

THE BRIEF

The focus of this project is looking at using light as a means of **ENGENDERING FEELINGS OR EMOTIONS** within a use context. It is intended to provide an opportunity to develop **CREATIVITY THROUGH EXPERIMENTATION** and exploration, and to achieve a physical resolution at the end of the project.

You are encouraged to consider **HOW A SINGULAR PRODUCT CAN BE DEVELOPED INTO A COLLECTION** or family of related products. Can a table lamp be developed into a free standing or wall mounted fitting? Or can a single form zip, pop, slot or tessellate into other forms to create a glowing cloud of multiples?

RESEARCH STAGE

The methods of research I adopted during this project is as follows;

- Explore contemporary methods of production and the availability of new materials
- The **SCULPTURAL & STRUCTURAL QUALITIES** inherent in manipulated sheet fabrication
- **APPROPRIATING PROCESSES** & techniques from paper engineering, origami, aerospace technology, fashion, sculpture, mathematical models and packaging.
- A design that encourages consumers to become a creative participants through customisation?
- Reinterpretation and appropriation; the playful experimentation with cheap, everyday materials and existing products.
- The role of lighting within domestic rituals and social situations
- **LIGHTING AS A CHARACTER** within the home
- Disposability vs objects for life? Adding value to the energy efficient light bulb
- The **POETIC QUALITIES** of light as space maker, 'sculpting habitat and inhabitant'.



THE FIRST PAPER MODEL

INITIAL DESIGN

I started off with taking a paper strip and played around creating a ribbon-like shape (above). I arrived at this shape and realised that I could make an **ORGANIC PATTERN** out of it. With the addition of light, it allows for the light to **CREATE DIFFERENT SHAPES AND SHADOWS** (below).

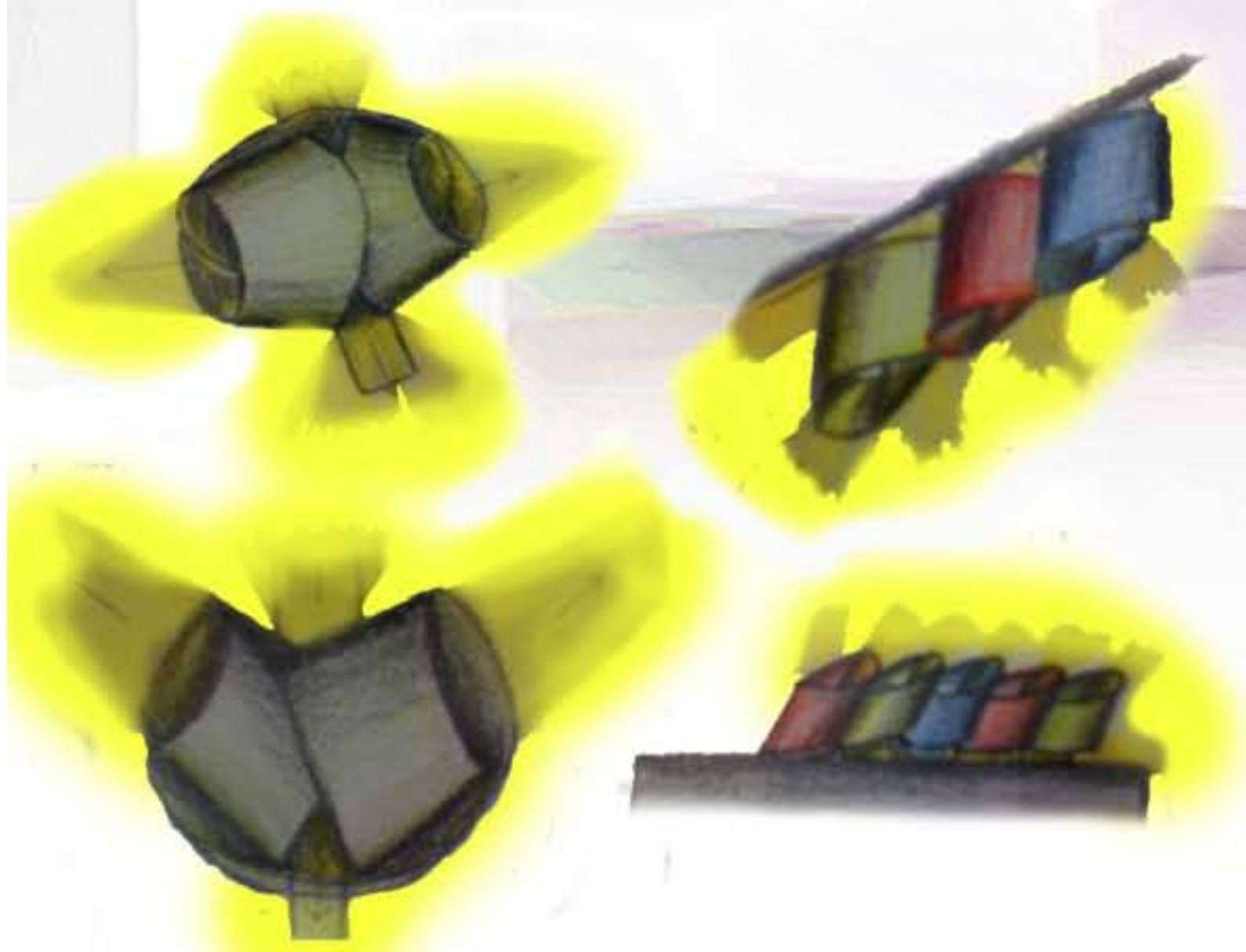
DESIGN INSPIRATION

My design inspiration has come from the work of Spanish architect Antoni Gaudi, who is famous for his **UNIQUE AND HIGHLY INDIVIDUALISTIC** designs regarded as **BEYOND THE SCOPE OF MODERNISM**.

Gaudi uses **A LOT OF CURVES** and virtually no straight lines. He incorporates this design method into a 3D scenario, which allows for the creation of fascinating shapes of light and shadow. Therefore, I came to realise that this idea used in a lighting product is **POSSIBLY NOT HAVE BEEN THOUGHT OF BEFORE** and it therefore has merit.



DESIGN PRECEDENTS OF ANTONI GAUDI

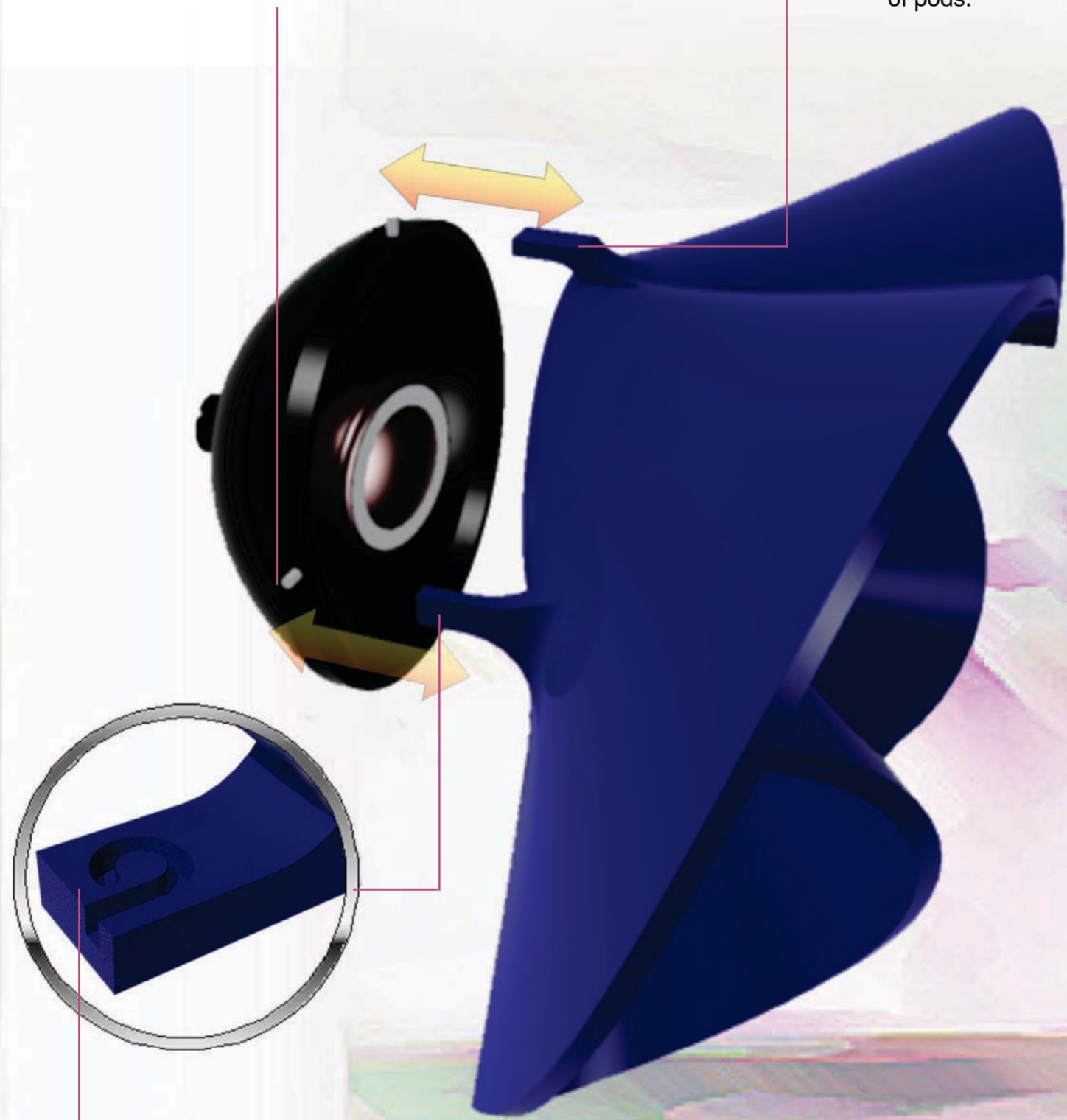




WORKING OUT HOW IT WOULD FIT TOGETHER

The light source piece implements "male pins", which interlock with the female receptors on the pod.

The pods have bayonet fixings, which allow for easy attachment and detachment of pods.



The pod implements "female receptors", which interlock with the male pins on the light source piece.

POD DESIGN BRAINSTORM

I have experimented with different pod shapes. Each shape will allow for different projections of light and shadow.



A CHECK ON THE INTELLECTUAL PROPERTY OFFICE

Before proceeding, I decided to go online to the Intellectual Property Office to check if a similar product exists. In the category of lighting of this type, there were 1956 different designs with an existing patent. The two that were closest to my design are those as emphasised below.



Designs #4001922 and #4001923
 Application Date: 9/3/07
 Grant Date: 5/4/07
 Proprietor Company: Harding
 Statement of product: Table Lamps

Both of these designs incorporate the idea of having one single light source which projects outwards into the unique shape beyond it. The lighting result is the same as my product idea, only the light and shadow projections are more solid, whereas the results of my light are **POTENTIALLY MORE FLUID**. Although it does create unique shapes of light and shadow, the design is only one piece and it is considered a table lamp. However, my lighting product has **USES IN VIRTUALLY EVERY SCENARIO POSSIBLE**. One light pod can be used **BY ITSELF OR SEVERAL** can be used, depending on the situation.

Information obtained from:

http://www.ipo.gov.uk/rs-bin/RightSite/formexec?TPO_CHUNK_SIZE=128&TPO_HITS_SO_FAR=96&edition=All&main=26&sub=05&subsub=All&proprietorname=&BROWSER_TYPE=ie4&andor=LOC&DMW_INPUTFORM=tpo/locarno_results&pstype=S



CHAINS THAT CAN BE FORMED

<NOTE: For ease of illustration, the coloured pods have been omitted from the diagrams>

The left is a simple arrangement of 5 lights. They are composed in a straight line, but each light is twisted about the 'line'. This would be used for a small room running horizontally along the top of the space near the centre of the ceiling, which would allow for **AN EQUAL DISTRIBUTION OF PROJECTED LIGHT**.

To the right is an arrangement of 6 lights. Unlike the preceding straight line layout, the chain itself also twists to **INTRODUCE ANOTHER LEVEL OF FLEXIBILITY**. This would also be used in a small area, but would most likely be used vertically as opposed to horizontally. It can be hanging from the ceiling or it can wrap around a pillar or a column.

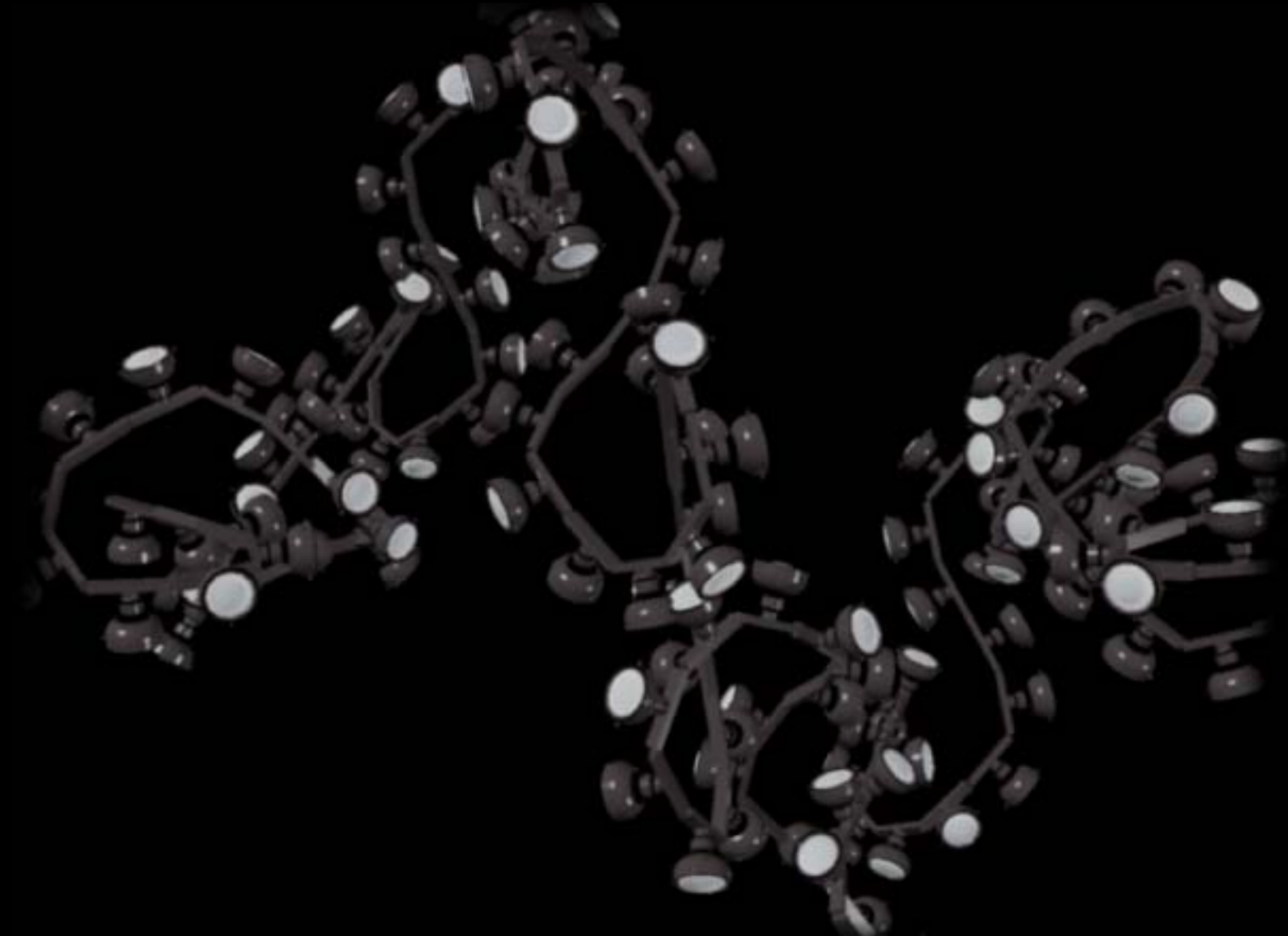
Below is a series of 24 lights can perhaps **INTRODUCE A WILDER OUTPUT** of light. Owing to the amount of light that would be produced, this arrangement would be **USED IN A LARGER ROOM OR A**



As you add more lights onto the chain, the **GREATER THE AREA THAT CAN POTENTIALLY BE ILLUMINATED**. The lights can be wrapped around trees in a forest, for instance, to serve for a small gathering.

But as always, if the gathering becomes larger and thus a larger area needs to be lit, **MORE LIGHTS CAN BE ADDED ON** to cater for the event.

But of course, the lighting assembly **DOES NOT HAVE TO BE IN ONE LINE**. This is just the same as Christmas lights. What is possible with this design is a means of **CREATING BRANCHES**. When it comes to selling the product on the market, just like Hornby train sets, **ACCESSORIES CAN ALSO BE SOLD** i.e. branch multipliers. The chains can disperse in different directions to create a weeping willow effect or any shapes that can be made which consist of paths sprouting out in all different directions.





CAD RENDER TESTS



The first box test. A red light in the box to DEMONSTRATE THE CREATION OF LIGHT AND SHADOW SHAPES created by a pod.

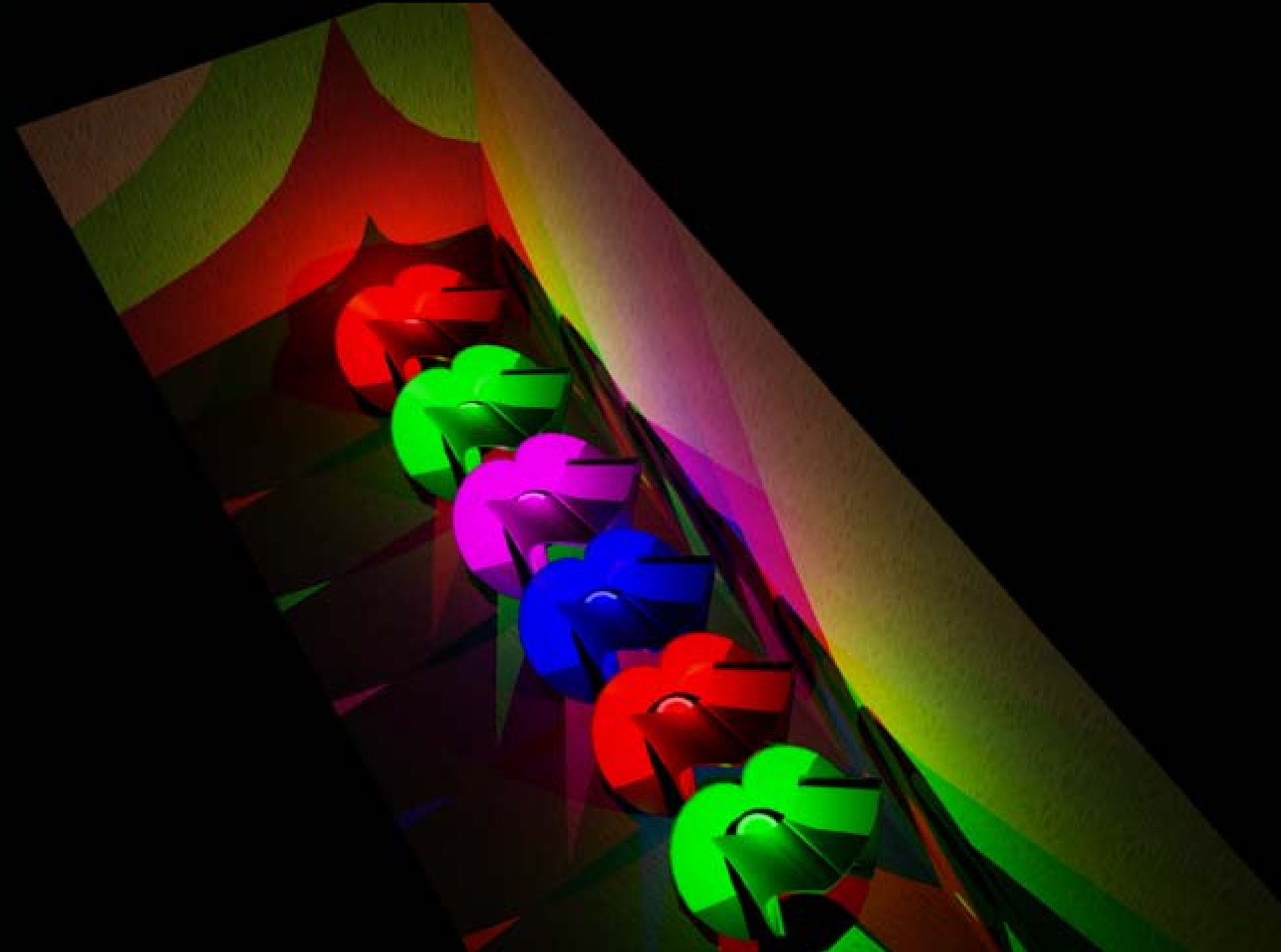


A blue light in a deeper box. It creates a somewhat SPOOKY EFFECT.



A 2 by 2 arrangement

An arrangement of several lights in a row in different colours. This is an experiment to see HOW DIFFERENT COLOURS BLEND TOGETHER and how the light and shadow SHAPES TESSELATE created by a pod.



An arrangement of white lights in a straight line but all rotated about the line to show a GREAT VARIATION IN SIZE AND SHAPE of light and shadow projected.



VISUALISATIONS



The product can be used as **A REPRESENTATIVE OF AN EXISTING OBJECT.** The light can be arranged to look like a bouquet of flowers, like white ones!

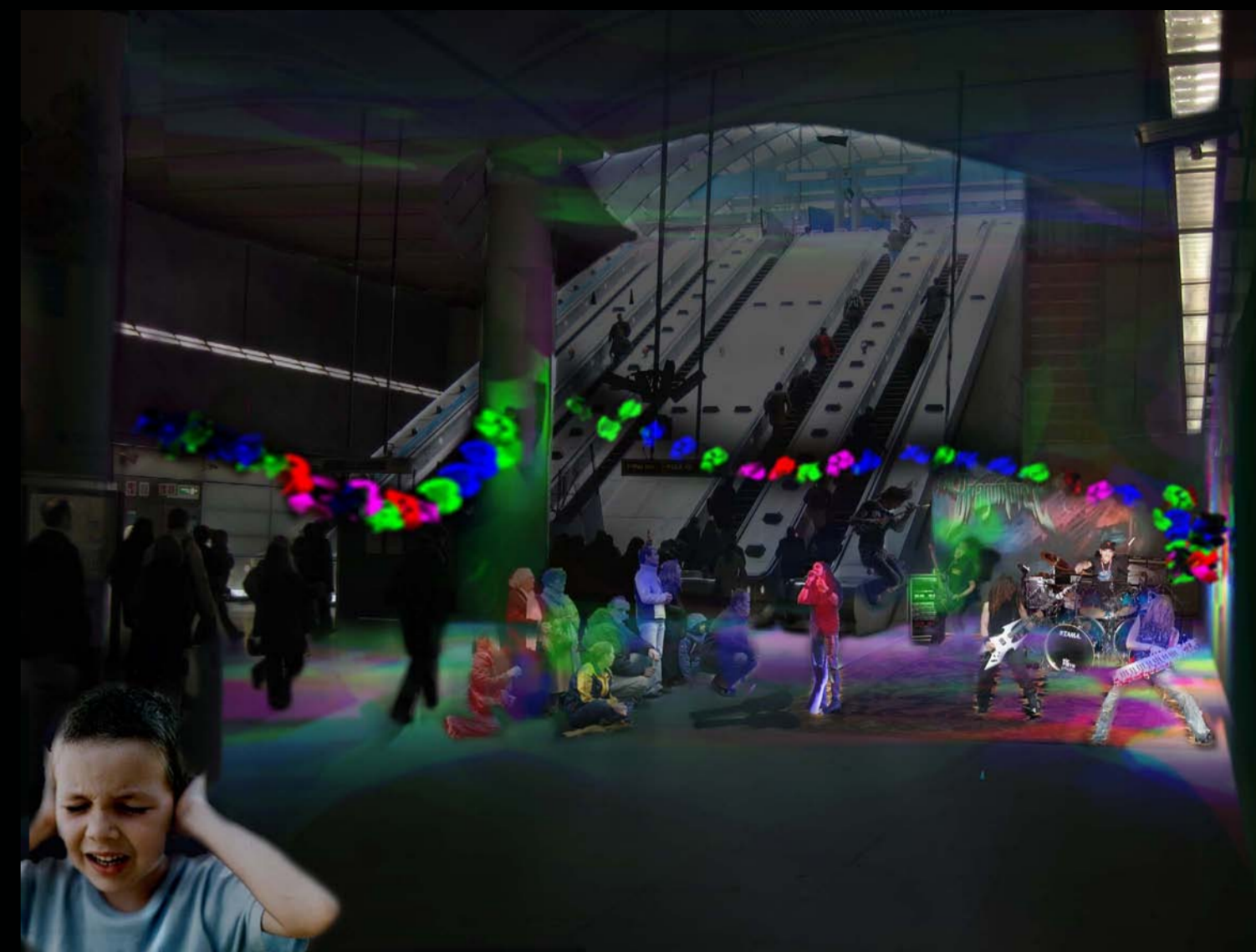


The "white flowers" light arrangement as used in a restaurant. For its purpose, the strength of the light source isn't as strong, but still creates the light and shadow effects on the table cloth and surrounding walls. Owing to its look, it still resembles the traditional centerpiece of real flowers on the table. White is used here to add a **DRAMATIC YET SAFE COMFORTABLE** atmosphere.



Lights can be used separately **DISTRIBUTED ALONG THE LENGTH** of swimming pool walls. This allows a regular swimming pool experience to be transformed into an exciting deep sea underwater type experience. The lights used are several shades of blue and cyan and the **ABSTRACT SHAPES** projected create the realistic deep sea feel to the swimming experience.

The underground test conducted earlier has proved it can be **USED IN A NATURAL UNDERGROUND ENVIRONMENT.** This hypothetical scene of popular power metal band Dragonforce performing a gig at Canary Wharf Underground Station uses **A LARGE ARRAY** of pods to add to the **ENERGETIC ATMOSPHERE.** Several vivid colours + several wild shapes + epic rock sound = an exciting arena like performance.



The blue lighting used in a bedroom, which has **SEXUAL ACTIVITY** going on. The colour, light and shadow effects used adds to the experience. Blue would be used in the situation since according to the psychology research, it is a friendly colour which shows **AN ABILITY TO COMMUNICATE.** It is a colour that would be used when a relationship is only beginning!

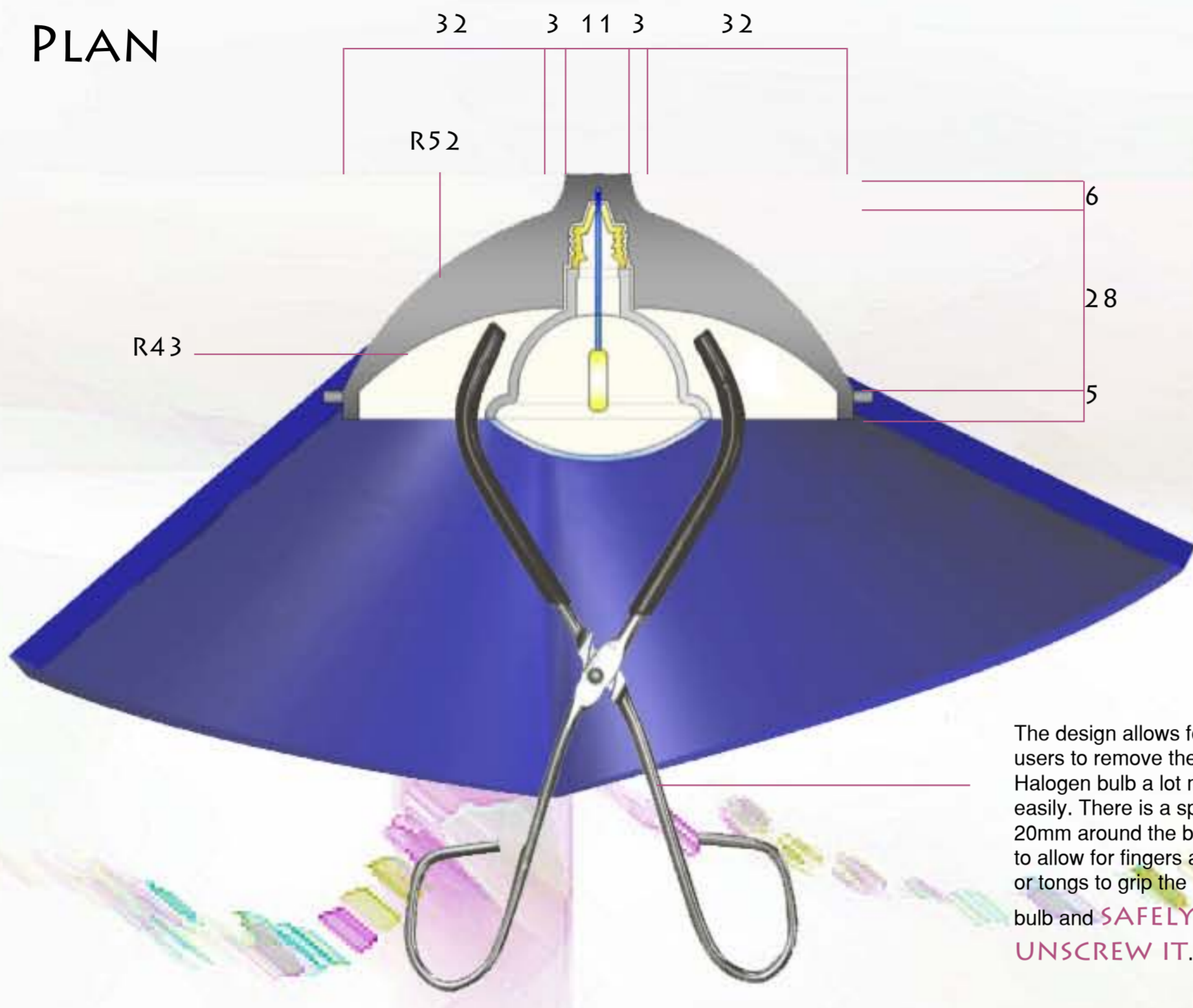


TECHNICAL DRAWINGS

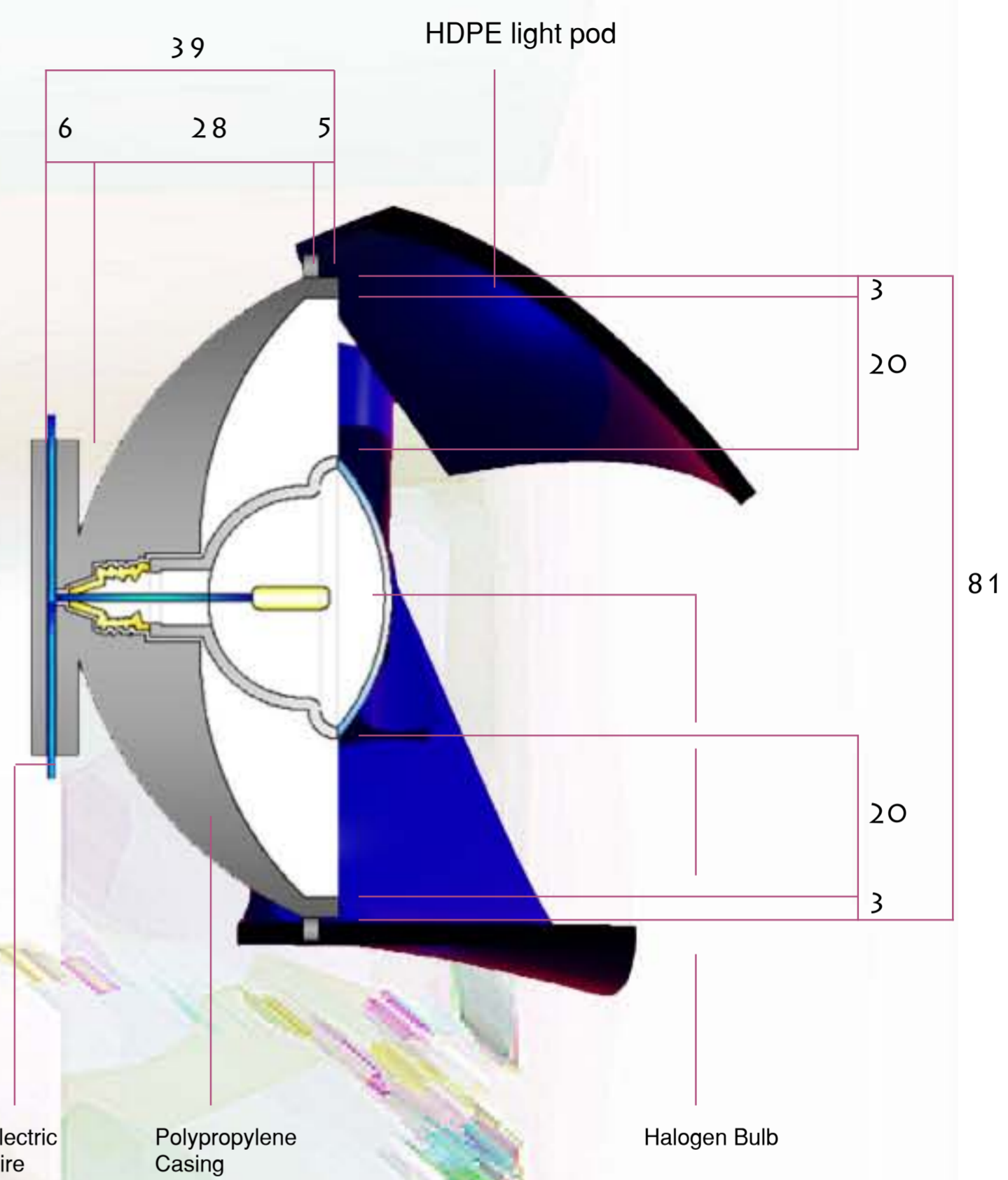
(Not to scale)

Consumers have switched to halogen bulbs to **SAVE ENERGY, MONEY AND TIME**. They burn longer and create purer, whiter light. However, even halogen bulbs eventually burn out and **NEED TO BE REPLACED SAFELY**. Tongs would be needed. This would be the process.

1. Allow the bulb to cool down as touching any hot bulb may cause severe burns.
2. Using tongs, grab the bulb by the metal ring.
3. Twist the halogen light counterclockwise until it comes out.



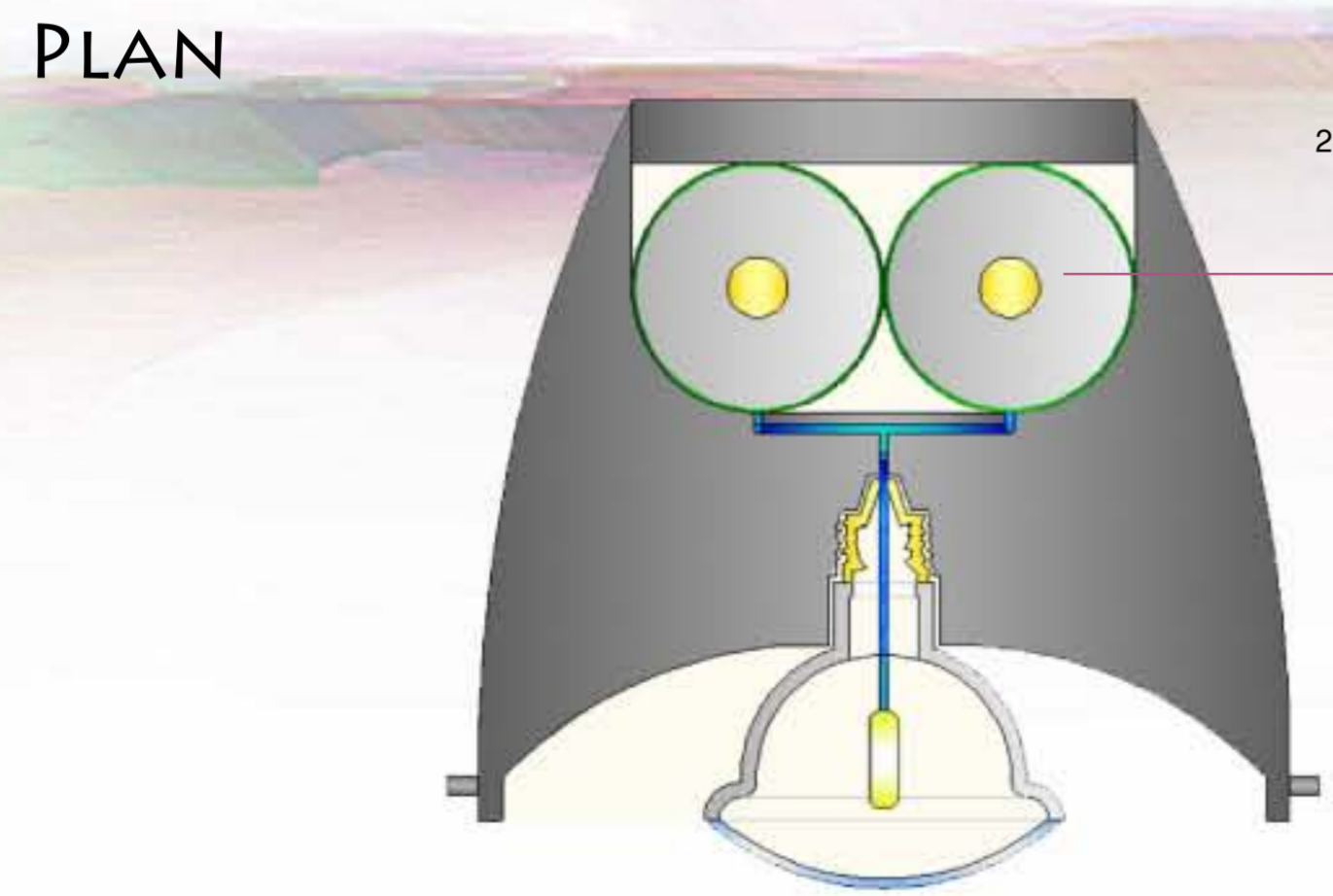
SECTION



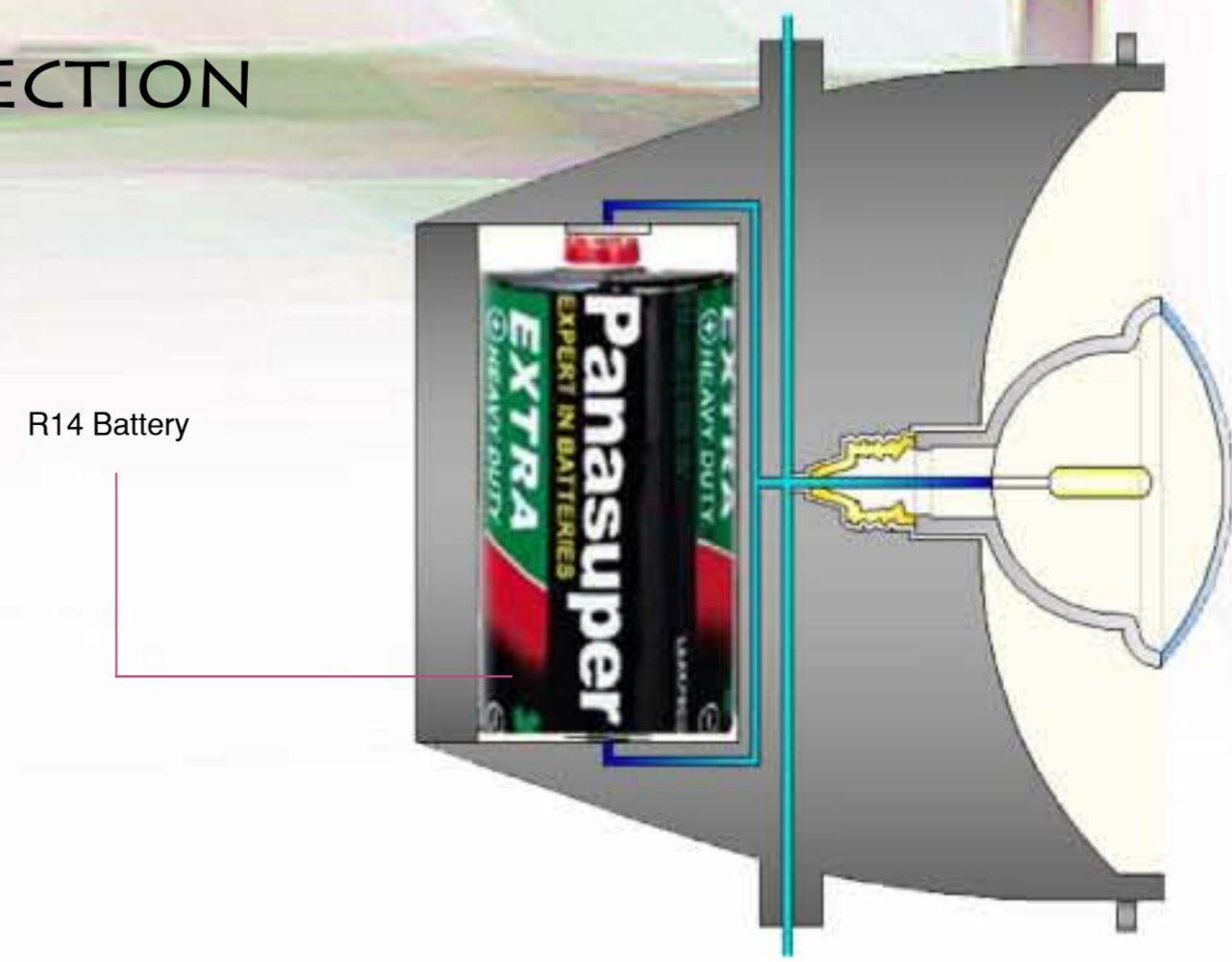
The design allows for users to remove the Halogen bulb a lot more easily. There is a space 20mm around the bulb to allow for fingers and/or tongs to grip the bulb and **SAFELY UNSCREW IT**.

A BATTERY POWERED ALTERNATIVE

If there is a scenario where only one light pod is needed, it may not be necessary to power it with mains electricity. Therefore, a battery powered alternative would combat that problem. But there is still always the opportunity to link one battery powered pod with others. Most battery powered lights take 2 No. R14 Size batteries to emit a good level of power, so therefore the alternative design.



SECTION



MATERIALS

HDPE

- Commonly recycled
- Stronger intermolecular forces and
- TENSILE STRENGTH**
- Only requires Carbon and Hydrogen to make!
- High melting point
- Other uses; milk jugs, Chemical-resistant piping systems, modern hula hoops
- **CORROSION PROTECTION** for steel pipelines

HDPE is commonly recycled, and has the number "2" as its recycling symbol.

PROPERTIES OF HDPE

HDPE has little branching, giving it stronger intermolecular forces and tensile strength than lower-density polyethylene. The difference in strength exceeds the difference in density, giving HDPE a **HIGHER SPECIFIC STRENGTH**. It is also harder and can **WITHSTAND HIGHER TEMPERATURES**. High-density polyethylene, unlike polypropylene, cannot withstand normally-required autoclaving conditions. The lack of branching is ensured by an appropriate choice of catalyst (e.g., Ziegler-Natta catalysts) and reaction conditions. HDPE contains the chemical elements carbon and hydrogen.

LIGHTING PRECEDENT



"The Mummy Vessel Light" by Marcel Sigel

PP

(PolyPropylene)

To make the casing for the light source, polypropylene would be the material to use.

It is a thermoplastic polymer and used in a **WIDE VARIETY OF APPLICATIONS**, including packaging, textiles (e.g. ropes, thermal underwear and carpets), stationery, plastic parts and reusable containers of various types, laboratory equipment, loudspeakers, automotive components, and polymer banknotes. An addition polymer made from the monomer propylene, it is rugged and unusually resistant to many chemical solvents, bases and acids.

Polypropylene is **COMMONLY RECYCLED**, and has the number "5" as its resin identification code.

MANUFACTURE PROCESSES

BENDING HDPE

HDPE comes in sheets, ranging from 3mm to as much as 30mm. For my project, my pods will need to be formed from flat sheets and bent into shape.



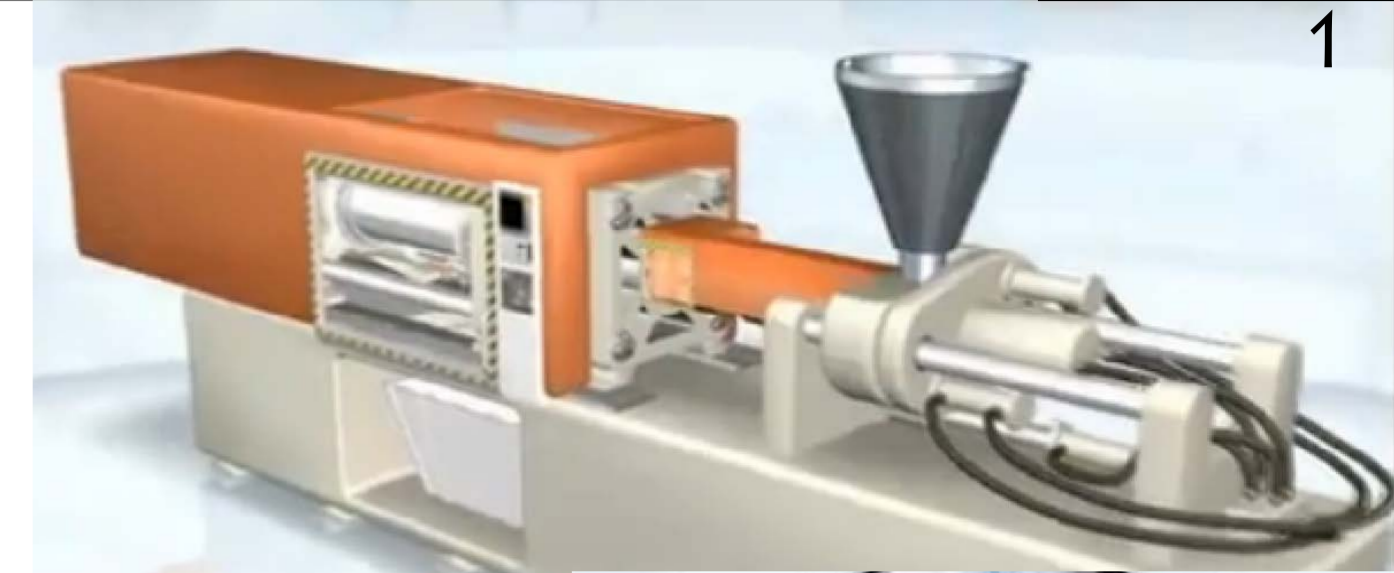
This will be the process...

My method of bending need to be adopted is the implementation of a strip heat bender. This process will **ALLOW FOR THE BENDS OF THE PLASTIC SURFACES IN ANY WAY DESIRABLE**. (Left image: A homemade strip bender, yes, such a thing does exist!)

The plastic sheet is placed on the heating strip **ACCORDING TO WHERE THE BEND IS DESIRED**. As the plastic starts to heat up, it will start to bend on the strip by itself. This will be visible with the eyes. As it softens further, it will start to relax and lie flat. At this point, to user can test the piece for flexibility, but within reason. It shouldn't be overdone since it will cause stress on the material.

After a while, it will bend to a good angle.

This is what would be used to make the coloured light shade. However, to make the light source casing, polypropylene would be needed.



INJECTION MOULDING

Melt processing of polypropylene can be achieved via extrusion and molding. Common extrusion methods include production of melt-blown and spun-bond fibers to form long rolls for future conversion into a wide range of useful products, such as face masks, filters, nappies and wipes. The most common shaping technique is injection molding, which is used for parts such as cups, cutlery, vials, caps, containers, housewares, and automotive parts such as batteries. The related techniques of blow moulding and injection-stretch blow moulding are also used, which involve both extrusion and molding.

For the manufacture of the insulative casing of the light source for my product would use the injection moulding process, which is described as below.

Diagrams taken from - <http://www.youtube.com/watch?v=cANvFsvY0Aw>

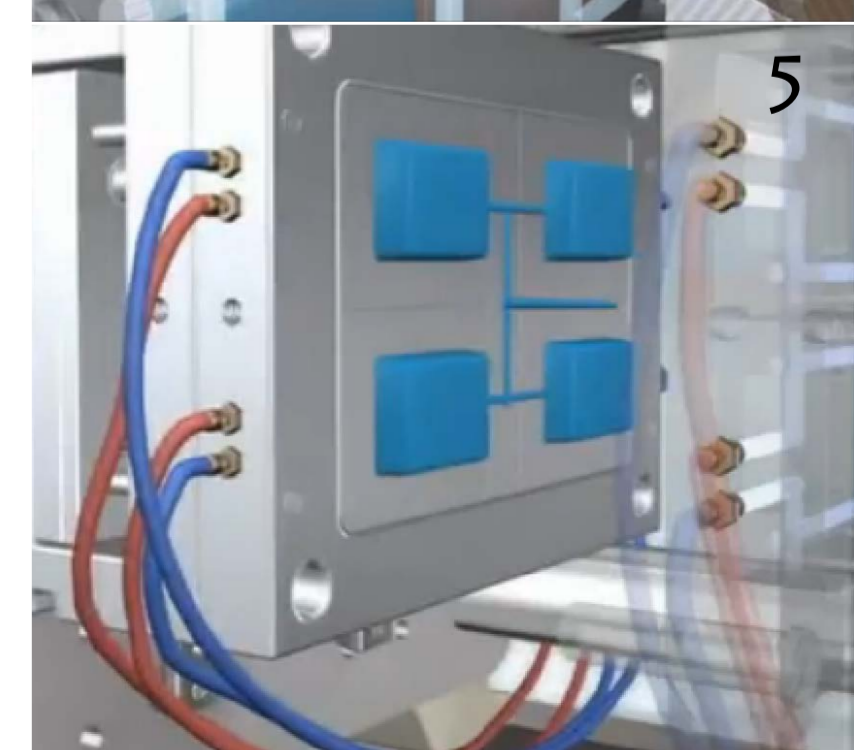
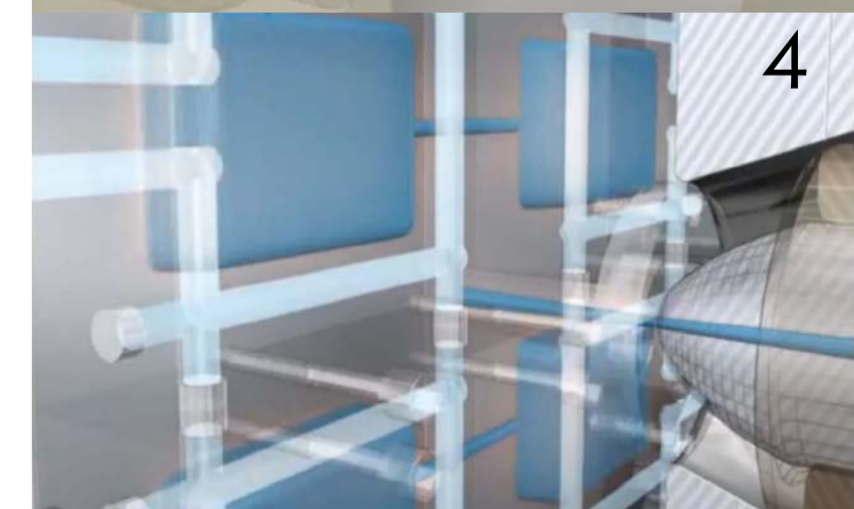
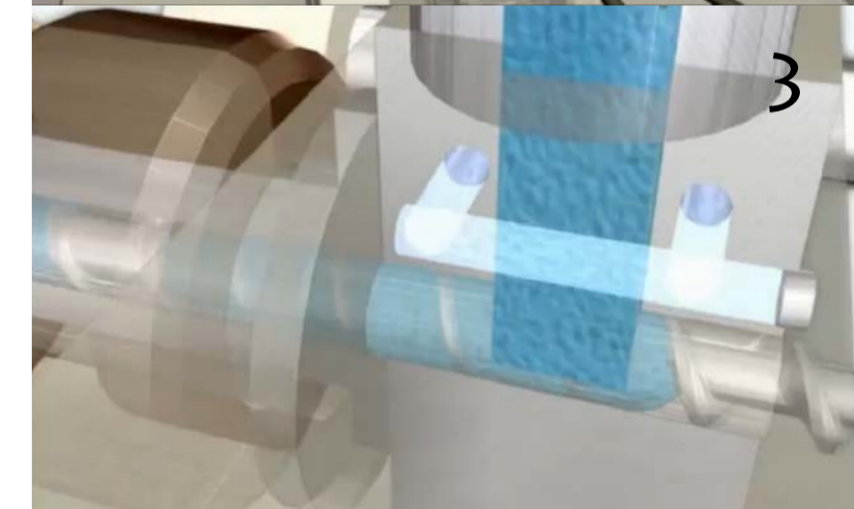
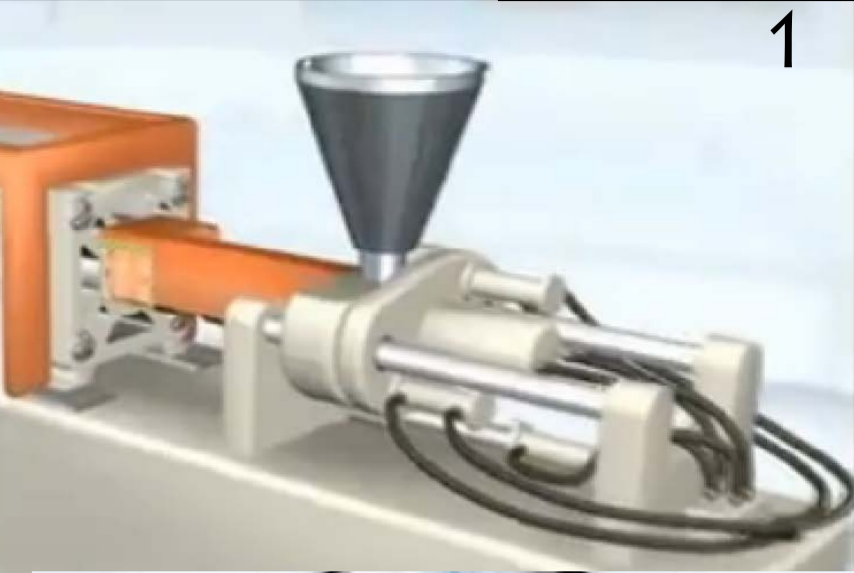
1 Parts needed to be formed via injection moulding are made via a machine.

2 Plastic pellets are fed into the hopper at the top of the machine

3 A screw, which takes the pellets, conveys and melts them within the barrel.

4 The melted plastic is then forced into the closed shape of the mould. The plastic is injected at a small rate at a time, hence the name. The part is formed and the plastic is cooled within the mould.

5 After cooling, the mould is opened and the finished part(s) is ejected from the machine. The cycle is repeated for any other part.



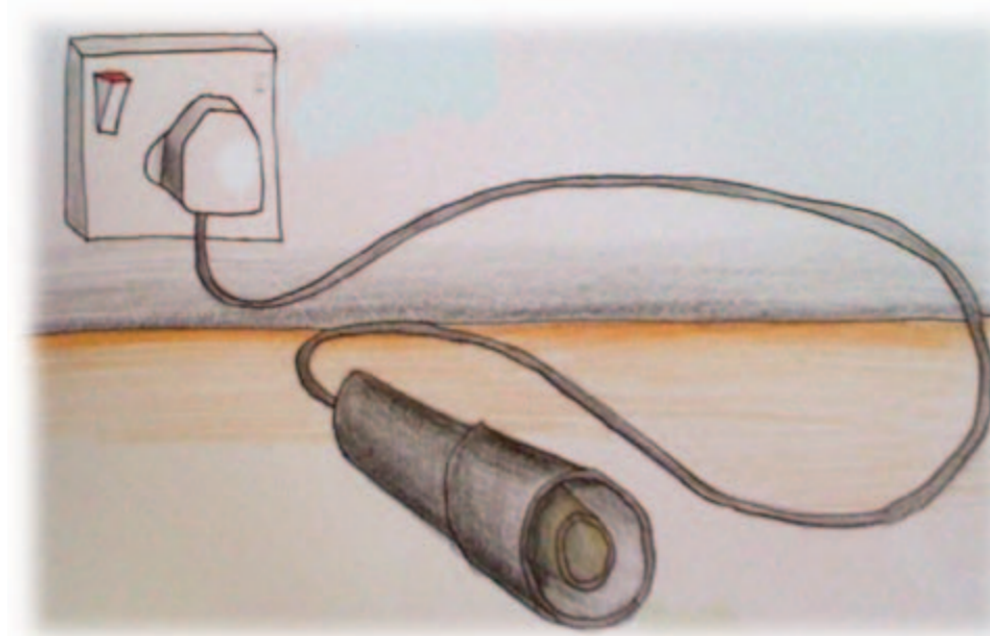
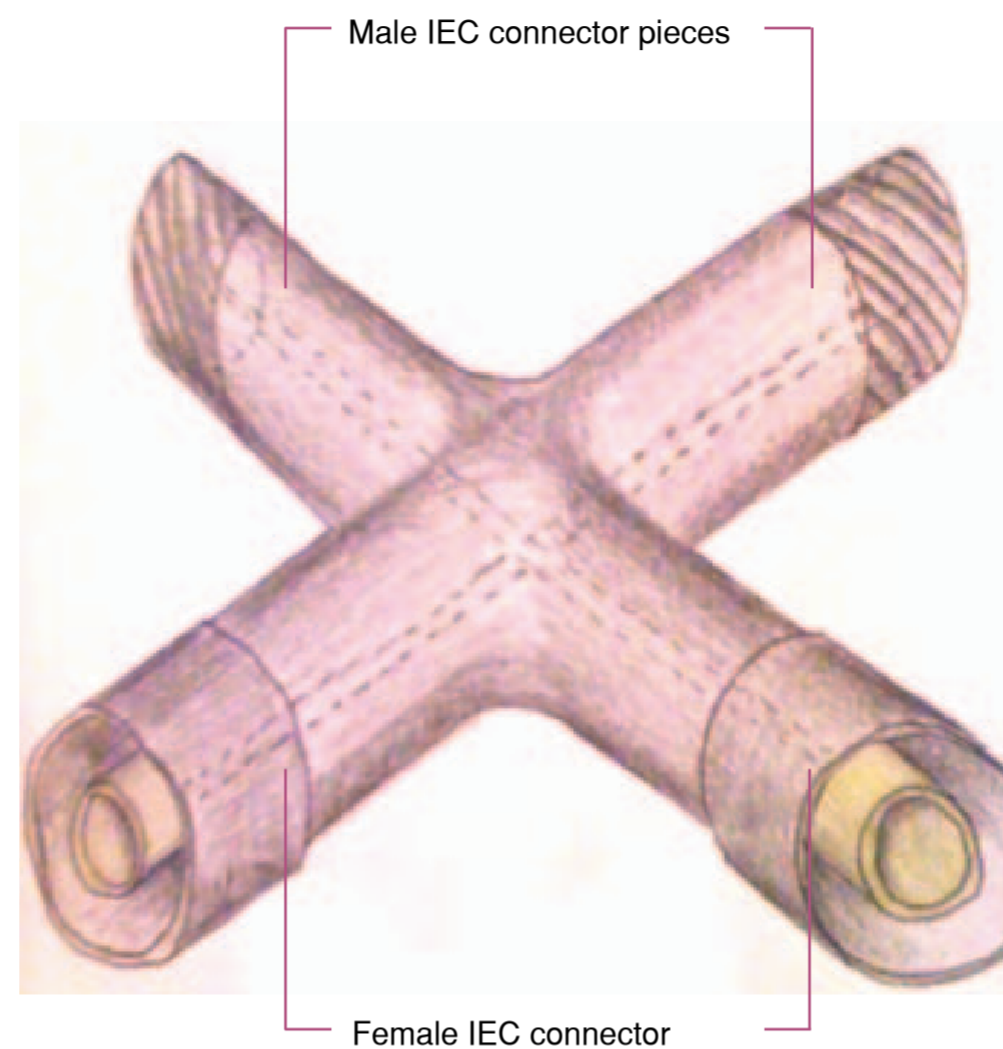
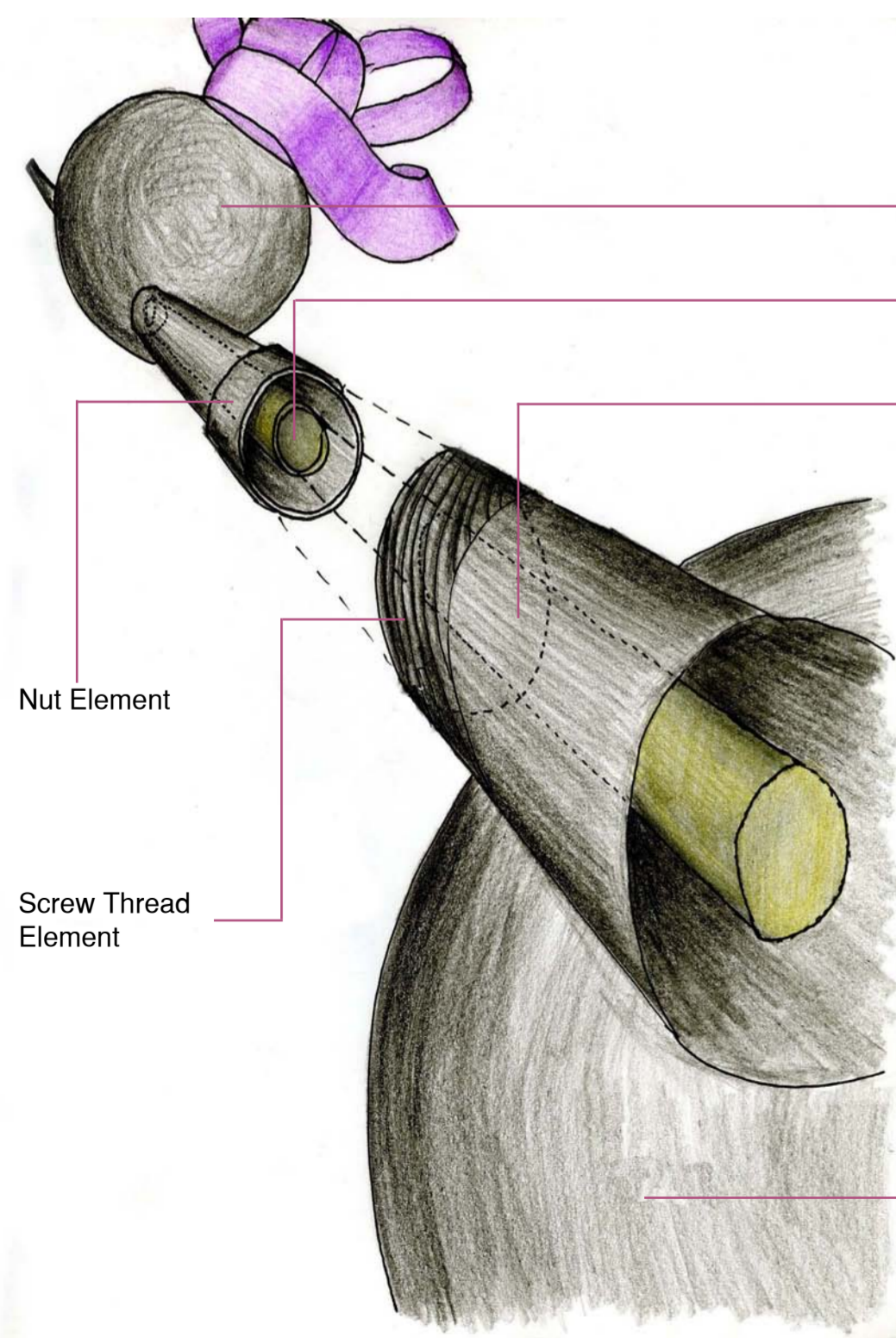


HOW TWO SEPARATE PODS JOIN TOGETHER

Two separate pods are joined by two connection measures. The first measure, which also passes the electric current through the device, consists of an **IEC CONNECTION**, which is used elsewhere in the connection of televisions to other devices.



When the pods join together, the male and female IEC connector pieces, as demonstrated on the diagram to the right, also connect and conduct electricity through. The second measure is a nut and screw element. The nut element can be twisted downwards onto the screw thread to ensure that the two light pods remain **SECURELY AND TIGHTLY FASTENED**.



ACCESSORIES

4 - Way chain disperser

In order for chains to branch off in **MULTIPLE DIRECTIONS**, this device can be used. Light pods can be connected to this accessory in the same way that light pods fit together.

Solar panel extension

If the light pods' chief consumer use was to be **IMPLEMENTED OUTSIDE**, it would be worth having them **CONNECTED TO A SOLAR PANEL** device.

Plug in transformer cable

The primary way for the light pods to be powered would be via a cable link to an electric socket. This accessory is linked to pods in the same way two separate pods are linked to each other.

Pod chain extension cable

Some might argue that a chain of pods, which are directly next to one another, may be overwhelming and may cause too much light to be shone in one immediate place. Therefore, an extension cable would help to **SPREAD OUT THE LIGHT** to avoid an area looking overcrowded with light. Some environments may call for lights to be spread out according to **PERSONAL PREFERENCE**.

