THE EPILIGHT

DNB311 - CAPSTONE A2 DDR

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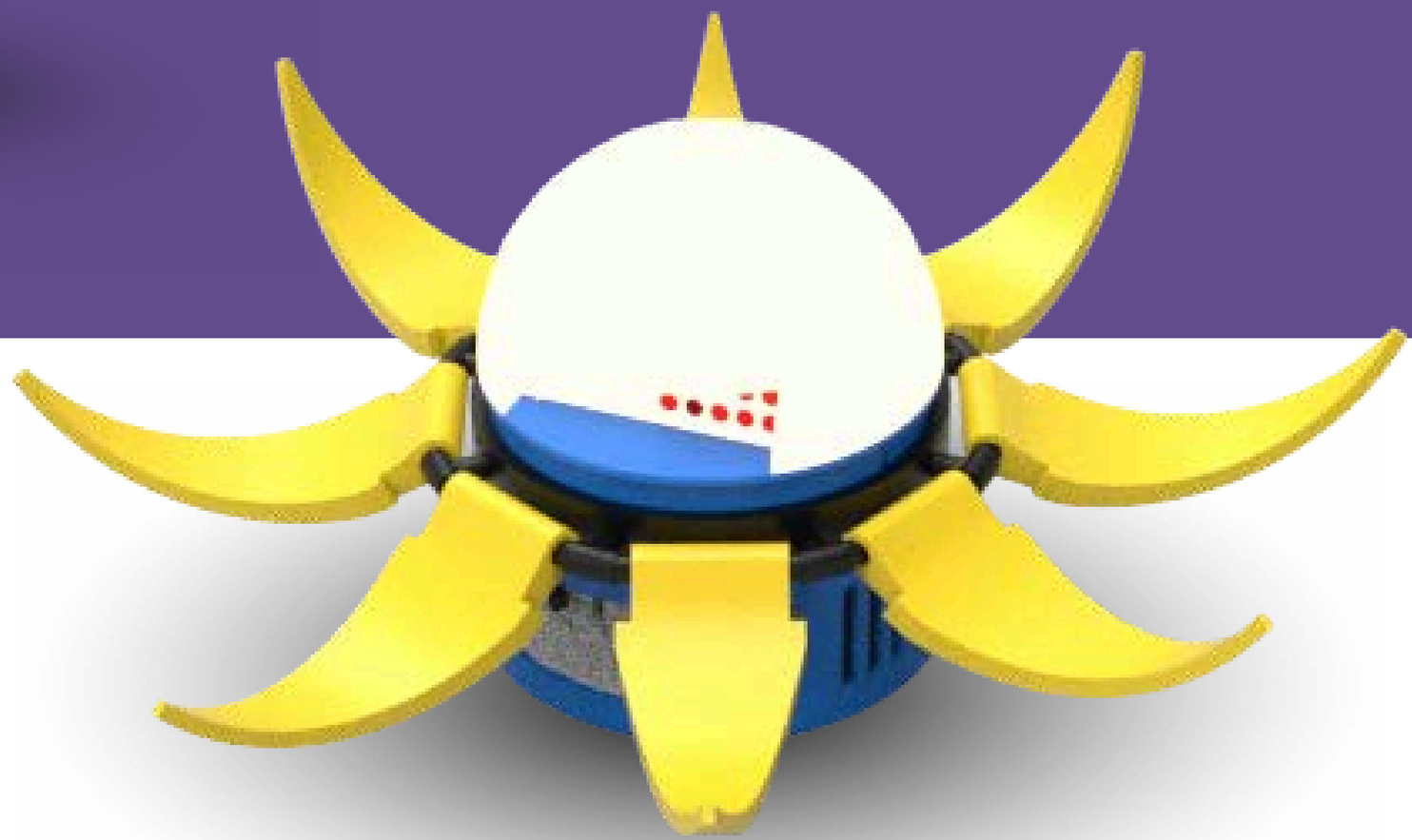
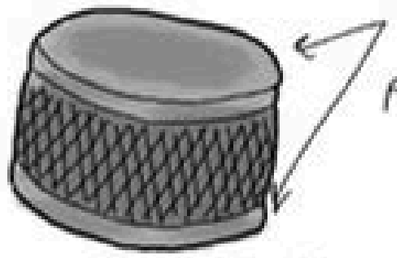
N11628464



CONCEPT SKETCHES

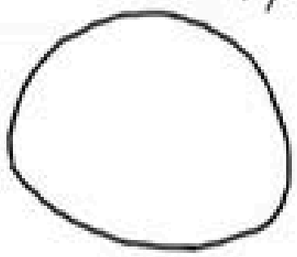
NIGHT-LIGHT FUNCTIONALITY

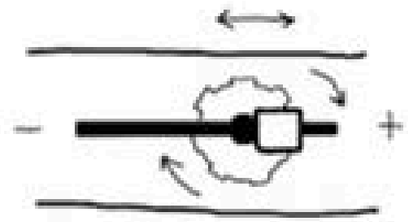


Magnetic ends to connect to other product components.

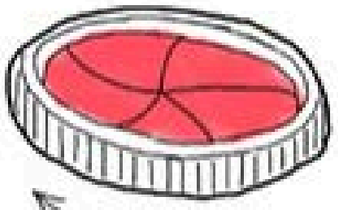
Small round speaker to emit sound from all angles for maximum efficiency.

Transparent cover that allows for light to seep through

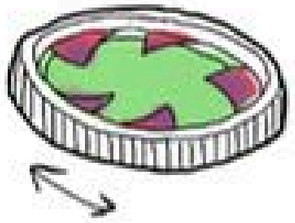


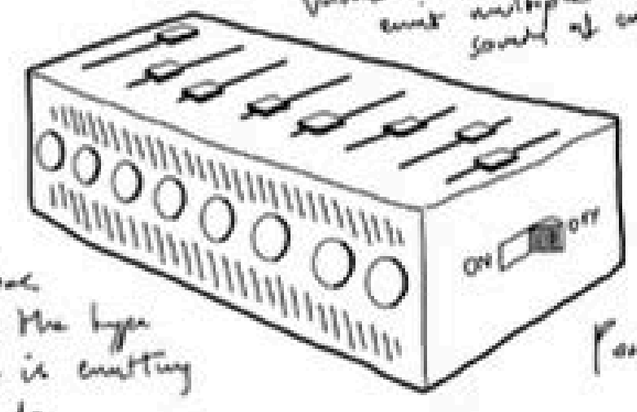


Sliding mechanism uses gear mechanism to change sound volume, light color, opacity, etc.



Twisting gear-like mechanism to change color + using RGB



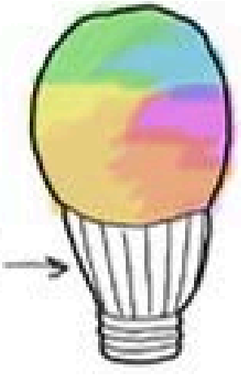


Volume sliders — can emit multiple sounds at once.

Small buttons that represent the types of sounds that is emitting from product.

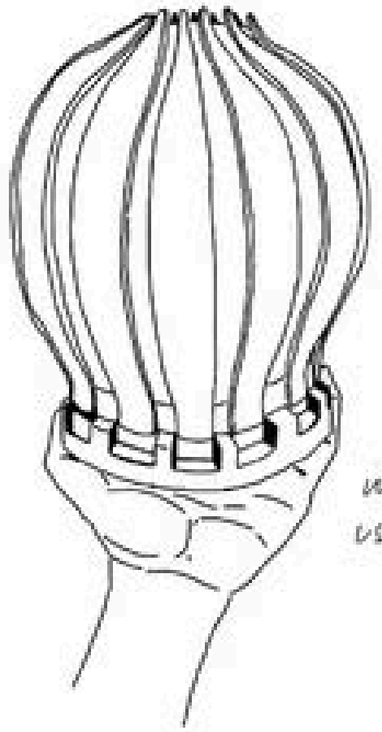
Rain, thunder, birds-chirp, ocean, forest, wind, etc

Power Switch



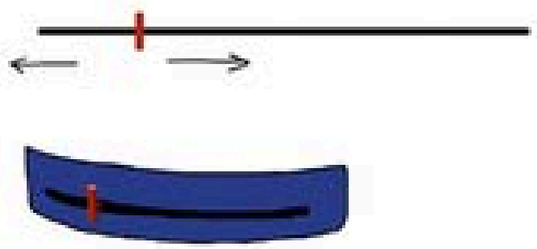
Color-changing light bulb.

Small computer chip to allow for bulb to change colours.



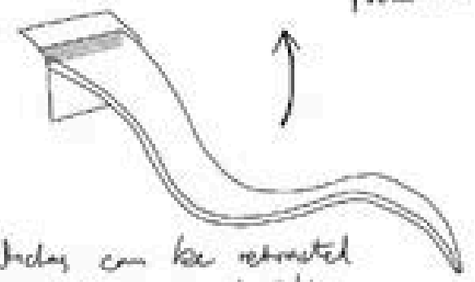
Product can fit into the palm of the user's hand.

Multiple colour options for the user's preference.



Sliding mechanism to control light intensity / colour / music volume.

Speaker underneath head. Round to emit sound from all angles.



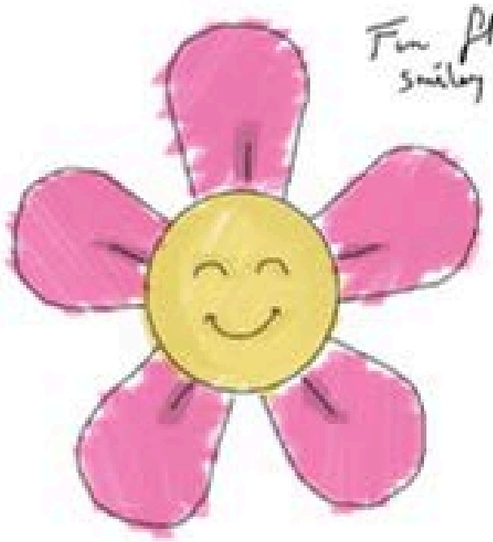
Tentacles can be retracted and lowered to any height.

Octopus tentacles can retract up and over the head — means light to change light angle / intensity.

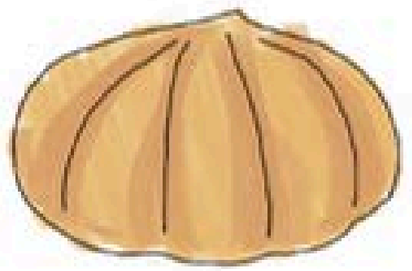
Playful, child-like aesthetic.

OCTOPUS NIGHT-LIGHT

FLOWER THEMED NIGHT-LIGHT

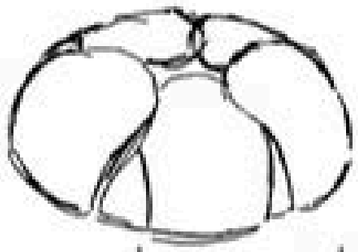


Fun flower petal necklace with a smiley flower situated in the middle.

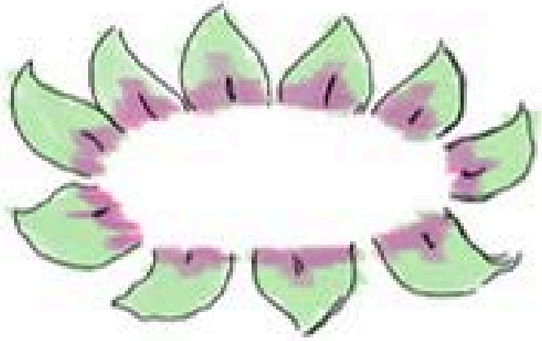


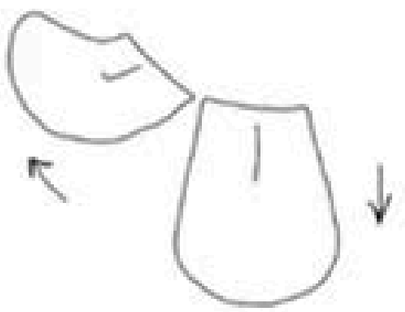
Middle of flower - warm light is warm & bright.

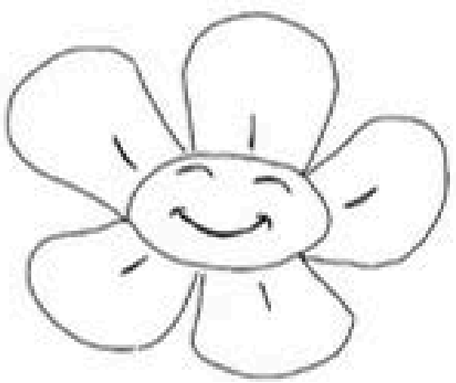
Bar is located around side exterior for each petal to slide on.

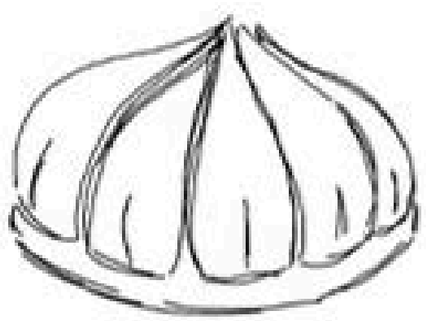


Flower petals close over each other to diminish how light.

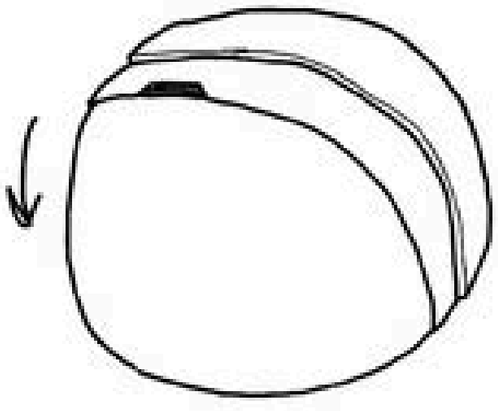




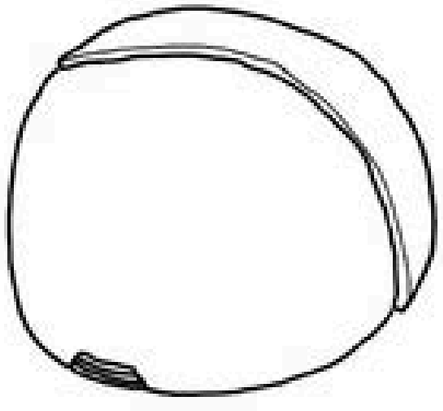


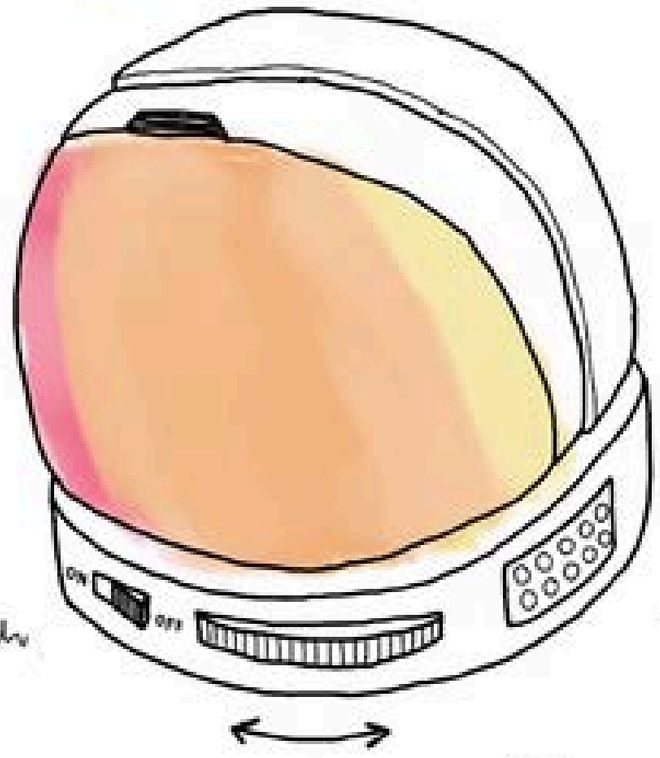


ASTRONAUT HELMET NIGHT-LIGHT



Contains a shutter to customise light angle and to turn off.

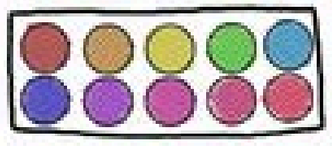




Power switch

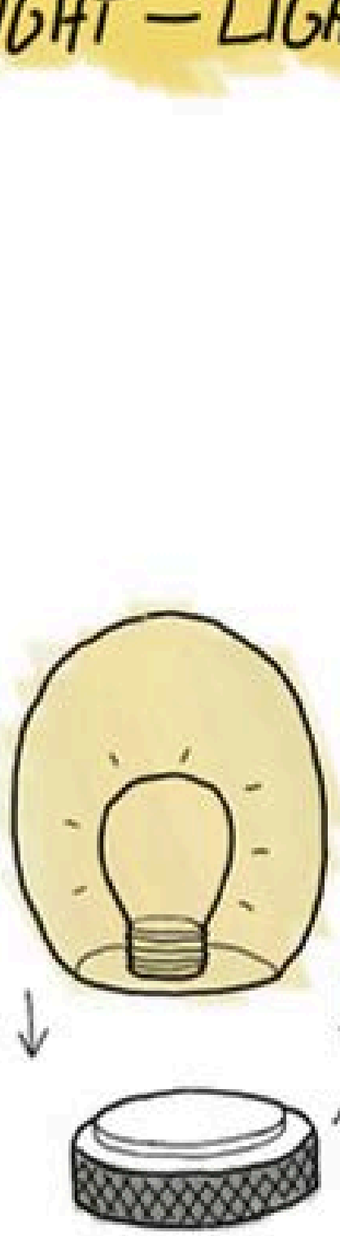
A slider to change the opacity of the lights.

Multiple colours can be picked for the user's preference.



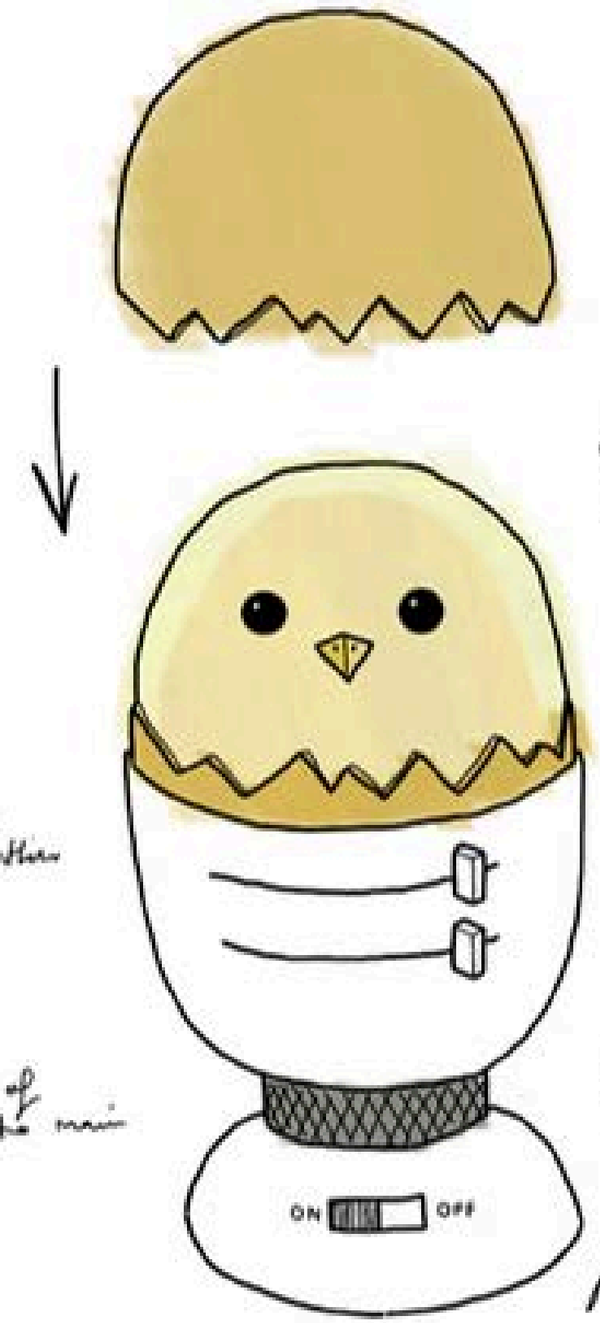
Colour buttons for multiple options for the user's preference.

CHICKEN + THE EGG NIGHT – LIGHT

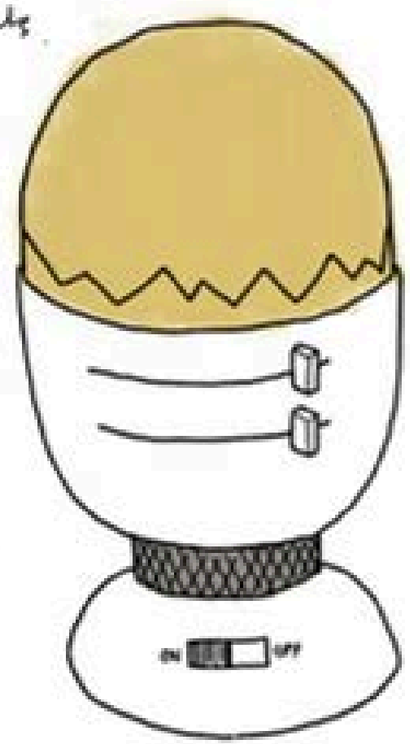


Lightbulb is located within the chicken head.

Magnet located on top of speaker to connect to main body.



Top of egg can be connected to main body using magnets.



Multiple sliders to customize opacity + colour of light.

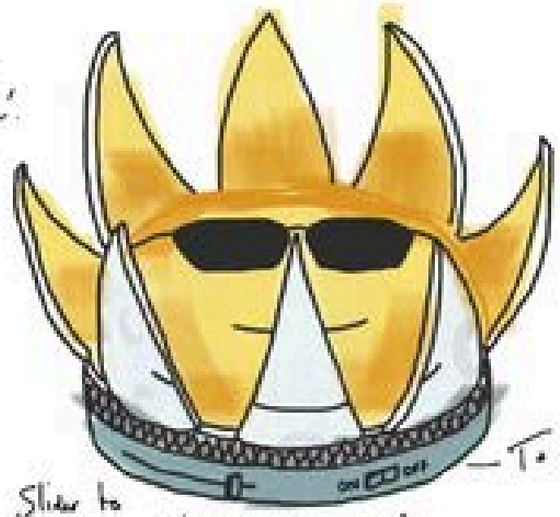
Speaker located in the middle of product.

Power switch located on bottom part.

SUN + MOON THEMED NIGHT-LIGHT

Sun light is warmer, brighter, yellow/orange.

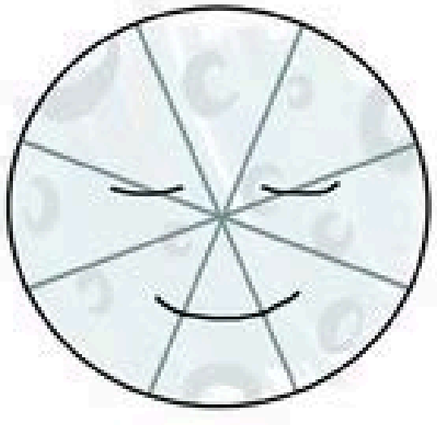
The light can still be changed / turned on when device is closed.



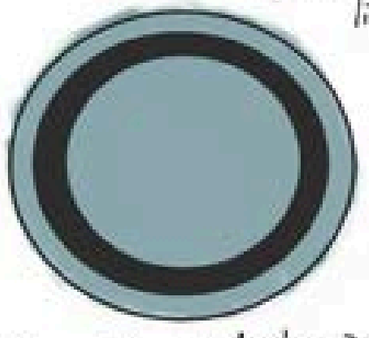
To turn the device on and off.

Slider to change color/brightness of light.

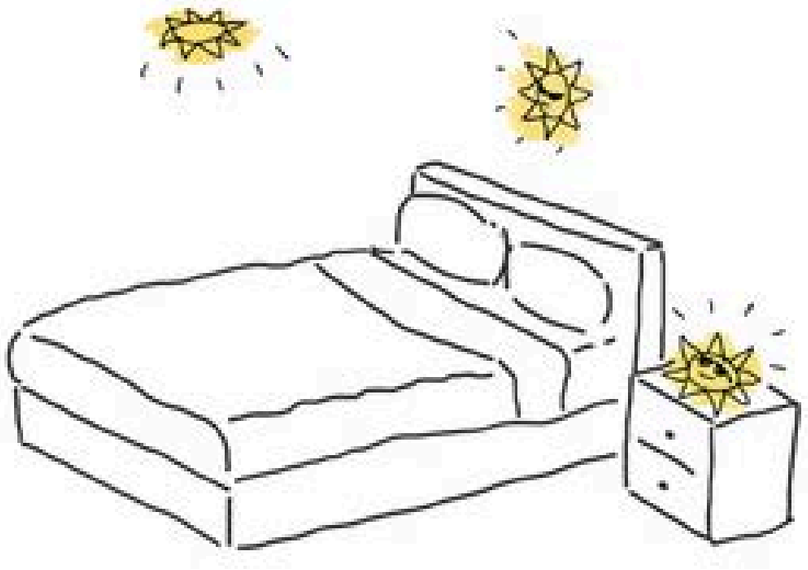
Speaker which is situated on the bottom of the light.



When closed the outside layer creates a moon face.

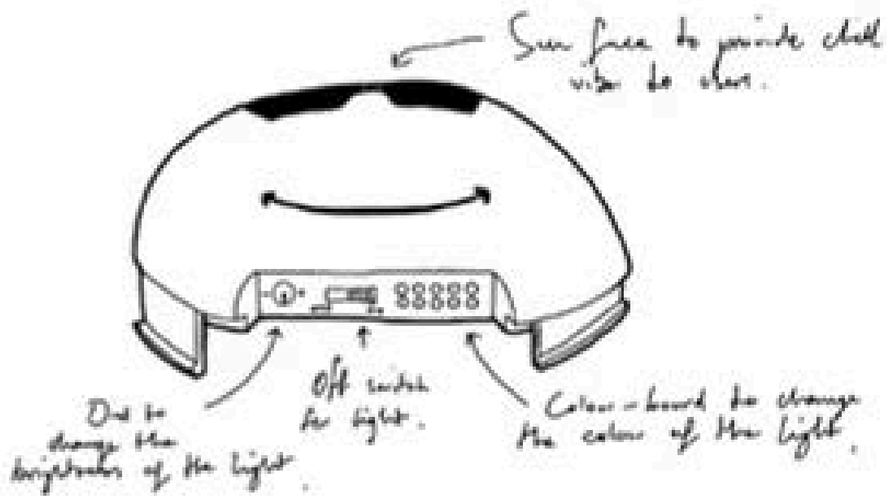


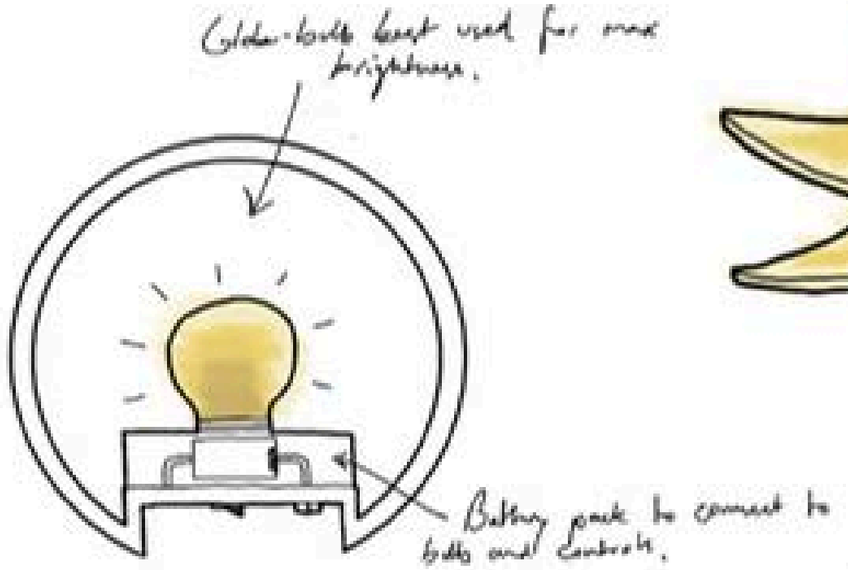
Bottom of product includes magnetic strip so light can be placed on any surface.

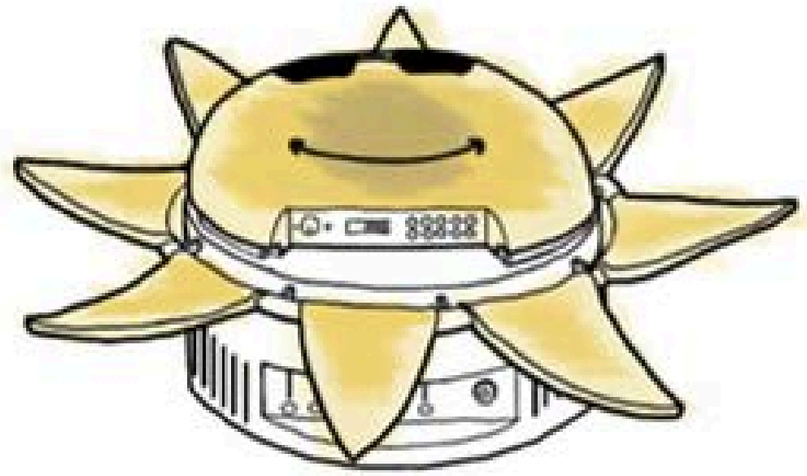


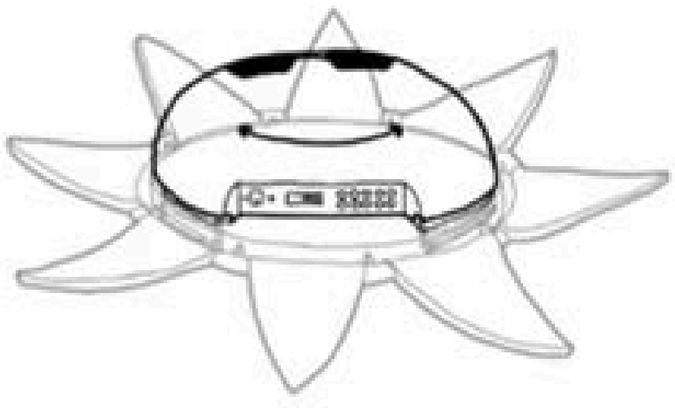
FINAL CONCEPT

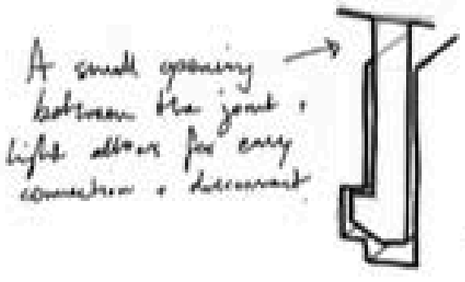
NIGHT-LIGHT LIGHT FUNCTIONS.





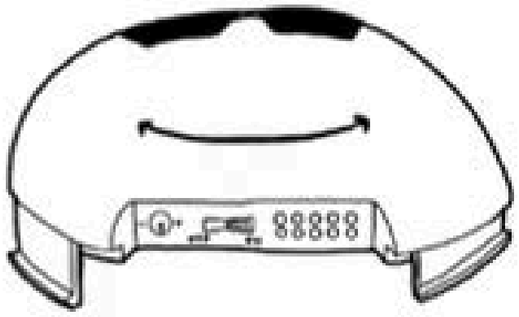


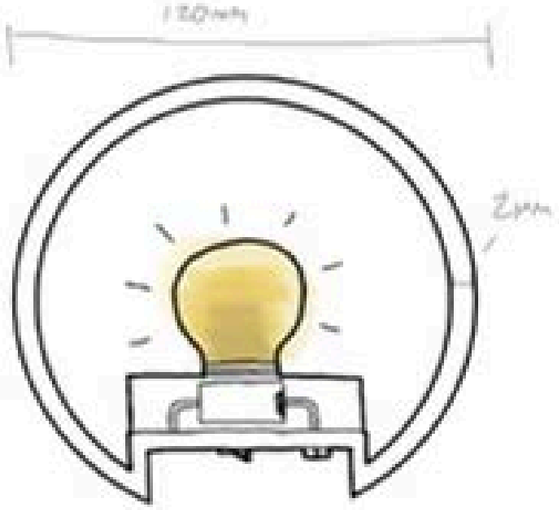


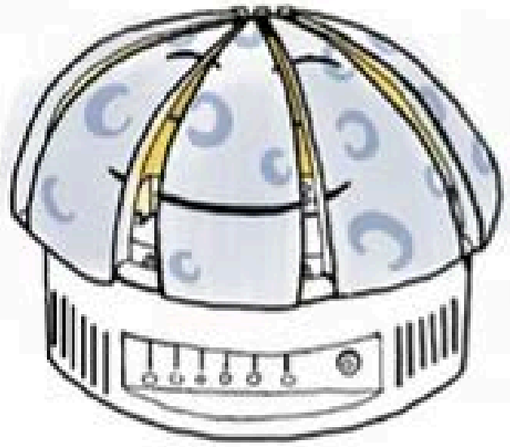


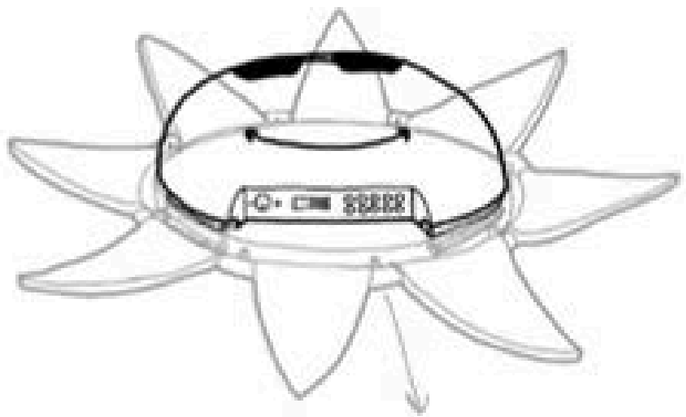
Snap-fit joints are used to connect the sun-light to the rest of the main body.

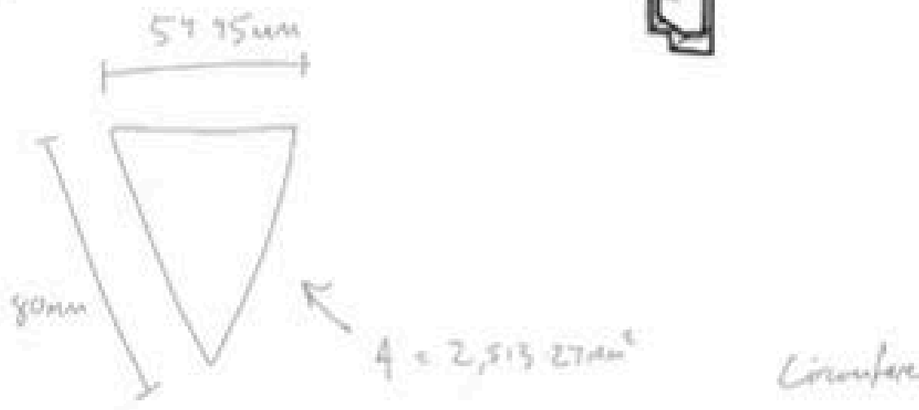
NIGHT-LIGHT DIMENSIONS

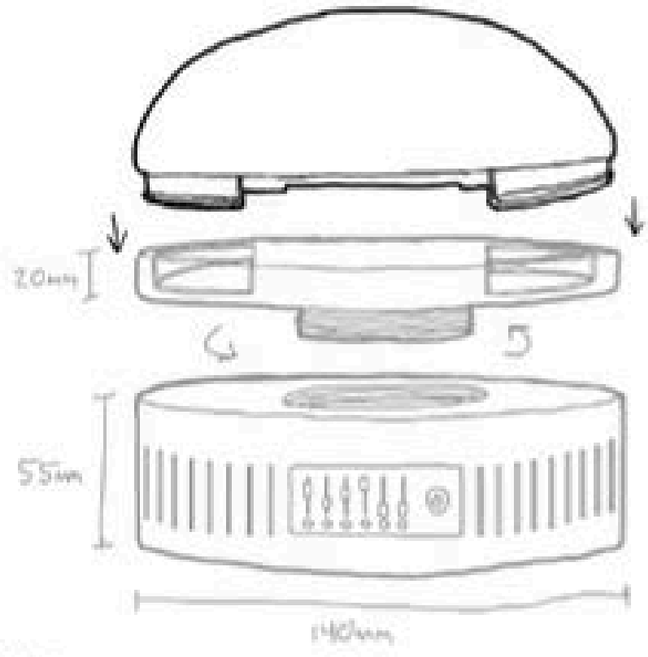






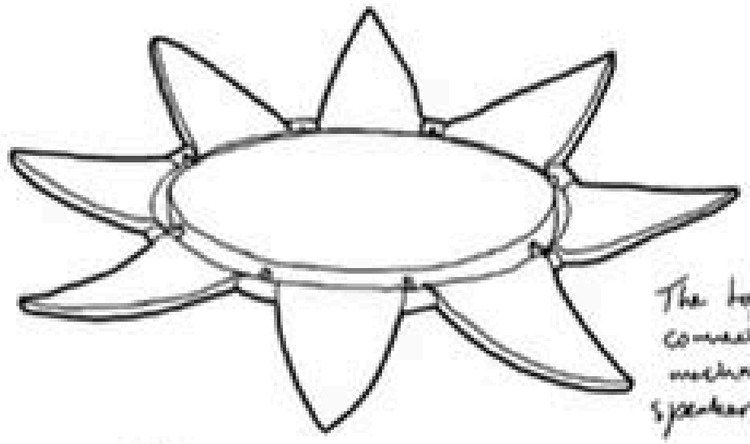




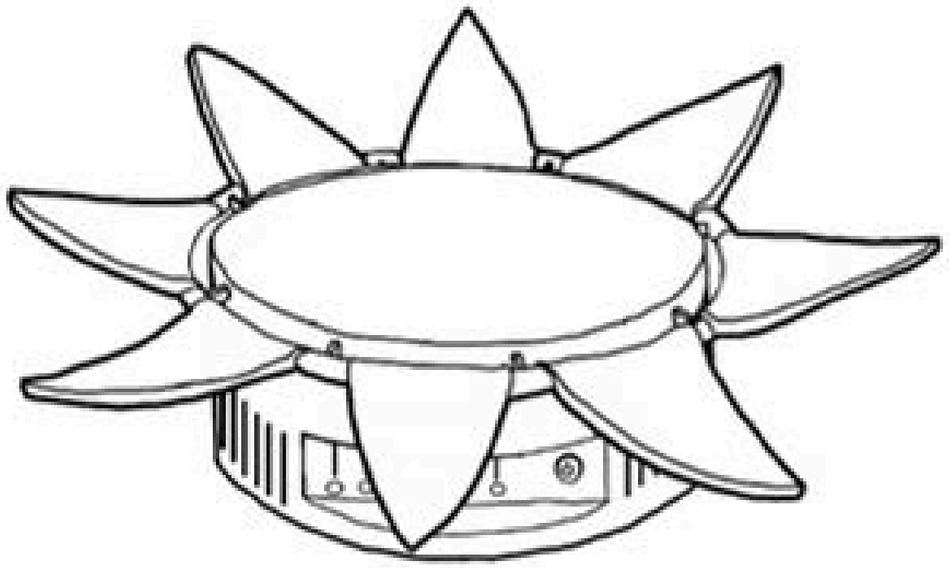


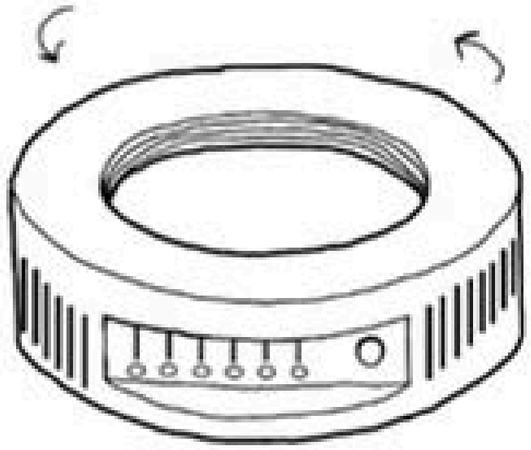
USABILITY OF PRODUCT

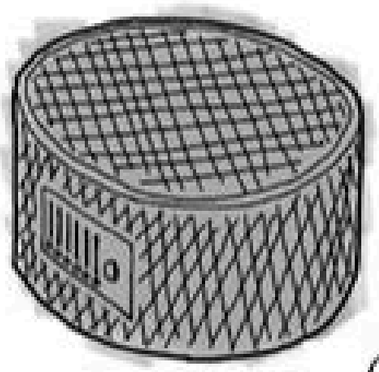
NIGHT - LIGHT SOUND FUNCTIONS



The top + foldable sides are connected and uses a thread mechanism to connect to the speaker body

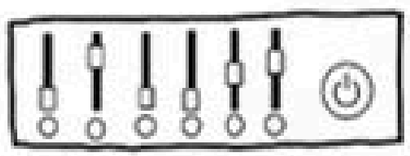






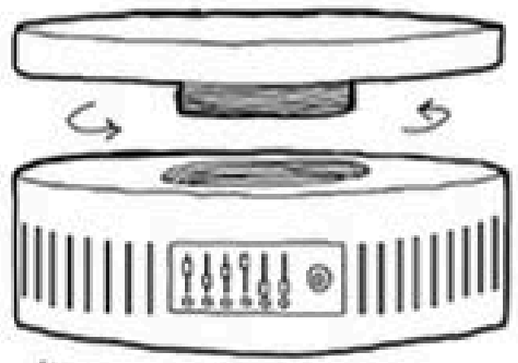
Use a USB-C charging port which is the most common charging unit.

Fully covered bluetooth speaker for maximum sound emission



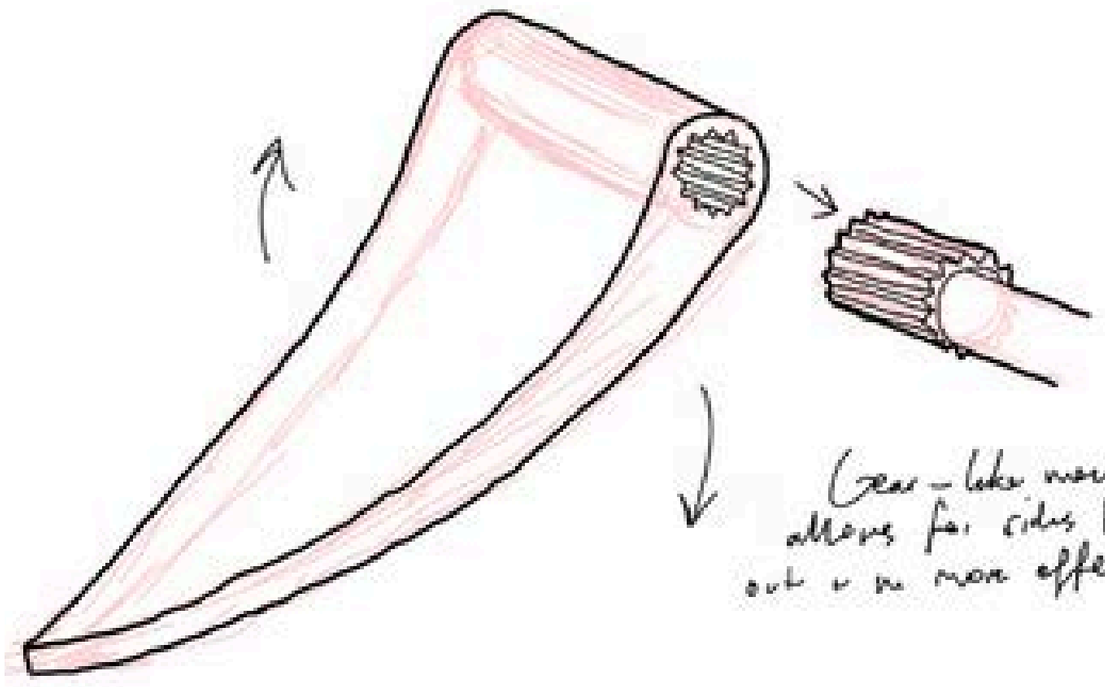
The speaker uses a soundboard + volume sliders to control volume of noise.

↳ Includes power button

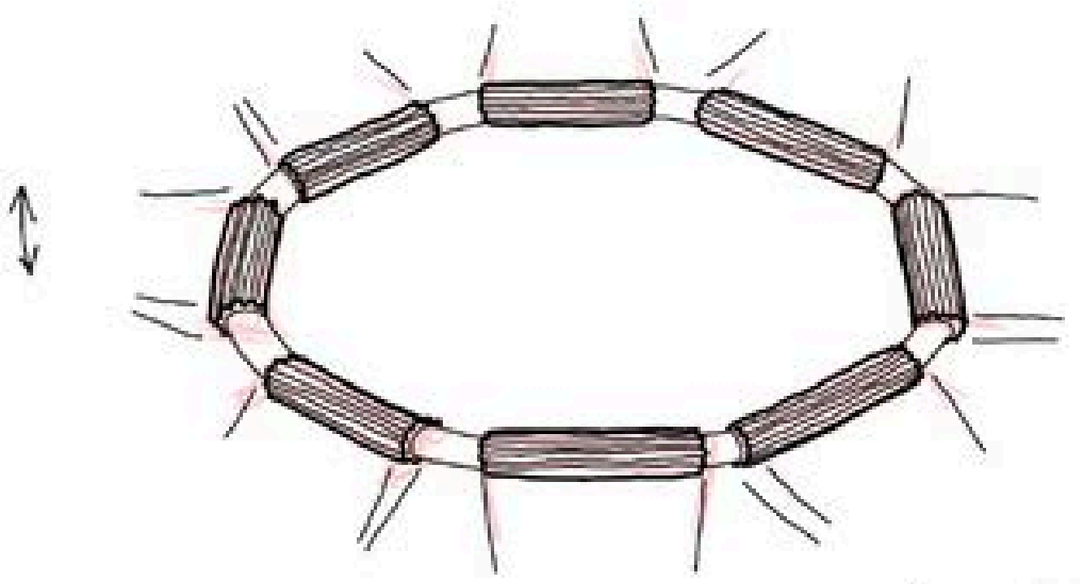


The speaker body includes speaker slits for the sound to come through.

SIDE-FRAMES FUNCTIONS

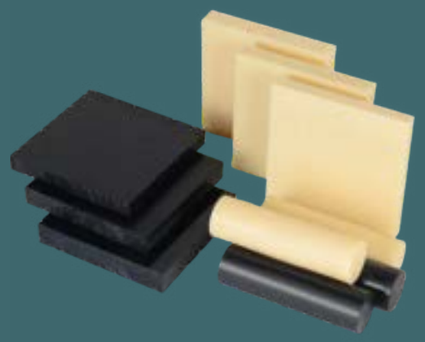
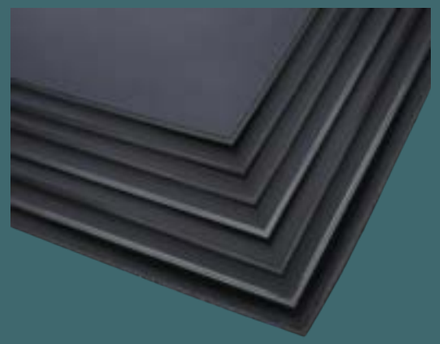
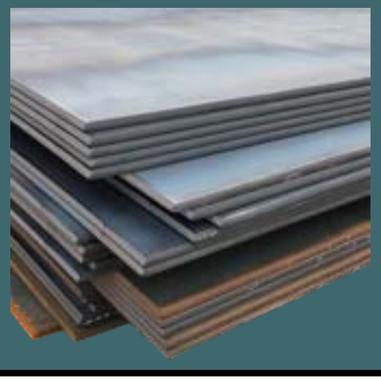


Gear-like mechanism allows for sides to fold out + in more effectively.

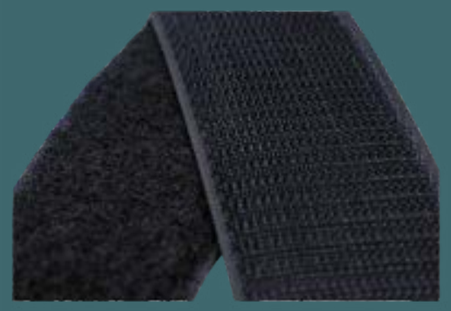


A ring is constructed around the main body which includes gear-like constructions for the sides to be moved and stay steady at any angle.

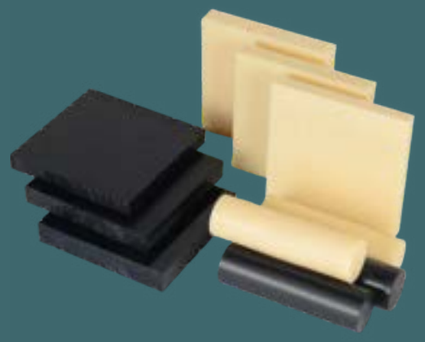
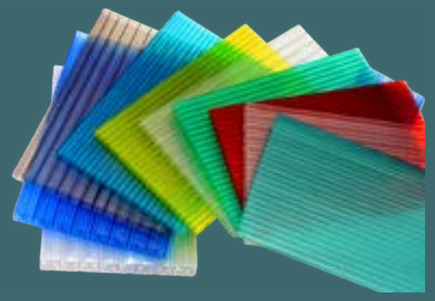
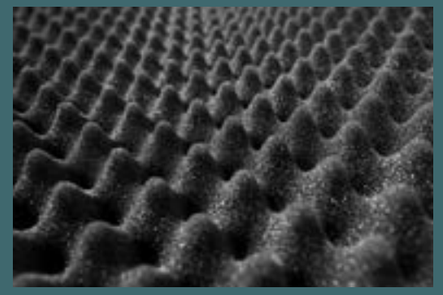
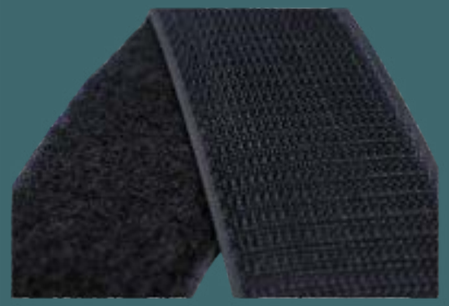
MATERIAL + MANUFACTURING RESEARCH

	Plastics	Polyethylene (HDPE)	Silicone	High-Carbon Steel	Acrylic
Material					
Context & positives	• Durable and impact resistant which is crucial for hand-held products. • Lightweight which makes it easier to transport and carry. • It is heat resistant which is crucial for night-lights. • It is a cheap material and cost-effective in mass manufacturing such as injection moulding.	• It is durable and more impact-resistant than glass. • Is very lightweight which makes it easy to transport and carry - used for children. • Can be moulded into various shapes which also makes it cost-effective in manufacturing.	• It is tactile and soft to touch which creates a pleasant feel - soothing for children. • It is made from BPA-free, non-toxic silicone which makes it safe for children to use and handle. • It is lightweight, portable and can be easily chargeable via USB/USB-C.	• Is durable and very strong which makes it highly resistant to impacts. It also has a longer lifespan than most products making long-term usage viable. • It is costly and very heavy which makes it not a good option for portable handheld products.	• Creates a visual appeal using a 3D illusion effect when illuminated. • It is easily customisable and allows for personalisation. • It is also very durable and resistant to impacts and oxidisation. • Has a high transmission rate - 92-93%.

	Light bulbs	LEDs	Smart bulbs - Bluetooth
Material			
Context & positives	• Blocks sleep-disrupting light that can confuse the brain into thinking it is awake. • It is energy efficient and consumes very little power(typically under 10 watts). • Has a longer lifespan than traditional bulbs making replacing them less occurrent.	• LEDs are safe to touch and produce very little heat when on. They are also very durable and safe for children to use. • They are customisable as they can be dimmed to create a non-disruptive glow. Allows for a wide range of colours. • They have lower energy consumption and have an exceptionally long lifespan.	• Customisable brightness and colour settings which allows for added comfort. • Can be remotely controlled from smartphone apps and Bluetooth. • Energy efficient - they use LED technology and consume less energy than traditional bulbs.

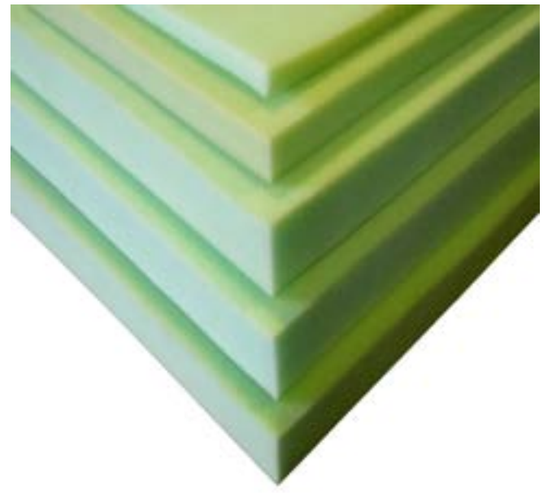
	Velcro	Magnets	Clamps	Pegs + holes	Removable adhesives
Material					
Context & positives	• It is simple to operate and requires no special tools which makes it ideal for children. • It is easily adjustable for custom fitting and adjusting. • It is reusable, gentle on surfaces, cost-effective and can be applied on any surface.	• Increased efficiency and speed as they can rapidly attach and detach. • Is a strong temporary adhesive material for applying product to various surfaces. • Easy to use and allow for safe security and preventing wear on connection points.	• Has accuracy and precision when securing objects firmly in place on various surfaces. • Versatile in shapes and sizes for holding small or large objects into place. • Allows for hands-free operation to create strong, lasting bonds.	• Pegs can be easily screwed into place for strong bonding and attachment. • Simple and inexpensive. • Versatile in shapes and sizes.	• They can bond securely and detach cleanly and easily without leaving any residue or damage to surfaces. • Reusable and can be re-applied multiple times without losing effectiveness. • Cost-effective in industrial applications.

DNB311 DDR - MATERIAL + MANUFACTURING RESEARCH - adhesive materials

	ABS Plastic	PC (Polycarbonate)	Polypropylene	Acoustic Foam	Velcro
Material					
Context & positives	• Is durable and lightweight and impact resistant. ABS is tough and can absorb impacts without cracking. • It has electrical insulation due to its poor electrical conductivity. • Cost effective - inexpensive material to produce, Easily mouldable, recyclable, and has a high-quality finish.	• Is a transparent thermoplastic with great impact, shatter resistance and stiffness. • It allows for optimal visibility and has a high melting point of 250 degrees Celsius. • Perfect for encasing electrical materials that release high heat.	• Has great electrical insulation due to it's strength and minimal water absorption - not affected by humidity. • Durable and lightweight - perfect for moulding into external controls that last. • Versatile in moulding and shaping into a wide range of designs.	• Reduces noise and reverberation which eliminates echoing sounds. • Enhances audio clarity and noise quality. • Increases sensitivity for older speakers and improves the overall quality of the speaker.	• It is simple to operate and requires no special tools which makes it ideal for children. • It is easily adjustable for custom fitting and adjusting. • It is reusable, gentle on surfaces, cost-effective and can be applied on any surface.

DNB311 DDR - MATERIAL + MANUFACTURING RESEARCH - chosen materials

PROTOTYPING PROCESS

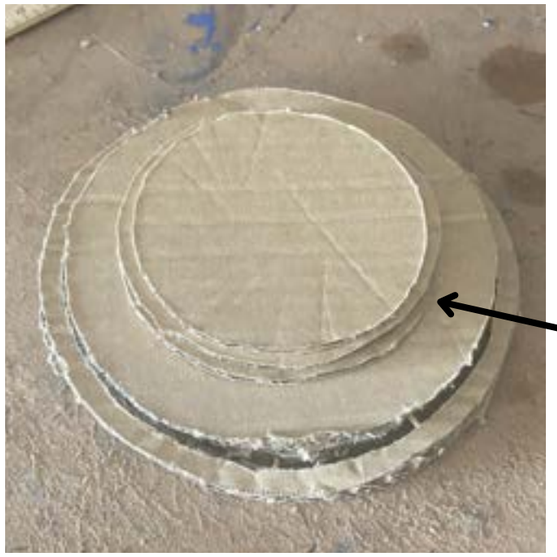


A thin cardboard ring was created to attach around the main body and sides.

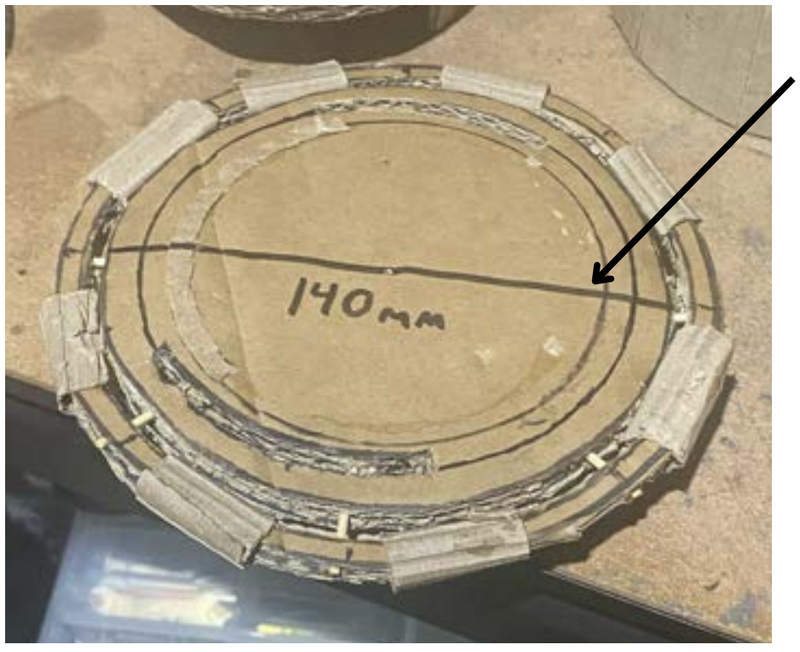
A circle containing measurements of the main body and rotating sectors was drawn up.

Main body was traced and cut in a circle

Eight toothpicks were inserted into the ring and main body to connect the two together safely and securely.

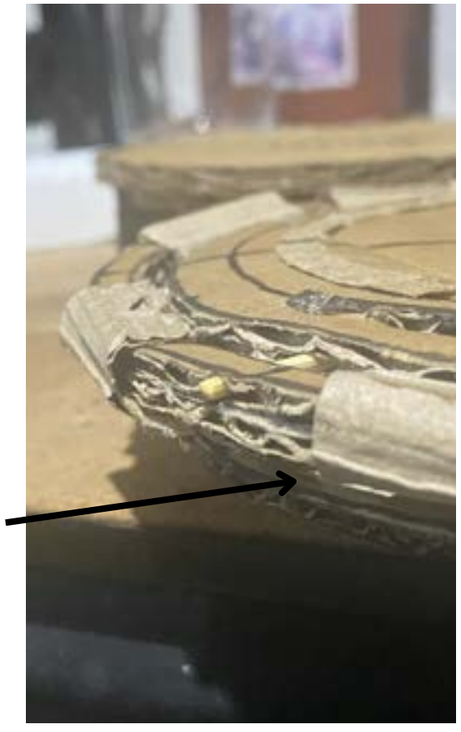


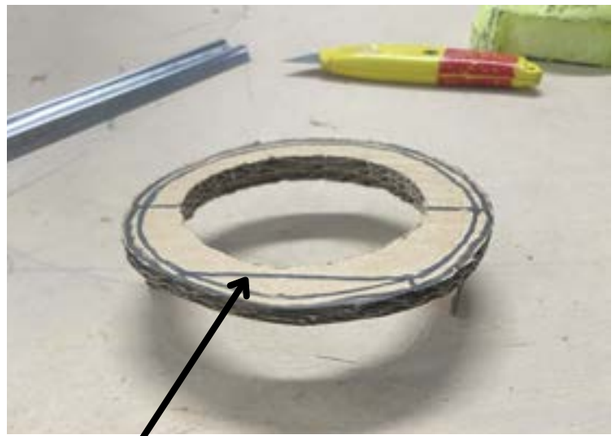
Smaller circles were connected on the bottom of the part as a connecting section to the base of the product.



The diameter top of the part, including the ring was measured at 140mm.

Corrugated cardboard sections were added to the ring to connect to the rotating sector sides.

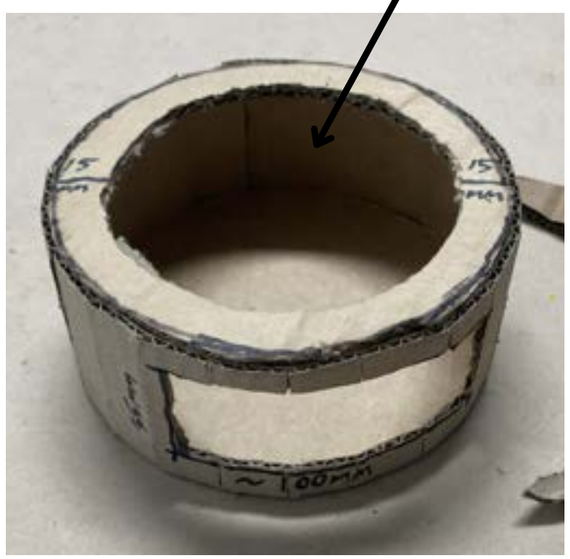


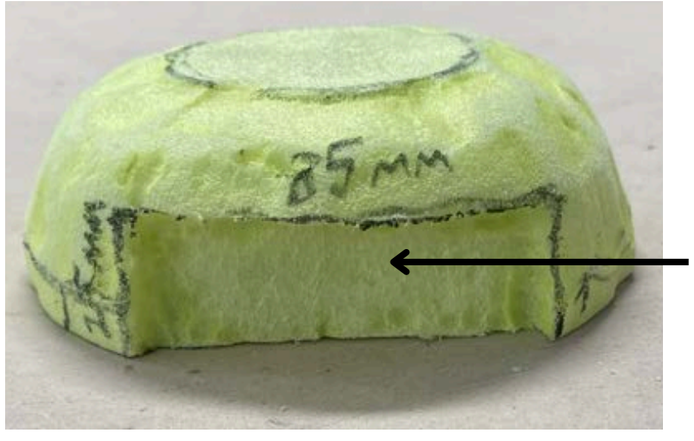


Two small corrugated cardboard strips were cut and attached to the base of the “light” part as attachment pieces.

A small circular hole was cut on the base of the “light” part.

The base of the product was made using a circular cardboard piece, a long cardboard strip - shallowly cut to be able to curve around the circular top + base. The top has a smaller circular hole cut for attachment.

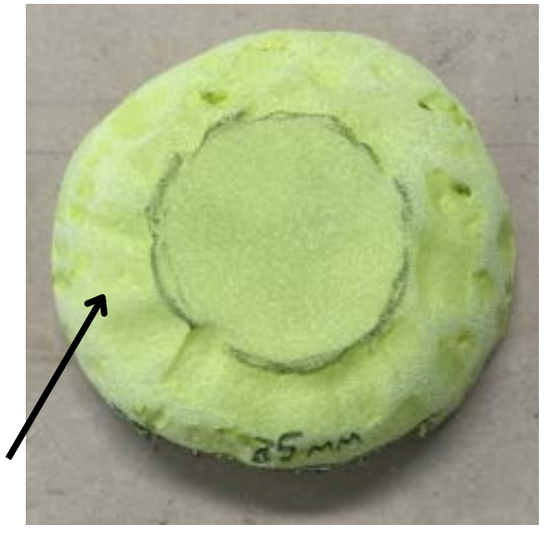




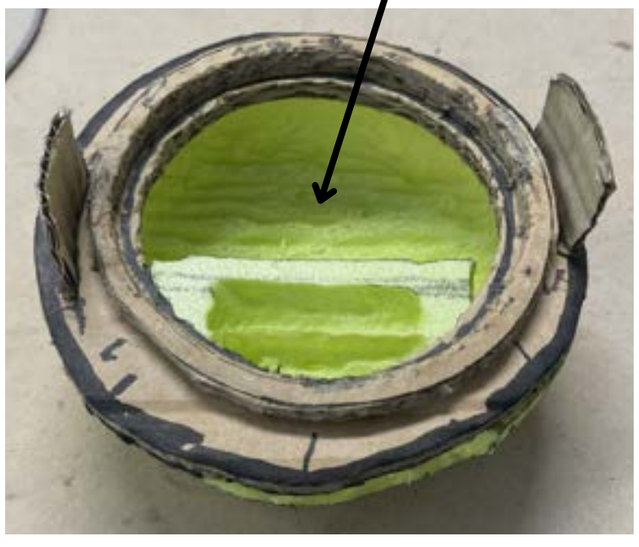
Hard, green foam was used to create the light dome. A rectangular shallow cut was made to contain the light controls.

The dimensions of the rectangular cut was 85mm x 25mm.

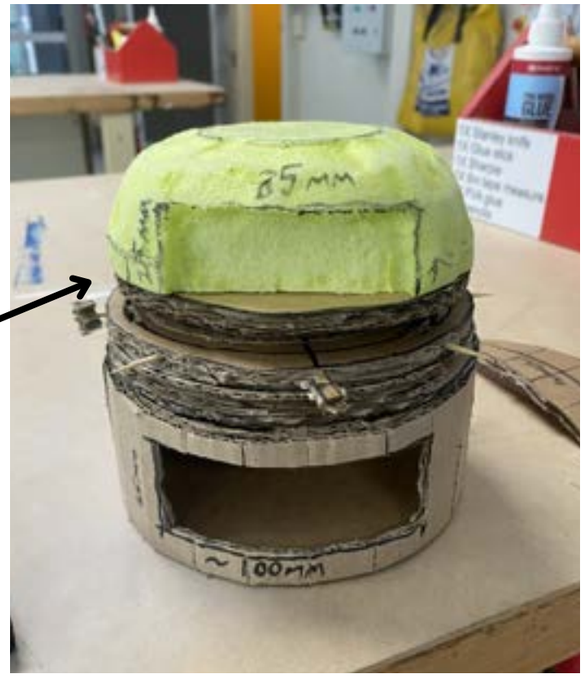
The dome was sanded, although it was rough it still represented a rough prototype of the intended product.



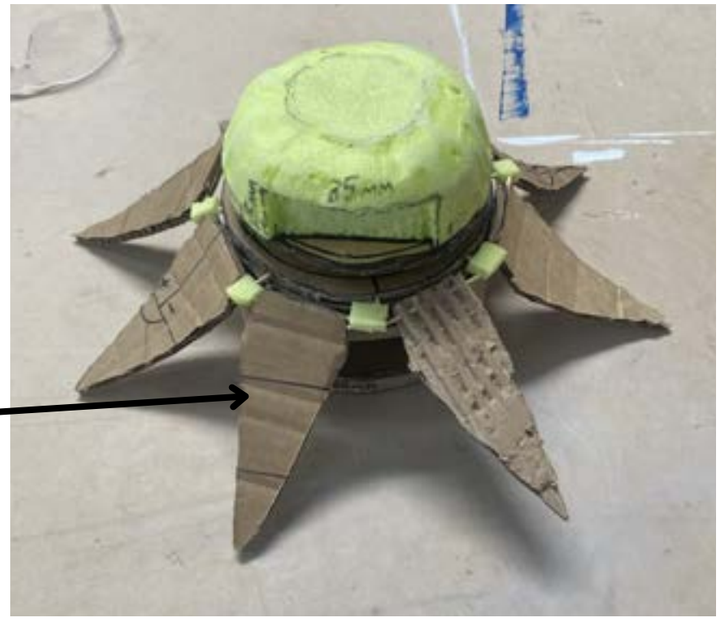
The cardboard base was attached to the bottom of the light dome and the hole allows to see inside of the dome which includes battery pack.



The final pieces aside form the side sectors were assembled to create the final depiction of my intended product.

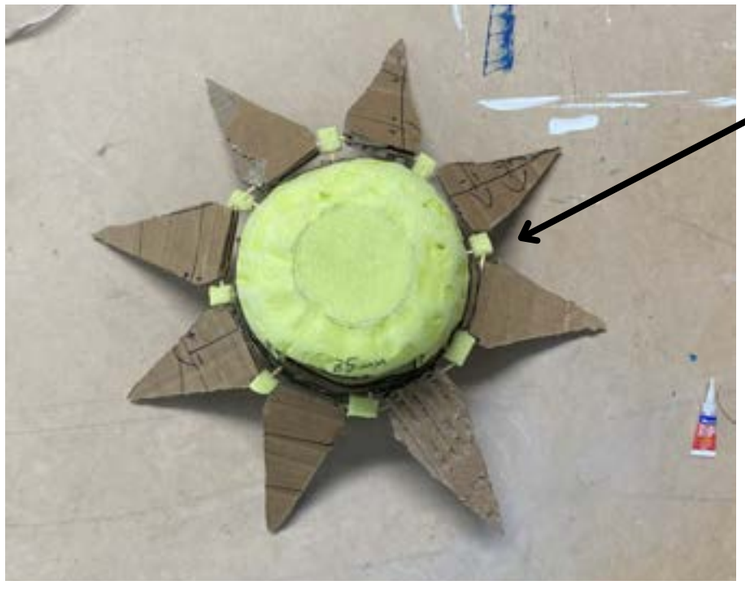


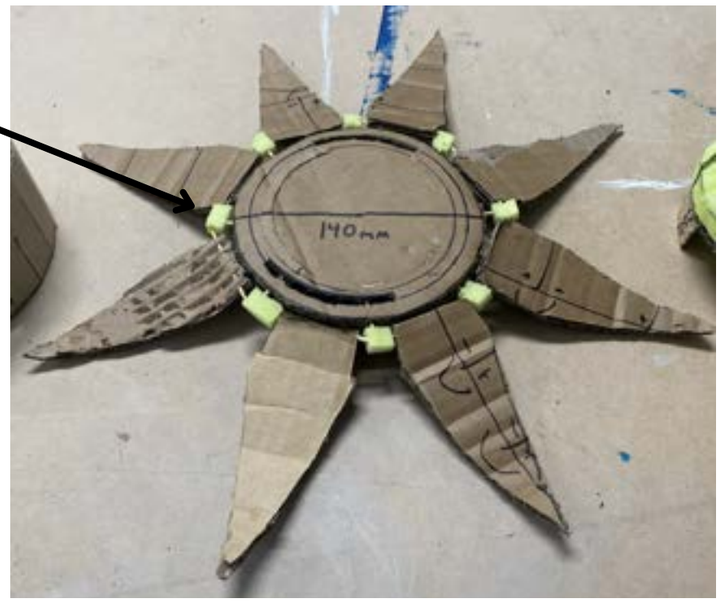
These sectors had shallow cuts along them to allow them to curve easier.

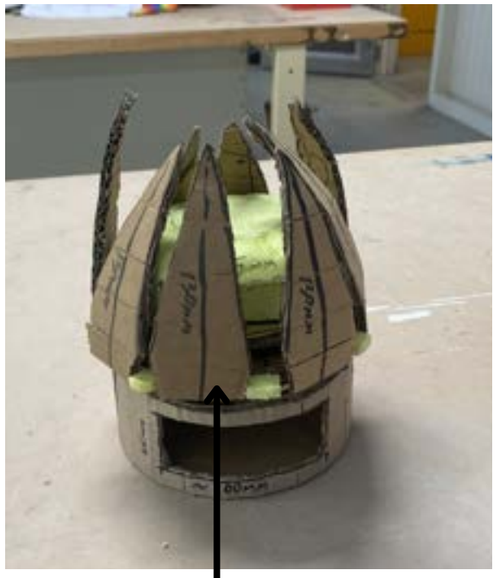


The triangular sectors were enlarged so they could fit over the dome properly.

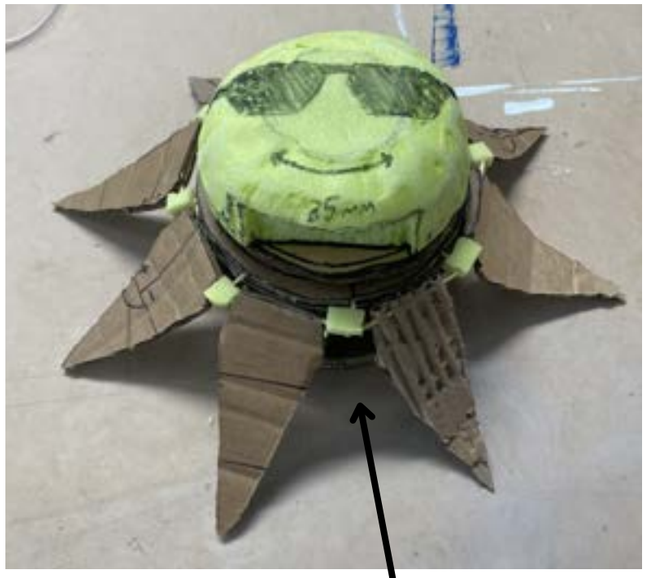
Smaller foam parts were also included to attach the toothpicks together and keep them firmly in place.





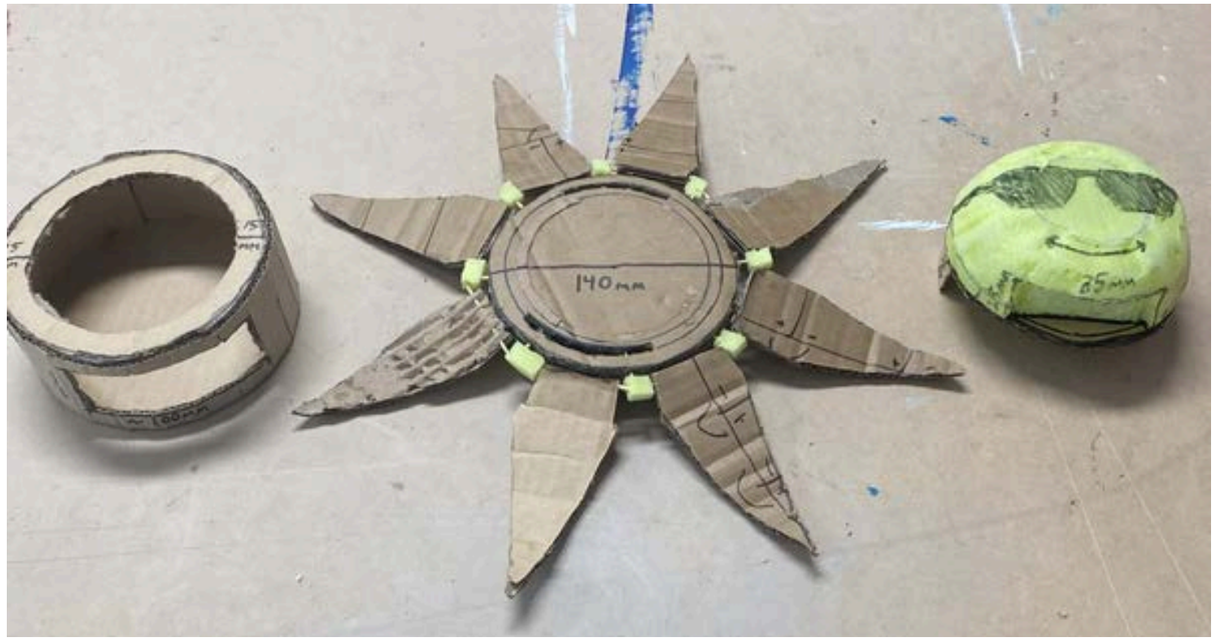


Measurements were drawn up along the triangular sectors showing them to be 130mm in length.



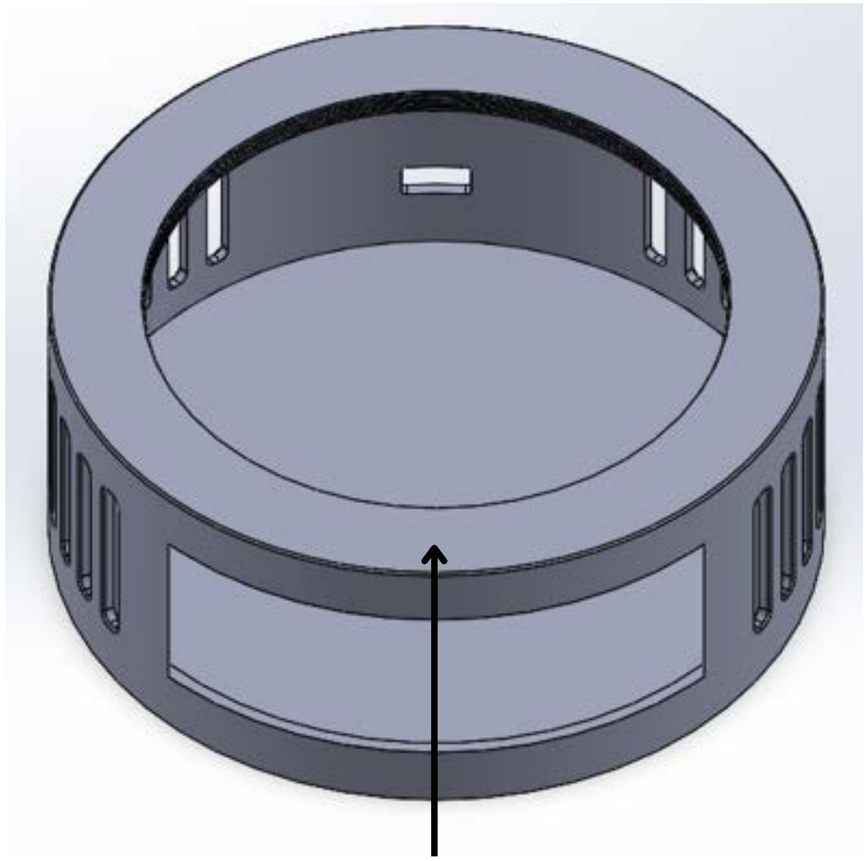
The final parts were assembled together and a smiley face with sunglasses was drawn over the dome to present a friendly aesthetic to the young users.

Each of the parts of the assembly can be detached which is clearly shown.



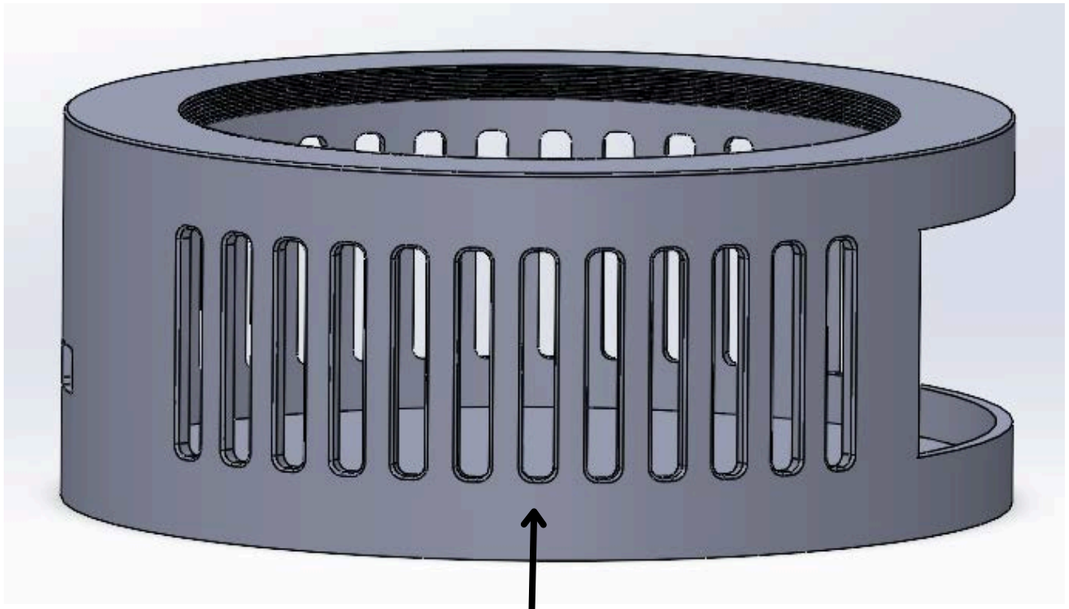
CAD PROCESS

SOLIDWORKS

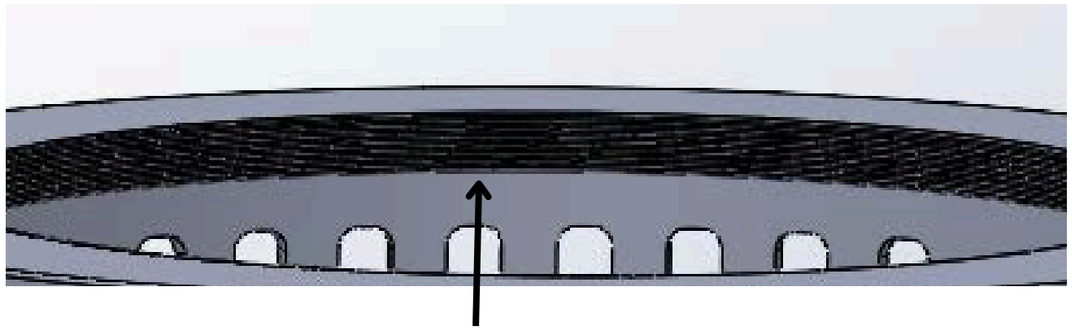


The base of the product was created in Solidworks first. A circular hole was cut on the top of the base extrusion.

A rectangular cut was made to fit the sound control board.



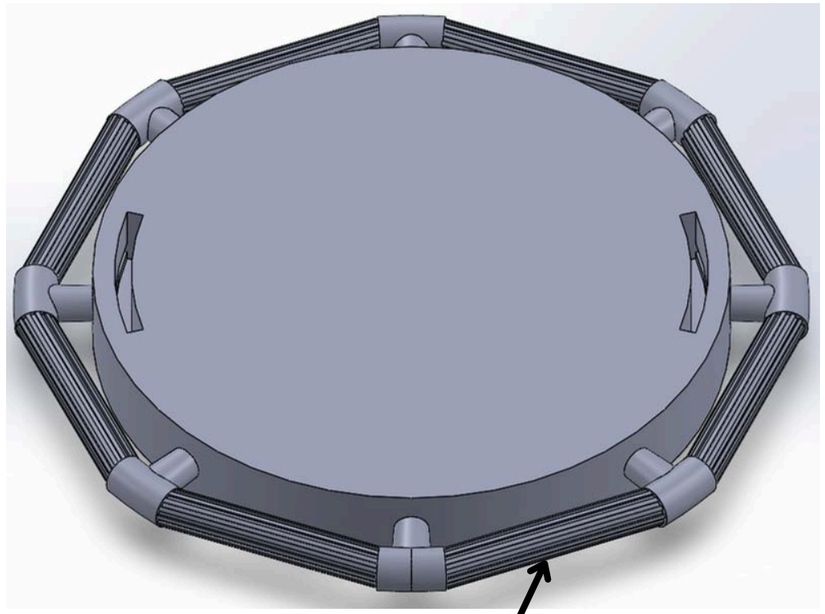
Thin, rectangular cuts were made for the speaker to emit sound from.



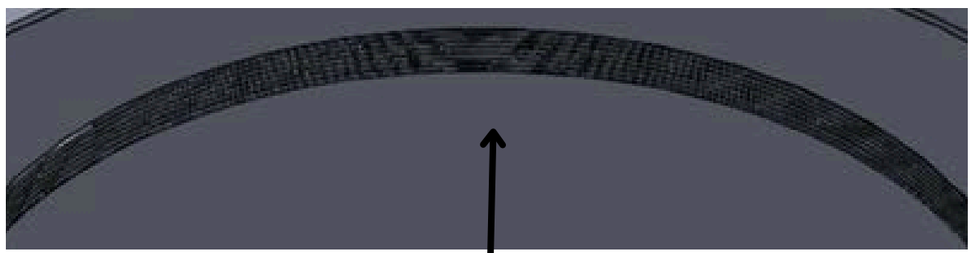
A thread was created for each part to attach to each other securely and safely.

DNB311 DDR - CAD PROCESS PART 1 - OUTER SHELL

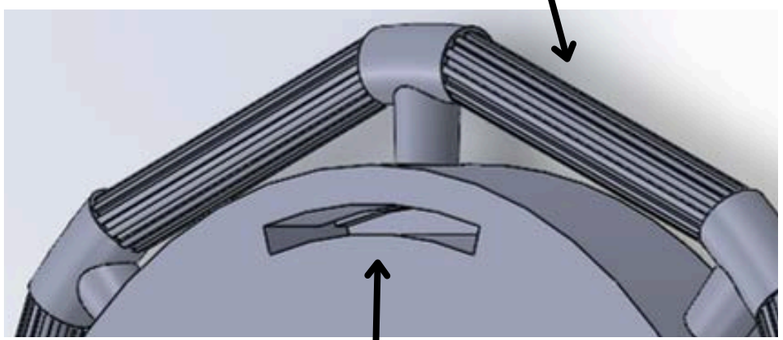
The second part was created using a cylinder of the same diameter as the base.



The ring was created using straight gear-like threads surrounding the cylinder for easier rotation.

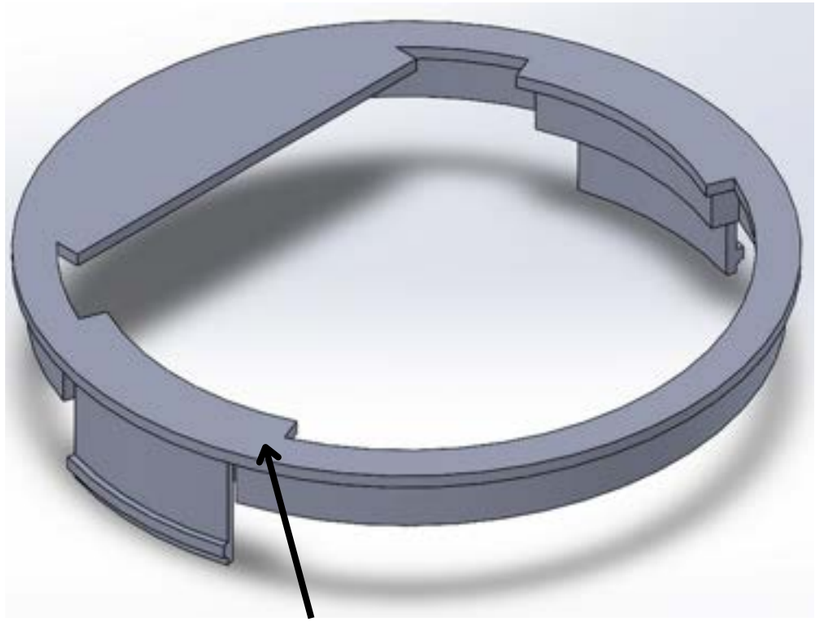


Another thread was made on a smaller cylinder to attach to the base part.

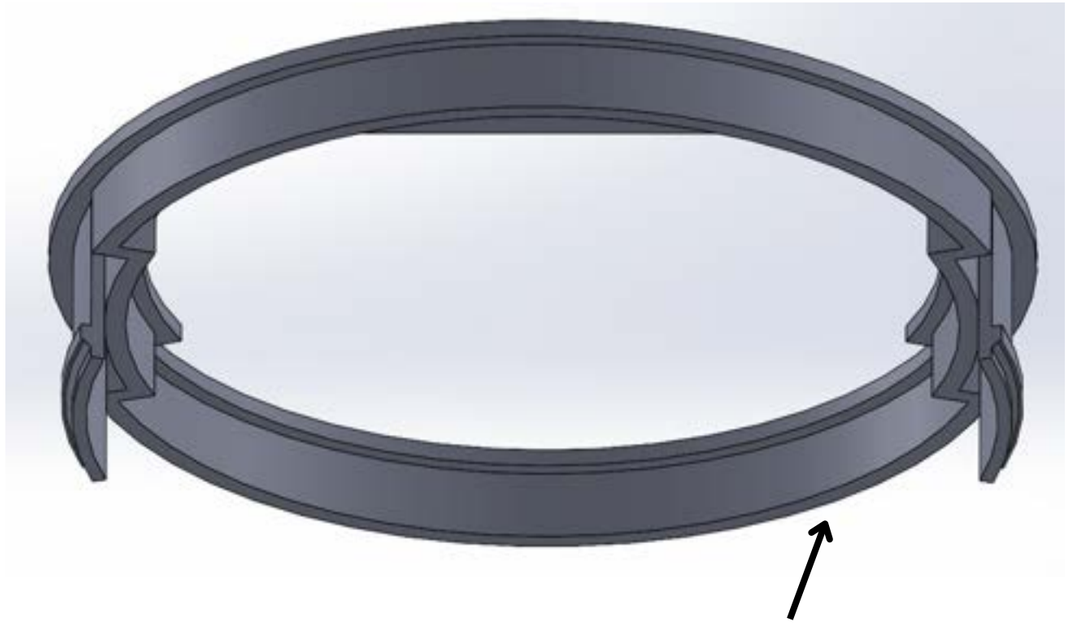


Thin curved cuts were made to attach onto the base of the light dome.

DNB311 DDR - CAD PROCESS PART 2 - CONNECTING RING

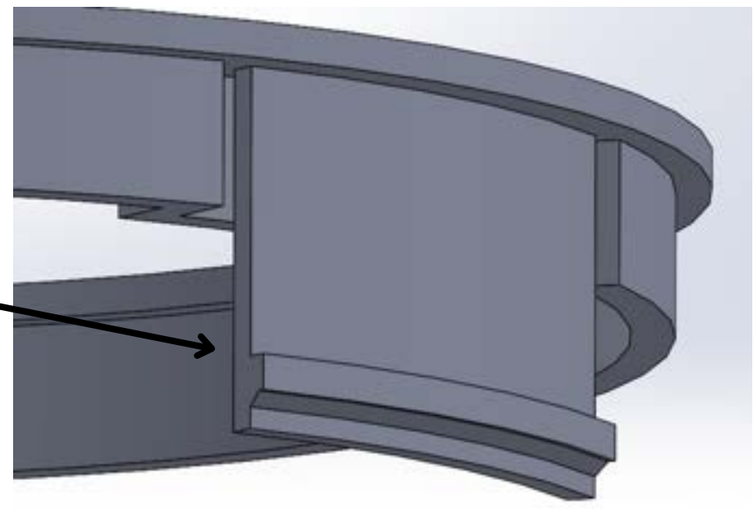


The base of the light dome was extruded using two cylinders which were cut to create the shapes and thickness shown.

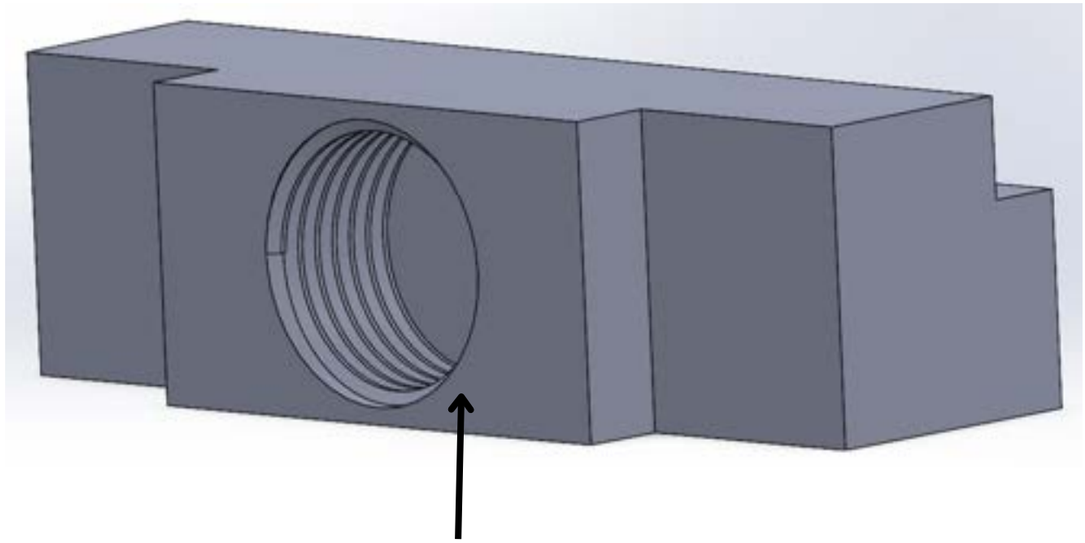


The bottom of the part has a thin 10mm long cylinder.

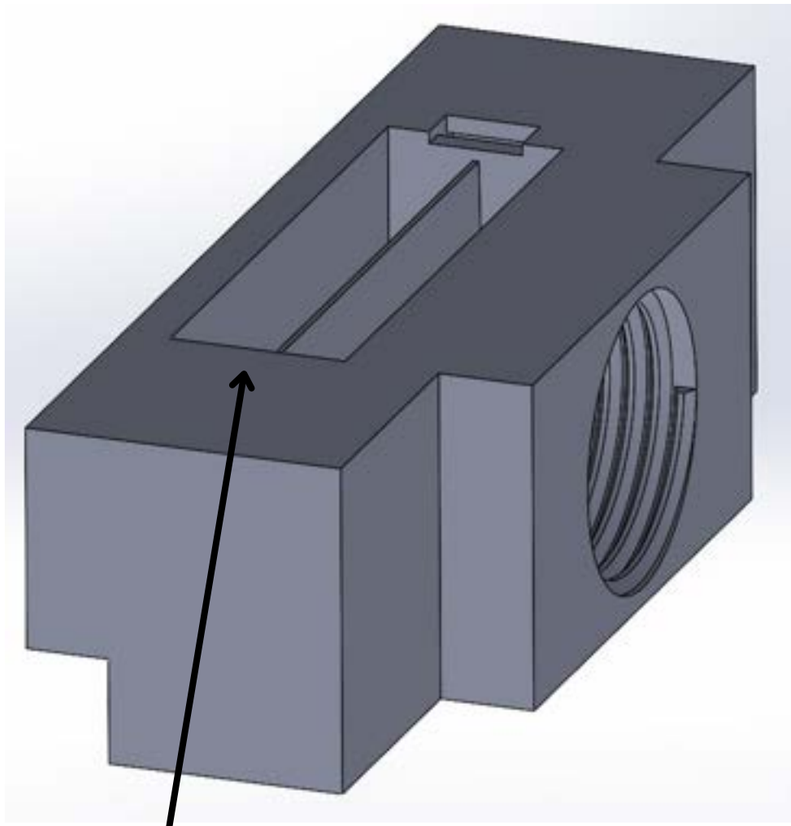
The connecting parts were extruded to create a tongue and groove joint to allow for easy and firm assembly.



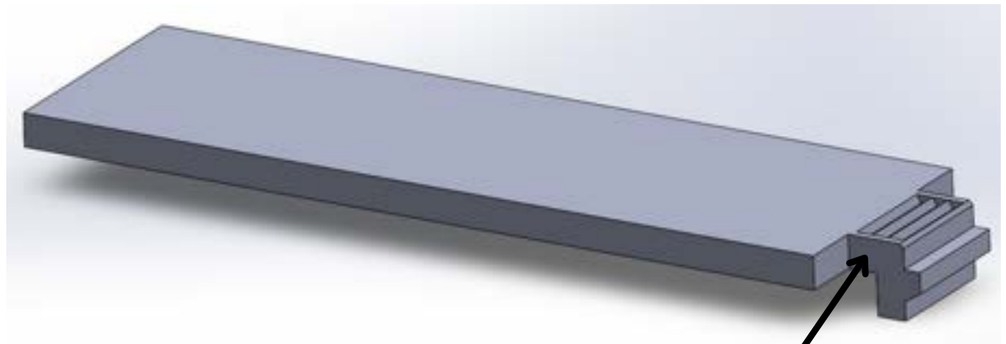
DNB311 DDR - CAD PROCESS PART 3 - LIGHT DOME BASE



The battery pack is small and includes a cylindrical cut to fit the bulb into. A thread was made to allow for easy and firm connection.

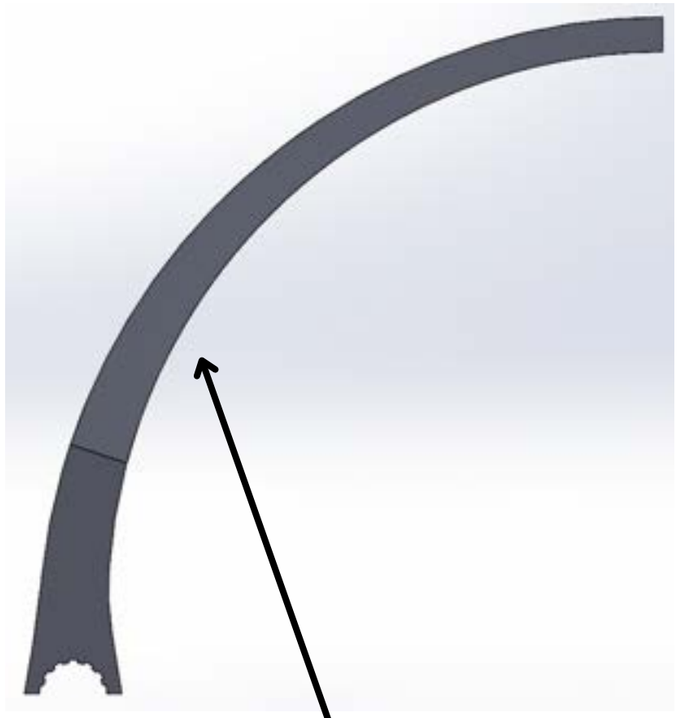


The batteries are contained in the battery pack using the similar battery pack styles.

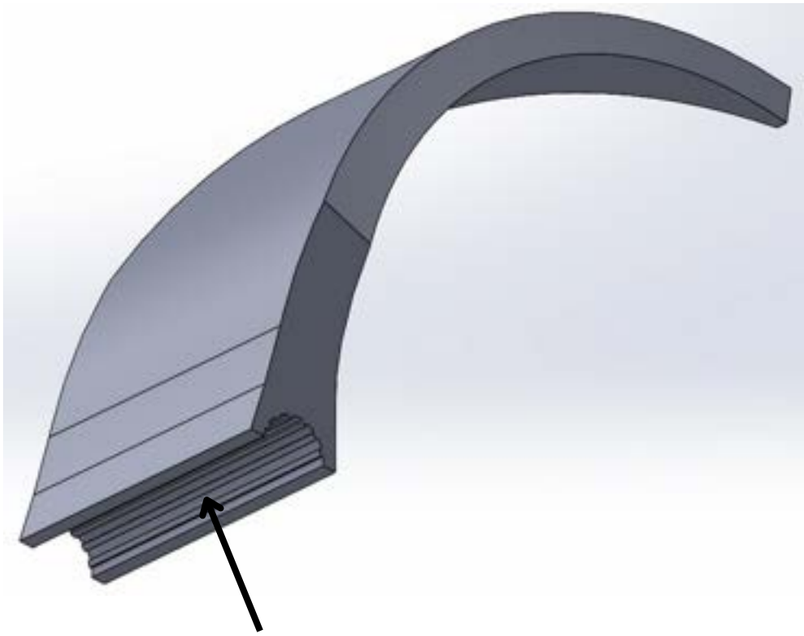


The cover for the batteries that connect to the pack and protect the batteries inside use a similar joint to the previous part.

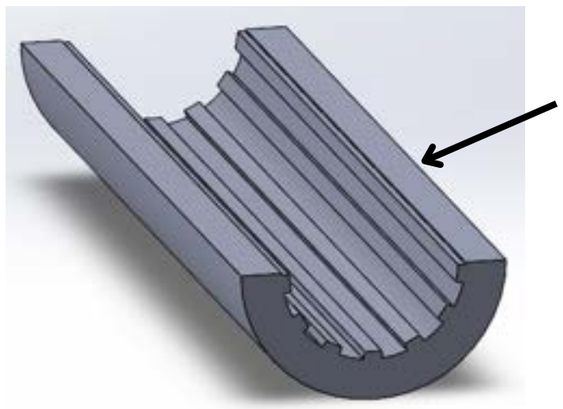
DNB311 DDR - CAD PROCESS PART 4 + 5 - BATTERY PACK



The connecting/rotating sectors were extruded in a curved way to fit over the dome smoothly and neatly.

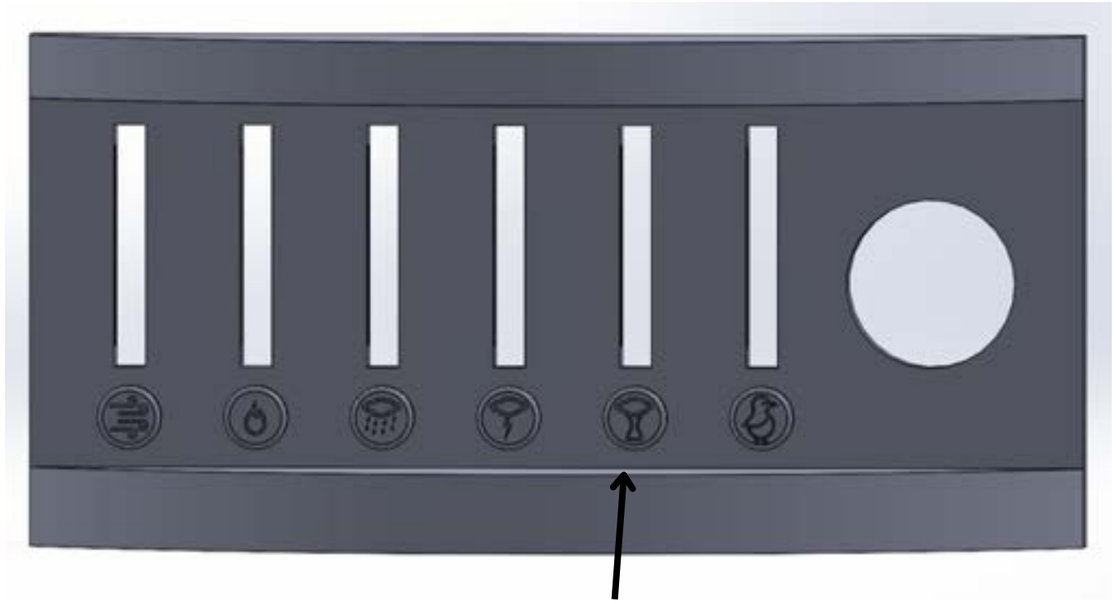


The bottom of the sectors where the gear cut was also cut in half to create a separate part for easier assembly.



The bottom half of the sectors include the same gear-like cut.

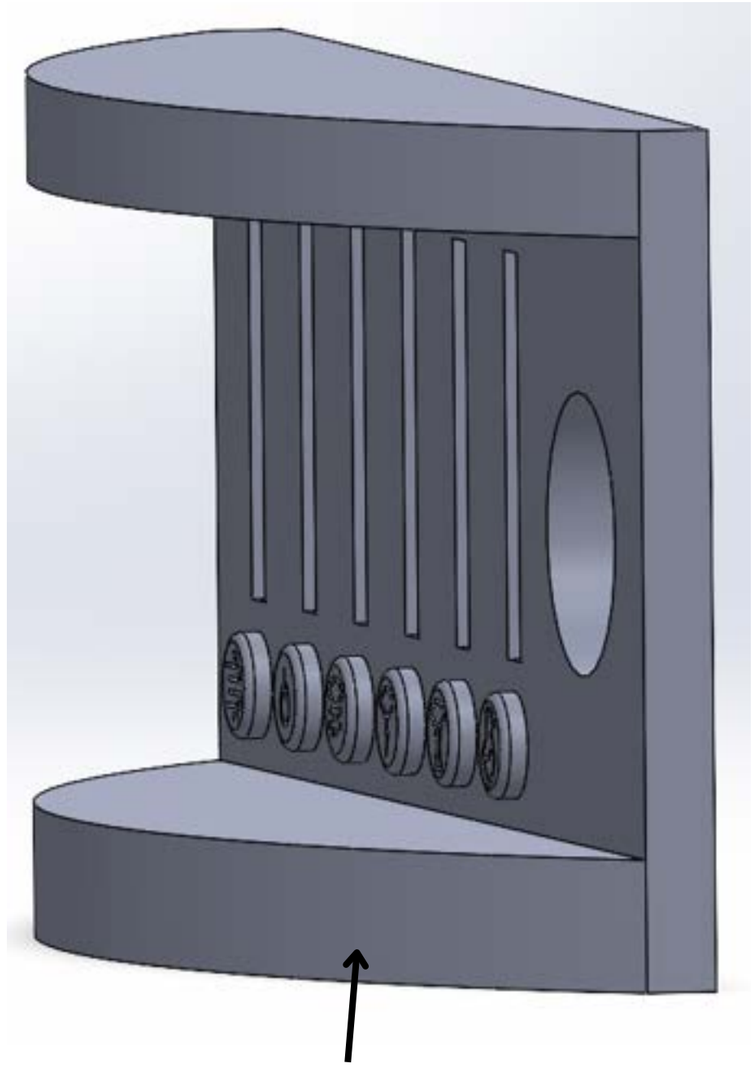
DNB311 DDR - CAD PROCESS PART 6 + 7 - SIDE SECTORS



The control board include various cuts for the sliding knobs and power button to fit into.
The icons to represent the noises from each knob were cut below.

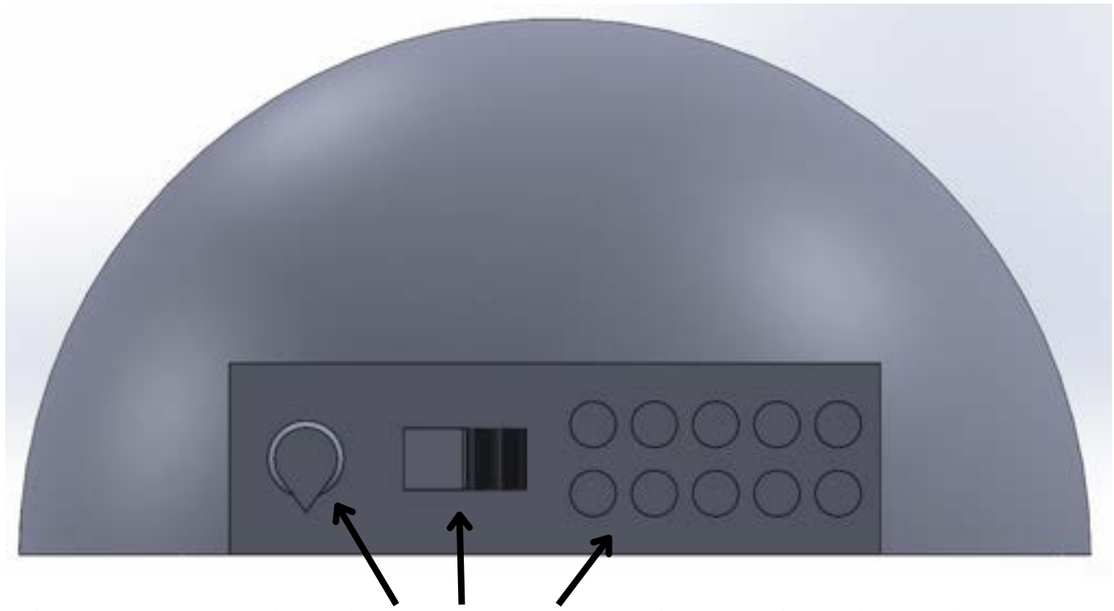
Knobs

Power button

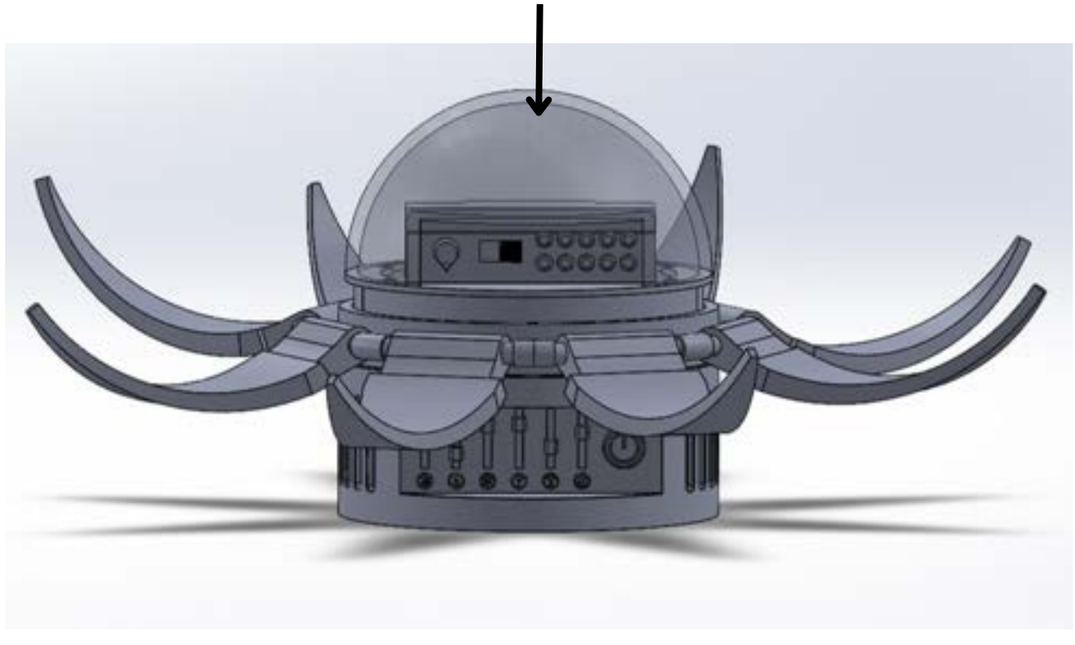


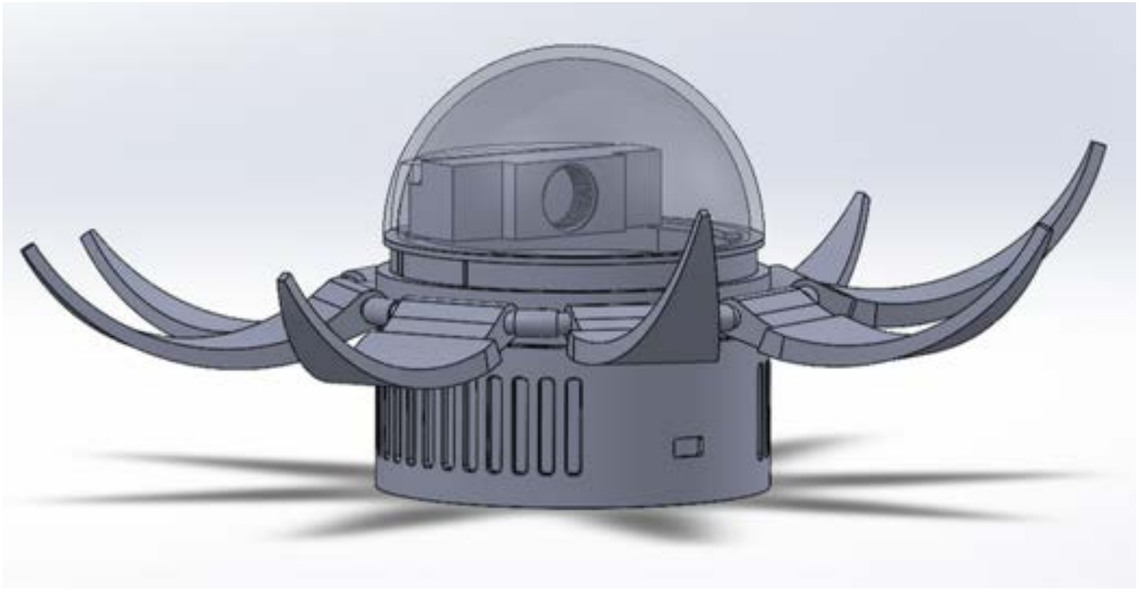
The bottom and top of the board also include semi-circle extrusions to fit neatly into the inside of the base part.

The final assembly was created to get a final view of what the product will look like.
The opacity of the dome was also lowered to see the inside of what it looks like.

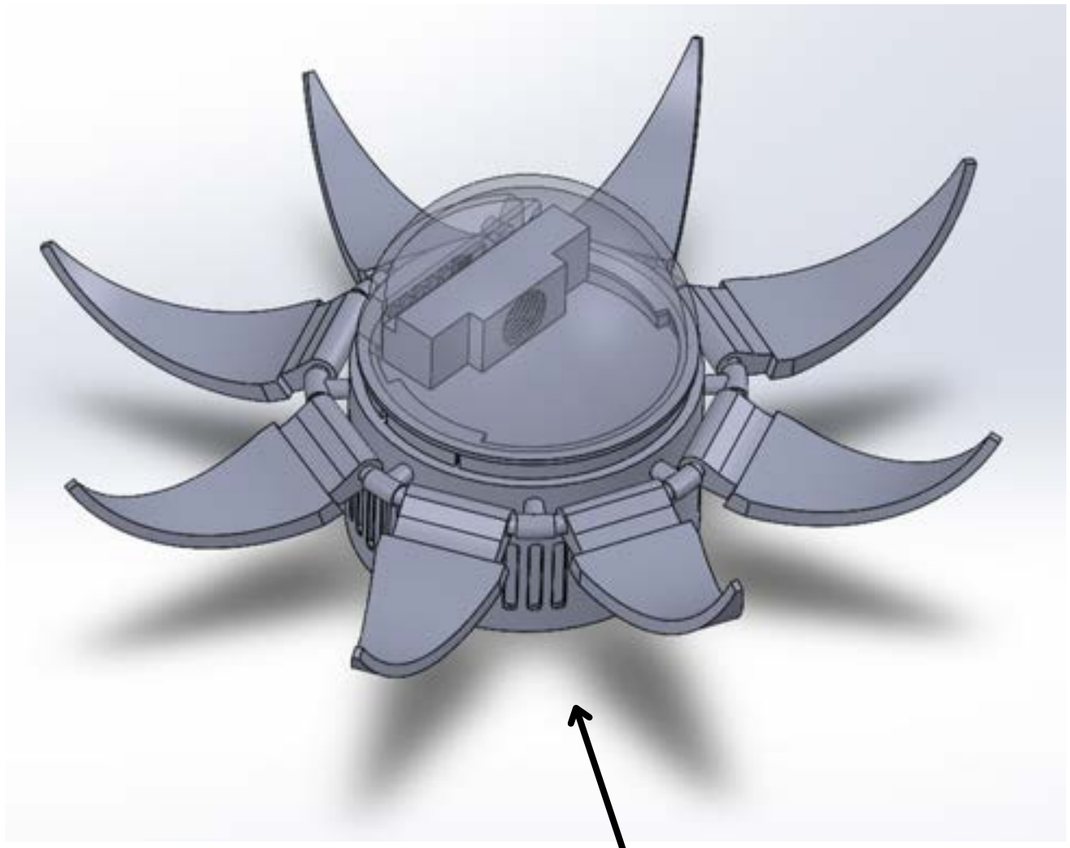


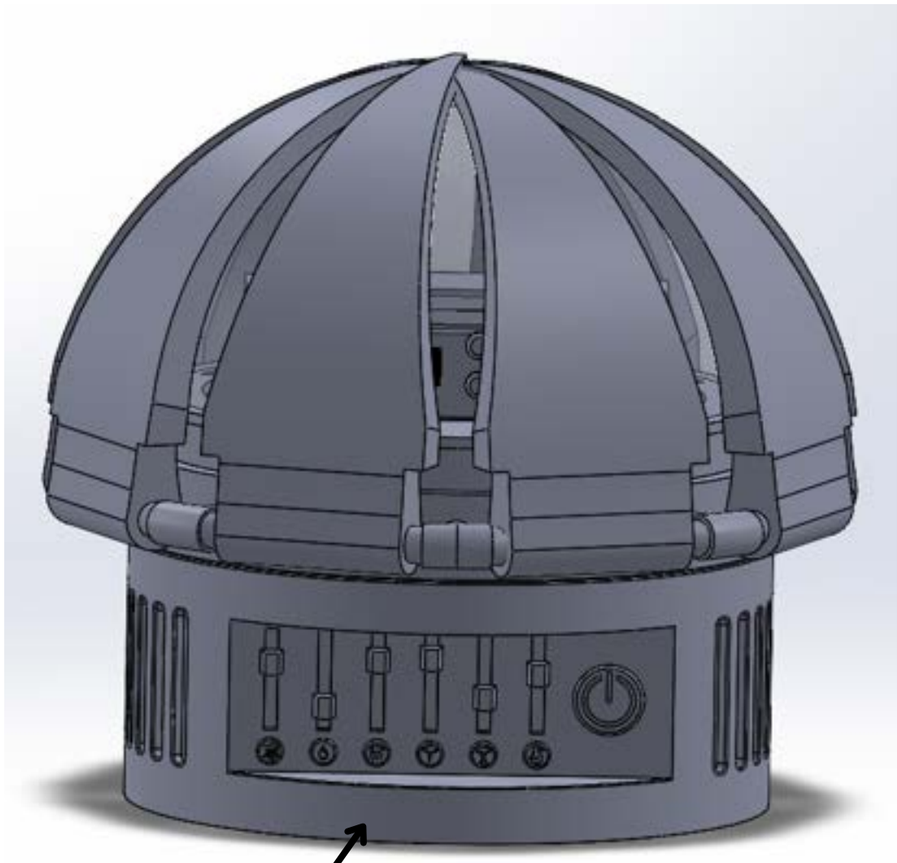
The opacity knob, power switch, and colour buttons were extruded onto the inner rectangle of the dome.



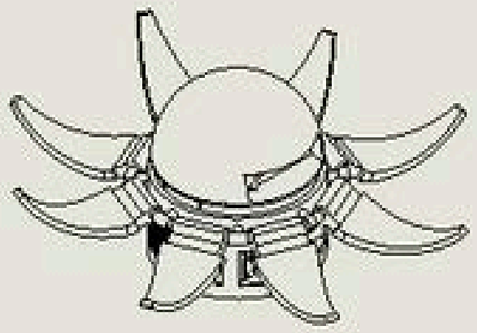


DNB311 DDR - CAD PROCESS PART 11 + ASSEMBLY - LIGHT DOME

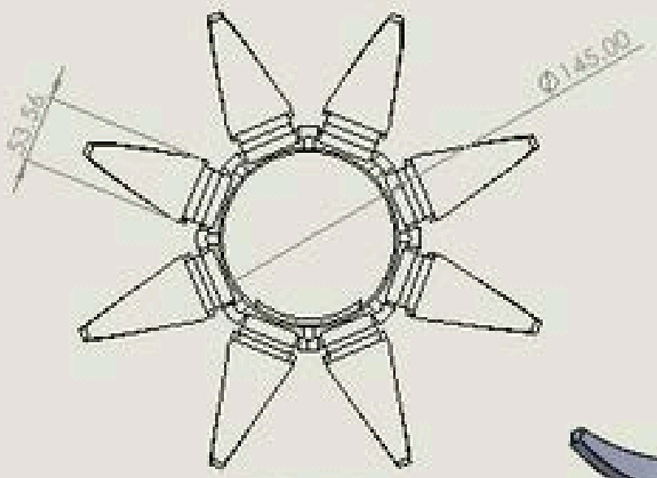




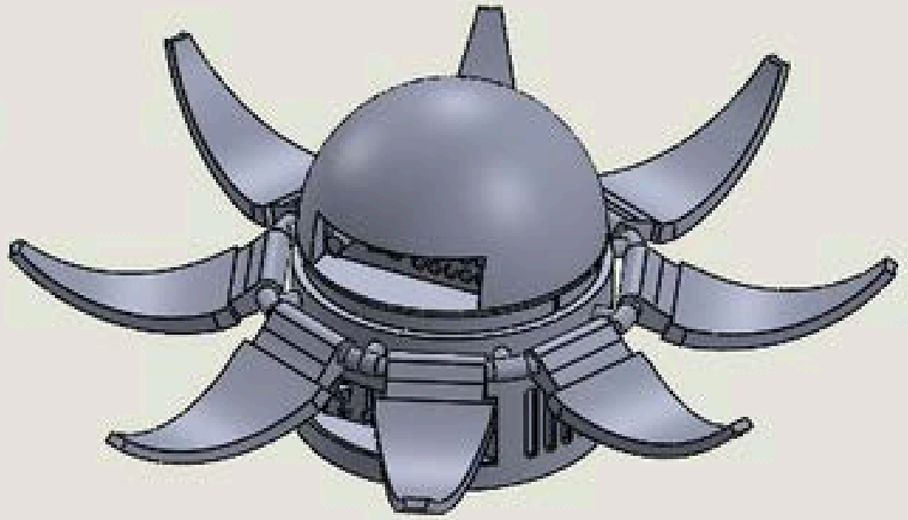
Two assemblies were created to demonstrate what the product will look like with the sectors open and closed.



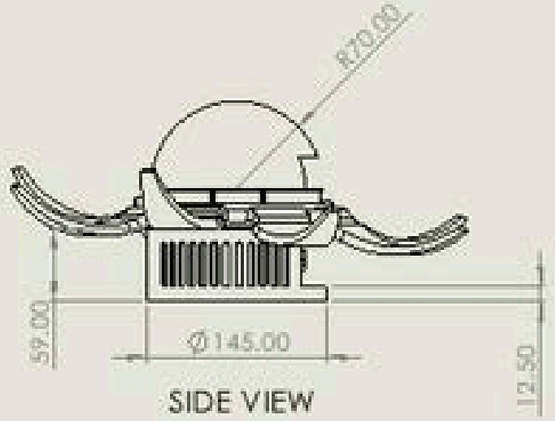
ISOMETRIC VIEW



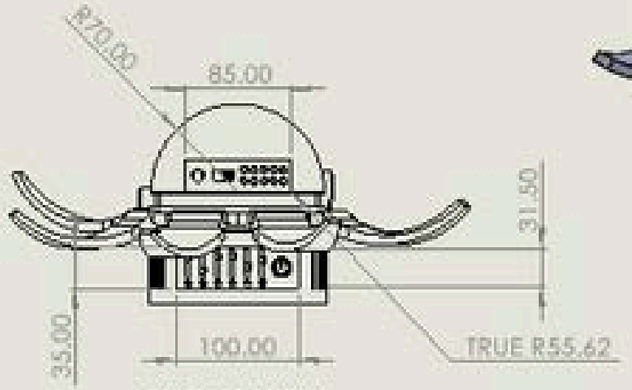
TOP VIEW



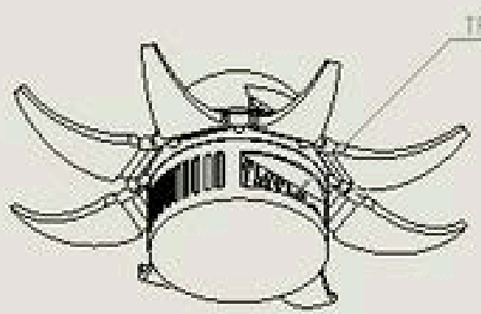
TRIMETRIC VIEW



SIDE VIEW



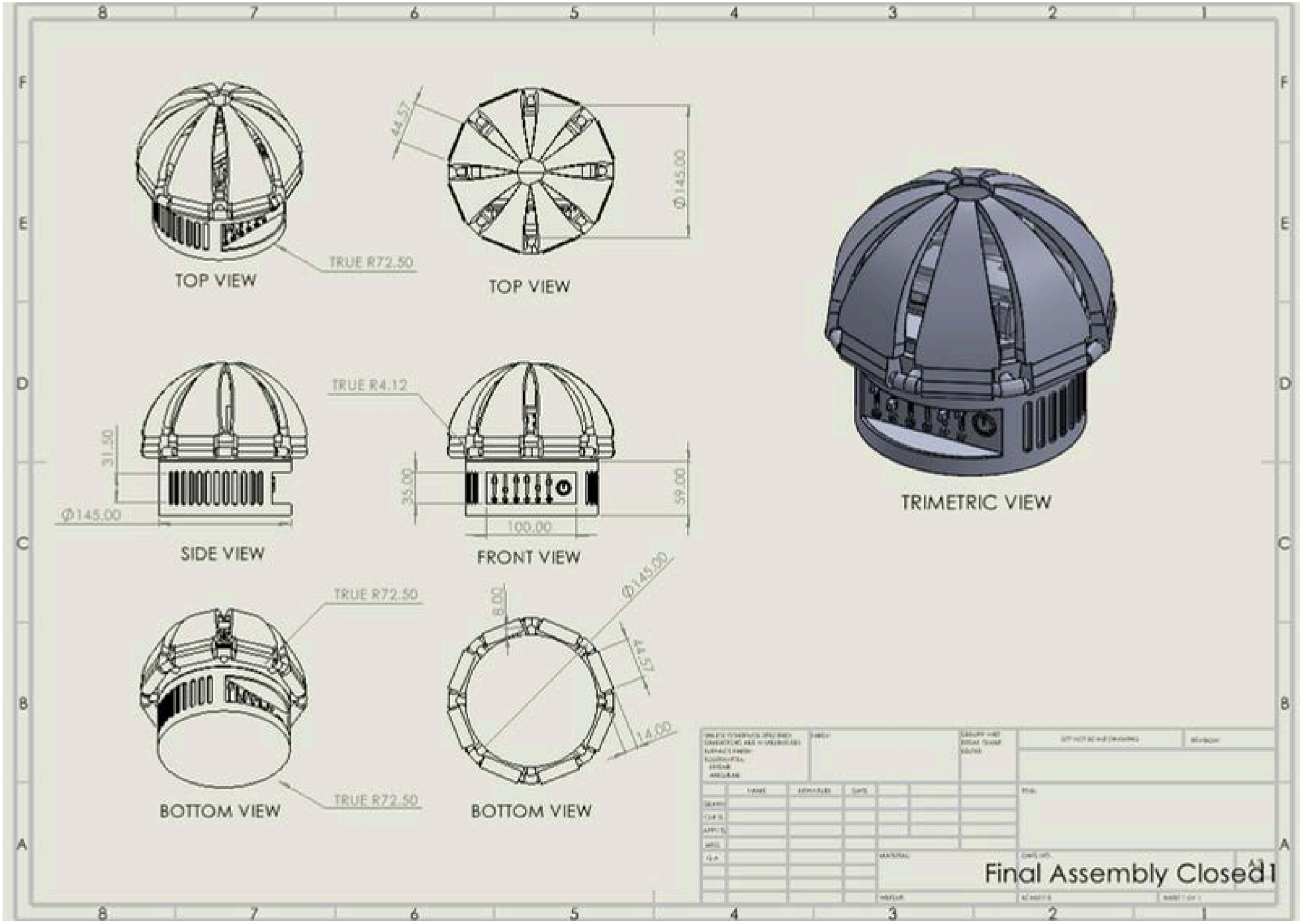
FRONT VIEW



BOTTOM VIEW

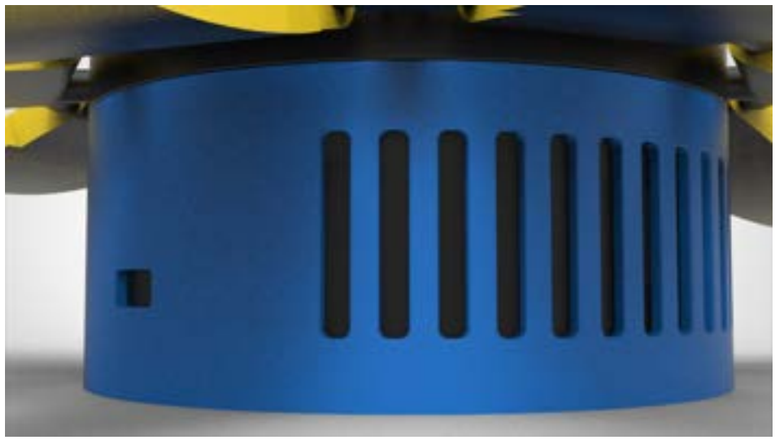
Final Assembly Open1

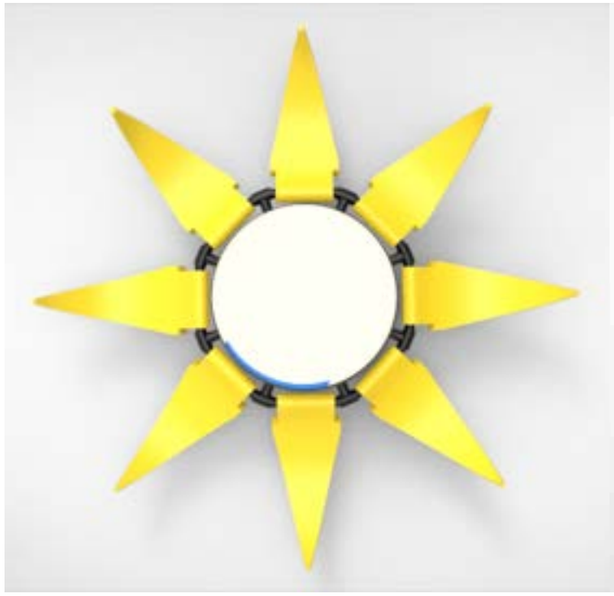
DNB311 DDR - CAD PROCESS ASSEMBLY TECHNICAL DETAILS

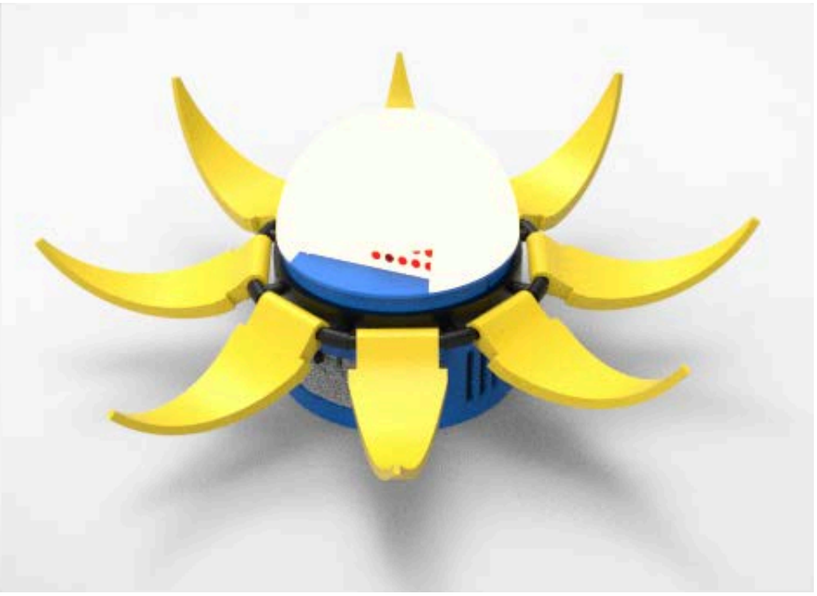


DNB311 DDR - CAD PROCESS ASSEMBLY TECHNICAL DETAILS

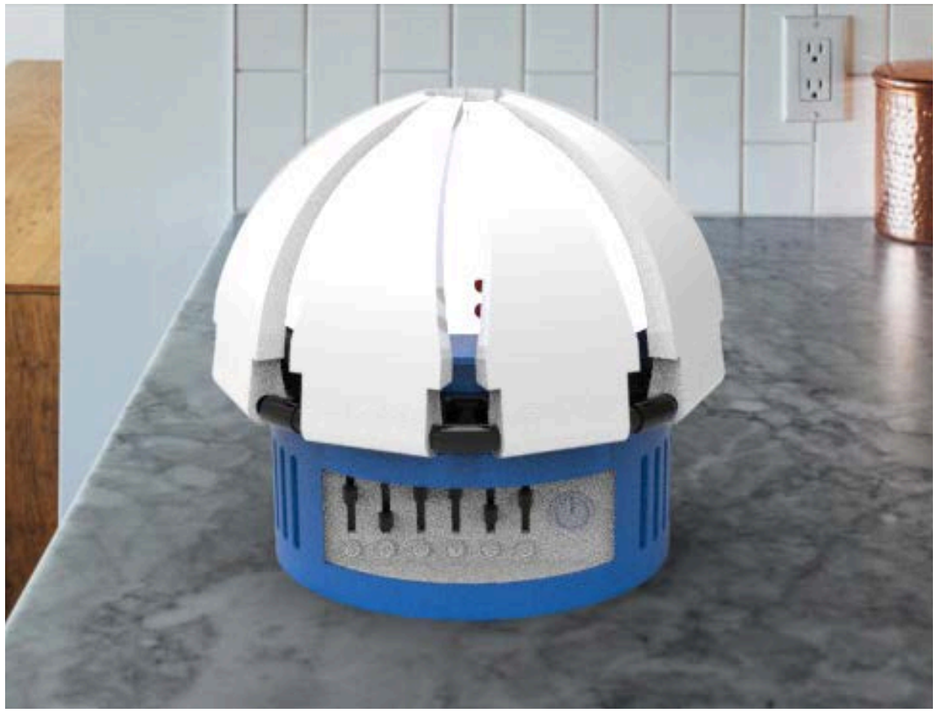
KEYSHOT RENDERS

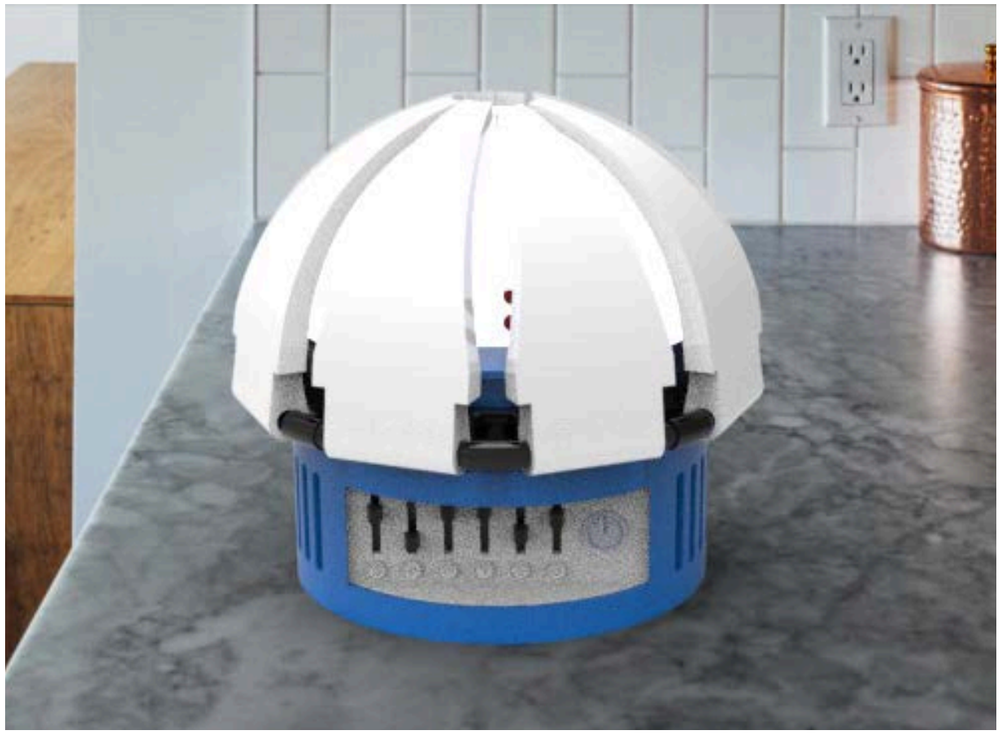


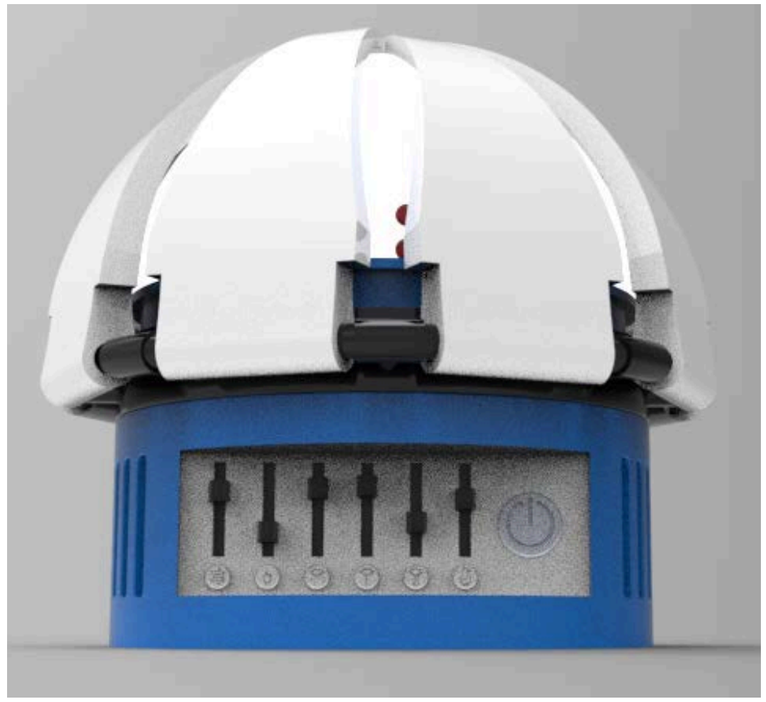




DNB311 DDR - FINAL ASSEMBLY RENDER - OPEN







DNB311 DDR - FINAL ASSEMBLY RENDER - CLOSED

FINAL MODEL MAKING

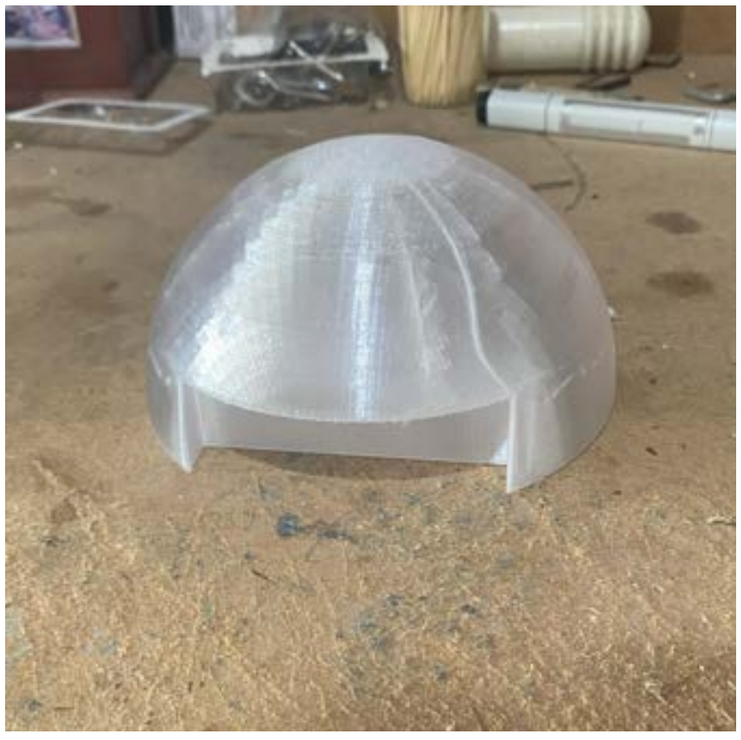
The second and third parts were 3D printed using FDM Plastic to create a stronger, more durable product.

However, when assembling and disassembling the two parts, the top parts connecting parts snapped which meant that I had to 3d print them again – this time using ABS Plastic.

The third part includes the edges and shape effectively, however, it was too brittle when assembling the parts.

DNB311 DDR - MODEL MAKING - DOME BASE

The light dome was 3D printed using FDM - Clear plastic which was foggy enough to not see the battery pack inside, but clear enough for the lights to filter through effectively.



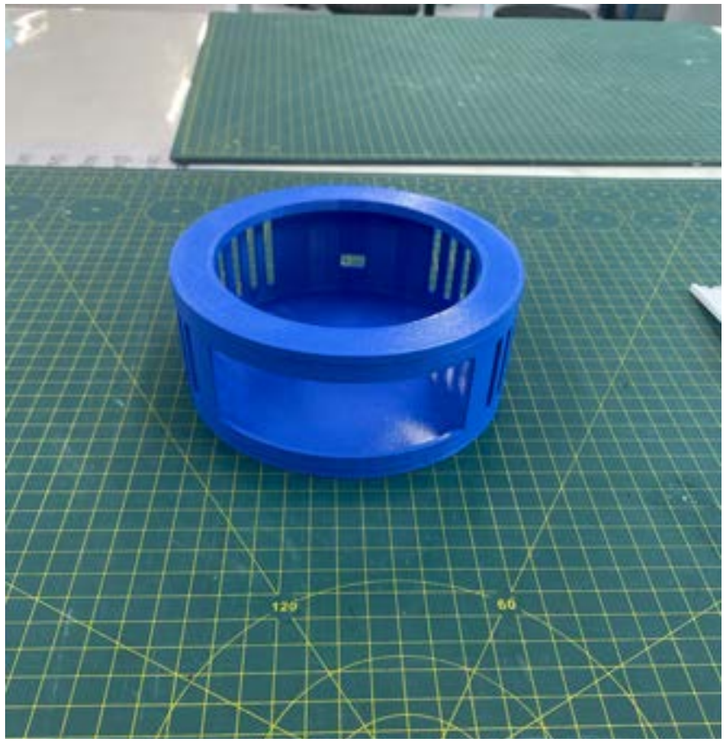
The rectangular cut was also made where the controls would be placed.

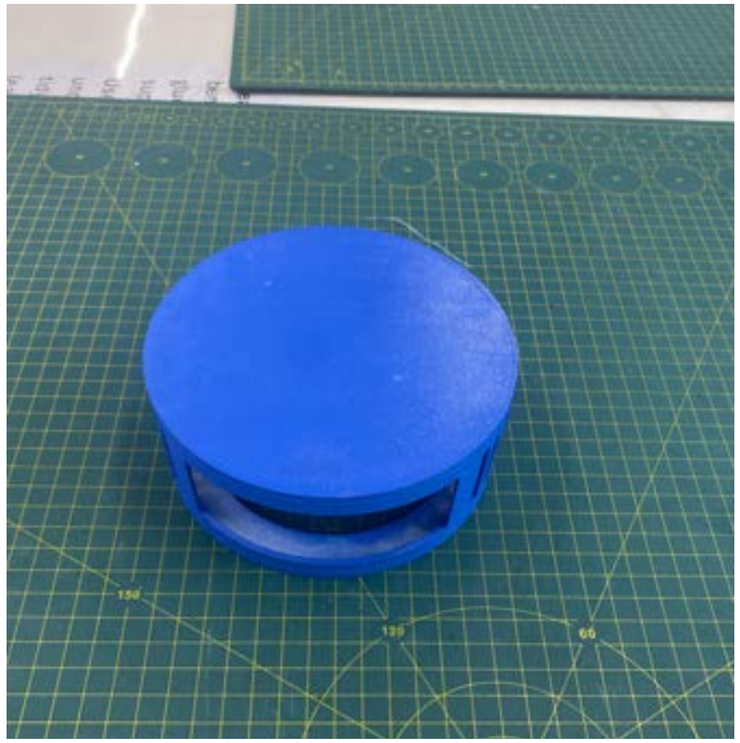
The sectors were also made from FDM plastic which allowed for tougher, impact resistant parts and they were able to rotate easier.

The gear-like cuts within each piece is clearly evident and shallow enough for the parts to rotate and stop at multiple angles effectively.

DNB311 DDR - MODEL MAKING - SIDE SECTORS

The base of the product was 3d printed in ABS Plastic and spray painted “denim blue” which was bright, and glossy.

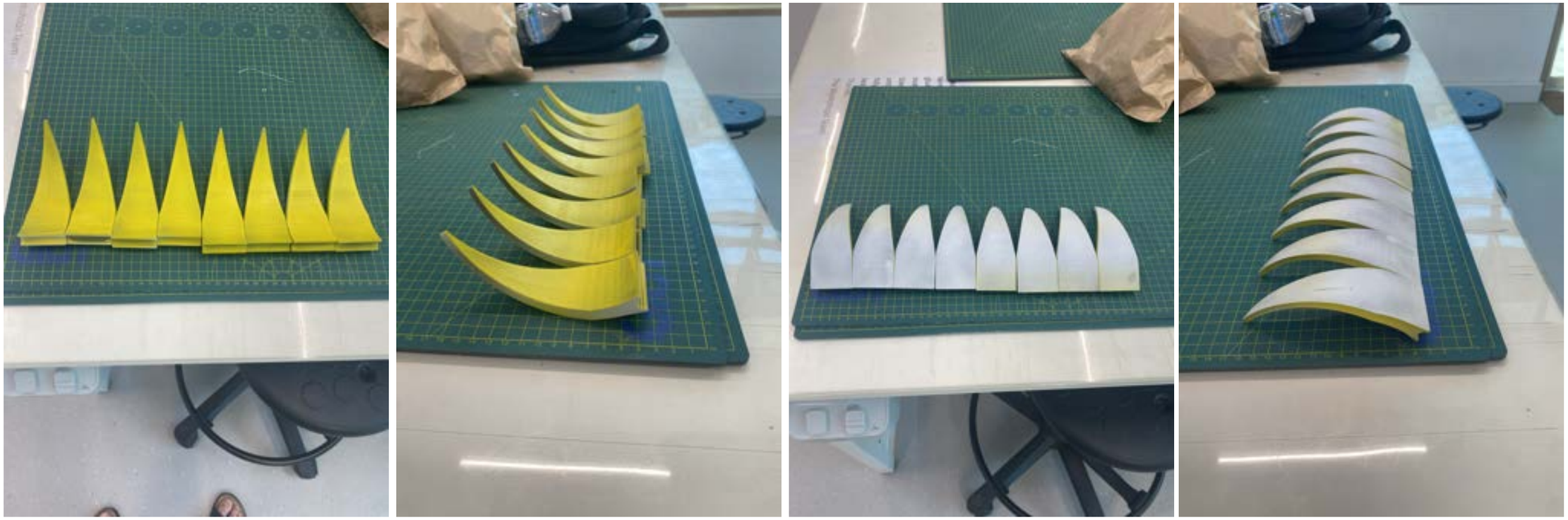




The base part also includes enough space for the speaker to fit into.

DNB311 DDR - MODEL MAKING - SPEAKER SHELL/BASE + SPEAKER

Glossy yellow spray paint was used to colour the inside of the curves sectors to represent the sun aesthetic.



The outside of the sectors was spray painted using glossy white to represent the moon aesthetic.

DNB311 DDR - MODEL MAKING - SIDE SECTORS - PAINTED

The speaker control board was first connected with the sliding knobs and power button which were both spray painted matte black. The sound board was spray painted matte white for a clean finish.

The top parts were then connected to the base part using super glue which was efficient at connecting them together.

DNB311 DDR - MODEL MAKING - SPEAKER SHELL/BASE + CONTROLS - ASSEMBLED

The parts that were printed in FDM plastic were 3d printed again using ABS plastic which were sturdier, thicker, and easier to assemble.

The base of the light was spray painted denim blue, whilst the connecting ring part and battery pack was spray painted matte black.

DNB311 DDR - MODEL MAKING - LIGHT DOME BASE + LIGHT DOME + BATTERY PACK

LED light strips were connected to the inside of the light dome which were used instead of a bulb for easier assembly.

The top of the dome has a black painted smiley face with sunglasses. A rotating fan knob was bought from bunnings and glued onto the dome part of the product.

DNB311 DDR - MODEL MAKING - LIGHT DOME ASSEMBLY + LED LIGHTS

The parts were then assembled together and fit effectively, however, the inner dome was still visible which was not the intended purpose.

The moon face on the outside of the sectors were traced in pencil to indicate where they will be painted later.

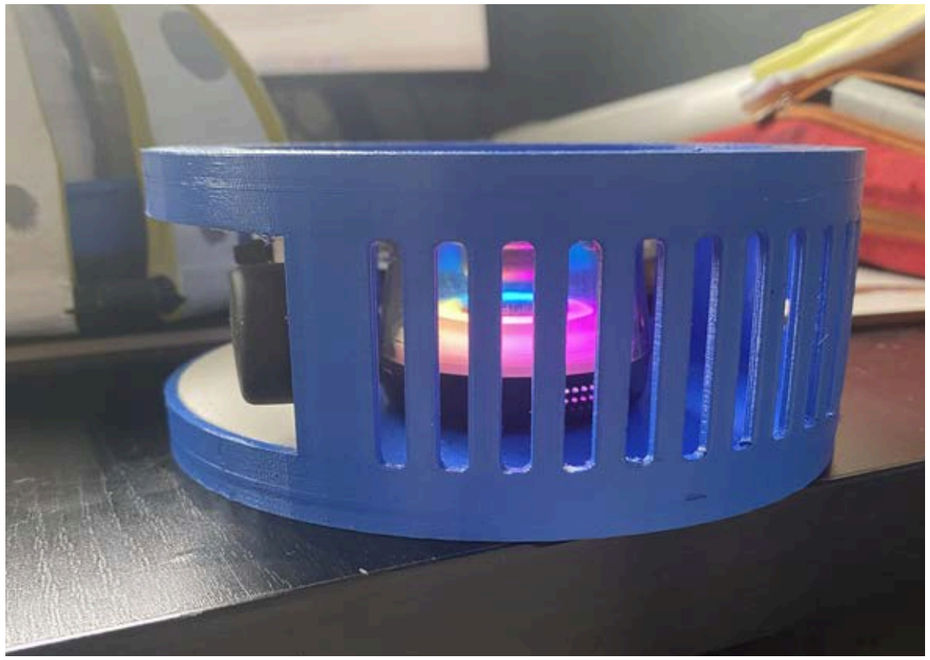
The sectors worked perfectly at different angles and the parts were connected using blue scotch tape which was then painted over later.

DNB311 DDR - MODEL MAKING - FINAL ASSEMBLY - OPEN

The final moon aesthetic face and patterns were finally painted on using grey and black paints.

DNB311 DDR - MODEL MAKING - FINAL PAINTED SIDE SECTORS

A small, circular Bluetooth speaker was used to create the sounds for the final model.

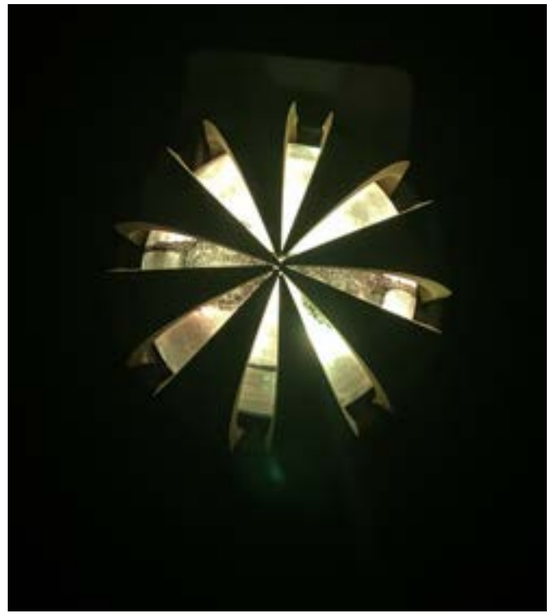


The speaker was visible through the slits in the shell and the sound was able to come through it.

The LED control allowed for me to change light colours and turn them on and off easily.

DNB311 DDR - MODEL MAKING - FINAL ASSEMBLY - OPEN LIGHT

DNB311 DDR - MODEL MAKING - FINAL ASSEMBLY - CLOSED LIGHT



DNB311 DDR - MODEL MAKING - FINAL ASSEMBLY IN BEDROOM ENVIRONMENT

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