft Drink PET Virgin Granules Plastic Raw Material". The main page displays a large image of grey granules, product details like "3-MID SPEED REPLY", "3000+ PRODUCTS", "CUSTOM COLORS", "QUICKLY DELIVERY", and "OWN FACTORY". Below the image, there's a "Start order" button. A modal window titled "Select variations and quantity" is open, showing three price options: \$1.18 for 25 - 9999 kilograms, \$1.16 for 10000 - 29999 kilograms, and \$1.15 for >= 30000 kilograms. It also includes a "Model Number(1)" field with "PET CZ-328" selected and a "Shipping" section for "Ocean+Express Southeast Asia (Standar...)".

Suppose ordering 1t

material per kg  
\$ 1.18

Shipping per kg (Ship to Thailand)  
\$ 28.18

Total price per kg  
\$ 29.36

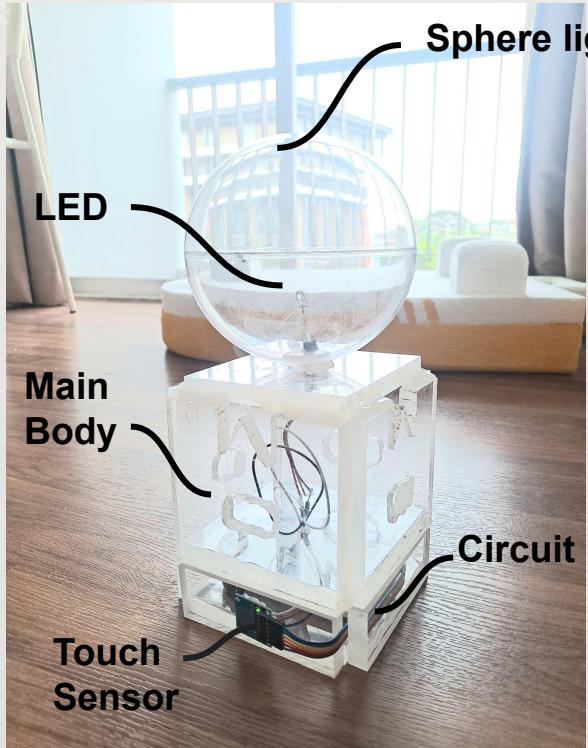
Weight per one product  
0.5kg (0.32kg + Alpha for circuit)

$$\$ 29.36 / 2 = \$ 14.68 \text{ (494 batt)}$$

[https://www.alibaba.com/product-detail/Pet-Plastic-Bottle-For-Carbonated-Soft\\_1601069868752.html?spm=a2700.7735675.0.0.7778AM0IAM0I1w&s=p](https://www.alibaba.com/product-detail/Pet-Plastic-Bottle-For-Carbonated-Soft_1601069868752.html?spm=a2700.7735675.0.0.7778AM0IAM0I1w&s=p)



# Detail callouts



# Estimated Retail Price - Research (1 / 2)

Best selling products



**NYMANE** นิมาน  
โคมไฟเพดาน/ติดผนัง/  
แขวน ขาว

**590 บาท**

Bulbs sold separately, we recommend using GU10 LED bulbs (2 pcs).

Must be used in conjunction with

Better value at a reduced price

**SOLHETTA** โซลเต้า  
หลอดไฟ LED GU10 345 ลumen  
79บาท/ชิ้น

How to receive products

Shipping Available Find all options at checkout

Buy at the store Check stock at the store

Add products to cart

All photos



[https://www.ikea.com/th/th/p/nymane-wall-up-downlighter-wired-in-white-60397861/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feed&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&gad\\_source=4&gclid=Cj0KCQiA8q--BhDiARIsAP9tKI1w5-sE8IoPRoV3HR8KmX11V18lOoGmGL2IkC1sqfh3LAUdy0IL3f4aAsLkEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/nymane-wall-up-downlighter-wired-in-white-60397861/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feed&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&gad_source=4&gclid=Cj0KCQiA8q--BhDiARIsAP9tKI1w5-sE8IoPRoV3HR8KmX11V18lOoGmGL2IkC1sqfh3LAUdy0IL3f4aAsLkEALw_wcB&qclsrc=aw.ds)

# Estimated Retail Price - Research (2 / 2)



**DEJSA** เดจจา  
โคมไฟตั้งโต๊ะ, เบจ/เบลว์ฟ้า แก้ว, 28 ซม.  
1,499 บาท  
**990 บาท**  
Promotional price from 01/03/2025 - 31/03/2025 or until stock runs out.  
★★★★★ (9)  
Light bulbs are sold separately. We recommend using LED bulbs.

Must be used in conjunction with  
**SOLHETTA** โซลเหต้า  
หลอดไฟ LED E27 470 ลumen  
49 บาท/2 ชิ้น

How to receive products  
Shipping Available Find all options at checkout  
Buy at the store Check stock at the store

Add products to cart

[https://www.ikea.com/th/th/p/dejsa-table-lamp-beige-opal-white-glass-90404983/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feed&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&gad\\_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tK1ORxOzrSG4Xv7WXv5fMJX5akdzloHtWMtkBmEOQpBrMN7nxND95kaAlgSEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/dejsa-table-lamp-beige-opal-white-glass-90404983/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feed&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&gad_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tK1ORxOzrSG4Xv7WXv5fMJX5akdzloHtWMtkBmEOQpBrMN7nxND95kaAlgSEALw_wcB&qclsrc=aw.ds)



[https://www.ikea.com/th/th/p/dejsa-table-lamp-beige-opal-white-glass-90404983/?utm\\_source=google&utm\\_medium=surfaces&utm\\_campaign=shopping\\_feed&utm\\_content=free\\_google\\_shopping\\_clicks\\_Lighting\\_Homeelectronics&gad\\_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tK1ORxOzrSG4Xv7WXv5fMJX5akdzloHtWMtkBmEOQpBrMN7nxND95kaAlgSEALw\\_wcB&qclsrc=aw.ds](https://www.ikea.com/th/th/p/dejsa-table-lamp-beige-opal-white-glass-90404983/?utm_source=google&utm_medium=surfaces&utm_campaign=shopping_feed&utm_content=free_google_shopping_clicks_Lighting_Homeelectronics&gad_source=4&qclid=Cj0KCQiA8q-BhDiARIsAP9tK1ORxOzrSG4Xv7WXv5fMJX5akdzloHtWMtkBmEOQpBrMN7nxND95kaAlgSEALw_wcB&qclsrc=aw.ds)

# Estimated Retail Price - LED Light Stand



IKEA

- Lower price : \$ 2.97 ~ \$ 8.91 (100 ~ 300 batt)
- Middle price : \$ 8.91 ~ \$ 14.86 (300 ~ 500 batt)
- High price : \$ 14.86 ~ \$ 29.42 (500 ~ 990 batt)

Best selling products - High price / Unique design

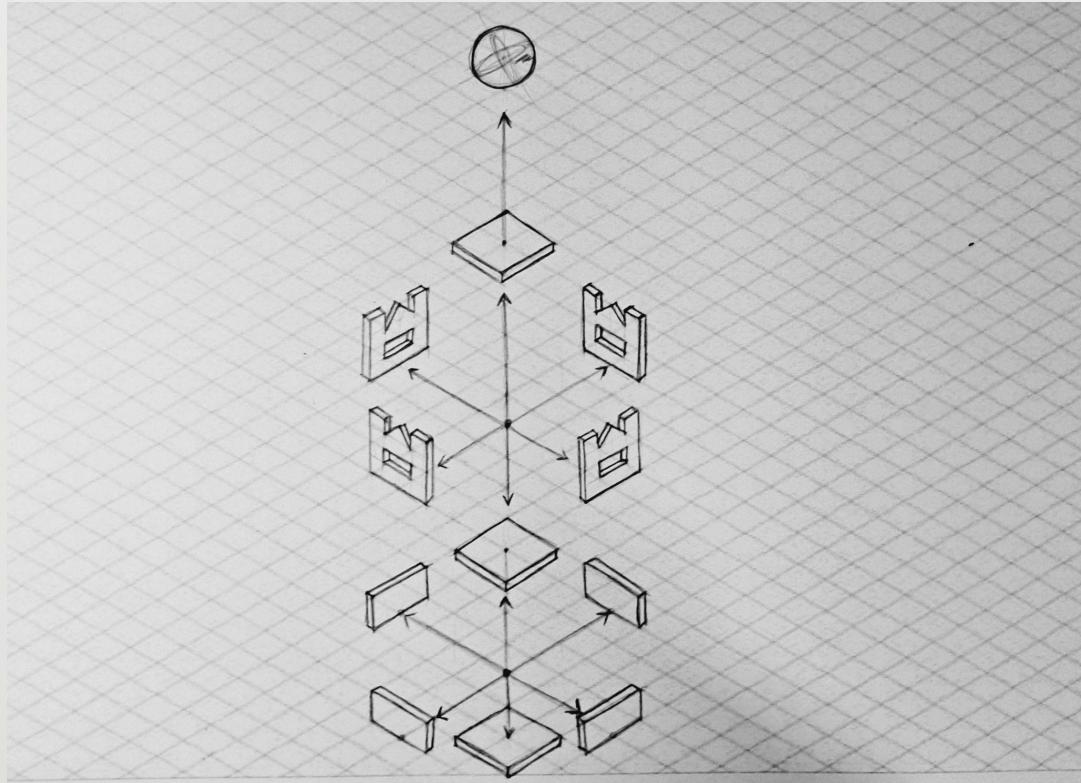
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**LED Light Stand - \$ 22.88 (770 batt)**

Reason

- Unique design inspired by Korean letter
- Recyclable & Reusable Plastic

# Exploded View





# Materials / Functions / Features / Benefits

- **Materials**

- PET
- HDPE

- **Functions**

- Touch sensor to turn on the light
- Lighting in the dark

- **Features**

- Design Inspired by Korean Letter
- LED
- Sphere Light Bulb
- Transparent

- **Benefits**

- Long lasting because of LED
- Energy efficient
- Beautiful shadow like Korean Letter
- Recyclable and Reusable
- Educational because of transparency

# Usage Scenario / Instruction



Equip with 2032 coin cell battery on battery holder

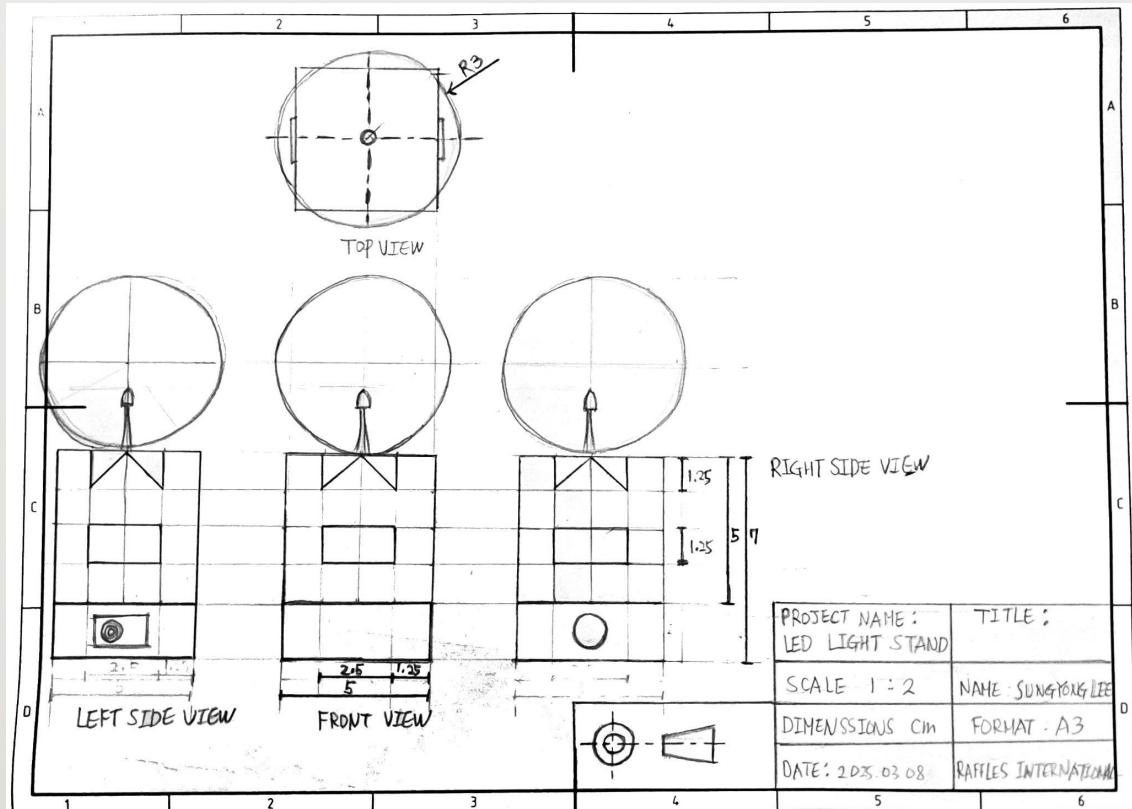


Touch sensor on the front side



Turn on LED in the dark

# Orthographic drawings (front / side/ top)



# Human Scale (Full Scale)



Lower than 1.5L water bottle

Width : 12 cm

Height : 27 cm



# Eco-Design / Sustainability (1 / 2)

Does it fulfill a need ?

Yes. This light stand is for students or kids studying everyday and who likes Korean culture. LED is energy efficient and long lasting. So it is useful and stable for students studying everyday. The Shape of main body is like Korean letter “ㅌ”, “ㅅ” and “ㄷ”. So students who likes Korean culture would definitely love this stand.



# Eco-Design / Sustainability (2 / 2)

Is it a Eco-Design or Sustainable Friendly ?

Yes. This light stand use recyclable plastic like PET or HDPE. So it minimize environmental destructive impacts and reduce pollution due to minimization of product waste. Second, it use LED for lightning. And thus it is energy efficient and long lasting. This fact reduce energy consumption and reduce waste due to long period of usage.



# Scale Model



LED Light Stand

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Thank you  
for Listening !



AH