

**DESIGNING UTILITY & DÉCOR ARTICLES
FOR RESIDENTIAL SPACES
BY REUSING PLASTIC WASTE**

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Designing Utility & Décor Articles for Residential Spaces by Reusing Plastic Waste

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Institutional Ethics
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Research
(IECHR)

FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Ethical Compliance Certificate 2022-2023

This is to certify that **Ms. Roshni Sahani's** study titled, **Designing Utility & Décor Articles for Residential Spaces by Reusing Plastic Waste** has been approved by the Institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda. The study has been allotted the ethical approval number IECHR/FCSc/M.Sc./2022/04.

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VADODARA**

CERTIFICATE

This is to certify that the thesis entitled **“DESIGNING UTILITY AND DÉCOR ARTICLES FOR RESIDENTIAL SPACES BY REUSING PLASTIC WASTE”** submitted for partial fulfilment of the requirement for the Degree of Masters in the Faculty of Family and Community Sciences (Family and Community Resource Management) to The Maharaja Sayajirao University of Baroda, carried out by Ms. Roshni Sahani, is her original bonafide work.

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INTRODUCTION

CHAPTER I

INTRODUCTION

“Recycling more plastics can help local businesses and expand jobs while supporting the goals of sustainability.”

- **Kevin de Leon (2013)**

Plastic waste is ‘the accumulation of plastic objects.’ ‘The Earth’s environment that adversely affects wildlife, wildlife habitat, and humans.’ (Chauhan, 2020)

According to Collins Dictionary (1979):

“Plastic is a material produced from oil by a chemical process and used to make many objects. It is light in weight and does not break easily.”

Plastics are a wide range of synthetic or semi-synthetic materials that use polymers as the main ingredient. Their plasticity makes it possible for plastics to be moulded, extruded, or pressed into solid objects of various shapes. This adaptability, plus a wide range of other properties, such as being lightweight, durable, and inexpensive to produce, has led to its widespread use. Plastics typically are made through human industrial systems. Most modern plastics are derived from fossil fuel-based chemicals like natural gas or petroleum; however, recent industrial methods use variants made from renewable materials, such as corn or cotton derivatives. ^[1]

The success and dominance of plastics started in the early 20th century that caused widespread environmental problems, due to their slow decomposition rate in natural ecosystems. Toward the end of the 20th century, the plastics industry promoted recycling in order to ease environmental concerns while continuing to produce virgin plastic and to push the responsibility of plastic pollution onto the consumer. Plastic collection and recycling are largely ineffective because of failures of contemporary complexity required in cleaning and sorting post-consumer plastics for effective reuse. Most plastic produced has not been reused, either being captured in landfills or persisting in the environment as plastic pollution. Plastic pollution can be found in all the world's

major water bodies, for example, creating garbage patches in all the world's oceans and contaminating terrestrial ecosystems. Of all the plastic discarded so far, 14% has been incinerated and less than 10% has been recycled. (Hopewell et al., 2014)

In developed economies, about a third of plastic is used in packaging and roughly the same in buildings in applications such as piping, plumbing or vinyl siding. Other uses include automobiles (up to 20% plastic), furniture, and toys. In the developing world, the applications of plastic may differ; 42% of India's consumption is used in packaging. In the medical field, polymer implants and other medical devices are derived at least partially from plastic. Worldwide, about 50 kg of plastic is produced annually per person, with production doubling every ten years. (Chauhan et al., 2019)

The world's first fully synthetic plastic was Bakelite, invented in New York in 1907, by Leo Baekeland, who coined the term "plastics". Dozens of different types of plastics are produced today, such as polyethylene, which is widely used in product packaging, and polyvinyl chloride (PVC) used in construction and pipes because of its strength and durability. [2]

1.1 Types of plastic

Plastic Resin Identification Codes						
 PETE	 HDPE	 PVC	 LDPE	 PP	 PS	 OTHER
Polyethylene Terephthalate	High-Density Polyethylene	Polyvinyl Chloride	Low-Density Polyethylene	Polypropylene	Polystyrene	Other
<p>Common products: soda & water bottles; cups, jars, trays, clamshells</p> <p>Recycled products: clothing, carpet, clamshells, soda & water bottles</p> 	<p>Common products: milk jugs, detergent & shampoo bottles, flower pots, grocery bags</p> <p>Recycled products: detergent bottles, flower pots, crates, pipe, decking</p> 	<p>Common products: cleaning supply jugs, pool liners, twine, sheeting, automotive product bottles, sheeting</p> <p>Recycled products: pipe, wall siding, binders, carpet backing, flooring</p> 	<p>Common products: bread bags, paper towels & tissue overwrap, squeeze bottles, trash bags, six-pack rings</p> <p>Recycled products: trash bags, plastic lumber, furniture, shipping envelopes, compost bins</p> 	<p>Common products: yogurt tubs, cups, juice bottles, straws, hangers, sand & shipping bags</p> <p>Recycled products: paint cans, speed bumps, auto parts, food containers, hangers, plant pots, razor handles</p> 	<p>Common products: to-go containers & flatware, hot cups, razors, CD cases, shipping cushion, cartons, trays</p> <p>Recycled products: picture frames, crown molding, rulers, flower pots, hangers, toys, tape dispensers</p> 	<p>Common types & products: polycarbonate, nylon, ABS, acrylic, PLA; bottles, safety glasses, CDs, headlight lenses</p> <p>Recycled products: electronic housings, auto parts,</p> 

Figure 1: Plastic resin identification codes [3]

- i. Polyethylene Terephthalate (PET or PETE):** PET is also known as a wrinkle-free fiber. It is different from the plastic bag that we commonly see at the supermarket. PET is mostly used for food and drink packaging purposes due to its strong ability to prevent oxygen from getting in and spoiling the product inside. It also helps to keep the carbon dioxide in carbonated drinks from getting out. Although PET is most likely to be picked up by recycling programs, this type of plastic contains antimony trioxide—a matter that is considered a carcinogen capable of causing cancer in living tissue. (Ishaiba, 2015)
- ii. High-Density Polyethylene (HDPE):** Compared to the other types, HDPE has long virtually unbranched polymer chains which makes them dense and thus, stronger, and thicker than PET. HDPE is commonly used in grocery bags, opaque milk bags, juice containers, and medicine bottles. Not only recyclable, but HDPE is also relatively more stable than PET. It is considered a safer option for food and drink. (Ishaiba, 2015)
- iii. Polyvinyl Chloride (PVC):** PVC is typically used in toys, blister wrap, cling wrap, detergent bottles, blood bags and medical tubing. PVC used to be the second most widely used plastic resin in the world (after PET). In term of toxicity, PVC is considered the most hazardous plastic. The use of it may leach a variety of toxic chemicals such as lead, dioxins, mercury, and cadmium. Several of the chemicals mentioned may cause cancer; they could also cause allergic symptoms in children and disrupt the human hormonal system. PVS is also rarely accepted by recycling programs (Ishaiba, 2015)
- iv. Low-Density Polyethylene (LDPE):** Polyethylene is the most used family of plastics in the world. This type of plastic has the simplest plastic polymer chemical structure, making it very easy and very cheap to process. LDPE polymers have significant chain branching including long side chains making it less dense and less crystalline (structurally ordered) and thus a generally thinner more flexible form of polyethylene. LDPE is mostly used for bags, plastic wraps, coatings for paper milk cartons and hot & cold beverage cups, food storage containers, container lids. Also used for wire and cable covering. Although some studies have shown

that LDPE could also cause unhealthy hormonal effects in humans, it is considered as a safer plastic option for food and drink use. (Ishaiba, 2015)

- v. **Polypropylene (PP):** Stiffer and more resistant to heat, PP is widely used for hot food containers. Its strength quality is somewhere between LDPE and HDPE. Besides in car parts, PP is also included in the disposable diaper and sanitary pad liners. Same as LDPE, PP is considered a safer plastic option for food and drink use. And although it bears all those amazing qualities, PP is not quite recyclable and could also cause asthma and hormone disruption in human. (Ishaiba, 2015)
- vi. **Polystyrene (PS):** Polystyrene is the Styrofoam commonly used for food containers, egg cartons, packaging, and bike helmet. When exposed with hot and oily food, PS could leach styrene that is considered as nervous system toxicant. It could also affect lungs and immune system. PS has a low recycling rate. (Ishaiba, 2015)
- vii. **Other (Mix plastics):** It includes all plastics other than those identified from above mentioned plastic and plastics that may be mixed with other types of plastics, such as bioplastics. Polycarbonate (PC) is the most common plastic in this category. PC is also known by various name: Lexan, Makrolon, and Makro clear. Ironically, PC is typically used for baby bottles, water bottles, water gallon, metal food can liner, and dental sealants. Due to its toxicity, several countries have banned its use. PC have been linked to numerous health problems including chromosome damage in female ovaries, early onset of puberty, and various behavioural changes. It has also been linked to altered immune function, impaired brain and neurological functions, obesity, increased risk of breast cancer, prostate cancer, infertility, and metabolic disorders. It has very low recycle rate. (Ishaiba, 2015)

1.2 Utilization of plastic waste

While plastic is durable, this also means plastic waste can be trapped in our environment for centuries, if not managed well. While plastics deteriorate into fragments easily through wear and tear, their polymer chains only break down into other smaller components at very high temperatures, such as during some chemical recycling processes. However, in current scenarios only 15% of plastic waste is recycled. The world still largely operates on the 'linear economy' model - sometimes known as 'take-make-discard' - where materials are used to manufacture products, only to be disposed of at the end of their short timelines. Transitioning to a more sustainable model is not rocket science if we can remember the 3R: Reduce, Reuse, and Recycle. [4]

- **Reducing** overall consumption is about respecting natural resources, only using what is needed, and refusing unnecessary excess.
- **Reuse** is key to increasing the lifespan of the things we use; this includes repairing or upcycling items to give them a new lease on life.
- **Recycling** the waste is key to closing the loop in a circular economical model.

This study focused on the reuse of plastic waste. There were tons of easy and creative ways to reuse some of the plastic items. Reusing was the way toward transforming plastic waste into new and usable items. Many studies solved the problem of the accumulation of waste in the place of its origin. Usually, large amounts of this waste end up in dumps every day with the highest environmental impacts (Andrea et al., 2018). The reuse of plastic was not only beneficial for the climate but also, very helpful for the plastic industry. Through the reusing of plastic, many reused items were created which were harmless to the ecosystem. Reusing plastic helped to develop and save energy and reduce pollution. [4]

Plastic waste can often be turned into new products such as recycled furniture, utility, and décor articles for interior spaces. Plastic waste is frequently transformed into new items, for example, reused plastic planters. Plastic waste has many uses and therefore is an incredible reuse material. The more plastic waste is used, the less it ends up in dumps. It

reduces the costs of processing materials and is cheaper for producers to use reused materials during the production of products. New opportunities can be obtained with the increment of reusing or utilizing reused materials. The advantages of plastic waste are it is cheap, convenient, durable, lightweight, and has a long lifespan. [4]

1.3 Utility articles

Utility is a term in economics that refers to the total satisfaction received from consuming a good or service. Economic theories based on rational choice usually assume that consumers will strive to maximize their utility. Utility articles are items or equipment that are not usually essential, but which can be used with or added to something else in order to make it more efficient, useful, or decorative. Utility Articles are items which are easy to replace and easy to move, and include almost any items that are not strictly functionally necessary in a decorated space. Their placement gives an atmosphere of personalization, reflecting the owner's taste. Utility articles vary according to the size and shape of the space, the owner's living habits, hobbies, tastes, and their financial situation. [5]

1.4 Décor articles

Décor comes from the French word *décorer*, meaning "to decorate." In its widest sense, 'decoration' refers to the process of making something more attractive. It can be referred to as 'interior decoration' or 'décor' and can be done by arranging and placing of décor articles that relate to the aesthetics of a space. In the construction industry, decoration refers to the 'dressing' of a room or interior space. The purpose of decoration is to make the space more aesthetic and functionally useful for the occupants, but this may include consideration of wider contextual issues such as fashion, culture, and so on. In a domestic context, decoration is something that may be undertaken by the homeowner or by hiring tradespeople. On higher-value projects, a professional may be responsible for designing decorations, and sometimes their role will extend beyond this to include the layout and use of the space. [6]

Natural fibre and eco-friendly products in Indian handicrafts is an art of creating crafts by hand in India named Indian handicrafts, in ancient India

people lived in colonies known as tribal and they used to create utility things for their daily needs, that art of creating the crafts is known as handicrafts, and the things known as handicrafts product. The utilization of plastic products has considerably and profoundly changed the structure of material research. Some of the advantages of using plastics include high resistance to corrosion, high flexibility, and low manufacturing cost. With the remarkable development of industrial society, the production of plastic waste has been an overwhelmingly growing domain. Plastic as a material is generating environmental problems throughout its entire life cycle. First, to produce plastic products, greenhouse gas emissions are generated. Second, the characteristics that consider plastic so useful materials also make waste management problematic, and presently, only a small fraction of plastic waste is recycled due to contamination and technical limitation. Third, there is a considerable accumulation of plastic waste in the environment. Reusing and repurposing precious waste materials can lead to the creation of amazing and useful items. Instead of dumping these waste items in landfills, a variety of unique and creative ideas might be combined to create something new and beneficial. The concept of plastic waste management has grown in importance during the last decade. Vast amounts of plastic wastes are generated each year as a result of the manufacturing process, and typical reusing technologies are incapable of removing all the waste materials. As a result, a creative and less expensive solution to the plastic waste problem is required. (Saleem et al., 2015)

This study generated theme-based designs for selected utility and décor articles for residential space use, all made from plastic waste. This work may inspire designers and makers to reconsider the use of waste materials in their work, discover the beauty and utility of these materials, and create attractive products, raise awareness of material reuse, and have a positive impact on the environment through a structured design process using the guidelines.

Justification of the study

Plastic is a versatile material. Hence, plastic waste varies widely. Plastics take many decades to break down completely. It does not matter where the plastic is stored or kept; it will still take a long time to degrade. By recycling and reusing plastic raw materials and fashioning them into other products, consumers can effectively reduce plastic space taken up in landfills that can be used for biodegradable materials to save the environment. Plastic waste is a resource that is abundantly available and can be used either for material recycling or energy production, depending on the quality grade. Recycling plastic waste materials help reduce the strain on the finite resources of the earth like natural gas, coal, plastic, and water. By reusing plastic instead of manufacturing the same grade of material every time, plastic footprint can be reduced on dump sites across the globe which helps in reducing environmental pollution and creating wealth and employment and thereby, fostering economic development of the country. Reusing the plastic waste can also help in healing the environment by lessening the damage that is already done. It can also be of great use to hike up the economy of the plastic industry. Reducing and reusing plastics is a sure way to protect our natural resources. However, reusing plastics also means that there is lesser plastic in landfills, rivers, forests, and oceans across the earth.

During the review of literature, the researcher came across various studies conducted on significant use of plastic waste viz; “Utilization of Plastic Wastes for Sustainable Environmental Management: A Review” (Kumar et al., 2021), “Plastic bags – the main culprit in plastic pollution?” (Nguyen, 2020), “Utilization and recycling of end-of-life plastics for sustainable and clean industrial processes including the iron and steel industry” (Devasahayam et al., 2019), “Plastic Waste Utilization as Asphalt Binder Modifier in Asphalt Concrete Pavement” (Alajarmeh et al., 2018), “Plastic Waste Management Scenario in Bangladesh” (Hasan, 2018). From the various studies, it was understood that plastic waste had extremely high potential and were being reused for various purpose. The present study therefore aimed to design and develop utility and décor articles for residential use from the available plastic waste.

The study will contribute to the field of Family and Community Resource Management as it offers interior design subject as a specialization and a diploma course in hotel interiors, as the objective of the study, such as developing theme-based designs for utility and décor articles and cost estimation will provide to be first-hand information for practical applications. The study will benefit other academic institutes offering courses in interior design. The study will be beneficial to the manufacturer and retailer of the plastic industry, as the design developed can be used as an example for reusing the maximum amount of plastic waste to create utility, and décor articles from plastic waste from their outlet. The study will also benefit students of interior design specialization as they can start their own business by designing similar kinds of handicrafts and creative products based on various themes and get them patented.

Statement of the problem

The present study aimed to design and develop utility and décor articles for residential space from plastic waste and to assess opinions of interior designers, students of interior design specialization and homemakers regarding the aesthetic aspects and functional aspects of selected utility and décor articles developed from plastic waste.

Objectives of the study

1. To prepare theme-based design of selected utility and décor articles to be developed from Plastic waste for residential spaces.
2. To assess opinions of interior designers, students of interior design specialization and homemakers regarding the aesthetic and functional aspects of selected utility and décor articles developed from plastic waste for residential spaces through display.
3. To prepare a cost estimate and catalogue for the designed utility and décor articles developed from plastic waste for residential use.

Delimitation of the study

1. The study was limited to those residences and scrap shops who gave plastic waste at minimal cost or free of cost.
2. The study was limited to those who were involved in homemaking and interior designing activity.
3. The present study was limited to those who gave consent to participate in the study.
4. The study was limited to the selected utility and decor articles for residential use namely:

Utility article

- Dustbin
- Hanging light (Pendant)
- Wall light
- Table light
- Laundry basket
- Pen stand
- Bird house
- Newspaper holder
- Ottoman
- Key holder
- Side table
- Coaster
- Stationary organizer
- Wall shelf
- Toothbrush holder
- Wall mounted wine glass holder

Décor article

- Planter
- Hanging pots
- Artificial flower pot
- Himmeli chandelier
- Himmeli wall hanging
- Himmeli ornament
- Painting
- Candle stand
- Vase
- Wall décor artifact
- Artificial sculpture
- Windchime
- Flowers
- Decorative mirror

Note - The development of the products was subjective to the availability of the plastic waste and financial considerations.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

The major areas of related literature, survey, scholarly articles, books, and other sources relevant to issues, areas of research, or theory, providing a description, summary and critical evolution of each work were presented here. In order to make the review clear and understanding the present chapter is divided into the following section:

2.1 Theoretical Orientation

2.1.1 Plastic waste: an overview

2.1.1.1 Sources of plastic waste

2.1.1.2 Classification and plastic waste

2.1.2 Significance and usage of plastic waste

2.1.2.1 Usage of plastic waste

2.1.2.2 Significant benefits of using plastic waste

2.1.3 Processing of plastic waste

2.1.3.1 Re-use

2.1.3.2 Recycling into plastic products

2.1.3.3 Energy generation

2.2 Empirical Studies

2.2.1 Research studies conducted outside India

2.2.2 Research studies conducted in India

Conclusion

2.1 Theoretical Orientation

2.1.1 Plastic waste: an overview

A world without plastics, or synthetic organic polymers, seems unimaginable today, yet their large-scale production and use only dates to ~1950. Although the first synthetic plastics, such as Bakelite, appeared in the early 20th century, widespread use of plastics outside of the military did not occur until after World War II. The ensuing rapid growth in plastics production was extraordinary, surpassing most other man-made materials. Notable exceptions were materials that were used extensively in the construction sector. Plastics' largest market is in packaging, and its growth was accelerated by a global shift from reusable to single-use containers. As a result, the share of plastics in municipal solid waste (by mass) increased from less than 1% in 1960 to more than 10% by 2005 in middle-income and high-income countries. (Geyer et al., 2017)

According to Giddens, et al., (1996),

“Instead of creative destruction, let us think
of sustainable innovation.”

According to European Parliament, Council of the European Union, and European Commission (2008), waste was defined as “any substance or object which the holder discards or intends to or is required to discard”. This same directive defines a hierarchy of waste prevention and treatment methods in order of priority: reduction in production and toxicity, reuse, recycling, and another recovery, including energy and elimination.

2.1.1.1 Sources of plastic waste

Packaging represents the largest single sector of plastics use in India. The sector accounts for 42% of plastics consumption and plastic is the material of choice in nearly half of all packaged goods. Apart from use in packaging, plastics are also extensively used in the consumer products such as furniture and households, building, construction, and in

industrial sectors. However, according to research findings of the National Plastic Waste Management Task Force, packaging constitutes 52% of total India's plastic consumption. This was in line with the consumption pattern of other countries such as the USA and the UK, where packaging exhibits the maximum share in total plastic consumption. After the primary use plastics in packaging, annually 0.93 MT (Megaton) of waste plastics are discarded along with the household waste. Although rag pickers recover a considerable portion of this waste, a huge amount of it either gets soiled with organic matter or not found appropriate for further processing. In India, PE, PP, and PVC dominate the market mainly because of their low cost, chemical structure, physical advantages, and high durability. Polyolefins account for 60% of the total plastic consumption in India.

Annually 1.3 MT (Megaton) of plastic waste is generated in India, which is 36% of total India's plastics consumption. Nearly, 42% of total generated plastic waste is recycled in India. According to the National Plastic Waste Management Task Force (1997), in 2000–2001, more than 5,400 tonnes of plastic waste were generated in India per day.

The lack of biodegradability of commercial polymers, particularly used in packaging, industry, and agriculture, focused public attention on a potentially huge environmental accumulation and pollution problem that could persist for centuries. The disposal of plastic waste has potential harmful effects on the environment and, therefore, the logical method should be used to recover maximum energy to maintain environmental sustainability. (Banerjee & Srivastava, 2014)

2.1.1.2 Classification and plastic waste

Types of plastic waste

The plastic can be distinguished by their recycling symbols with the number used (plate-1), it also shows which kind of plastic was used for what and its recyclability. [7]

- i. Polyethylene Terephthalate (PETE)
 - ii. High-Density Polyethylene (HDPE)
 - iii. Polyvinyl Chloride (PVC)
 - iv. Low-Density Polyethylene (LDPE)
 - v. Polypropylene (PP)
 - vi. Polystyrene (PS)
 - vii. Other (Mix plastics)
- i. **Polyethylene Terephthalate (PET or PETE):** Polyethylene terephthalate which is also defined as PET or PETE is mainly used to manufacture the packaging material for food products such as fruit and drinks, and beverages due to its ability to keep the product from spoiling. It is lightweight, transparent, and available in some colours. They are safer than the rest of the plastic. They are the most used plastic all around the world as have a high strength-to-weight ratio. Polyethylene terephthalate is easily recycled. [7]
 - ii. **High-Density Polyethylene (HDPE):** HDPE stands for high-density polyethylene, which is a thermoplastic polymer. It is mostly used for Hygiene products like plastic bottles, milk jugs, juice containers, shampoo bottles, body wash products, bleach bottles, cutting boards, and piping, and is also used in children's toys. With its lightweight, durability, and malleability, HDPE is a perfect material for injection moulding. It is easily recycled and is quite strong and thick when compared to PET. [7]
 - iii. **Polyvinyl Chloride (PVC):** Polyvinyl Chloride can be defined as PVC it is a "thermoplastic" material. PVC offers a wide variety of applications and advantages across multiple

industries in both rigid and flexible forms. Rigid PVC possesses a high density for plastic, making it extremely hard and generally incredibly strong. PVC is extremely durable and lightweight, making it an attractive material for construction, plumbing, and other industrial applications. PVC is very dense compared to most plastics, readily available, and cheap. And has excellent tensile strength. [7]

- iv. **Low-Density Polyethylene (LDPE):** LDPE's lower density and branched molecules provide it with somewhat different properties. It is resistant to impact (does not break easily), moisture (waterproof), and chemical resistant (can stand up to too many hazardous materials). It is mostly used as bags for groceries, newspaper delivery, dry-cleaning, bread packing, beverage cups, plastic wraps, and so on, plus product overwraps, bubble wraps, and cereal box liners. Plus, there are many industrial and agricultural uses, particularly plastic film, and packaging to protect all sorts of products. They are recycled into film plastic, furniture, plastic lumber, rubbish, and compost bins. [7]
- v. **Polypropylene (PP):** Polypropylene also known as (polypropene), is a thermoplastic polymer used in a wide variety of applications. In simple terms plastic is known for being a tough and rigid material. Polypropylene is plastic that can be used as packaging material, medical supplies, plastic furniture, automotive parts, and plastic films. Polypropylene is one of the foremost common sorts of plastic utilized in the manufacturing process. [7]
- vi. **Polystyrene (PS):** Polystyrene may be a synthetic hydrocarbon polymer made up of the monomer referred to as styrene. It can either be solid or foamed form. Commonly used polystyrene is transparent, hard, and brittle. It is mostly used for Plastic forks, DVD cases, the housing of computers, model cars, toys, rulers, hair combs, disposable cutlery, and bowls, packing materials, and egg cartons. [7]

- vii. **Other (Mix plastics):** Mix Plastic is that plastic which is different from all plastic. It is polycarbonate, polylactide, acrylic, acrylonitrile butadiene, styrene, fiberglass, and nylon. plastic CDs and DVDs, baby bottles, large water bottles with multiple-gall capacity medical storage containers eyeglasses, and exterior lighting fixtures use this type of plastic. It is not very easy to interrupt down these plastics once they are created unless they are exposed to high temperatures. [7]

2.1.2 Significance and usage of plastic waste

Plastic is one of the most popular materials used all around the world. Being used so commonly all over the world, the waste generated from the use of the element is enormous. This waste, if not managed properly, has numerous ill effects on the environment and living beings. Hence, plastic waste management is very important. Plastic waste management refers to managing the plastic waste generated and processing it to make it reusable. Millions of tons of plastic waste are generated every year because of plastic bottles, polythene bags, and other plastic items. Since, plastic is non-biodegradable, reusing it again is one of the alternatives. One challenge is the sorting of plastic waste into different categories for the good quality of the new materials. The need to have efficient plastic waste sorting is therefore very crucial to develop a quality product from the re-using process. [8]

2.1.2.1 Usage of plastic waste

plastic, as a material, is generating environmental problems throughout its entire life cycle. First, to produce plastic products, greenhouse gas emissions are generated. Second, the characteristics that deem plastic so useful also makes waste management problematic, and presently, only a small fraction of plastic waste is recycled due to contamination and technical limitation. Third, there is a considerable accumulation of plastic waste in the environment. Plastic waste has various uses and therefore is an incredible reuse material. Plastic

waste that has been recovered can be turned into a variety of new products. There is a vast array of objects that can be repurposed from waste materials. It may be used in any residential space available in the home, from utility to décor purposes. It can be transformed into a small side table, storage cabinets, paintings, planters, and other pieces of utility décor articles.

2.1.2.2 Significant benefits of using plastic waste

Reduces pollution across ecosystems

Greenhouse gases are a major reason for the increasing pollution levels in our environment. They are the driving factor behind climate change – a pressing issue that the whole world is striving to mitigate today. During the manufacturing of plastics, petroleum is burnt that creates greenhouse gases. Recycling plastic instead of manufacturing it from scratch hence indirectly reduces the emission of hazardous greenhouse gases. Plastic waste besides contaminating land, water, and soil with harmful chemicals, is also responsible for the death of thousands of animals on land, in water and in the sea due to ingestion. Reusing plastic means a reduced quantum of plastic waste. This in turn reduces pollution and saves a lot of animal species crucial to the food chain. ^[9]

Requires less energy and helps conserve natural resources

Manufacturing plastic from scratch requires much more energy compared to producing products from recycled and reused plastic. The energy saved can be used for other important requirements in the economy. Also, the manufacturing process requires natural resources such as water, petroleum, natural gas, and coal as raw materials. Hence, plastic recycling and reusing can save natural resources. ^[9]

Saves fast-depleting landfill space

Landfill sites are fast diminishing. The growing human population means that habitable land is becoming more and more valuable with each passing day. Proper waste management through reusing and recycling plastics can save a significant amount of landfill space. 7.4 cubic yards of landfill space can be saved by recycling 1 ton of plastic. ^[9]

Promotes a sustainable lifestyle

The business greatly impacts the lifestyle of the communities in which they operate. If businesses work along with their internal and external stakeholders towards creating awareness and promoting positive impacts of plastic reuse and recycling, they are bound to bring about a sea change towards environment conservation. ^[9]

2.1.3 Processing of plastic waste

2.1.3.1 Re-use

the Packaging Directive 94/62/EC and the WEEE (Waste Electrical and Electronic Equipment Regulation) Directive 19/2012 defined reuse of waste as any operation by which products or components that were not waste were used again for the same purpose for which they were conceived. ^[10]

Plastics are used in a wide range of applications and some plastic items, such as food packaging, become waste only a short time after purchase. Other plastic items lend themselves to be reused many times over. The re-use of plastic waste refers to instances where there is minimal processing of the waste material or alteration of the original product function.

Plastic versatility combined with durability, strength and cost-effectiveness makes them ideal materials and they offer the most attractive options for varied applications in every facet of human life. The application of plastic has facilitated the

preservation of natural resources, energy conservation, hygiene, and numerous advantages. Plastic has become a natural choice in various applications due to its flexibility, inherent properties, and the fact that these are economical. Plastic has immense advantages when it comes to packaging. Plastics have replaced many conventional packing materials which otherwise would have resulted in deforestation, consumption of many energies, greater transportation cost. Recycling of plastics is an undaunted challenge and task as there are about 10-20 main polymer types and thousands of different resin grades and blends available for commercial application. Reusing plastics is preferable to recycling as it uses fewer resources. (Prahallada et al., 2018)

2.1.3.2 Recycling into plastic products

Direct recycling of plastic waste involves processing the material to manufacture a new solid plastic-based product. There are multiple plastic recycling processes and each one is based on the type of plastic. However, the simplest plastic recycling processes include the following: The first step involves collecting plastic waste from communities. Plastic waste is sorted by its respective types and whether they are recyclable. Then the waste is shredded into flakes. then, the plastic flakes are soaked in hot water to eradicate contaminants. After that plastic is heated to a melting point so that it can be processed into granules. The last step includes pelletizing in which plastic is moulded to form the desired product. (Shanker et at., 2022)

2.1.3.3 Energy generation

Plastics are one type of macromolecule formed by the polymerization process. Plastic waste is a problem that has been taken seriously for environmental pollution, especially

soil pollution. One alternative to handling plastic waste that was being studied and comprehensively developed is converting plastic waste into fuel oil. By this method, two important issues could be overcome simultaneously, namely the issue of plastic waste accumulation and the innovation of fuel oil from plastic waste. (Nugroho et al., 2018)

2.2 Empirical Studies

2.2.1 Research studies conducted outside India

A study was conducted by **Newaj and Masud (2014)** on “Utilization of Waste Plastic to Save the Environment” at Rajshahi University of Engineering & Technology, Rajshahi, Bangladesh. The objectives of the study were to find different sources of plastic waste, to know about all the applications of waste plastic, and to get a green environment by utilizing waste plastic. The research design of the study was descriptive. The study concluded that by the proper utilization of plastic waste in different areas a green environment could be pursued. It also suggested that by proper utilization of this plastic waste nature could be saved and it could be beneficial economically.

Mansour and Subhi (2014) conducted an experimental study on “Reusing waste plastic bottles as an alternative sustainable building material” in the Architecture and ID Department at University of Nizwa, Oman. Different materials and methods were used to conduct the experiments. Findings showed that the block of air-filled bottles showed slightly higher strength than the different types of bottle filling, and was proved to have structural stability with a high factor of safety and could be used as either a partition (in a multi-story building) or a bearing wall for a roof slab, with a factor of safety of 5.8 in a one-story building. The simulated air-filled plastic bottle construction model showed much better thermal insulation properties than the traditional block construction. Findings also showed that using plastic bottles as an infill building material, not only relieved the burden of their waste disposal but was

also an acceptable thermal insulation material, that was structurally stable and achieved environmental awareness.

Friman (2014) conducted a study on “Designing a sustainable product from electronic plastic waste”. The objectives of the study were to show how an environmentally friendly product can be developed starting with the discarded material WEEE Plastic, to design products from WEEE plastic material, and to show how future products can be designed to suit a sustainable society. This research was descriptive research that used a survey method to collect information from the respondents and the tool used was an interview schedule. The respondents of the research were 9 recycling companies and electronic companies. The locale of was Linköping University Linköping, Sweden. The study concluded that in order to develop an environmentally friendly product the specification of requirements should be set in a wider context. Requirements on how the product acted in society, and how it was treated and handled, should be included. Human interaction with the product also played a large role in the design of the products. The study would be helpful for others on how an environmentally friendly product can be developed. 3D designs of the products were the outcome of this study.

Onyango et al., (2015) conducted research with an exploratory research design on the topic of “Effect of Rubber Tyre and Plastic Wastes Use in Asphalt Concrete Pavement”. The study was conducted at The Vaal University of Technology (Vanderbijlpark) and The Tshwane University of Technology (Pretoria) in South Africa. The objective of the study was to optimize the use of recycled wastes in improving the engineering properties of the asphalt concrete mix. The laboratory results showed an increase in viscosity, softening point and stiffness of the binder. The modified asphalt was then used in preparing asphalt mixtures by the Marshall Mix design procedure. The Marshall Stability values for mixes containing 2% crumb rubber and 4% LDPE were found to be 30% higher than the conventional asphalt concrete mix. Findings revealed that the use of recycled plastic and crumb

rubber can be beneficial to the performance of asphalt concrete pavements as well as provide a mean to safe disposal of these non-biodegradable wastes.

Hasan (2018) conducted a study on “Plastic Waste Management Scenario in Bangladesh” at Daffodil International University, Dhaka, Bangladesh. The objectives of the study were to document the poor management scenario of plastic waste, to document the effects of the pollution by plastic waste, to reduce plastic waste in streams to save non-renewable resources and to enable carbon-neutral energy production from waste, and find the major obstacles to decreasing plastic waste in residual waste streams and mixed waste streams. An exploratory research design was used to conduct this study. The finding revealed that in Bangladesh there was no specific national law for plastic waste management or banning plastic, due to this nobody obeyed the rules of plastic dumping, recycling, reuse, or reproduction. The waste management of Bangladesh was poor compared to other countries. In urban areas, though the city corporation fixed the specific areas to dump the waste, there was still a lack of proper plastic waste management. In rural areas, people are not aware of the harmful effects of waste plastic and dump the waste at random spots instead of using dustbins. The findings also showed different ways to manage plastic waste.

Putri et al., (2018) conducted a study on “Plastic waste management in Jakarta, Indonesia: evaluation of material flow and recycling scheme”. The research aimed to evaluate the performance of recovering plastic waste at the source, to identify the amount of plastic waste recycled and plastic waste residue through an MFA, and to propose alternative solutions to improve plastic waste management in Jakarta. The locale of the study was Jakarta, Indonesia. This research was descriptive research that used an interview schedule method to collect information from the respondents. The respondents of the research were 5 municipalities from Jakarta selected using a purposive sampling technique. The study concluded that two methods of plastic

waste recovery at the source, scavenging and waste banks were evaluated. Scavengers recovered more plastic waste than waste banks in terms of the amount of plastic recovered per month. The difficulties hindering the performance of waste banks included that they rely heavily on client participation, which can cause problems if waste banks lack clients to fulfil their intermediate waste quota or had unstable waste input from clients. The recycling scheme in Jakarta was evaluated using an MFA. In Jakarta, 24% of plastic waste was recycled, leaving 76% of plastic waste as residue in landfills or the environment. There were several steps that can be taken in Jakarta to increase recycling rates.

d'Ambrières (2019) conducted a study on the topic “Plastics recycling worldwide: current overview and desirable changes” in Germany. The objectives of the study were to document the current situation: complexities and disparities in plastic waste management., to find answers to why people should accelerate plastic recycling and find ways to accelerate plastic recycling. Findings concluded that from the environmental and socioeconomic standpoints, the best answer to the problem of how to manage waste plastic was to recycle it. The findings also showed that the Supervisory body was needed to help create promising frameworks for this industry to flourish, encouraging eco-design, separated collection, and the inclusion of recycled plastic in products. It was also found that consumer pressure on brands was determining, as companies worried about losing significant market share because of actions such as boycotts. Citizen engagement and awareness of environmental problems were sufficient to force manufacturers to act.

A study was conducted by **Alajarmeh et al., (2019)** on “Plastic Waste Utilization as Asphalt Binder Modifier in Asphalt Concrete Pavement”. It aimed to study the ability to use recycled plastic waste as a low-cost asphalt binder modifier to improve the performance of asphalt roads as well as to extend their service life. The study was conducted at the World Academy of Science, Engineering and Technology, Turkey. In

order to evaluate the plastic waste modified (PWM) asphalt mixtures, the OBC for the conventional asphalt mix was first identified, and then different percentages of crushed plastic waste by weight of the identified Optimum Binder Content (OBC) were tested. Findings revealed that a PWM content of 7.43% by weight of OBC was recommended as the optimum PWM content needed for enhancing the performance of asphalt mixtures. Asphalt mix modified with 7.43% PWM by OBC % significantly enhance stability by 42.56%, flow by 89.91%, and strength by 13.54%. This improvement was explained by the enhanced adhesion developed between asphalt and plastic waste-coated aggregates caused by the intermolecular bonding which improves asphalt mix strength. This was reflected in the enhanced durability and stability of the asphalt mix which led to enhancing pavement resistance to fatigue cracking and rutting or permanent deformation.

Mercadé (2020) conducted a study on “Plastic Reuse Innovation”. The objectives of the study were to understand and present the big picture of the global Plastic waste problem, to identify Plastic waste-related innovation opportunities by reusing the waste Plastic, and to present recommendations and follow-up actions to serve as orientation or inspiration for further researchers, organizations, entrepreneurs, or any interested readers. This research was descriptive research that used a survey method to collect information from the respondents by using questionnaires. The respondents of the research were 120 people from different nations selected via a simple random sampling technique. The locale of the study was Chicago, Illinois, United States. Results indicated that broad and complex issue based on 3 steps (Collection, Separation, and Conversion) were currently gaining importance globally and where social implication and awareness was needed for innovation at all levels, the need to implement responsible, friendly, and effective methods in regions and areas where poor or no collection was taking place. It was also found that mixed Plastics cannot be effectively processed, so more research and effort were needed to

improve this, both on traditional recycling, WtE (technology) solutions, and others. The findings also revealed that a lack of social awareness of Plastic reuse and waste management presents a great opportunity for action and innovation.

Kennedy et al., (2020) conducted a study on “Public opinion surrounding plastic consumption and waste management of consumer packaging”. The objectives of the study were to develop and implement research to understand the public’s awareness of the issue, current behaviours around usage and recycling, and attitudes toward Plastics and to identify possible solutions for Plastic waste management and understand the perceived responsibilities of different entities. This research was exploratory research that used a survey method to collect information from the respondents’ using questionnaires. The probability sampling technique was used to select a sample size of 1098 adult residents (age18+) of the U.S. The findings showed that among environmental concerns, pollution from Plastic waste was ranked in the middle, behind water pollution, air pollution, and climate change, and ahead of loss of forests, loss of habitat, and population growth. It also revealed that there was a strong belief that Plastics have negative impacts, especially on the oceans and marine life. The finding also indicated that 11% of Americans recycled none of their Plastic household waste and 33% recycled a little or some, with availability and uncertainty of what was accepted as the top reasons for not recycling more. Lack of access to recycling was greatest in non-metro areas where more than one-quarter reported no access.

A study was conducted by **Nguyen (2020)** on “Plastic bags - the main culprit in plastic pollution?”. The objective of the study was to find out Plastic bags’ contribution to environmental pollution and to identify consumers’ perception towards Plastic bags. An exploratory research design was used to conduct this study and the target audience was professional readers and academic readers. The finding showed that Plastic bags being the main problem in Plastic pollution has a weak foundation. It was determined that using paper bags to replace Plastic

bags was not a sustainable approach and that PE bags and biodegradable bags might have had the same impact on plants. It also indicated that the reduction of Plastic bags used would lead to environmental improvement was a misbelief. The findings suggested that PE waste could be recycled into industrial energy. It was also found that the public information was lacking, hence, led to the misbelief that governments' policies were enough to help the environment and providing a dangerous mindset to consumers that they had done enough.

Chamas et al., (2020) conducted a literature study on "Degradation Rates of Plastics in the Environment". The aim of the study was to present an overview of Plastics degradation pathways in the environment, to summarize current knowledge about degradation rates for different types of commodity Plastics under various environmental conditions and to document various methods to stimulate polymer degradation. The study was conducted in California, United States. Exploratory research design was used to collect information. The study focused to describe the times needed for various plastics to degrade in the environment. The finding revealed that Each year, 400 Mt (Metric tonne) of Plastic waste was generated, of which 175 Mt entered landfills and the natural environment. It was also found that the literature on Plastic degradation under environmental conditions was disproportionately thin. Larger molecules, as well as micro- and nanoscale plastics with a higher bioavailability and associated potential negative effects on ecosystems throughout the food web, may be among the many degradation by-products. Findings also showed that studies on Plastic degradation often omit key information, such as the temperature, microbial loading, and the size and shape of the sample, which were essential to interpret the results properly. It also showed that the SSSDR (the specific surface degradation rate) method only measured how much material, or mass, was lost from the sample. Therefore, neither structural changes nor the extent of the mineralization of Plastics could be addressed using SSSDR alone.

2.2.2 Research studies conducted in India

Siddiqui and Pandey (2013) conducted a study on “A Review of Plastic Waste Management Strategies”. The objective of the study was to review different waste management technology for plastic waste. The research design used was explanatory. The locale of the study was the Department of Civil Engineering, M.M.M. Engineering College, Gorakhpur, UP, INDIA. Findings showed that Plastic Waste Management had assumed great significance in the present-day context. Various schemes were being implemented to mitigate the impacts of plastic waste in India. Recycling was one such scheme for waste management of plastic products. It made rising sense environmentally as well as economically and current trends demonstrated a considerable increase in the rate of recovery and recycling of plastic wastes. These trends were expected to continue, but some significant challenges still existed from both technological factors and from economic or social behaviour issues relating to the collection of recyclable wastes, and substitution for virgin material. Joined with efforts to increase the specification and use of recycled grades as a replacement for virgin plastic, recycling of waste plastics was an efficient way to improve the environmental performance of the polymer industry.

Rajput and Yadav (2016) conducted a study on “Use of Plastic Waste in Bituminous Road Construction”. The objective of the study was to study the effect of mixing plastic waste in bituminous mixes. Based on the results obtained from laboratory tests on S.D.B.C. containing a different proportion of waste plastic the following conclusions were drawn: 1) By increasing the percentage of waste plastic into the mix the Marshall stability value was increased and maximum stability was found for the mix containing 12% plastic by weight of the bitumen. At 14% plastic content, the stability value had decreased. Therefore, the optimum plastic content was found as 12%. 2) The flow value continuously increased with the addition of plastic content in the mix. 3) The % air voids in the mix decreased continuously and VFB

continuously increased with the addition of the plastic waste in the mix. From the above test results, it was concluded that the addition of plastic waste to the semi-dense bituminous concrete mix significantly improved the performance of the mix. The strength and voids parameter also satisfied the requirement of MORTH specification. The optimum plastic content was obtained as 12% by weight of the bitumen content.

Awasthi et al., (2017) conducted a study on “Plastic solid waste utilization technologies”. The objective of this study was to review different technologies for plastic waste utilization used in India. The study was conducted in the Department of Chemistry, School of Advanced Sciences, VIT University, Vellore, Tamil Nadu, India. Findings revealed that various techniques of plastic solid waste had contributed to the image of plastic solid waste management. The recycling technique was a great technique to manage plastic solid waste in the current situation. But there were certain disadvantages appeared when mechanical recycling was selected as a route of recycling. There were some issues that were highlighted during mechanical recycling as the degradation and heterogeneity of plastic solid waste because additional polymerization and polycondensation happened due to chemical reactions. These all were reversible in theory, energy or heat supply could cause photo-oxidation. Linear and branching of plastic polymer chains could also form the formation of oxidized compounds and extreme climatic conditions. There were a lot of scopes to utilize plastic waste in combination with other materials for the improvement of the recycling of plastics.

Devasahayam et al., (2019) conducted a study on “Utilization and recycling of end-of-life Plastics for sustainable and clean industrial processes including the iron and steel industry”. The locale of the study was Hubballi, India. The objective of the study was to summarise various end-of-life options for Plastics and environmental benefits offered by feedstock recycling in material processing, especially in iron and steel industries and exploratory research design was used to

conduct this study. This study focused on recycling options, feedstock recycling of plastics in high-temperature materials processing, for a sustainable solution to the plastic wastes not suitable for recycling. The findings showed that plastics replace fossilized resources as reductants, alloying materials, and binders in iron ore palletization, contribute to a reduction in process temperature, saving on energy resources, contribute to energy generation and the hydrogen economy, and reduce harmful emissions. It also revealed that the thermos-Plastics and the thermosets both benefit the iron ore industry. The thermosets offered a solid-liquid-gas wetting mechanism offering a new paradigm for efficient iron ore palletization and iron alloy production. It was also found that Plastics had higher H₂ content, than coal. They also had high calorific values with high carbon reactivity. They inhibit the sticking of iron ore during smelting processes with a high metallization rate. Iron ore reduction in presence of Plastics increased the reaction rates due to higher diffusion of H₂ compared to CO, reducing the process temperature by at least 100–200 °C. Plastics aid carbon nanotube formations offering broader industrial applications requiring high strength, e.g., car bodies, ships, fittings of overhead electric transmission lines, and greatly in construction. It was also concluded that feedstock recycling offered a competent waste management strategy for Plastic waste.

Yadav and Patel, (2019) conducted a study on “The innovative ways of utilization of plastic waste”. The objective of the study was to document various innovative ways with the help of which Plastic waste. The locale of the study was Lucknow, India. It focused on reviewing innovative methods for the utilization of plastic waste in the current scenario. The finding concluded that we must reuse and reutilize the Plastic waste surrounding us. It also showed that Plastic waste could be utilized by reusing it and creating utility and décor articles. The outcomes of the study were different utility and décor articles i.e., brooms, containers, chandeliers, dustpans, etc.

Kumar et al., (2021) conducted a study on “Utilization of plastic waste for sustainable environment management”. It aimed to document various sustainable and demanding technologies for utilizing Plastic waste and converting them into valuable products. The study was conducted in Nagpur, India. Findings revealed that there were various ongoing works to reuse and recycle plastic waste in various sectors, such as fuel, carbon material preparation and construction industries. Findings also revealed that pollution created from Plastic waste had started to reach an epidemic that extends globally with a massive quantity of pollution posing severe threats to the environment. It was also found that different measures can be taken to sustainably utilize Plastic waste.

Pandey et al., (2021) conducted a study on “Plastic Waste Utilization”. The objectives of the study were to make the recycling of plastic wastage useful in the domestic area and industries as well as for scrap collectors and to make a machine that processes the plastic waste as cheaply as possible at the initial stage of plastic pollution. An applied research design was used to conduct this study. The locale of the study was the Department of Mechanical Engineering, Buddha Institute of Technology, GIDA, Gorakhpur, Uttar Pradesh, India. The outcome of the study was a shredding machine that was low in cost. Based on the limited amount of use of this machine and analysis of working, several conclusions were made. Firstly, Recycling was a very complex method of plastic utilization so it had its own complexity of collecting and separating the waste. The large particle of plastic had to be broken down into small particles for the smooth flow in the extruder. Because of the low density of plastic, the flow rate of melted plastic was high. The mass flow rate increased with the increase in speed of the motor. Because of less manufacturing cost and small size, it reduced the general cost of the recycling process and labour work and there was no requirement for skilled labour.

Singh and Trivedi (2021) conducted a study on “Plastic waste management”. The objectives of the study were to assess the impact

of plastics on the environment, to analyse the prevalent methods of plastic waste management and to propose adoption strategies for Newer and more efficient methods of waste management. The research design was exploratory. the study was conducted at Jayoti Vidyapeeth women's university, Jaipur, Rajasthan, India. The finding showed that various methods of plastic waste management had been adopted, but there were still prominent flaws in most of them which could only be avoided through exhaustive restructuring. The awareness of the Government about the waste management scenario and their strict intervention was required to improve prevalent conditions. The study listed various measures that could be taken by the government to better manage and dispose of plastic used by industries as well as households. Also, improvements could be made in the current procedures for plastic waste management by increasing awareness from an elementary level with the cooperation of educational institutions, establishing city waste disposal units at a larger scale, and study ways to manufacture biodegradable plastics in order to eliminate the problems at a manufacturing level itself.

Conclusion

The literature review emphasized that effort was made on utilization of plastic waste, with different methods and purposes in India and Abroad. The researchers focused on effective recycling, degradation, uses in the plastic industry, efficient waste management, and assessment of reusing and recycling of plastic waste. An overview of the literature highlighted that most of the studies conducted in India were on effective recycling and utilization, efficient use, and management of plastic waste. While researchers from abroad highlighted waste management practices and strategies, up-cycling waste materials, creative designing of home decoration, and designing of innovative products from plastic waste had been undertaken. However, the researcher did not come across many studies conducted in India on "Designing of Utility and Decor Articles". This motivated the researcher to conceptualize the study on the topic "Designing Utility & Décor Articles for Residential Spaces by Reusing Plastic Waste".

METHODOLOGY

CHAPTER – III

METHODOLOGY

The purpose of the research was to gather information on the opinion of the respondents regarding the designed utility and décor articles for residential use from plastic waste. The research was designed after reviewing various research outside India and within India. In order to achieve the aims of the present study, a detailed plan of work and the sequential procedure was followed, which is presented in this chapter under the sub-headings:

- 3.1 Research Design**
- 3.2 Operational Definitions**
- 3.3 Locale of the Study**
- 3.4 Unit of Inquiry**
- 3.5 Sample Selection Criteria, Size and Sampling Procedure**
- 3.6 Selection, Construction and Description of the Tool**
- 3.7 Establishment of Content Validity of Tool**
- 3.8 Establishment of Reliability**
- 3.9 Phases of Product Development**
- 3.10 Data Collection**
- 3.11 Data Analysis**

3.1 Research Design

The present study assessed the opinion of the interior designers, students of interior design specialization and homemakers about selected existing parameters namely size, quality, durability, proportion, convenience of use, and aesthetic value of the designed utility and décor articles. Descriptive Research design was used for the present study.

3.2 Operational Definitions

3.2.1 Plastic waste – For the present study, plastic waste was referred to as used plastic waste such as bottles, containers of different sizes, buckets, etc., which were collected from residences or scrap shops in Vadodara city of Gujarat, which could be reused for utility and décor article for residential space.

3.2.2 Utility article – For the present study, utility article was referred as an article that was practical or in the condition of being used.

3.2.3 Décor article – For the present study, décor article was referred as an article that could be used to add aesthetic value to a space.

3.2.4 Interior designers, students of interior design specialization and homemakers' opinion scale – For the present study, opinion of the interior designers, students of interior design specialization and homemakers' opinions on the extent of expediency were defined as their views regarding what they perceive about selected parameters namely size, quality, durability, proportion, the convenience of use, and aesthetic value of the designed utility and décor articles. Five points 'Likert scale' was used to measure interior designers, students of interior design specialization and homemakers' opinions, namely: "strongly agree, agree, undecided, disagree, strongly disagree," where the scores were ascribed as 5,4,3,2,1 for positive and vice a versa for negative statements i.e., 1,2,3,4,5.

3.3 Locale of the Study

The present study was conducted in Vadodara city of Gujarat, India.

3.4 Unit of Inquiry

For the present study, the unit of inquiry were interior designers, students of interior design specialization and homemakers residing in various areas of Vadodara city of Gujarat, India.

3.5 Sample Selection Criteria, Size and Sampling Procedure

3.5.1 Sample selection criteria:

- **Sample election criteria for the interior designer and students of interior design specialization**

For the present study, the sample selection criteria set for the respondents were, only those interior designers and students of interior design specialization from Vadodara city were selected who were involved in the interior designing activities.

- **Sample selection criteria for the homemakers**

For the present study, the sample selection criteria set for the respondents were, only those homemakers from Vadodara city were selected who were involved in homemaking activities.

3.5.1.1 Inclusion criteria

- The study was limited to plastic waste available on residences and scrap shops that gave plastic waste at minimal cost or free of cost.
- The present study was limited to 60 respondents (20 interior designers, 20 students of interior design specialization and 20 homemakers) from Vadodara city of Gujarat, India.

3.5.1.2 Exclusion criteria

Those respondents who did not gave consent to participate in the study were excluded.

3.5.2 Sample size

The sample of the present study was restricted to 60 respondents (20 interior designers, 20 students of interior design specialization and 20 homemakers) from Vadodara city of Gujarat, India.

3.5.3 Sampling procedure

For the present study, purposive sampling technique was used to select the respondents from Vadodara city as only those interior designers, students of interior design specialization and homemakers

from Vadodara city were selected who were involved in interior designing and homemaking activities and were willing to participate in the research study.

3.6 Selection, Construction and Description of the Tool

3.6.1 Selection of tool

For the present study, interview schedule was used.

- **Interview schedule:** for the present study interview schedule was used to know the opinion of interior designers, students of interior design specialization and homemakers regarding what they perceive about selected parameters namely size, quality, durability, proportion, the convenience of use, colour combination, and aesthetic value of the designed utility and décor articles as it gives the accurate data and it offers flexibility which increases the understanding between the respondent and the researcher.

3.6.2 Description and development of data collection tool

The interview schedule was constructed in compliance with the objectives of the study and statements were divided into 3 sections as follows:

Section I: Background information of the respondents

This section contained questions regarding the background information of the respondents like name, age, educational qualifications, occupational status, and family monthly income of the respondents.

Section II: Interior designers, students of interior design specialization and homemaker's opinions for utility articles

The present section comprised a set of questions regarding the product's quality, size, design, product's convenience, and use. A five-point continuum scale of “strongly agree, agree, undecided, disagree and strongly disagree” was used to know the opinion of the respondents regarding the designed utility articles from plastic waste.

Section III: Interior designers, students of interior design

specialization and homemaker's opinions for décor articles

The present section comprised a set of questions regarding the product's quality, size, design, convenience, and use. A five-point scale of “strongly agree, agree, undecided, disagree and strongly disagree” was used to know the opinion of the respondents regarding the designed décor articles from plastic waste.

3.7 Establishment of Content Validity of Tool

To establish content validity, the developed tool was given to the panel of judges comprising experts from the Department of Family and Community Resource Management, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara. They were requested to judge the clarity and relevance of the content for each scale. They were also requested to state whether each statement fell in the category of “relevant, clear and ambiguous.” A total of 204 positive and negative statements were developed. The judges were requested to give suggestions for the developed tool. The statements were modified as per the suggestions of the panel of judges.

3.8 Establishment of Reliability

A pre-test was carried out with 30 respondents (10 interior designers, 10 students of interior design specialization and 10 homemakers) to establish the reliability of the data collection tool. To measure the opinion of the respondent regarding designed utility and décor articles, a set of 204 positive and negative statements were developed and, a five-point continuum scale “strongly agree, agree, undecided, disagree and strongly disagree” was used to know the opinion of the respondents regarding the designed utility and décor articles from plastic waste.

Scale	Reliability Coefficient
Respondent's Opinion	0.93

The reliability coefficient was found through the following formula:

$$r_{rel} = \frac{2r}{1 + r}$$

Where r_{rel} = reliability coefficient &
 r = correlation coefficient

3.9 Phases of Product Development

The product development was carried out in three phases during the study:

Phase 1: The researcher procured plastic waste from the residences and scrap shops at minimal cost or free of cost.

Phase 2: The drawings of utility and décor articles were prepared using AutoCAD 2020 software by the researcher. The prepared drawings of the utility and décor articles were used for the development of the articles. To give value-addition to the developed utility and décor articles, the designer hand-painted the articles. The products were displayed through an exhibition in the seminar room of The Department of Family and Community Resource Management and data collection was done.

Phase 3: Cost estimation of the products was done based on material cost, labour cost and profit. A catalogue was prepared by mentioning the product description, namely product name, type of plastic used, size of the product, and costing of the developed utility and décor articles.

3.10 Data Collection

The interview schedule was administered to know the opinion of the interior designers, students of interior design specialization and homemakers regarding the usefulness of selected utility and décor articles that were developed from the plastic waste. The products were displayed in the seminar room of The Department of Family and Community Resource Management on 9th February 2023. The researcher collected feedback where the respondents were asked to analyse the developed articles according to the existing parameters namely, size, quality, durability, proportion, convenience of use, colour combination, and aesthetic value of the designed utility and décor articles developed by the researcher then the opinion of the respondents were noted on the opinion scale “strongly agree, agree, undecided, disagree and strongly disagree” by the researcher.

3.11 Data Analysis

the data was analysed by calculating the weighted mean, frequency, and percentage.

3.11.1 Categorization of data

The following categories were used to classify respondents' age (in years), marital status, educational qualification, occupational status, and family monthly income (in ₹):

Section I: Background Information

1. Age (in years)

- 18-27
- 28-37
- 38-48

2. Marital Status

- Married
- Unmarried

3. Educational Qualifications

- Higher Secondary
- Diploma
- Graduation
- Post-graduation
- Ph.D.

4. Occupational Status

- Employed
- Unemployed
- Self-employed

5. Family monthly income (in ₹)

- ≤100000
- 100001-200000
- 200001-300000

Section II: Interior designers, students of interior design specialization and homemaker's Opinion scale and pattern of response

To gather the information regarding Homemakers' opinions regarding the selected parameters namely size, quality, durability, proportion, convenience of use, colour combination, and aesthetic value of the designed utility and décor articles from plastic waste. The response pattern of the scale used is given below:

Opinion Scale	
Response	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

Opinion of the respondents regarding designed utility and décor articles from plastic waste

To measure the opinion of the respondent regarding designed utility and décor articles, an interview schedule of 204 statements was developed. Total 30 articles were designed for different residential spaces. The minimum and maximum scores under each aspect were obtained and a range of scores was developed based on the equal interval method to take the opinion of the homemakers for the developed utility and décor articles. The responses were measured on a five-point continuum, i.e., "strongly agree, agree, undecided, disagree and strongly disagree" and ascribed scores were 5 to 1. To obtain the category of opinion followed the weighted mean (5 - 1) and the range of scores was divided at equal intervals.

3.11.2 Tabulation

The weighted mean, frequency, and percentages were calculated using the data that had been tabulated from the excel sheets.

FINDINGS AND DISCUSSION

CHAPTER IV

FINDINGS AND DISCUSSION

Finding and discussion is considered the most important chapter in dissertation as well as other types of research reports. The present chapter described the analysis of data collected during the research using the interview schedule, followed by relevant discussion and interpretations. For a systematic presentation, the chapter was divided into the following sections;

Section I

4.1: Designing and development of utility and décor articles for residential use from plastic waste.

Phase 1: Procuring of plastic waste.

Phase 2: Designing and development of utility and décor articles.

Phase 3: Preparation of catalogue and cost estimation of utility and décor articles.

Section II

4.2: Background information of the respondents.

Section III

4.3: Opinion of interior designers, students of interior design specialization, and homemakers for the developed utility and décor articles.

Conclusion

Section I

4.1: Designing and development of utility and décor articles for residential use from plastic waste.

This section describes the phases of designing and development of the utility and décor articles from plastic waste along with the cost estimation of the products.

Phase 1: Procuring of plastic waste.

For procuring plastic waste, different residences and scrap shops were identified and were approached by the researcher. The plastic waste that was procured from residences and scrap shops included waste like plastic bottles, paint buckets, containers, PVC pipe etc. The procured plastic waste was obtained free of cost from residences and at minimal cost from scrap shops.

Phase 2: Designing and development of utility and décor articles.

- A.** Designing of utility and décor articles using AutoCAD 2020 software
- B.** Development of utility and décor articles from plastic waste
- C.** Value addition to the utility and décor articles

A. Designing of utility and décor articles using AutoCAD software

The researcher designed 30 utility and décor articles using the AutoCAD 2020 Software. All articles were developed from available plastic waste.

List of developed utility and décor articles

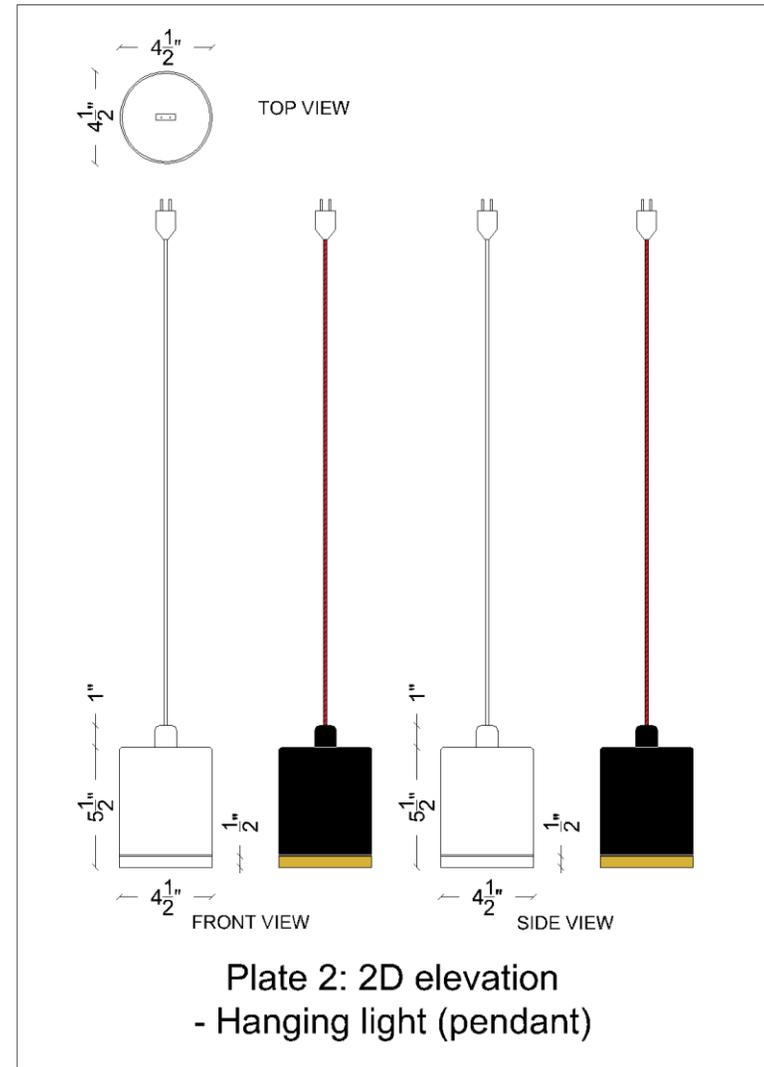
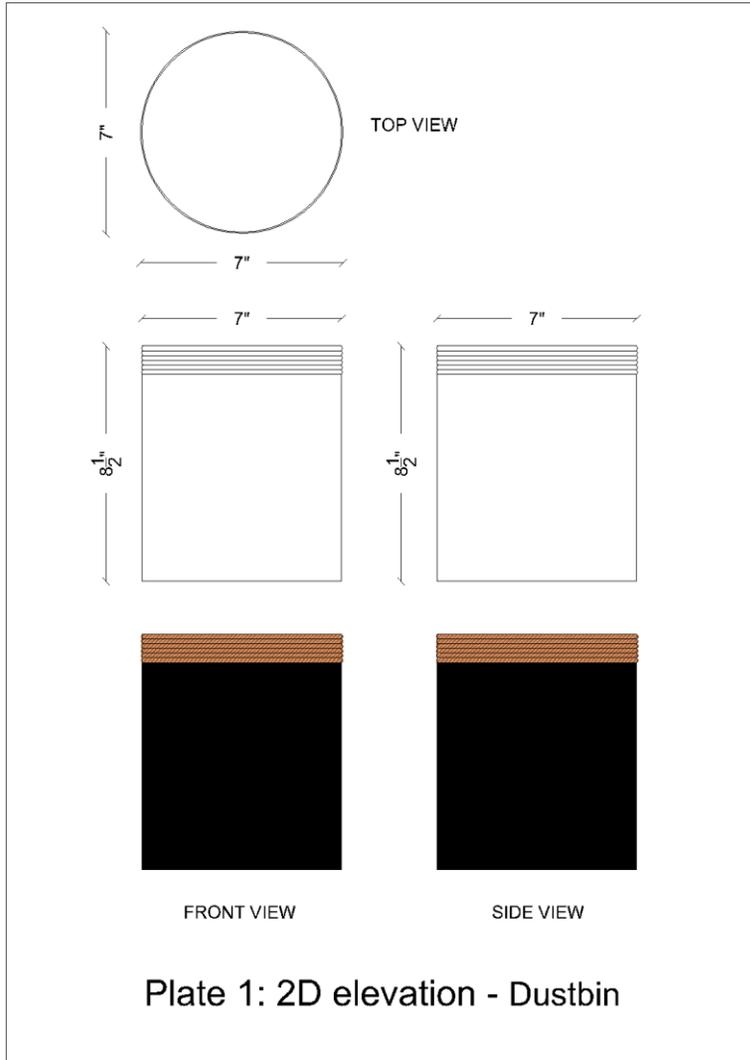
Utility article

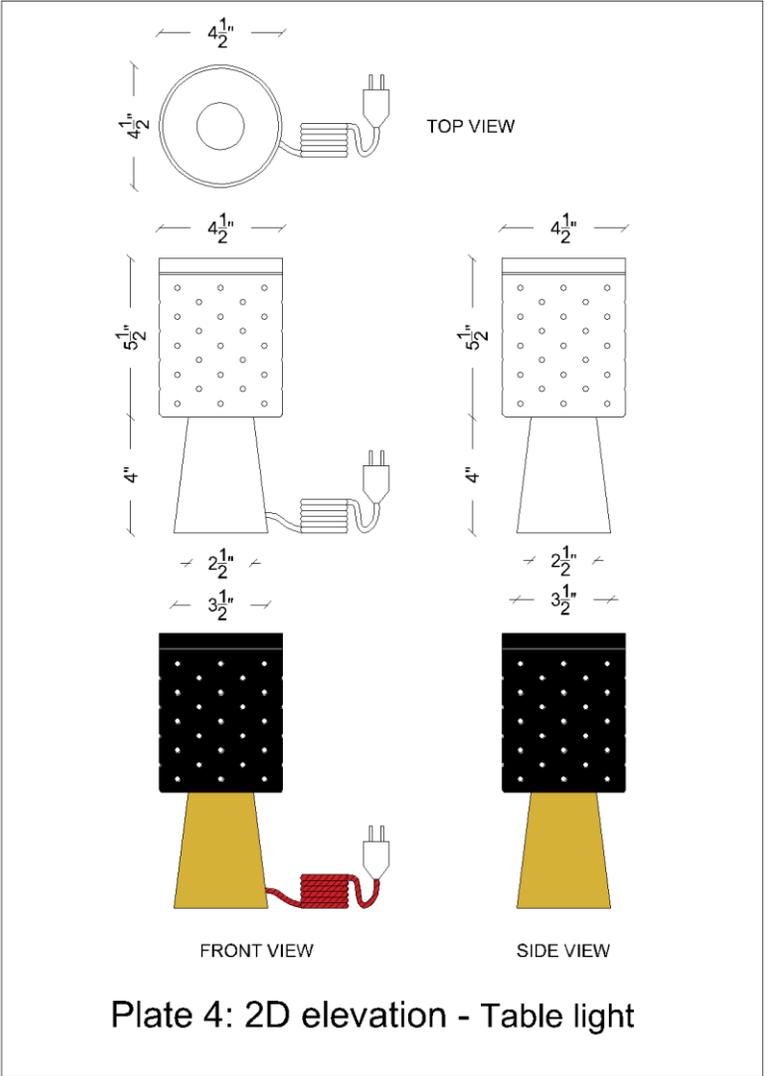
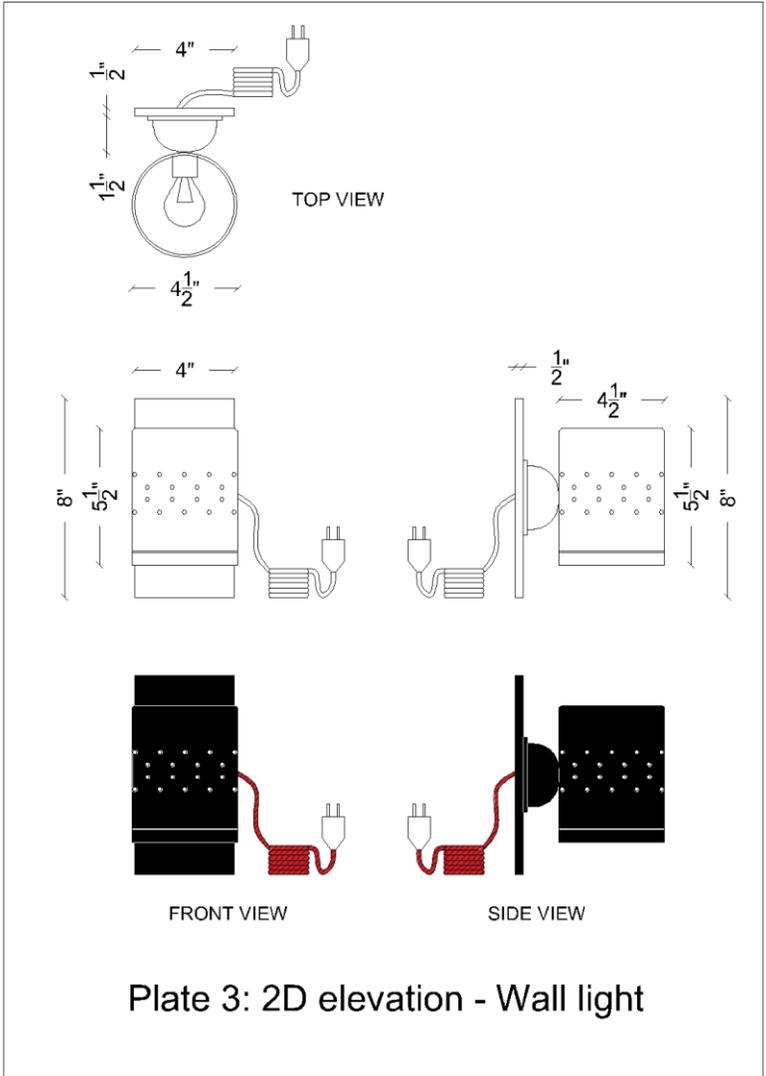
- Dustbin
- Hanging light
- Wall light
- Table light
- Laundry basket
- Pen stand
- Bird house
- Newspaper holder
- Ottoman
- Key holder
- Side table
- Coaster
- Stationary organizer
- Wall shelf
- Toothbrush holder
- Wall mounted wine glass holder

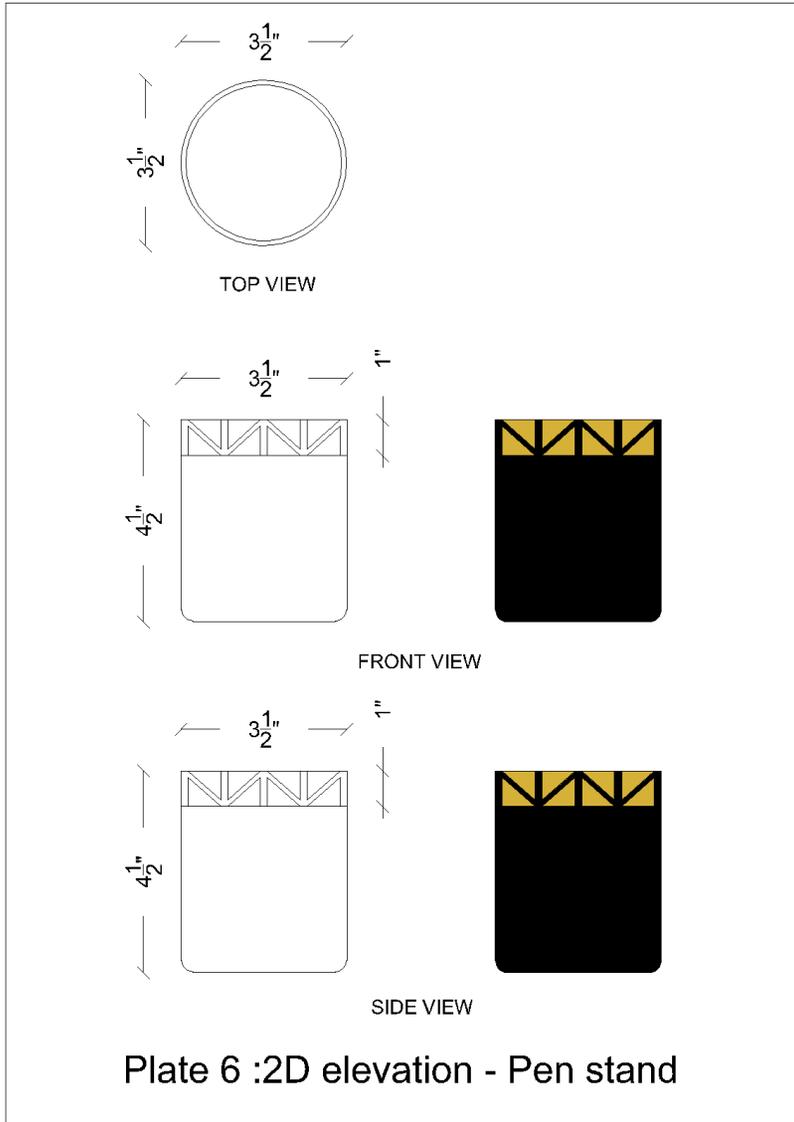
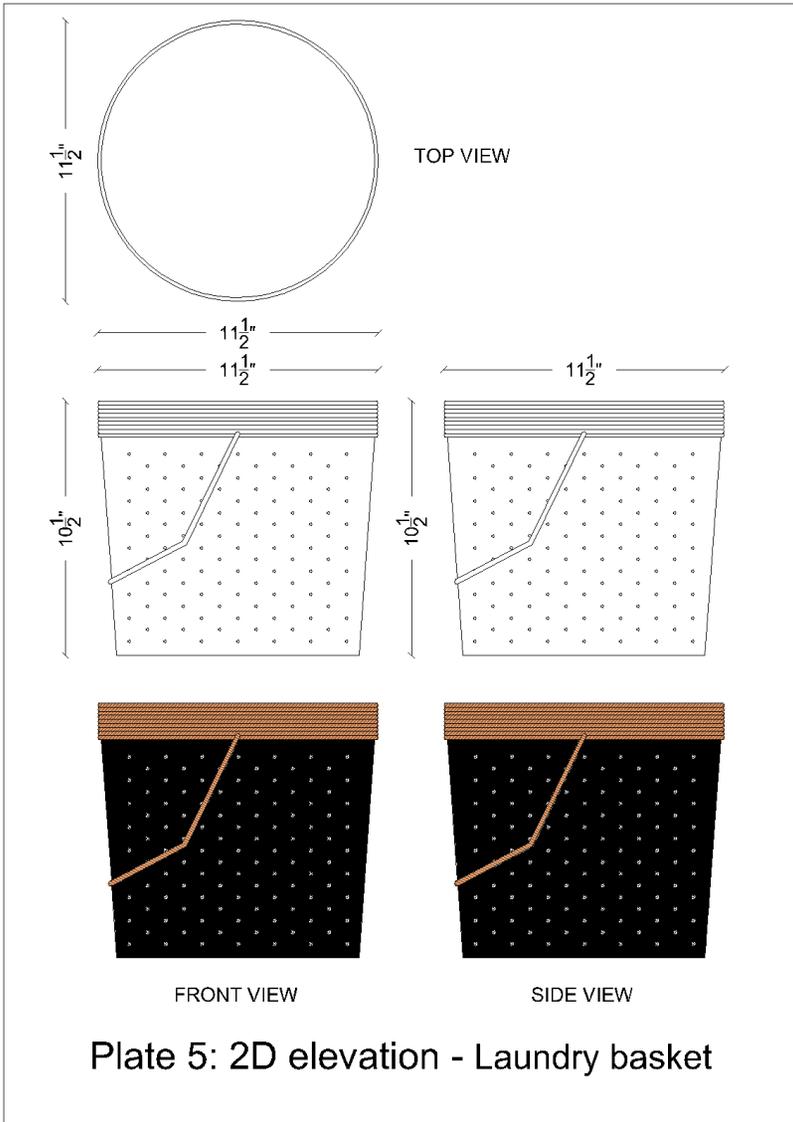
Décor article

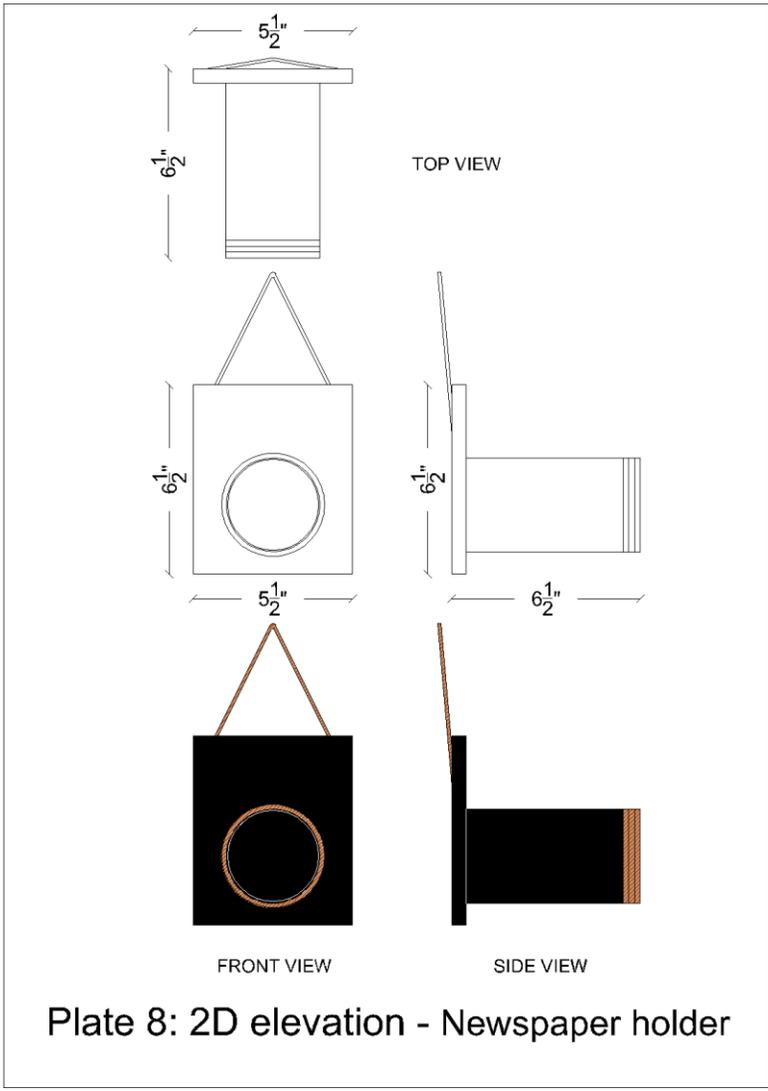
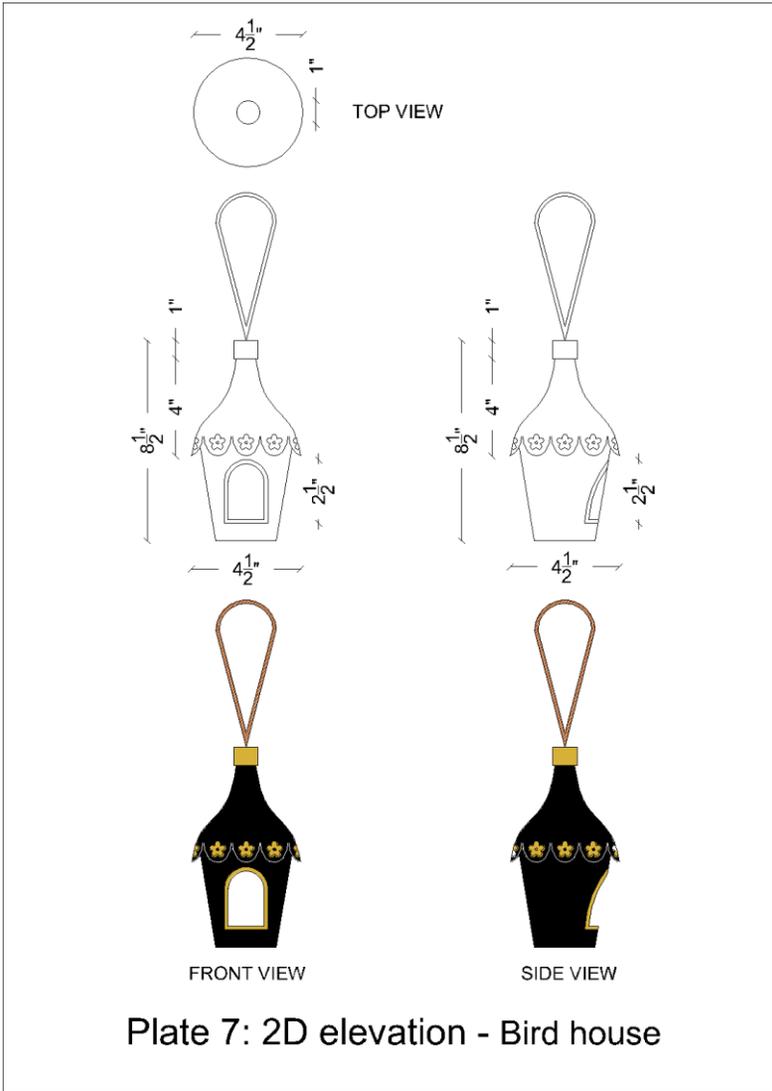
- Planter
- Hanging pots
- Artificial flower pot
- Himmeli chandelier
- Himmeli wall hanging
- Himmeli ornament
- Painting
- Candle Stand
- Vase
- Wall décor artifact
- Artificial sculpture
- Windchime
- Flowers
- Decorative mirror

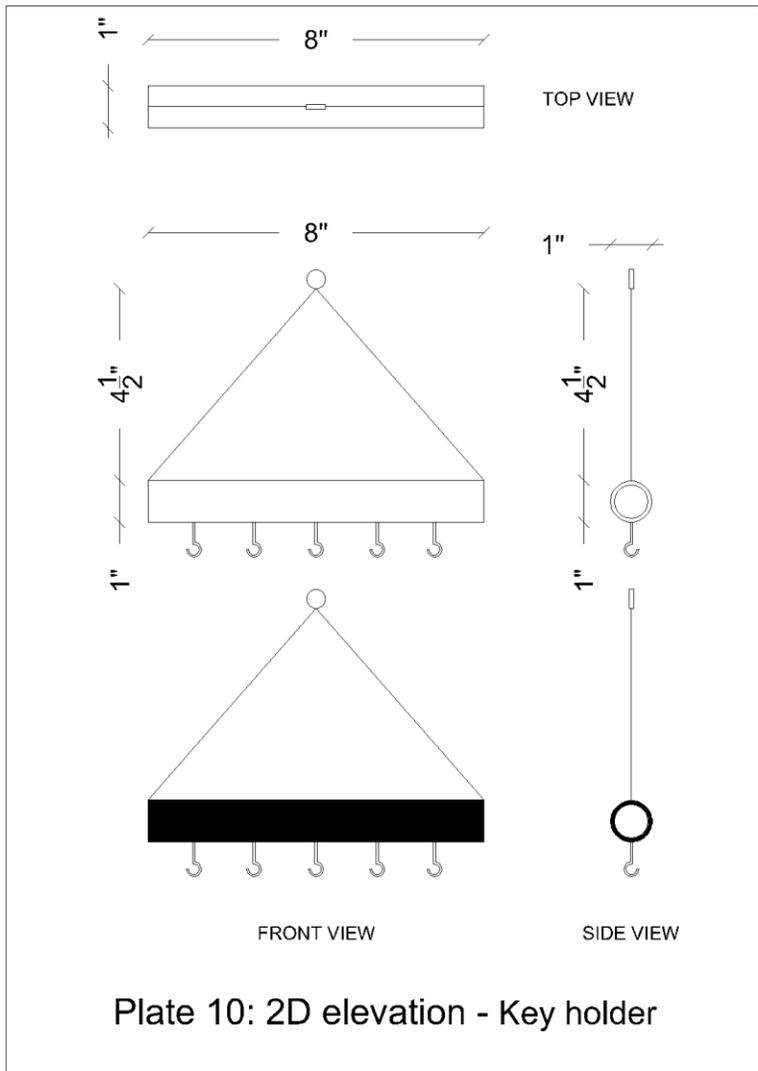
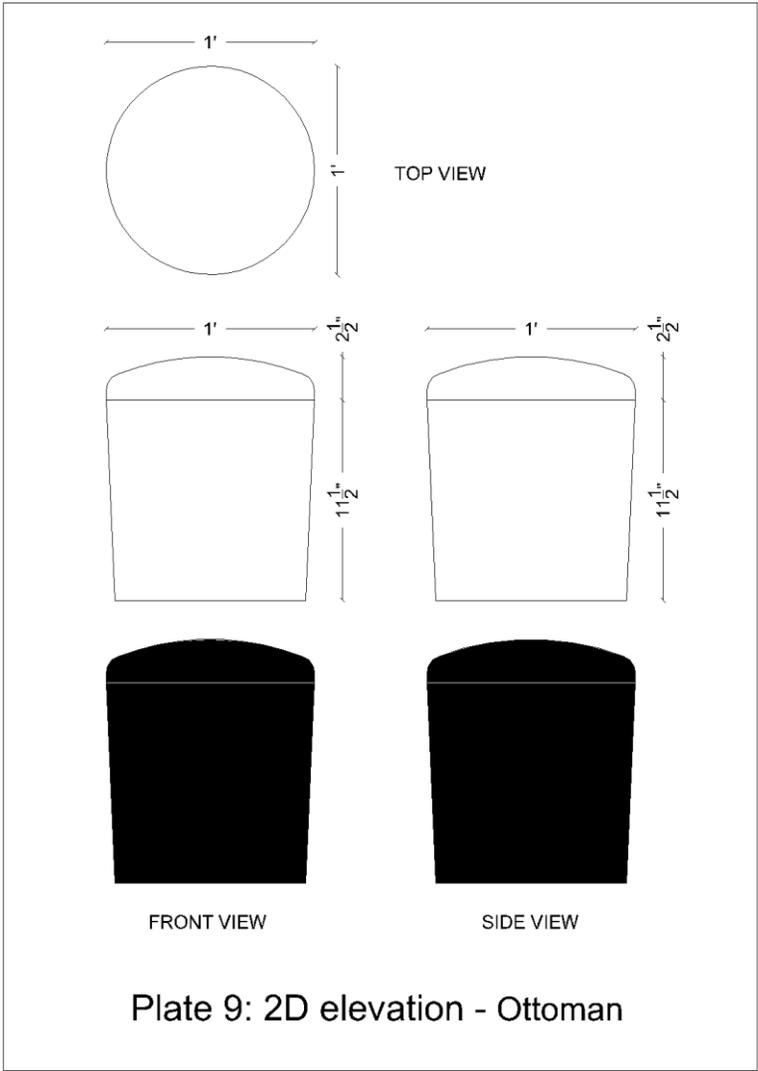
Drawings of developed utility and décor articles

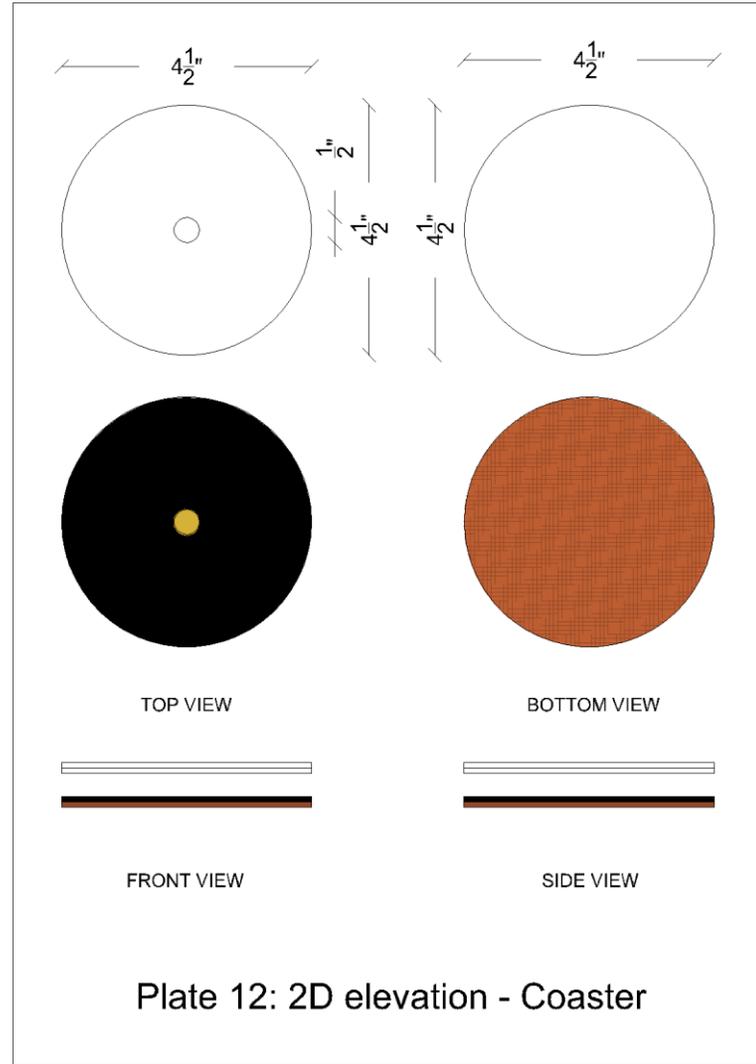
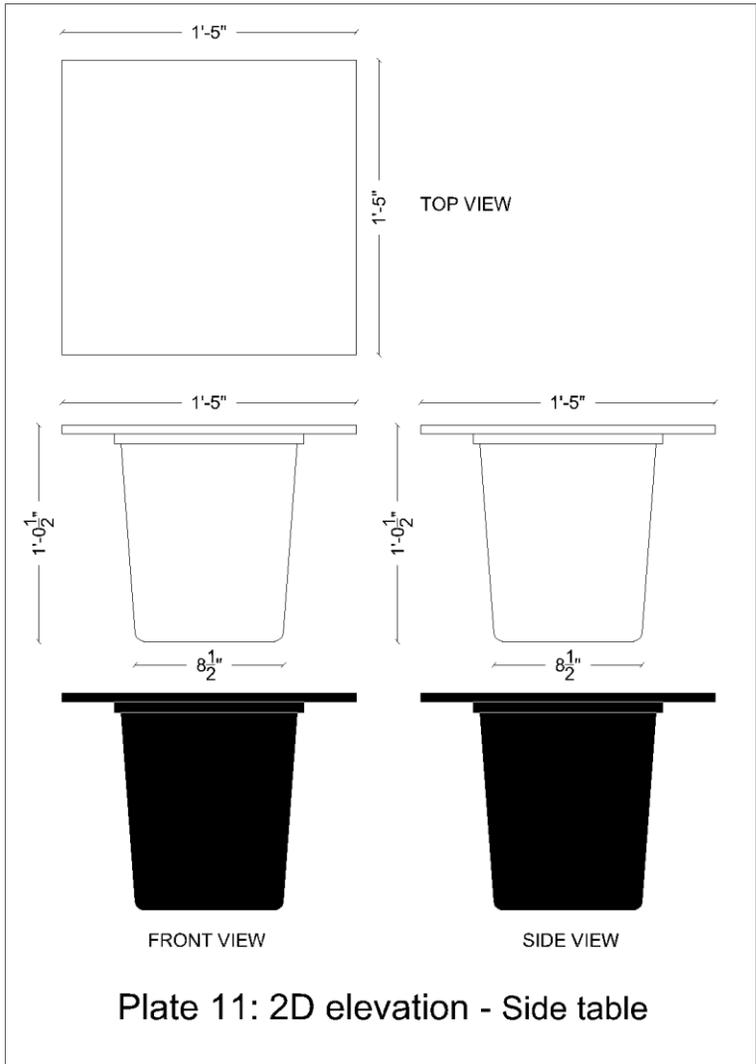


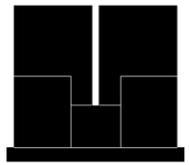
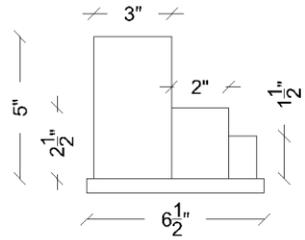
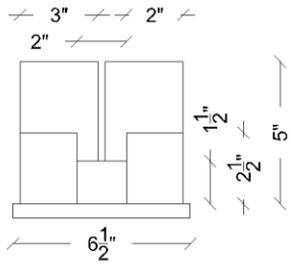
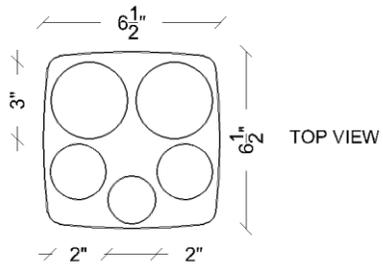




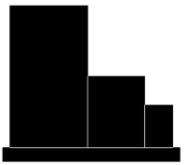






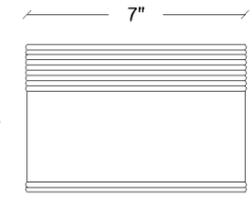
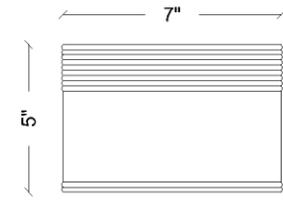
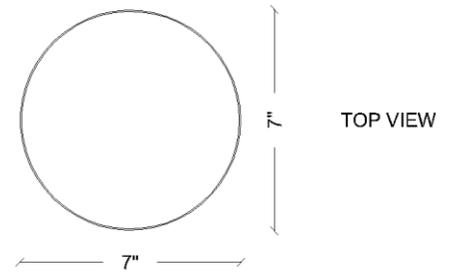


FRONT VIEW



SIDE VIEW

Plate 13: 2D elevation - Stationary organizer

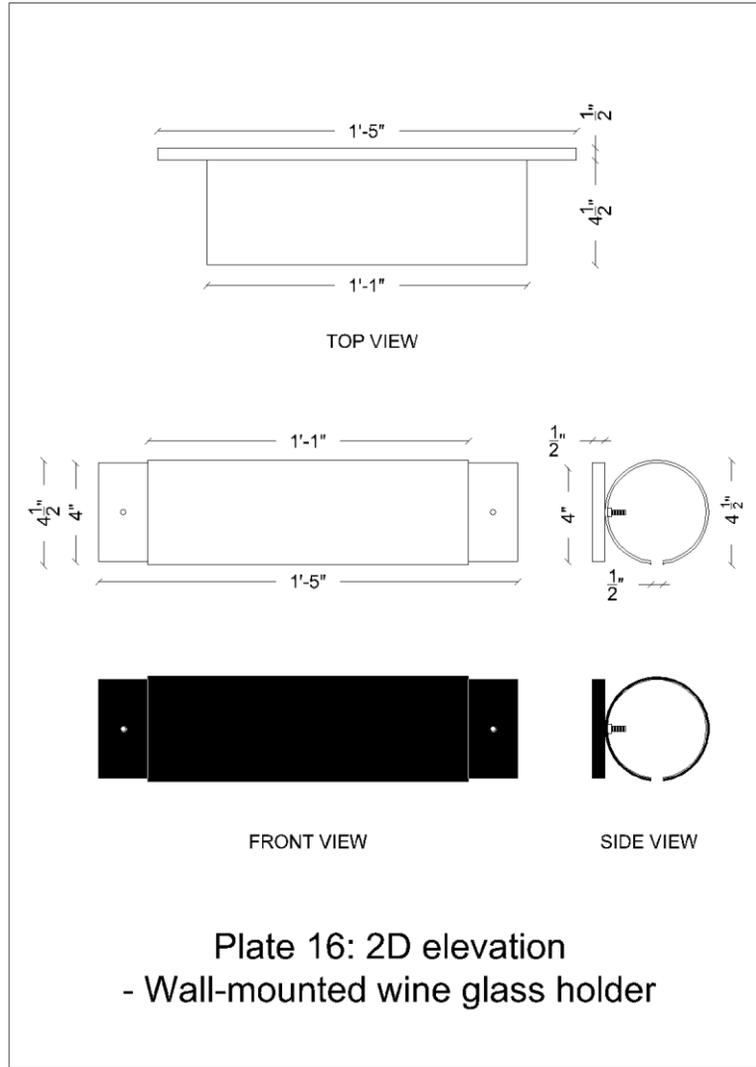
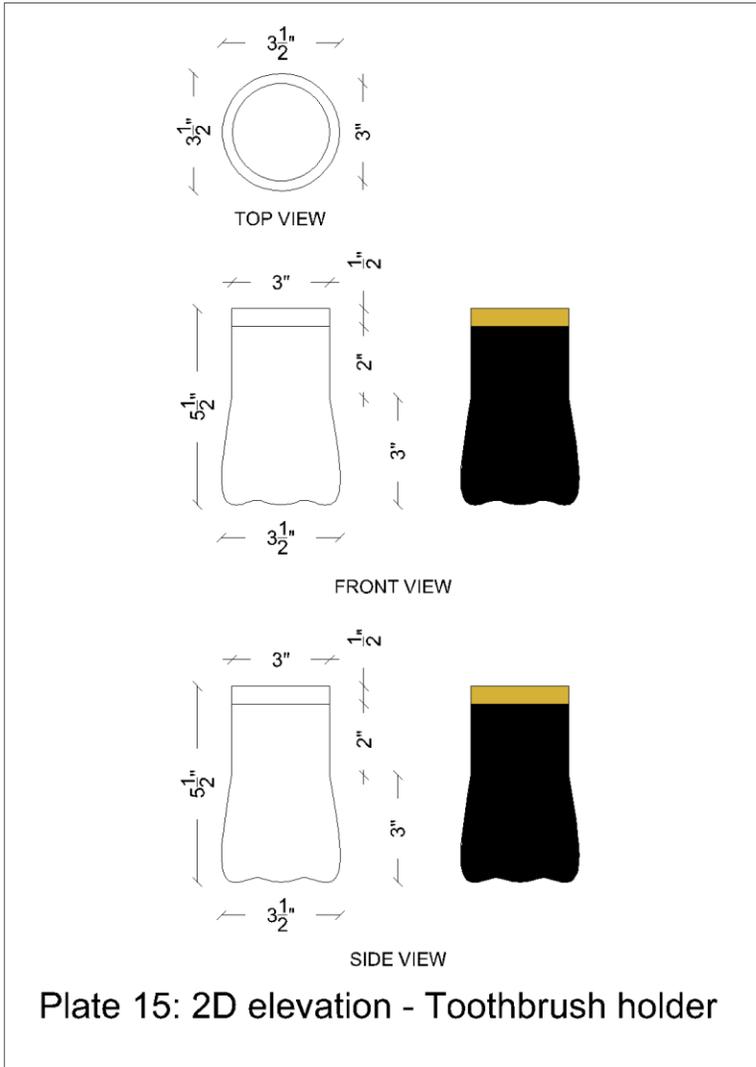


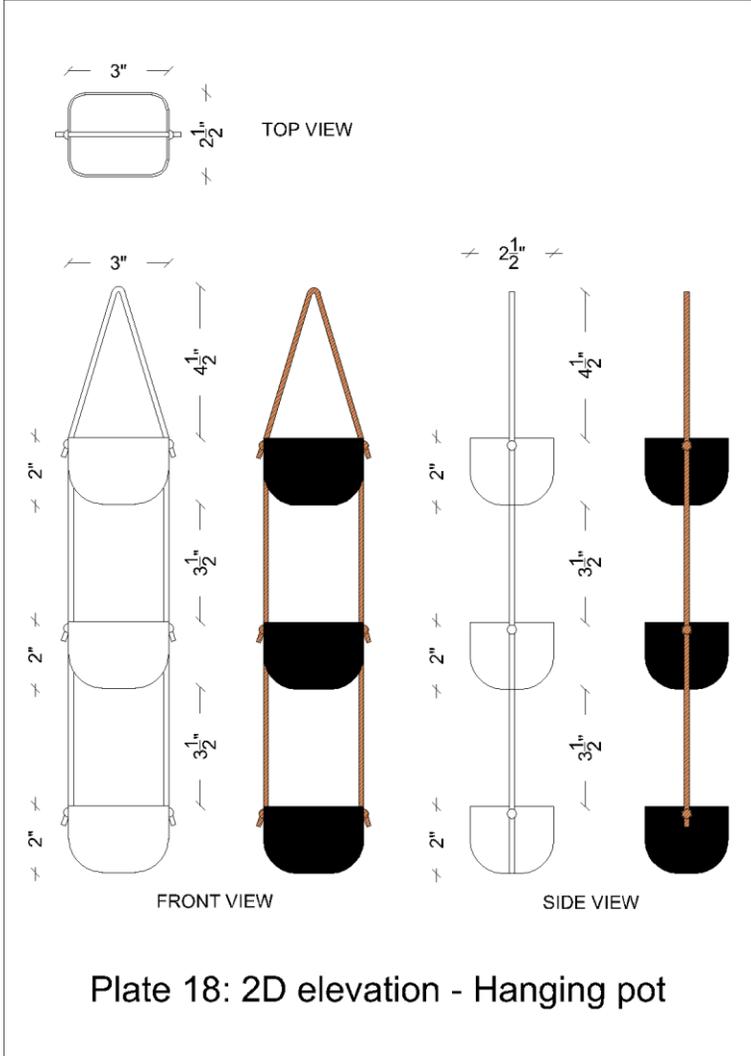
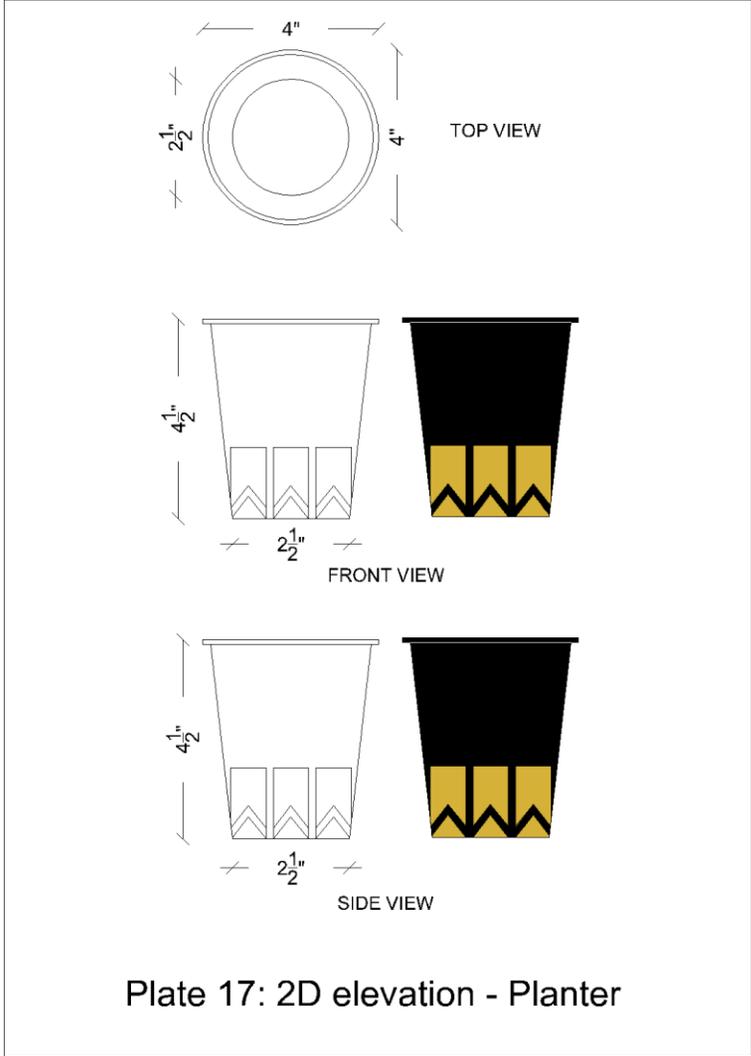
FRONT VIEW



SIDE VIEW

Plate 14: 2D elevation - Wall shelf





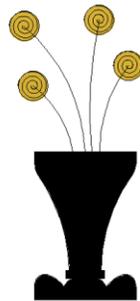
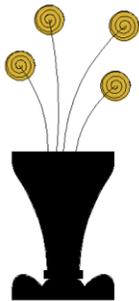
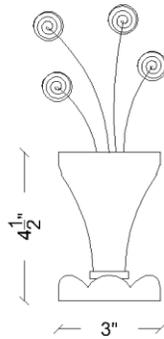
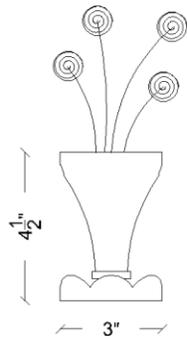
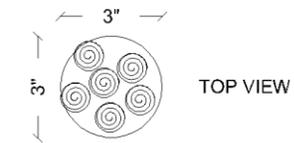


Plate 19: 2D elevation - Artificial flower pot

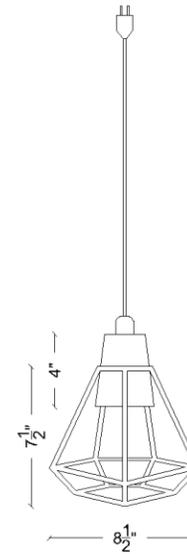
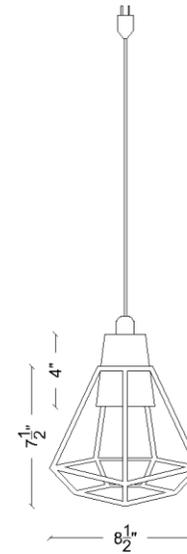
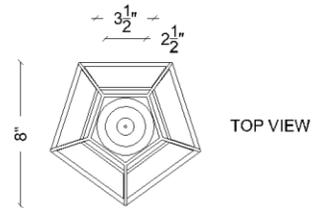
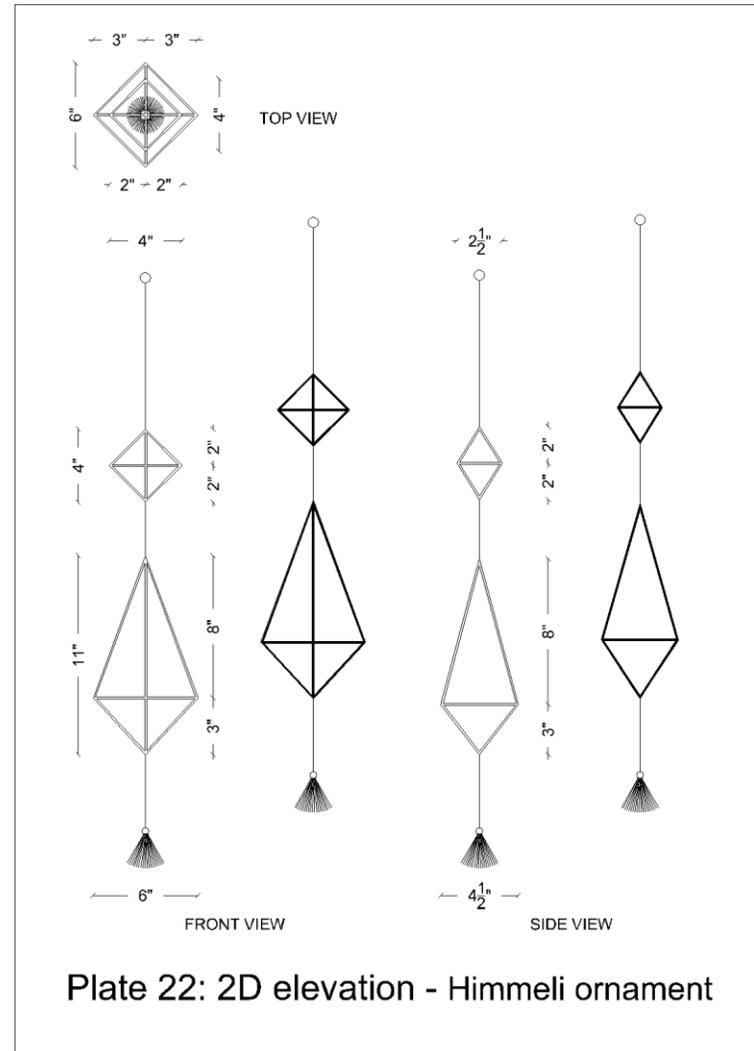
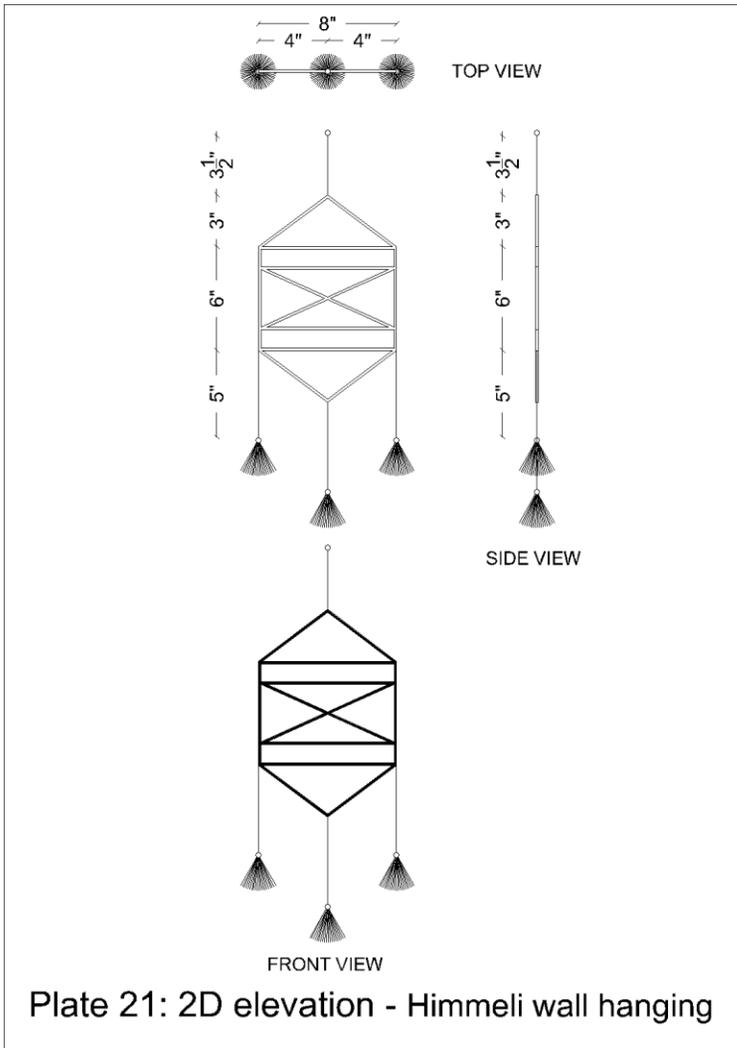
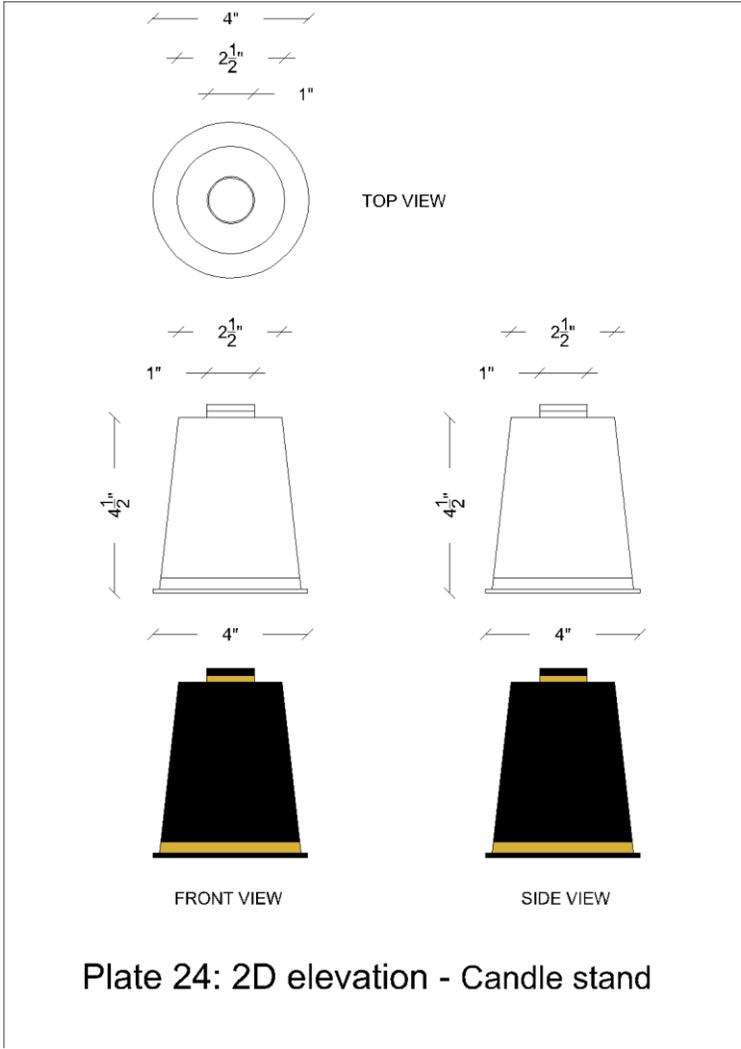
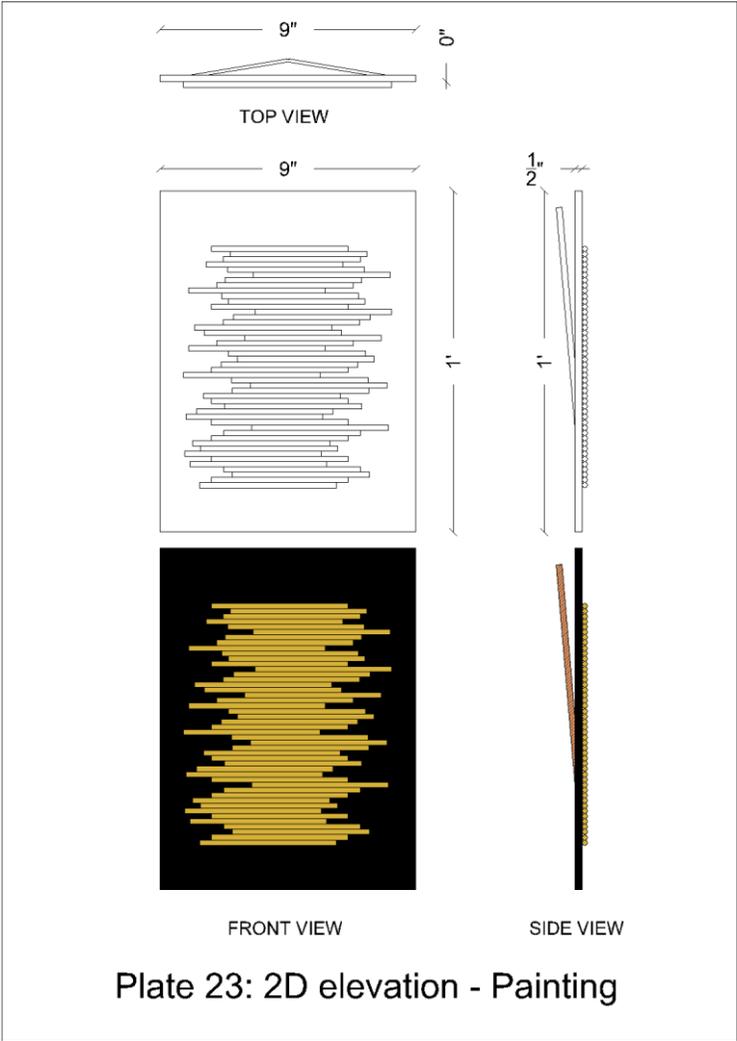
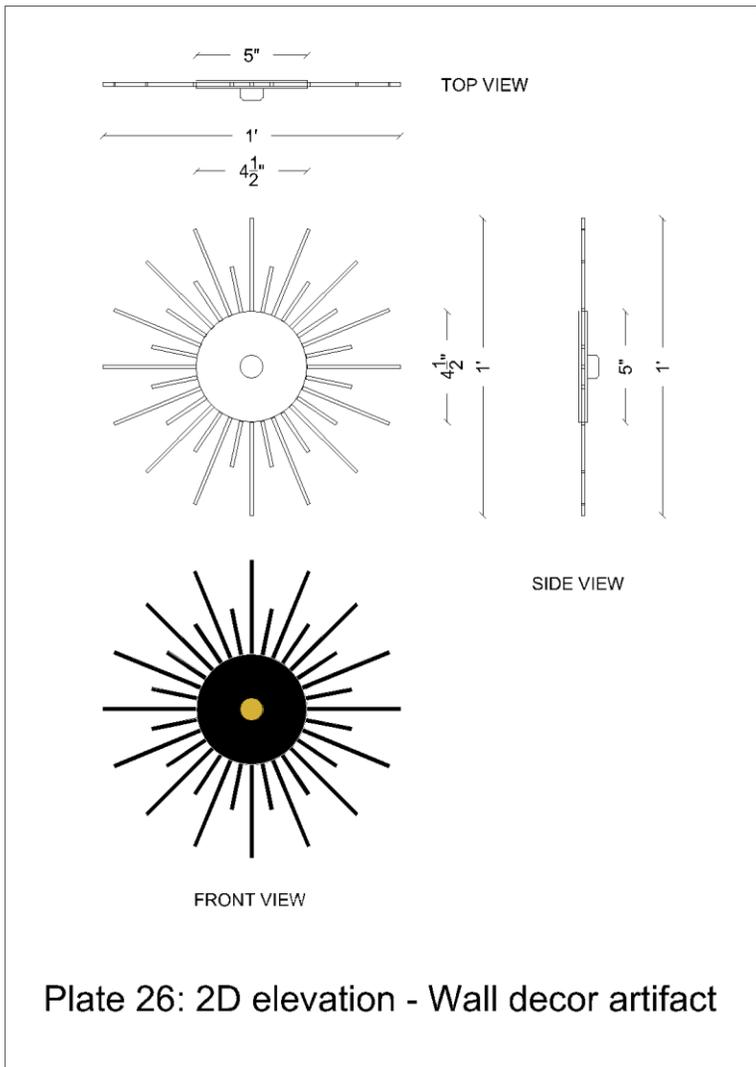
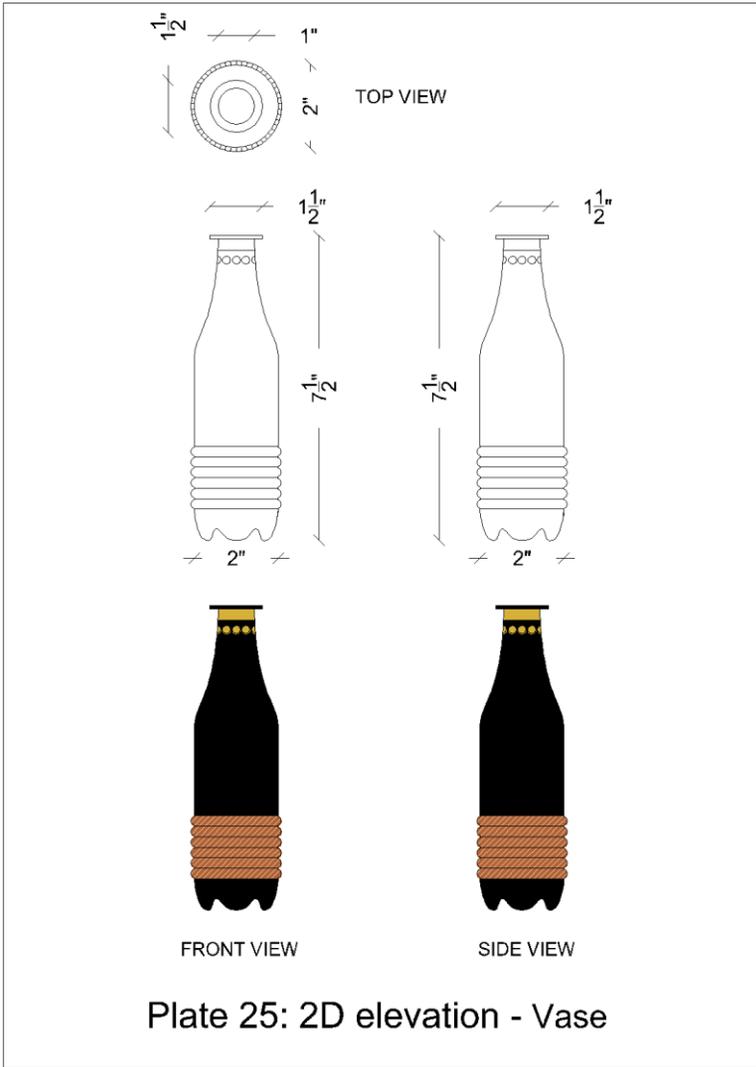


Plate 20: 2D elevation - Himmeli chandelier







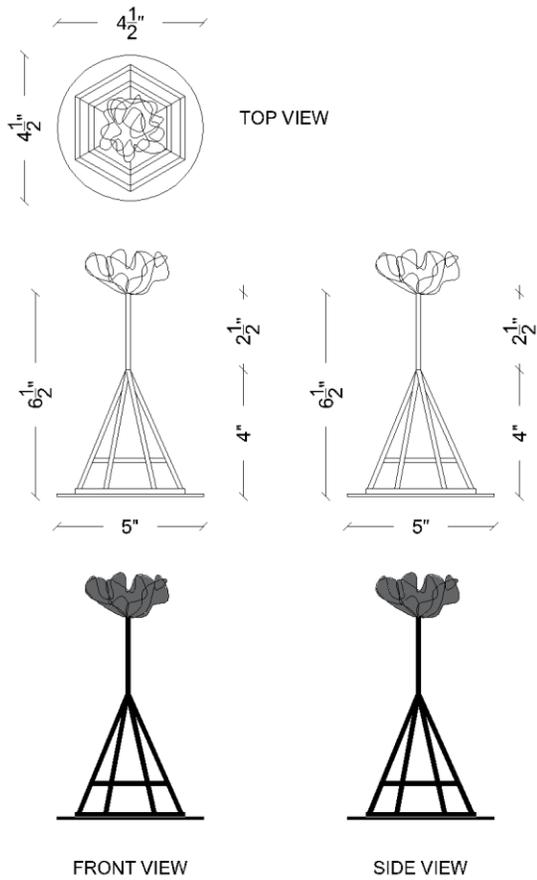


Plate 27: 2D elevation - Artificial sculpture

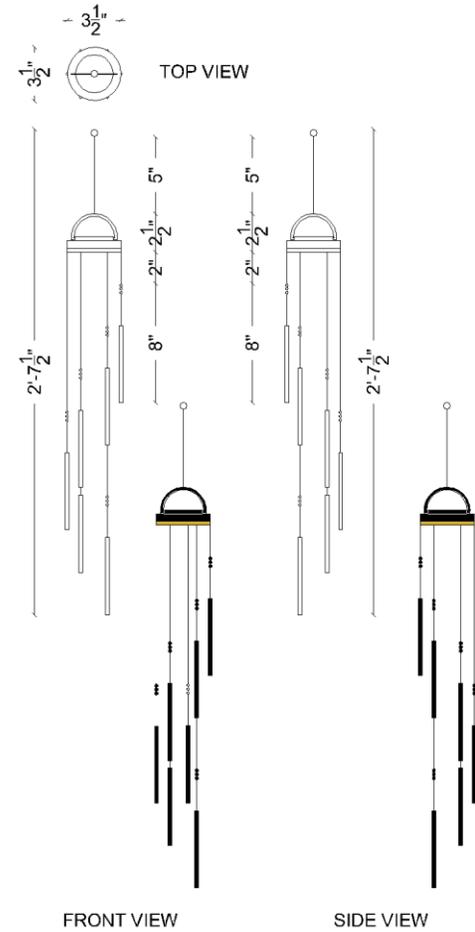
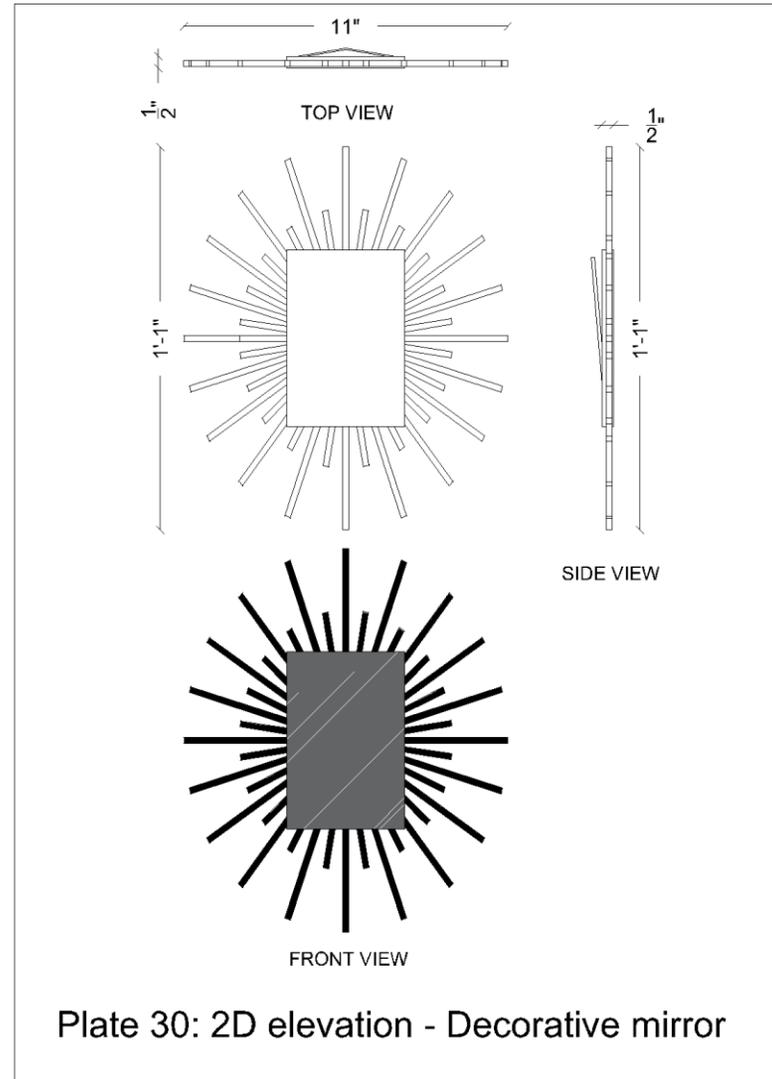
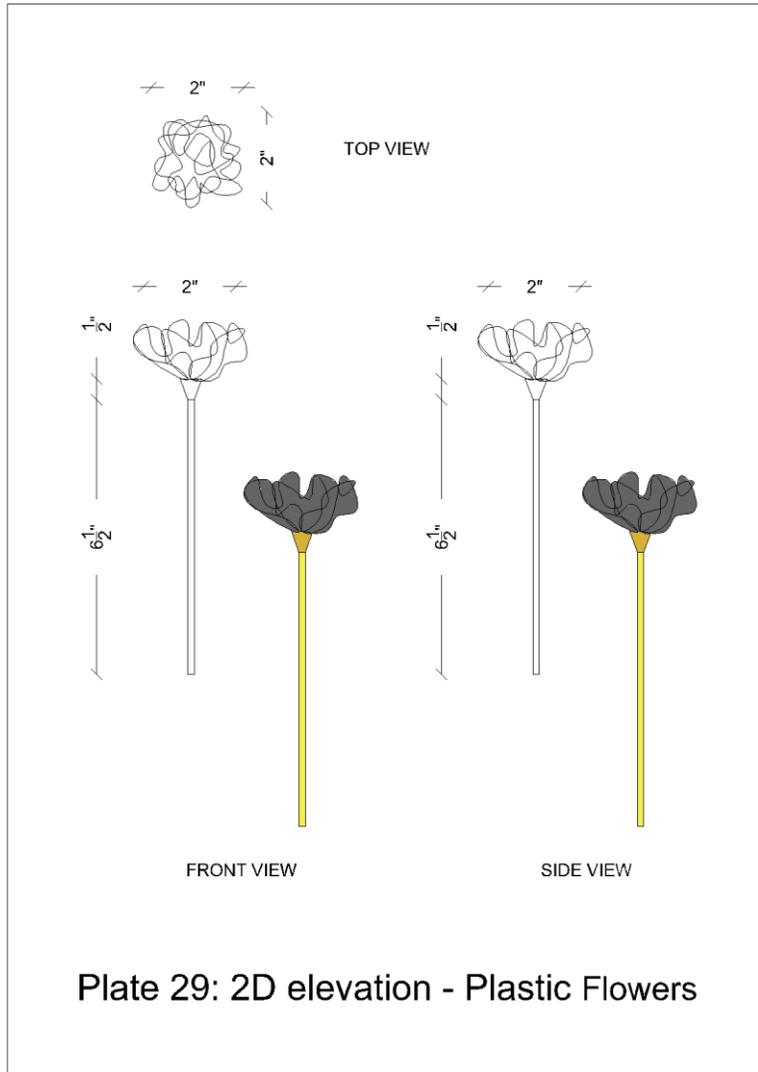


Plate 28: 2D elevation - Windchime



B. Development of utility and décor articles from plastic waste

The drawings of the utility and décor articles were prepared using AutoCAD 2020 software and were used for the development of the articles. The number of utility and décor articles were developed according to the plastic waste procured from residences and scrap shops.

General steps for the development of utility and décor articles

Step 1: The drawings of the articles were prepared in AutoCAD 2020 software and were used by the researcher for the development of the articles.

Step 2: Plastic waste was selected according to the article's measurements, size, and requirements.

Step 3: A cutting knife, a scissor, and a soldering iron machine were used to cut plastic products. The edges were smoothed with the help of sandpaper.

Step 4: Four to five coats of primer were first applied to the plastic surface to create a solid foundation for the acrylic paint to adhere to.

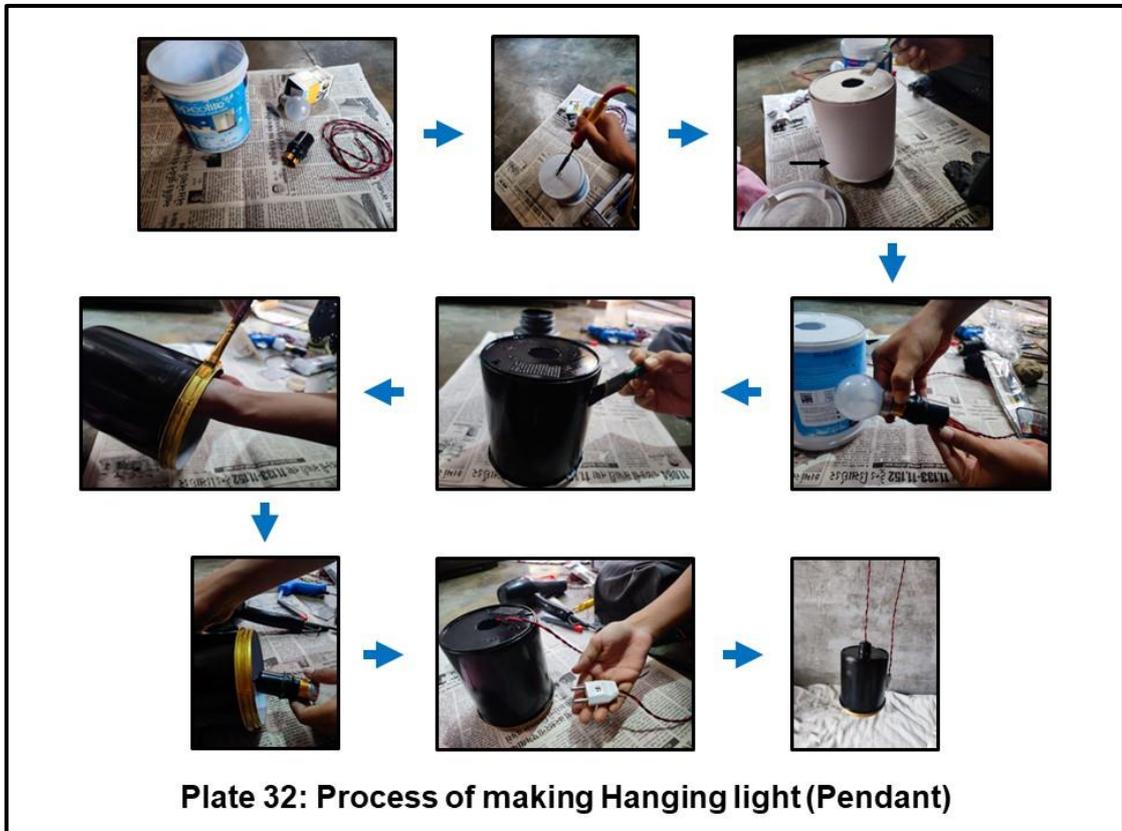
Step 5: One layer of black acrylic paint was used for the final coating, and to add aesthetic appeal, gold acrylic paint, gold-coloured foam sheets (0.2mm thick), and jute thread were also used.

Step 6: to join different pieces together hot glue gun, fevicol solution, nut bolt, and stapler pins were used.

C. Value addition to the utility and décor articles

To give value addition to the developed utility and décor articles, the researcher selected a Black and Gold theme, and according to the theme, hand painted the utility and décor articles with acrylic colours.

Plates for the process of making utility and décor articles



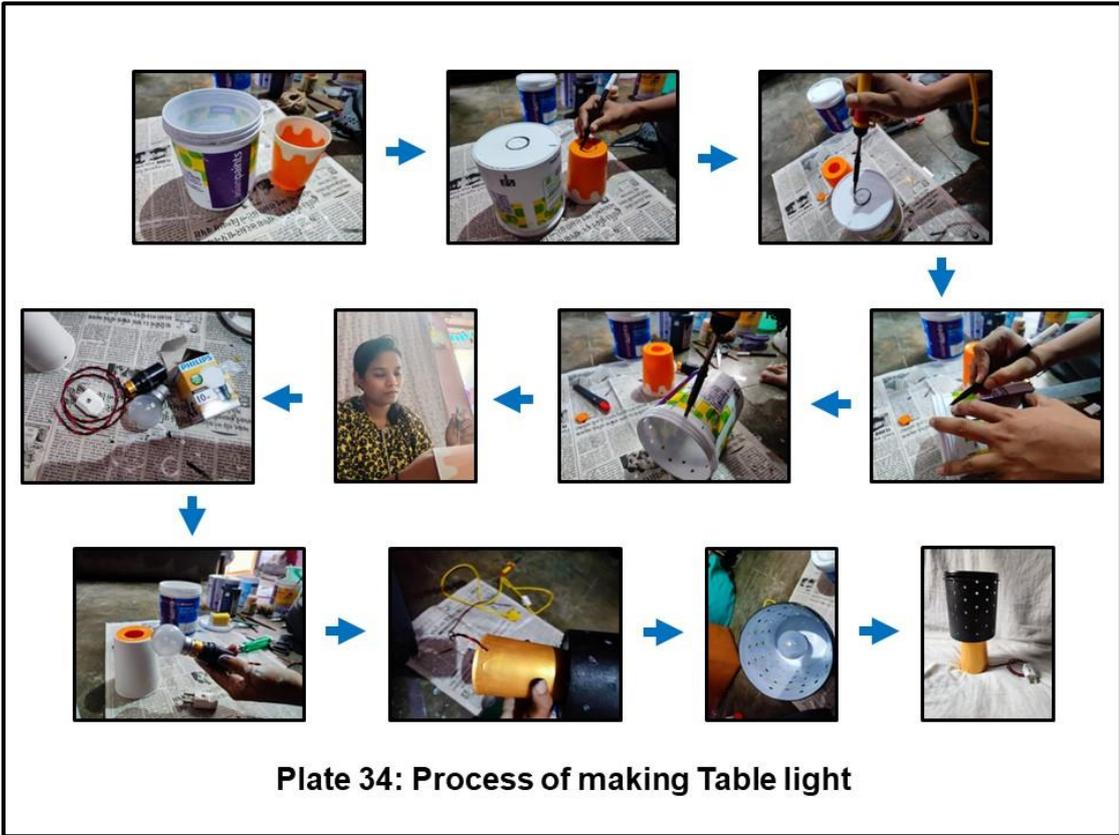
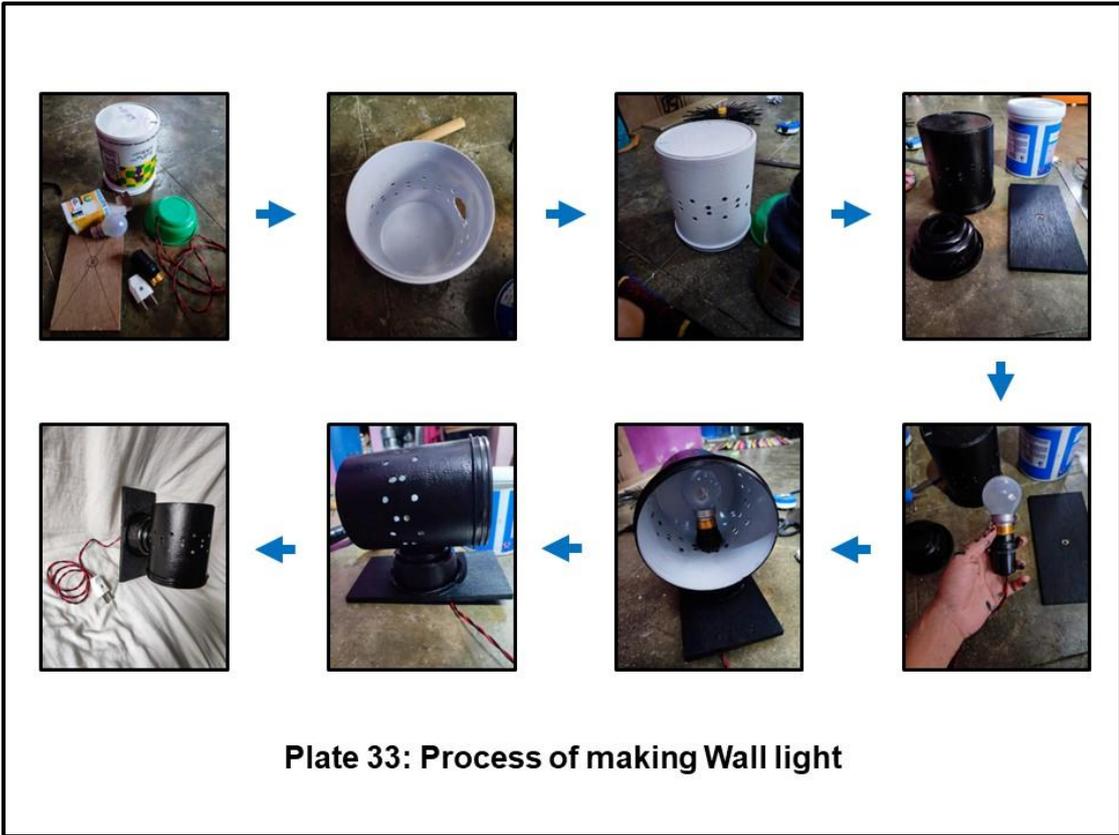




Plate 35: Process of making Laundry basket

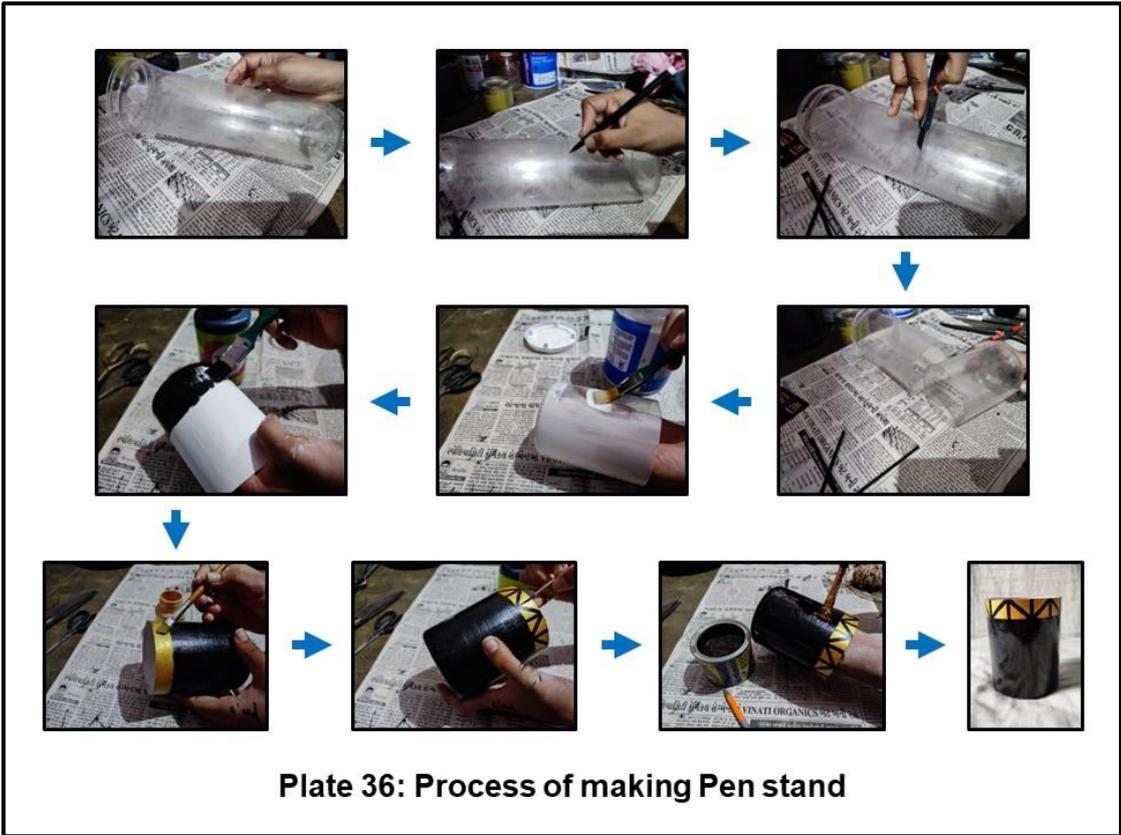
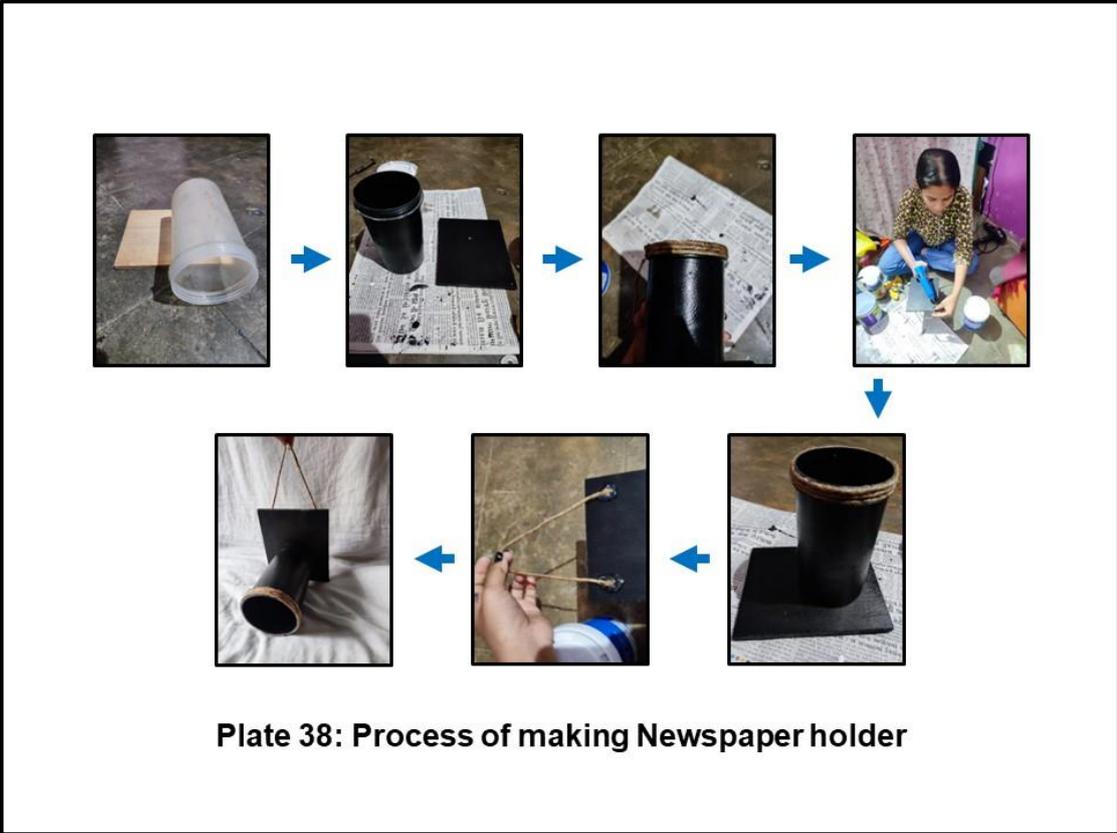
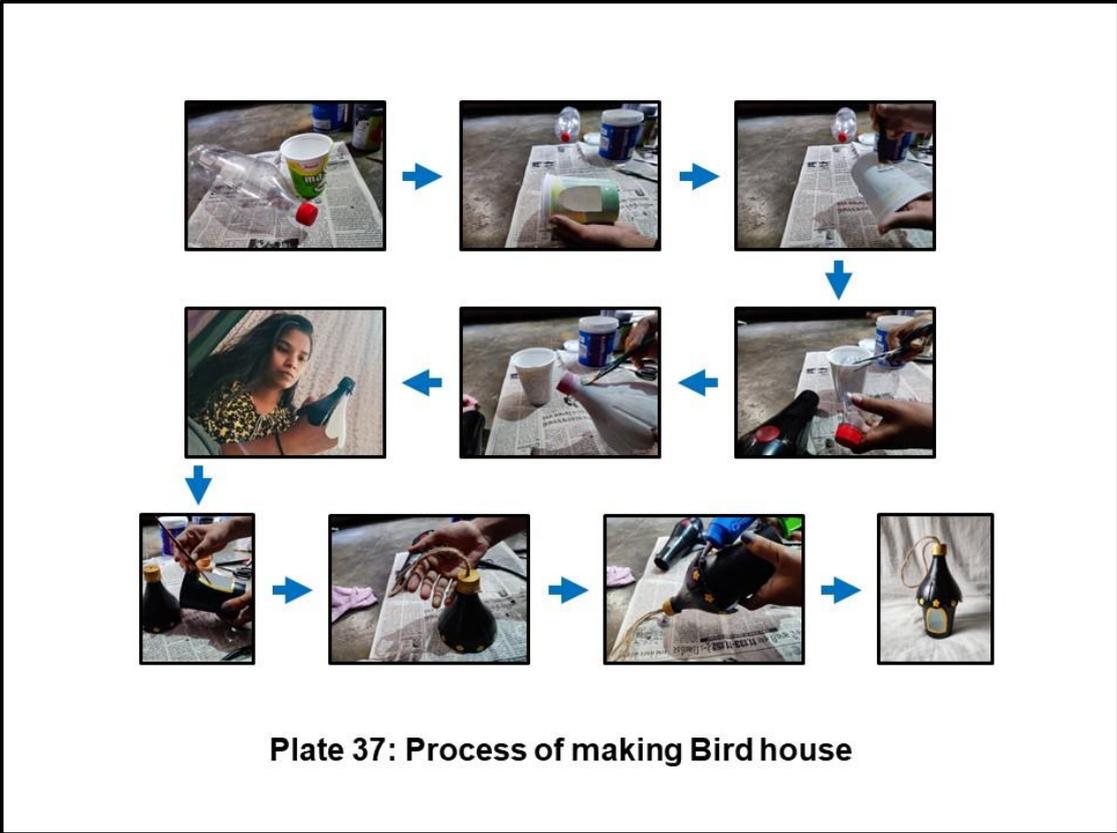


Plate 36: Process of making Pen stand



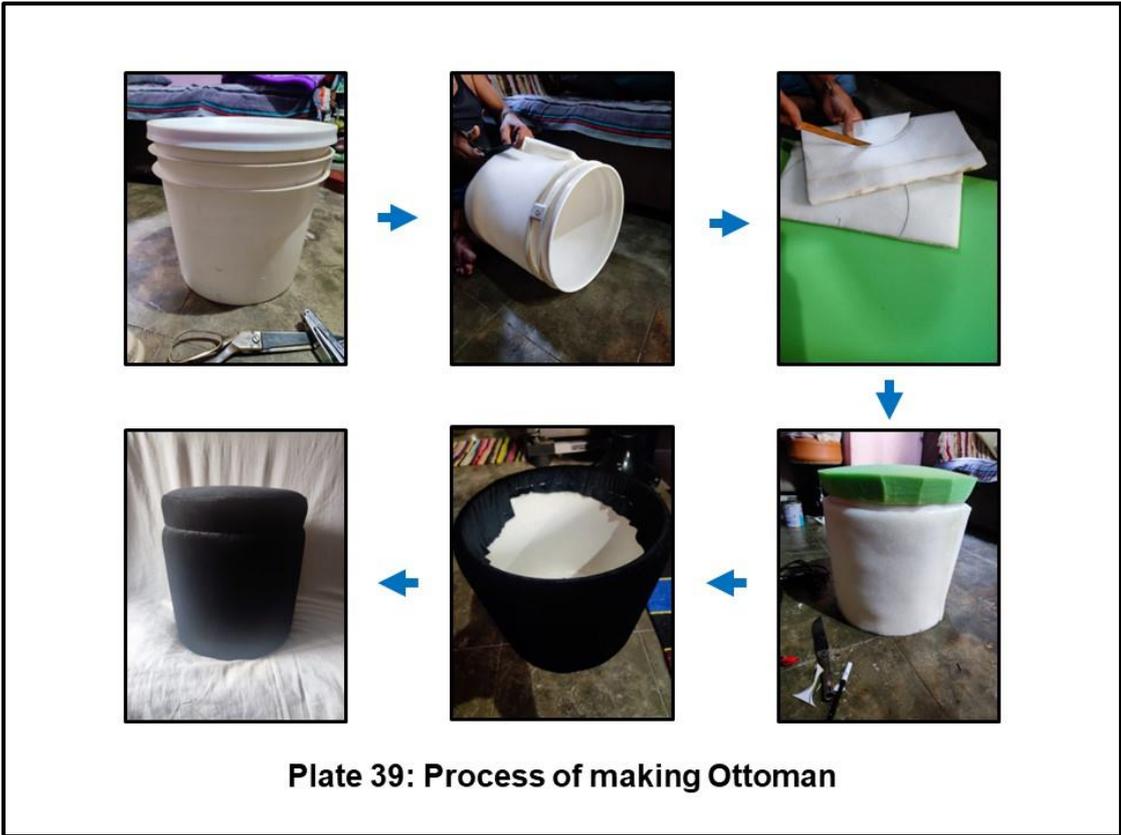


Plate 39: Process of making Ottoman

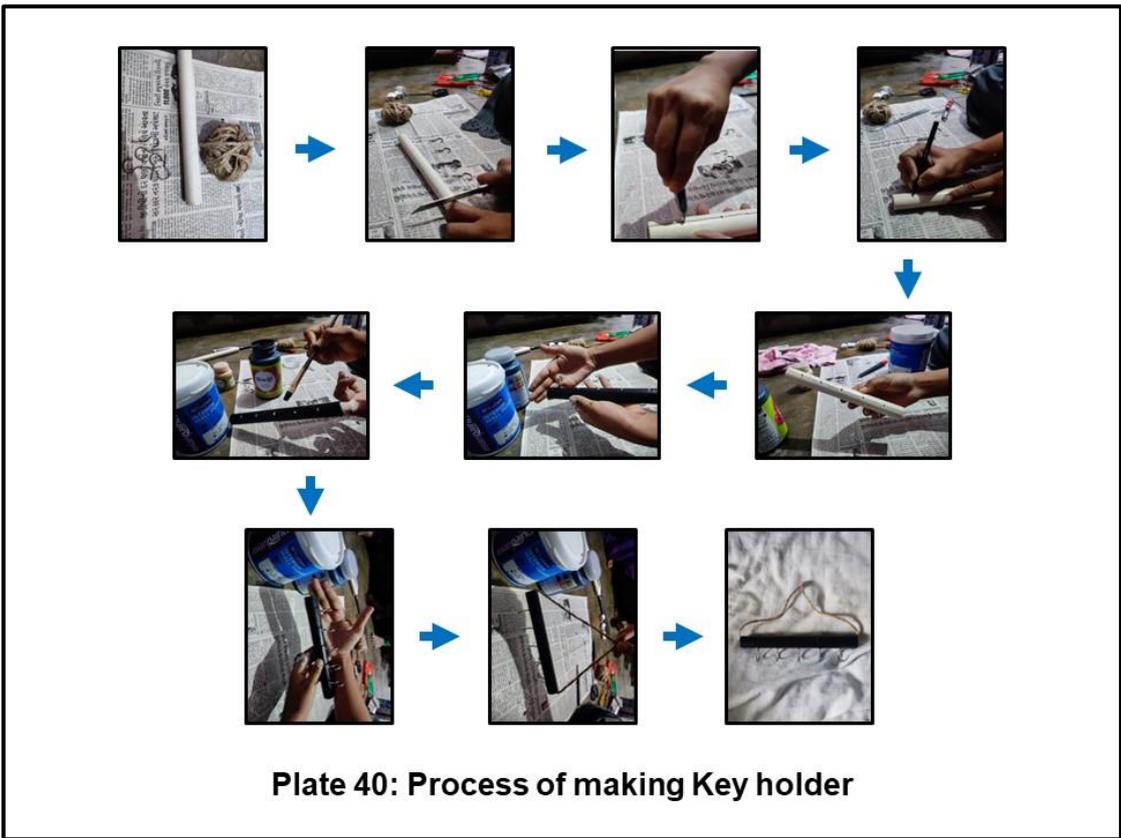
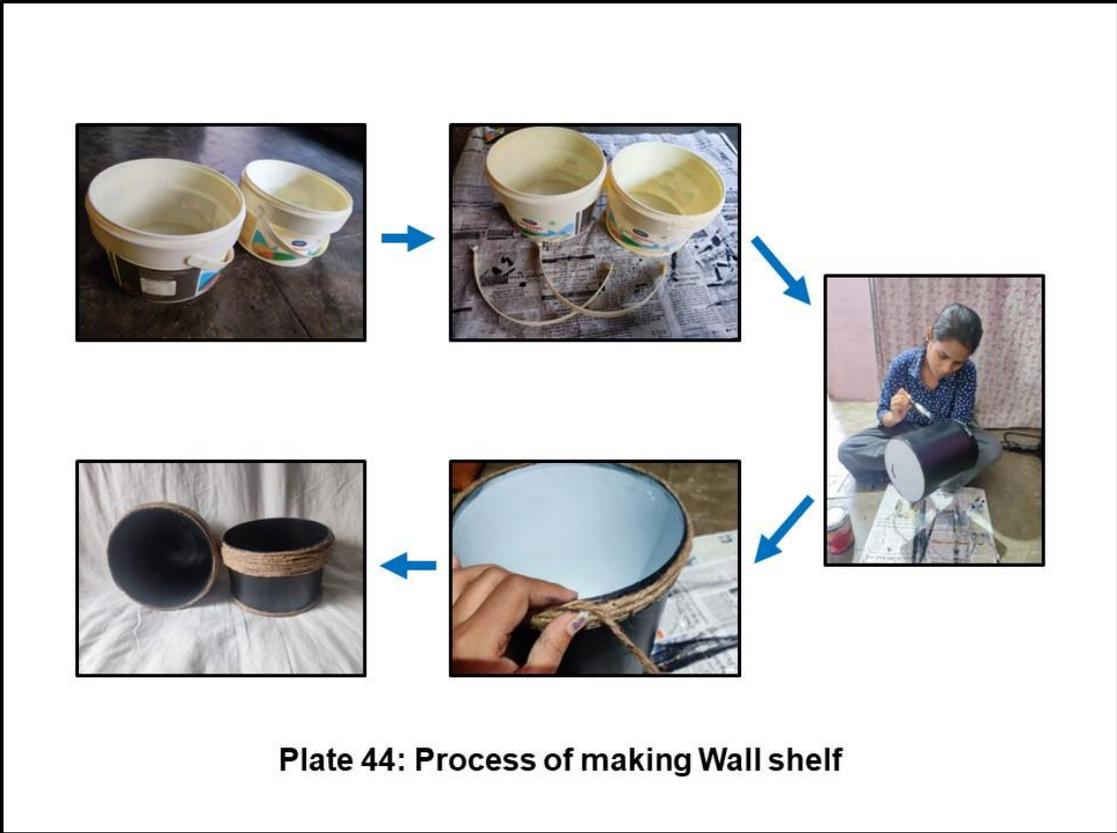
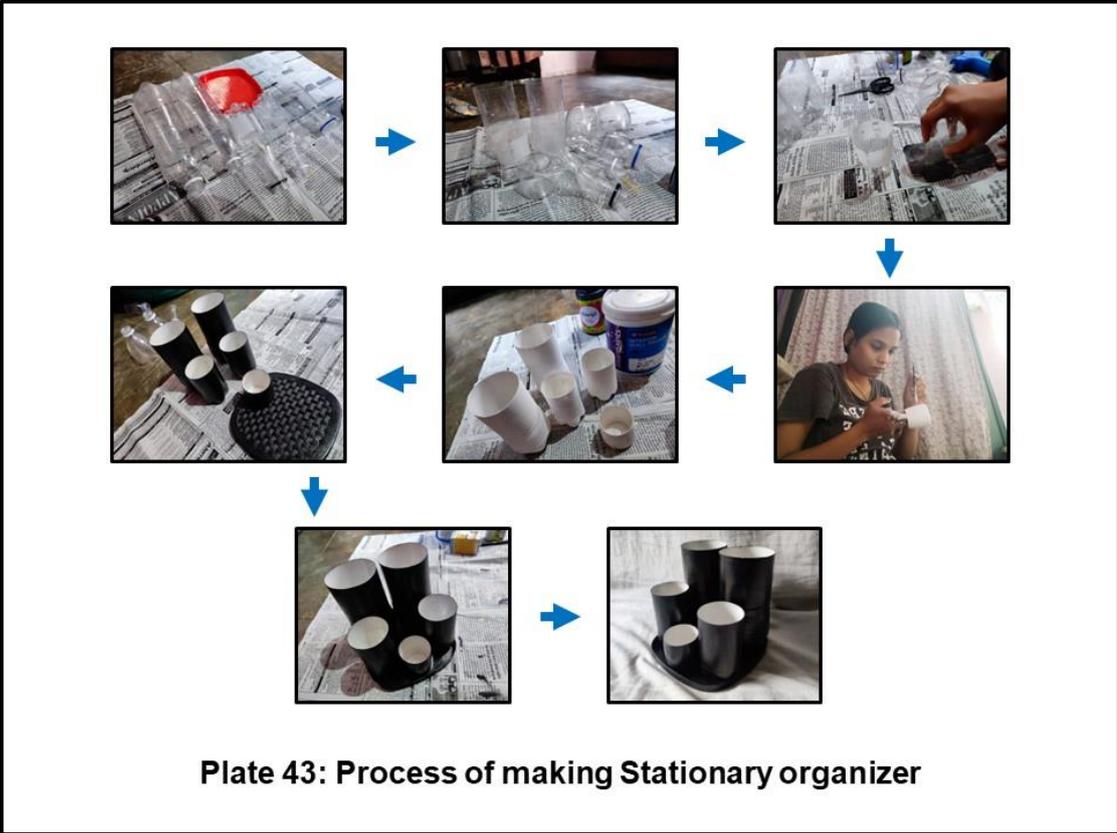
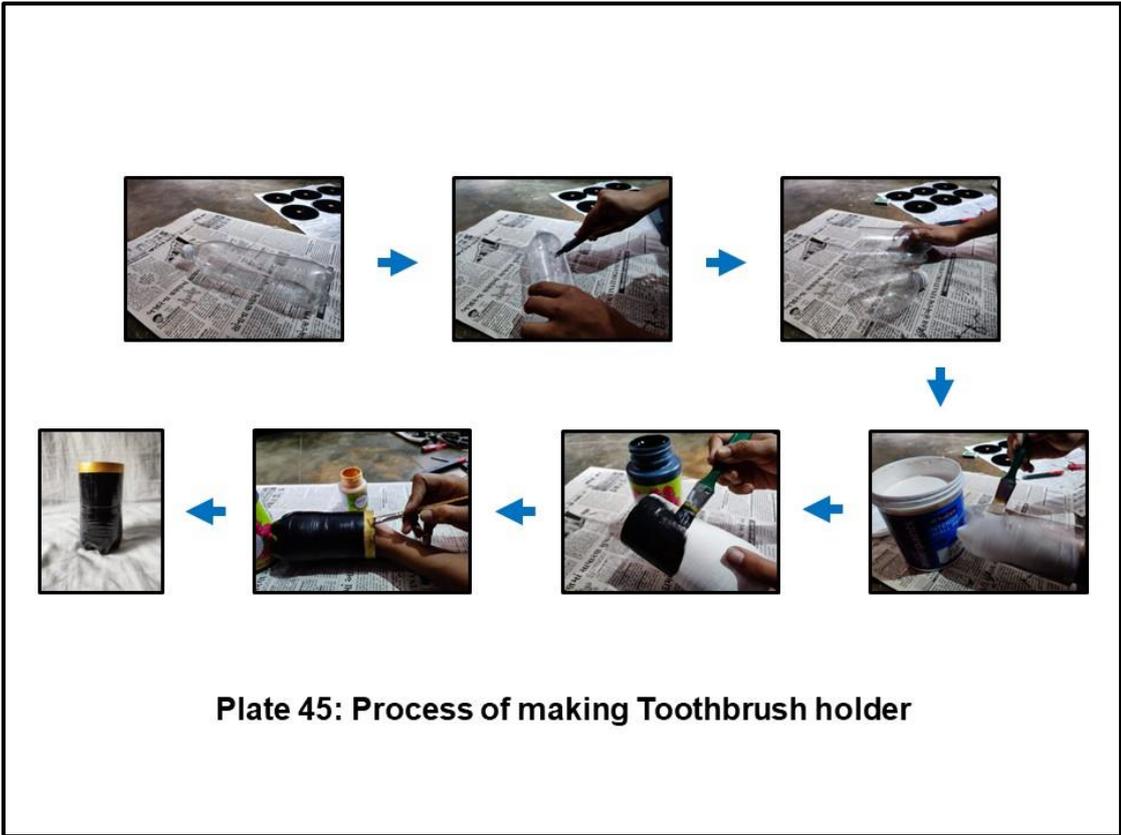


Plate 40: Process of making Key holder





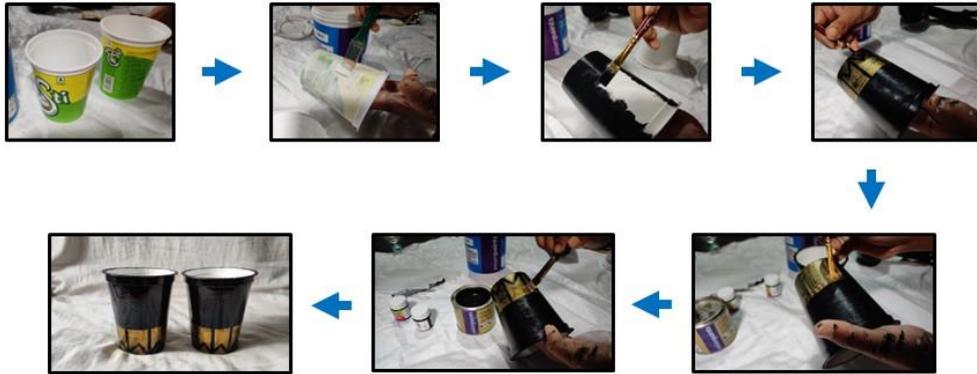


Plate 47: Process of making Planter

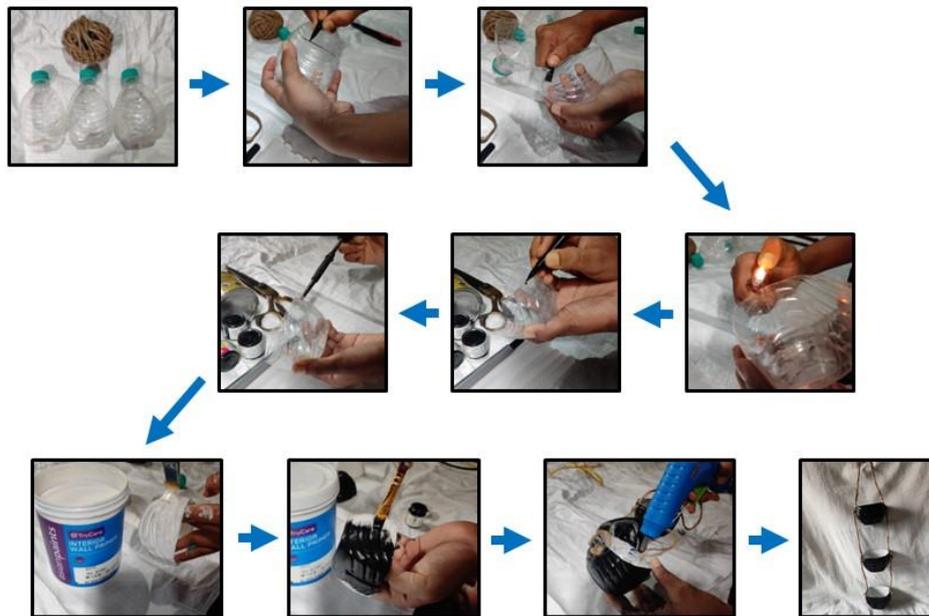
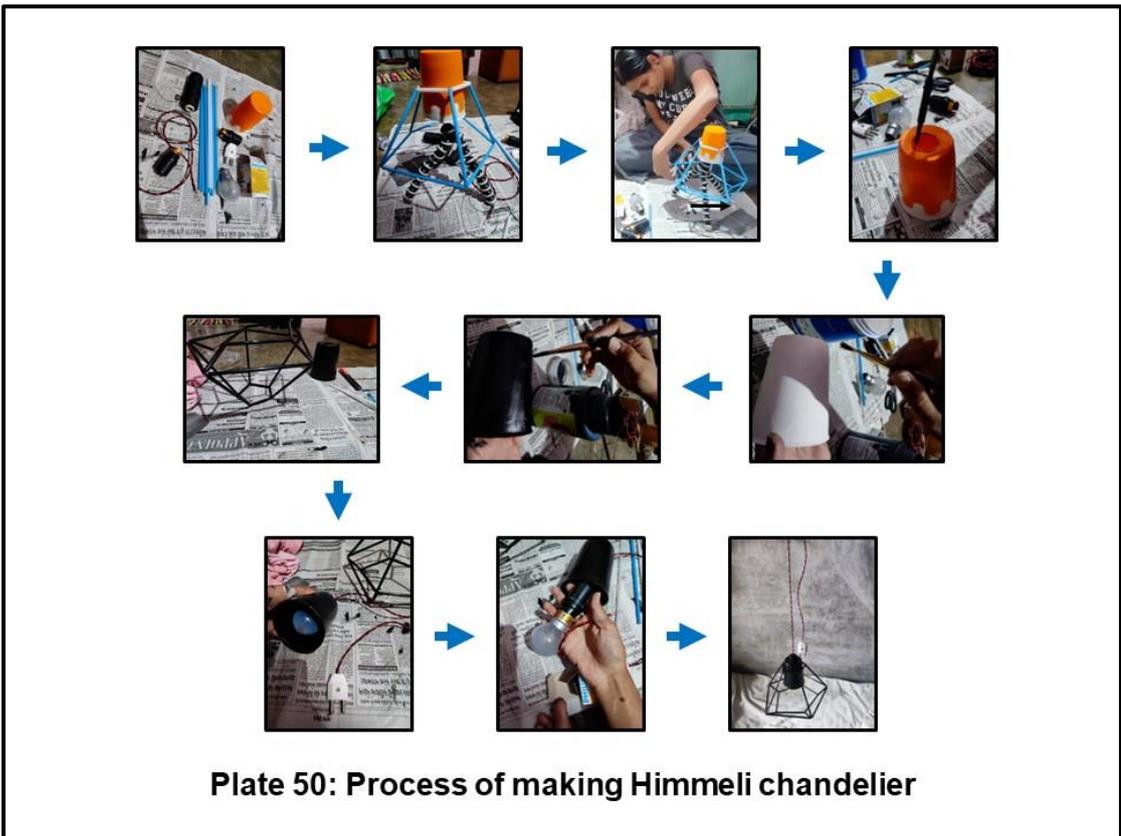
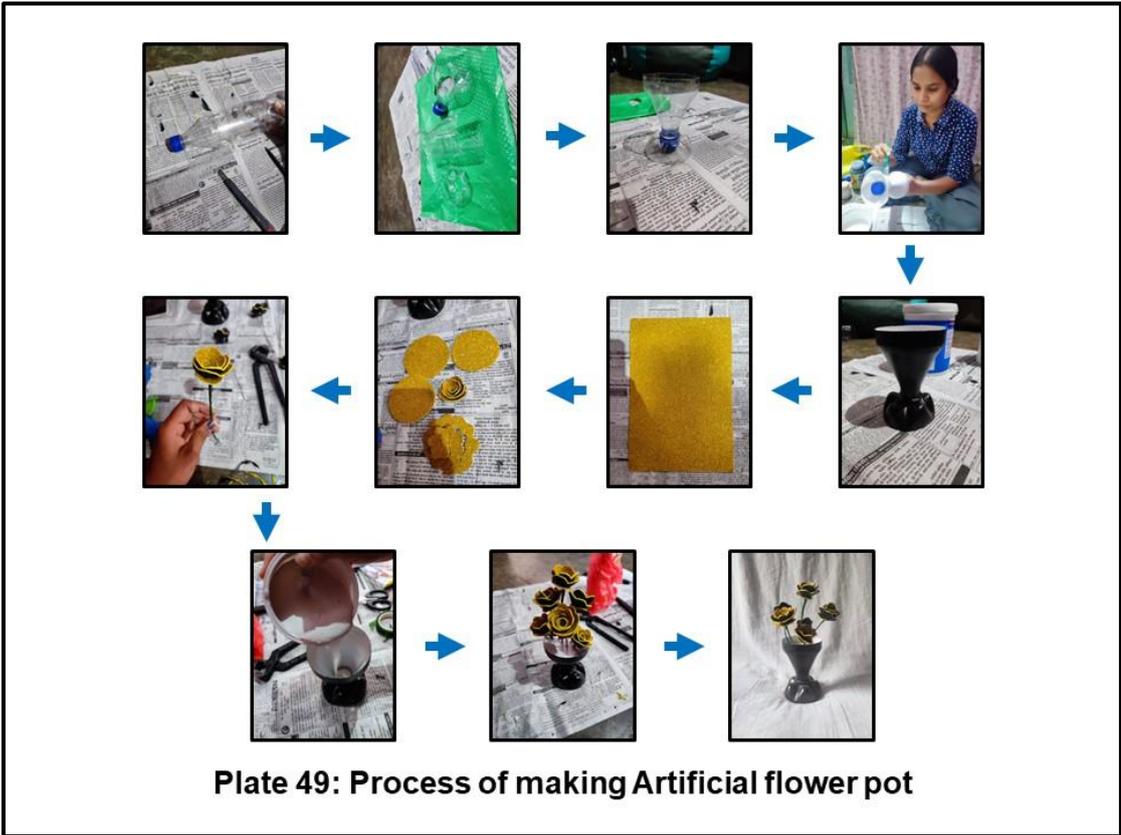
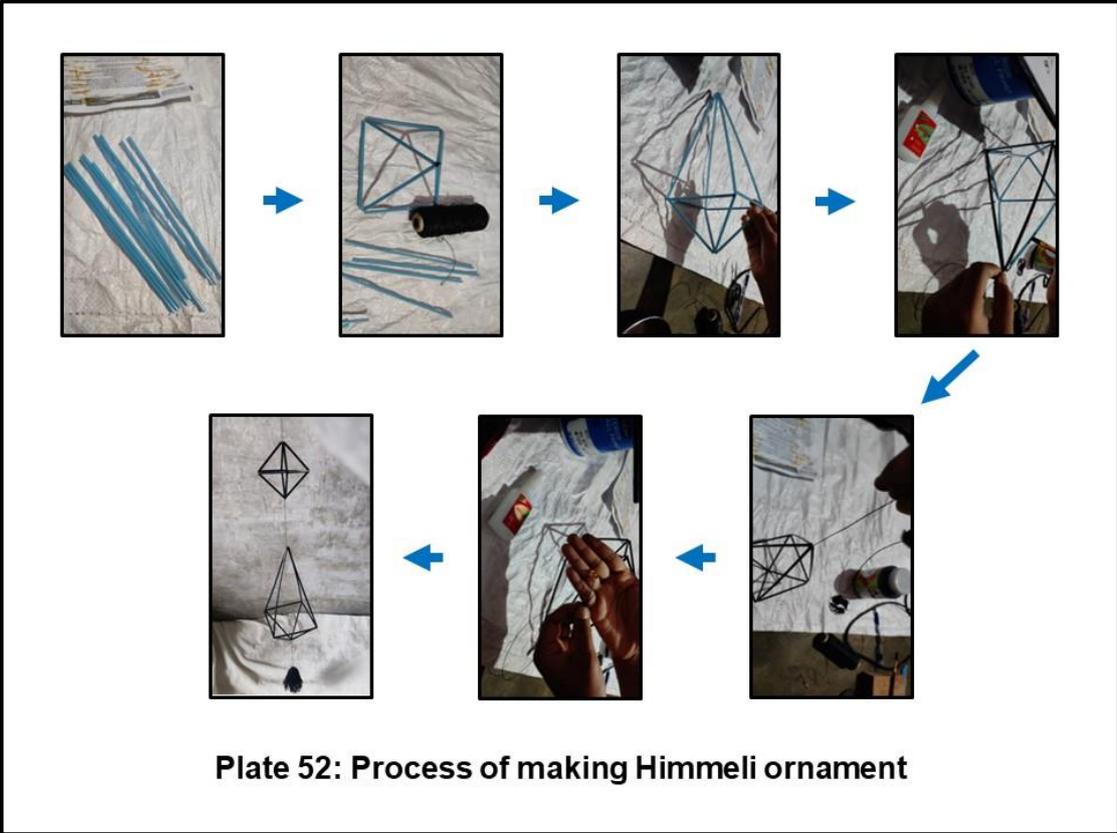
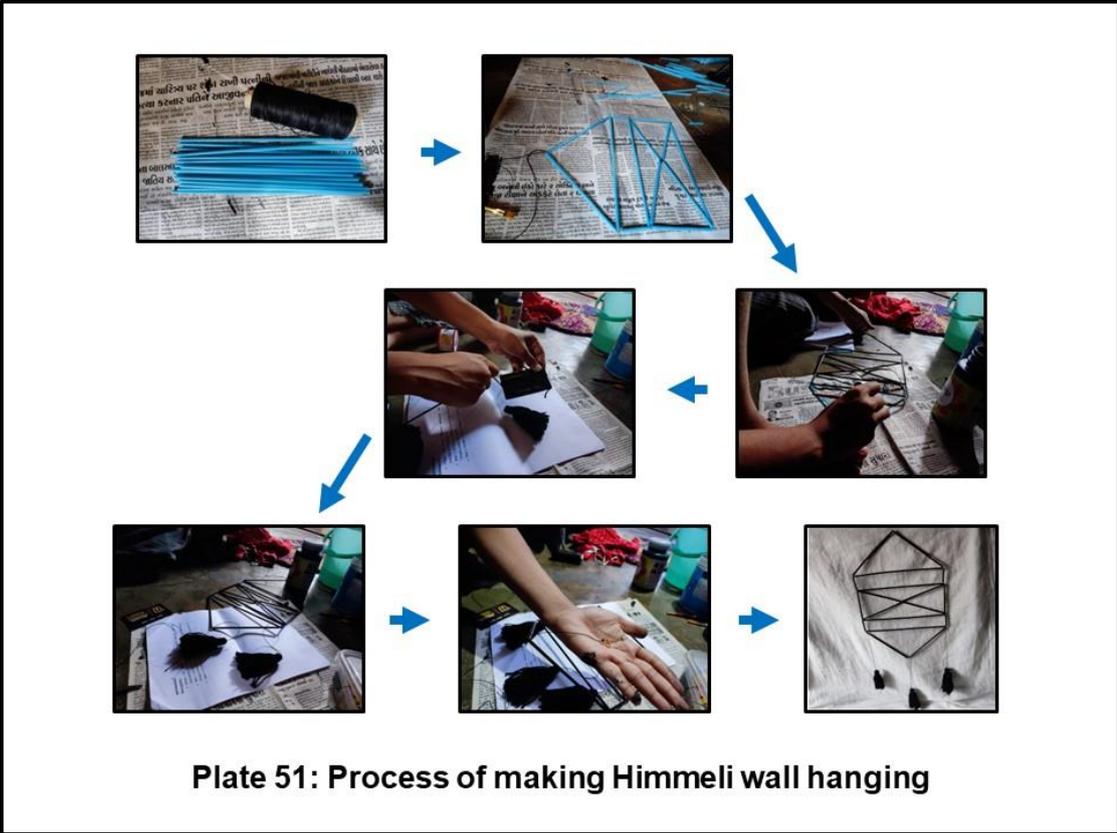
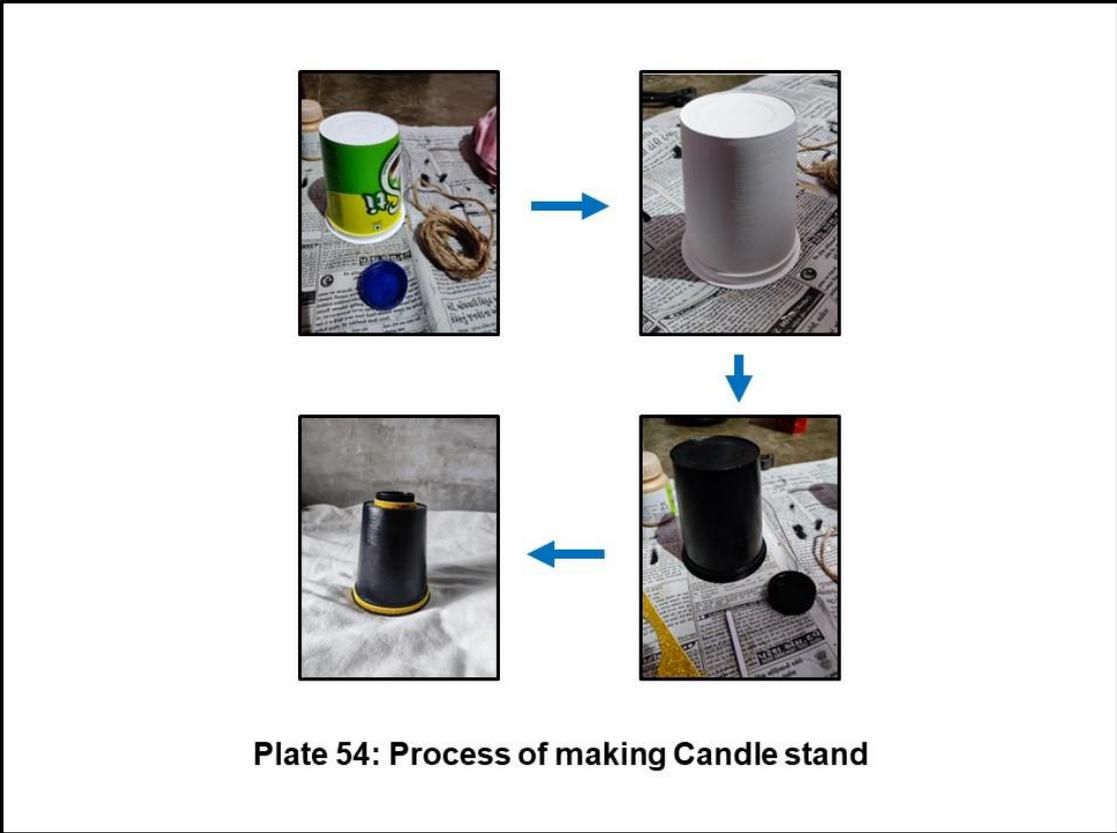
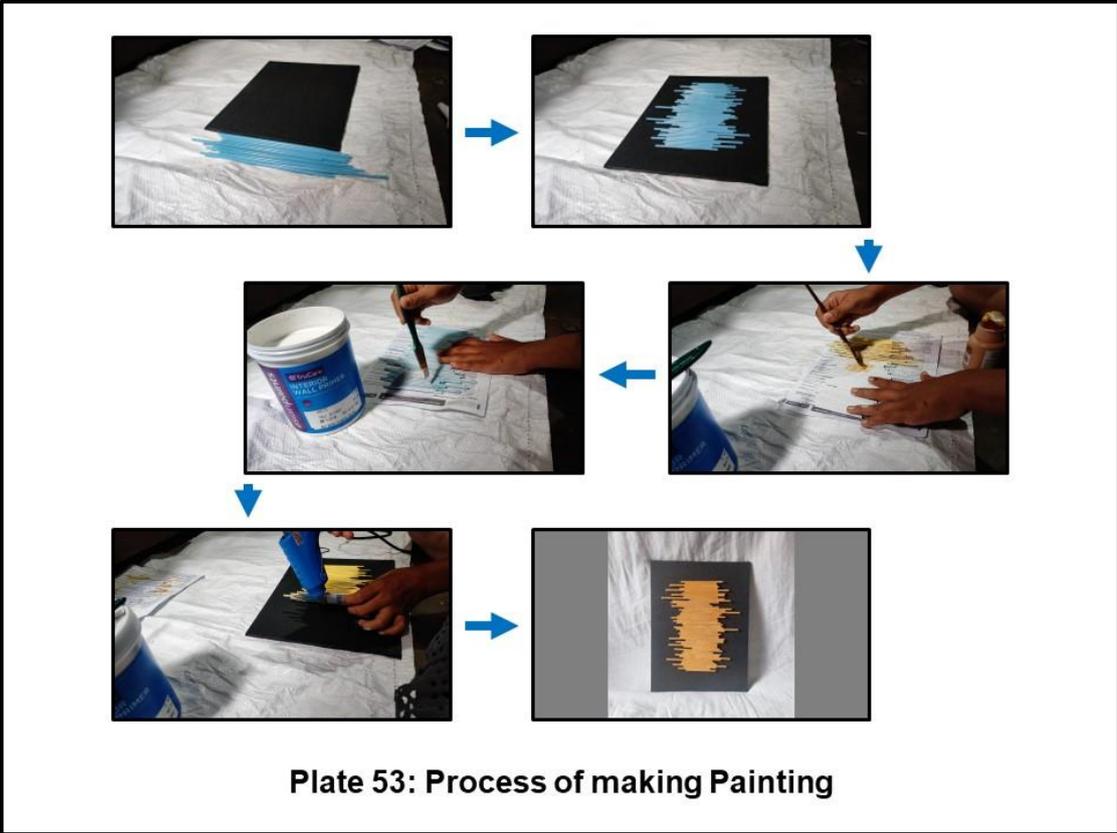


Plate 48: Process of making Hanging pot







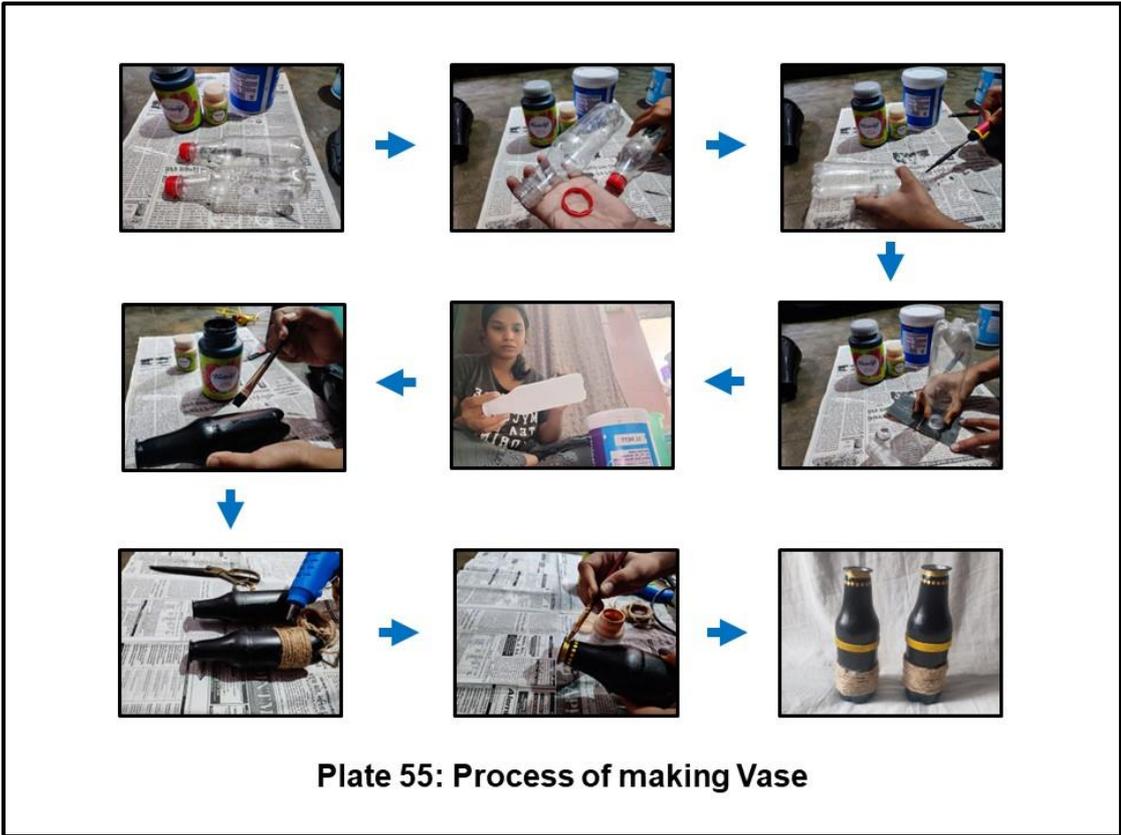


Plate 55: Process of making Vase

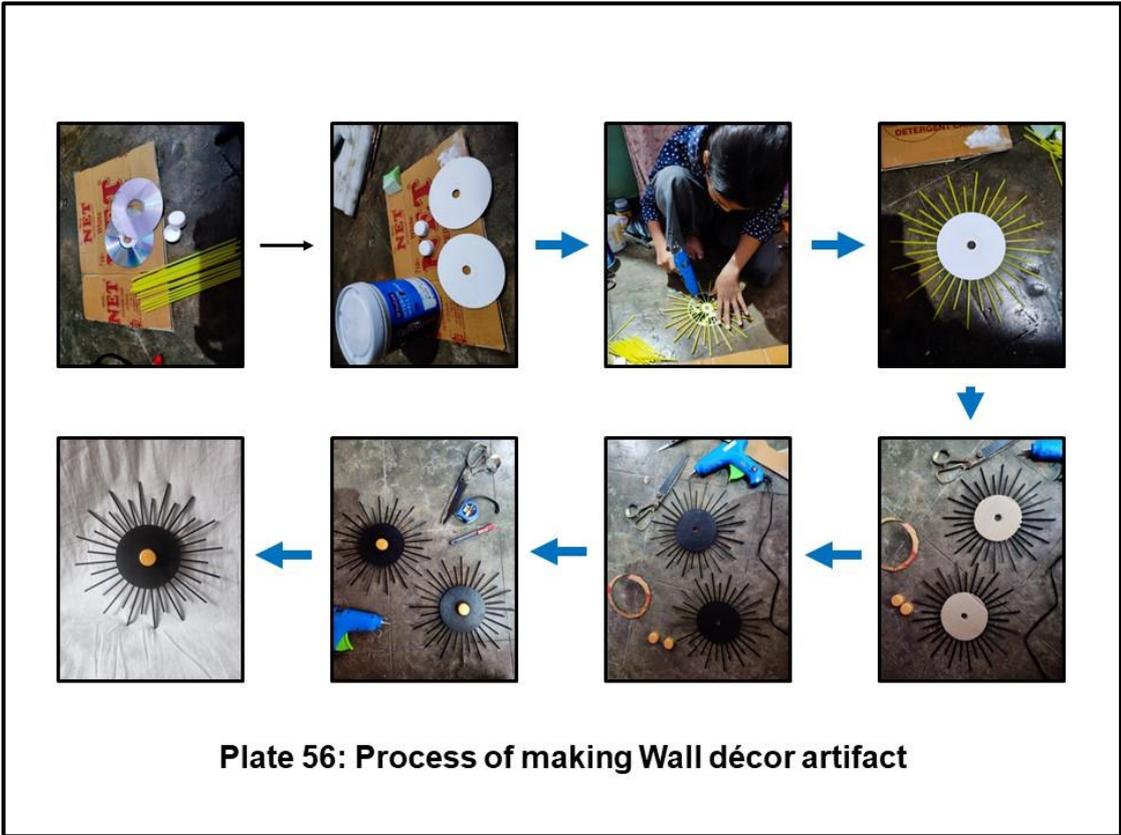


Plate 56: Process of making Wall décor artifact

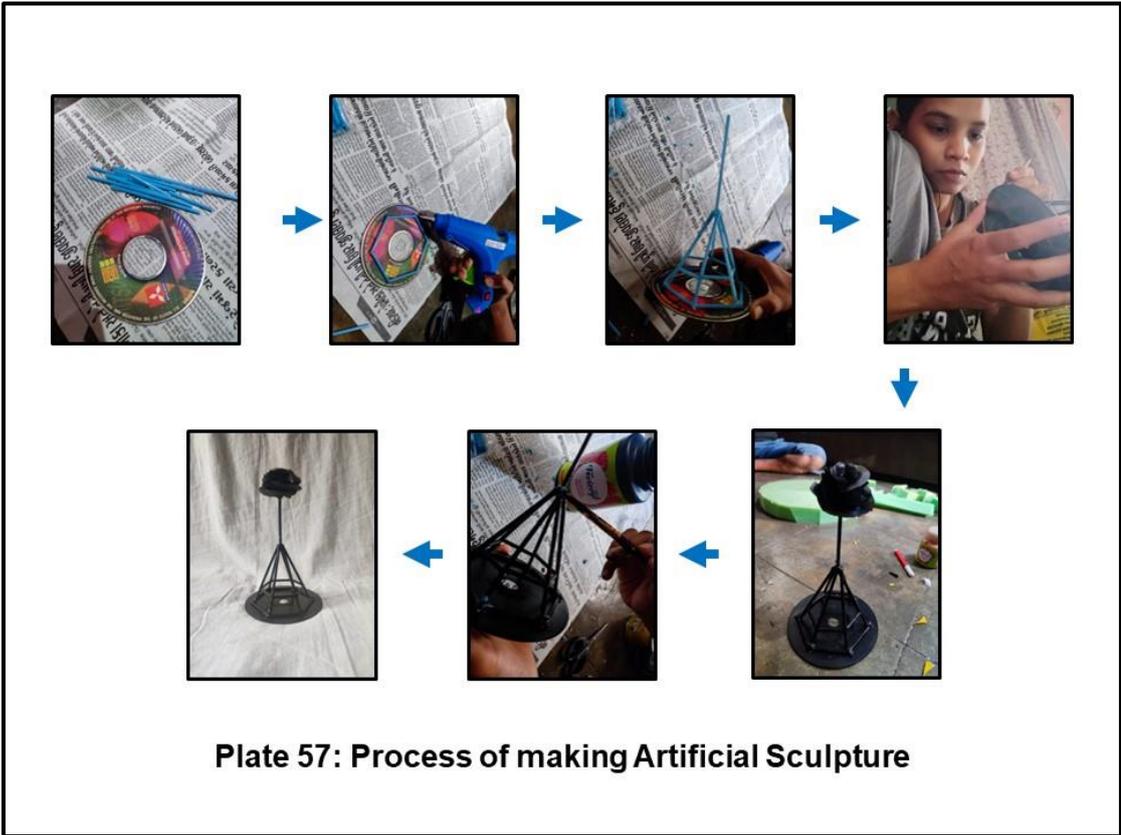


Plate 57: Process of making Artificial Sculpture

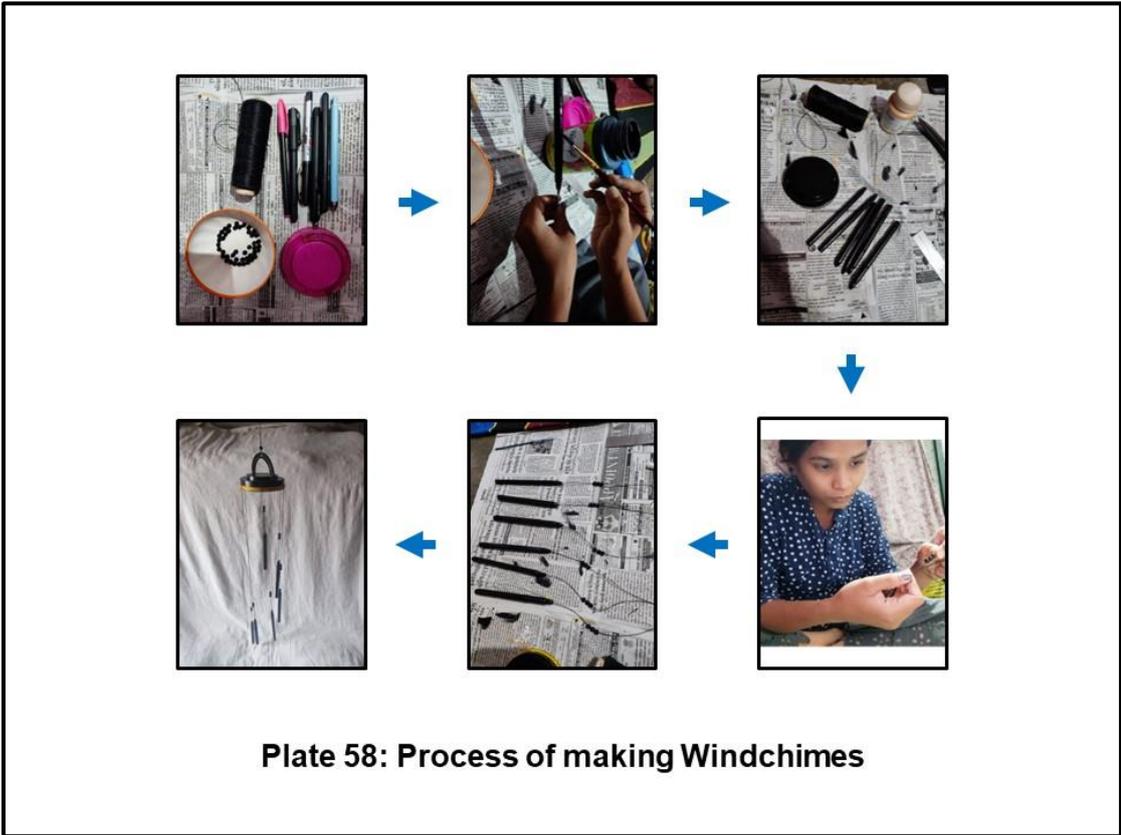
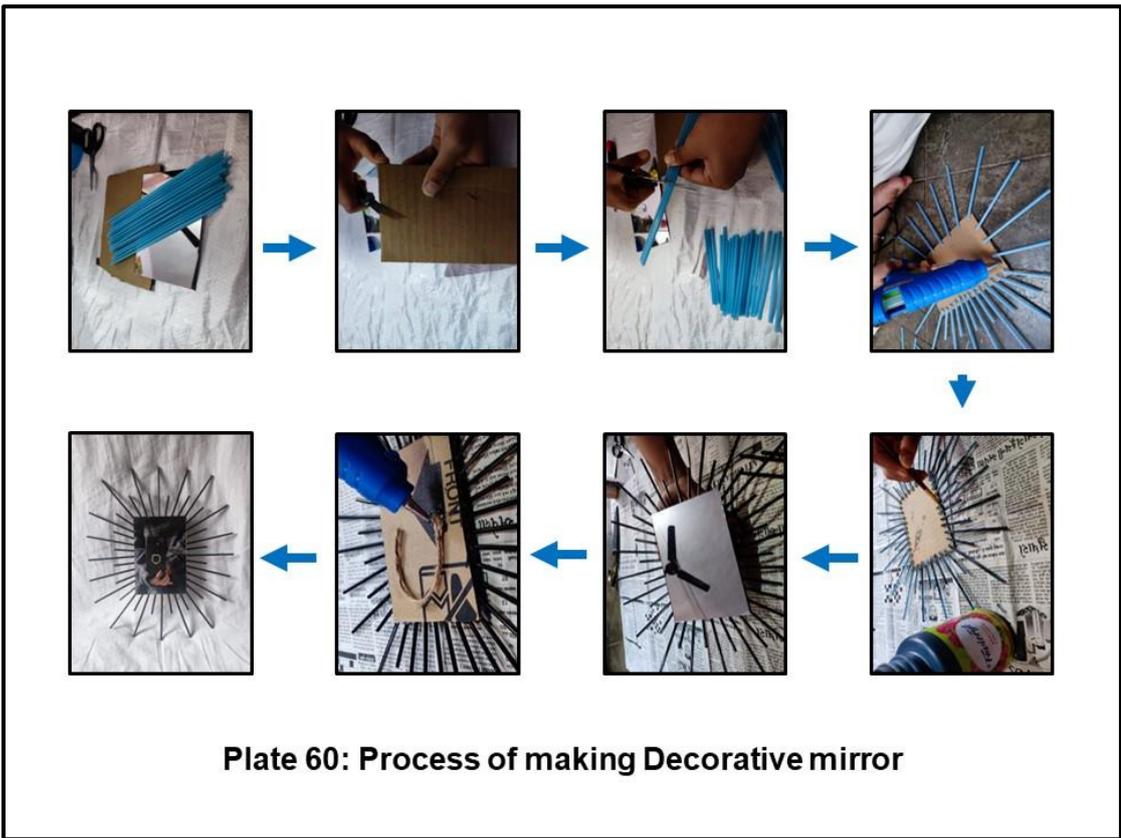
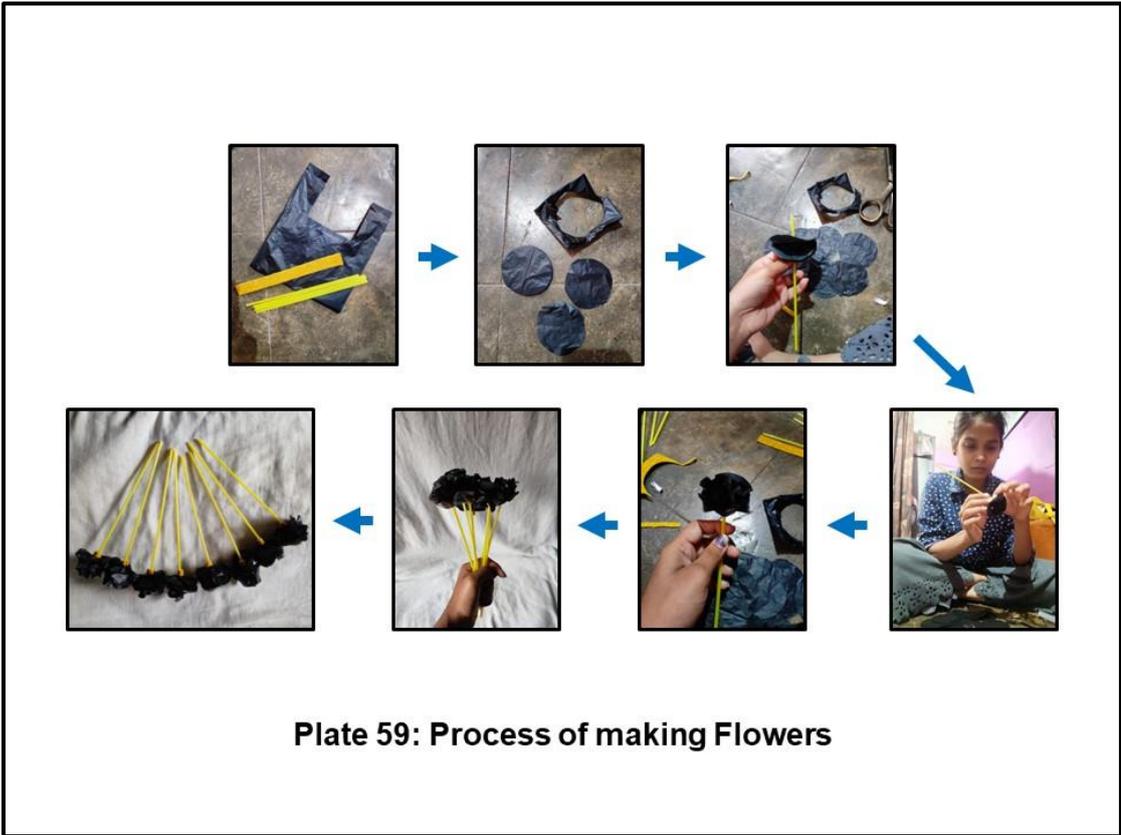


Plate 58: Process of making Windchimes



Phase 3: Preparation of catalogue and cost estimation of utility and décor articles

Cost estimation was done based on material costs, labour charges and profit for the developed utility and décor articles. A catalogue was prepared mentioning the product description namely product name, type of plastic used, size of the product and price of the developed utility and décor articles.

Table 1: Material costs and labour charges for the developed utility and décor articles for residential use from plastic waste

Sr. no.	Utility & Décor Article	Material cost & Labour Charges (in ₹)	Profit (in ₹)	Selling Price (in ₹)
1.	Dustbin	150	50	200
2.	Hanging light (Pendant)	270	100	370
3.	Wall light	330	100	430
4.	Table light	300	100	400
5.	Laundry basket	500	200	700
6.	Pen stand	30	20	50
7.	Bird house	150	50	200
8.	Newspaper holder	80	30	110
9.	Ottoman	1100	300	1400
10.	Key holder	140	40	180
11.	Side table	800	300	1100
12.	Coaster	290	60	350
13.	Stationary organizer	110	50	160
14.	Wall shelf	190	60	250
15.	Toothbrush holder	30	20	50
16.	Wall-mounted wine glass holder	250	150	400
17.	Planter	70	30	100
18.	Hanging pot A	60	20	80
19.	Hanging pot B	60	20	80
20.	Artificial flower pot	140	30	170

Sr. no.	Utility & Décor Article	Material cost & Labour Charges (in ₹)	Profit (in ₹)	Selling Price (in ₹)
21.	Himmeli chandelier	250	100	350
22.	Himmeli wall hanging	40	10	50
23.	Himmeli ornament	40	10	50
24.	Painting	250	50	300
25.	Candle Stand	20	10	30
26.	Vase	120	50	170
27.	Wall décor artifact	120	50	170
28.	Sculpture	40	10	50
29.	Windchime	70	40	110
30.	Flowers	80	40	120
31.	Decorative mirror	160	50	210
Total		6240	2150	8390
Note:				
<ul style="list-style-type: none"> • The material cost includes the cost of jute rope, Stapler pin, glue & adhesive, polish, primer, acrylic paints, and other materials used for the development of the utility and décor articles. • The profit was decided according to the making time and material cost was calculated based on prevailing market rate from November 2022 - December 2023. 				

Section II

4.2: Background Information of the respondents

This section contained the background information of the respondents which was divided into two parts i.e., personal information and family Information. Personal Information included age, marital status, educational qualification, and occupational status of the respondents. Whereas, family information included family monthly income (in ₹).

4.2.1: Personal Information of the respondents

Personal Information contained information regarding age (in years), educational qualification, marital status, occupation of the respondents.

Table 2: Frequency and percentage distribution of the respondents according to their Personal Information

Sr. No.	Personal Information	Respondents (n=60)	
i. Age (in years)		f	%
1.	18-27	40	66.67
2.	28-37	11	18.33
3.	38-48	9	15
Total		60	100
Mean		27 years	
S.D.		7.86	
ii. Marital Status		f	%
1.	Married	27	45
2.	Unmarried	33	55
Total		60	100
iii. Educational Qualifications		f	%
1.	Higher Secondary	4	6.67
2.	Diploma	1	1.67
3.	Graduation	43	71.67
4.	Post-graduation	9	15
5.	Ph.D.	3	5

iii. Educational Qualifications		f	%
Total		60	100
iv. Occupational Status		f	%
1.	Employed	27	45
2.	Unemployed	27	45
3.	Self-employed	6	10
total		60	100

i. Age (in years):

It was found that 66.67 per cent of the respondents were in the age group of 18 to 27 years with the Weighted Mean of 27 years. Whereas, 18.33 per cent of the respondents were from the age group of 28 to 37 years. In contrast, very few, i.e.; 15 per cent of the respondents were in the age group of 38 to 48 years. (Table 2, figure 2)

ii. Marital status:

Regarding Marital Status, it was found that 55 per cent of the respondents were unmarried and 45 per cent were married. (Table 2, figure 2)

iii. Educational qualifications:

The data revealed that 71.67 per cent of the respondents were qualified up to graduation level. Whereas, 15 per cent of the respondents were qualified up to post-graduation y. 6.67 per cent were qualified up to higher secondary level and 5 per cent were qualified up to Ph.D. level. Whereas, very less 1.67 per cent of the respondents were qualified up to diploma. (Table 2, figure 2)

iv. Occupational status:

the data revealed that 45 per cent of the respondents were employed and unemployed respectively and very few 10 per cent of the respondents were self-employed. (Table 2, figure 2)

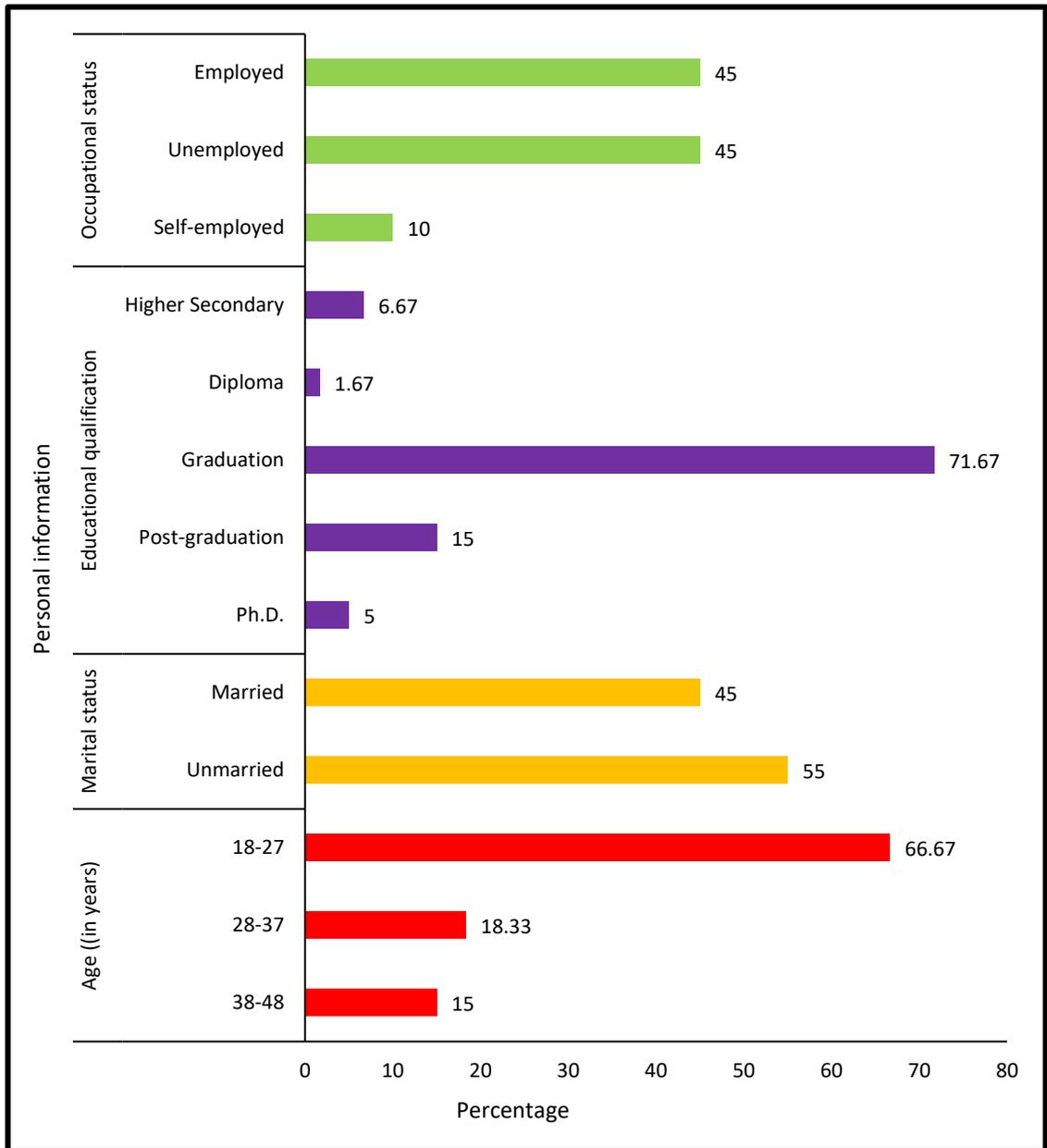


Figure (2): Percentage distribution of the respondents according to their Personal Information

4.2.2: Family Information of the respondents

This section contained information regarding family monthly income of the respondents.

Table 3: Frequency and percentage distribution of the respondents according to their family monthly income

Sr. No.	Family monthly income (in ₹)	f	%
1.	≤100000	51	85
2.	100001-200000	5	8.33
3.	200001-300000	4	6.67
Total		60	100
Minimum		30,000	
Maximum		3,00,000	
Mean		85,254	
S.D.		65,728.17	

i. Family monthly income (in ₹):

A range obtained from family monthly income was classified into three categories, 85 per cent of the respondents had their family monthly income ranging from less than or equal to 1,00,000 with the mean income of 85,254. While, 8.33 per cent of the respondents had their family monthly income ranging from 1,00,001 to 2,00,000. Whereas, in contrast a few (6.67 %) respondents' families' monthly income was in the range of 2,00,001 to 300000. (Table 3, Figure 3)

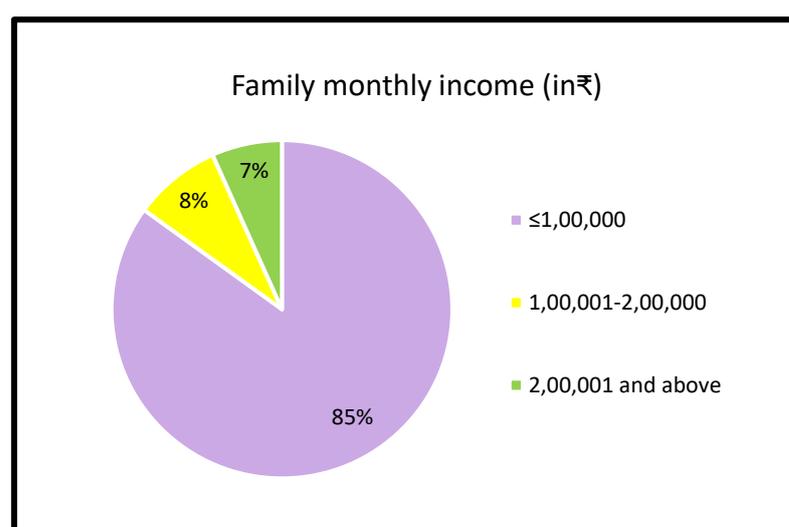


Figure (3): Percentage distribution of the respondents according to their Family Monthly Income

Section III

4.3: Opinion of Interior designers, students of interior design specialization and homemakers for the developed Utility and Décor Articles.

This section described the respondent's opinion regarding what they perceive about selected existing parameters namely "size", "quality", "durability", "proportion", "convenience of use", "colour combination" and "aesthetic value" of the developed utility and décor articles from plastic waste for residential spaces.

A. Utility article

1. Dustbin

Plastic handcrafted dustbin that was hand painted with oil paint and to provide an aesthetic look the top edge was finished with multiple layers of jute rope. A functional utility article for the home that can be used to collect waste, has a refined, simple, and minimalist look, and will help to keep the space clean.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 200



Plate 61: Dustbin

The data from Table 4 revealed that 63.33 per cent of the respondents strongly agreed that the dustbin was solving the purpose for what it was designed. While 61.33 per cent of the respondents strongly agreed that the design of the dustbin reflected unity and the colour combination was appropriate for residential spaces, 58.33 per cent of the respondents strongly agreed that the design of the dustbin was appropriate for its use. 53.33 per cent of the respondents strongly agreed that the size of the dustbin was appropriate for its use.

Based on weighted mean score of 4.41 it was concluded that the respondents agreed that the Quality of the product was satisfactory and the price of the dustbin was acceptable.

Table 4: Frequency and percentage distribution of the respondents according to their opinion for the Dustbin

Sr. No	Attributes of the Dustbin	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1	The design of the dustbin is appropriate for its use.	35	58.33	25	41.67	0	0.00	0	0.00	0	0.00	4.58
2	The size of the dustbin is appropriate for its use.	32	53.33	18	30	9	15	0	0.00	1	1.67	4.33
3	The design of the product reflects unity.	37	61.67	20	33.33	1	1.67	2	3.33	0	0.00	4.53
4	The product is solving the purpose for what it is designed.	38	63.33	21	35	0	0.00	1	1.67	0	0.00	4.6
5	The colour combination is appropriate for residential space.	37	61.67	13	21.6%	7	11.67	3	5.00	0	0.00	4.4
6	The dustbin is easy to clean with a damp cloth.	26	43.33	23	38.33	7	11.67	2	3.33	2	3.33	4.15
7	The overall product is functional.	29	48.33	25	41.67	5	8.33	1	1.67	0	0.00	4.37
8	The overall quality of the dustbin is satisfactory.	32	53.33	25	41.67	3	5	0	0.00	0	0.00	4.48
9	The price of the product is acceptable.	28	46.67	24	40	3	5	3	5.00	2	3.33	4.22
Total Weighted Mean Score											4.41	

2. Hanging light (pendant)

Hanging light that was handcrafted and hand-painted with primer and acrylic paints and can be hung on the ceiling of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. edge was finished with a layer of golden acrylic colour. A functional utility article for the home that has a simple and minimalist look and will help to keep the space bright.



Type of Plastic: Polypropylene (Container)

Price: ₹ 370

The data from Table 5 revealed that 60 per cent of the respondents strongly agreed that the light was solving the purpose for what it was designed. 58.33 per cent of the respondents strongly agreed that the size of the light was big enough for its use and 55 per cent of the respondents strongly agreed that the hanging light added aesthetic value to the space. Whereas, it was observed 51.67 per cent of the respondents strongly agreed that the finishing of the hanging light was satisfactory. While 43.33 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory.

Based on weighted mean score of 4.17 it was concluded that 41.67 per cent of the respondents strongly agreed and agreed that the price of the product was acceptable.

Table 5: Frequency and percentage distribution of the respondents according to their opinion for the Hanging light (Pendant)

Sr. No	Attributes of the Hanging light (Pendant)	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the hanging light is satisfactory.	31	51.67	24	40	2	3.33	2	3.33	1	1.67	4.37
2.	The size of light is big enough for its use.	35	58.33	20	33.33	3	5	2	3.33	0	0.00	4.47
3.	The product adds aesthetic value to the space.	33	55	23	38.33	2	3.33	2	3.33	0	0.00	4.45
4.	The product is solving the purpose for what it is designed.	36	60	20	33.33	1	1.67	3	5	0	0.00	4.48
5.	It is not easy to clean with a damp cloth.	8	13.33	15	25	12	20	17	28.33	8	13.33	2.97
6.	The overall quality of the product is satisfactory.	26	43.33	24	40	6	10	4	6.67	0	0.00	4.2
7.	The price of the product is acceptable.	25	41.67	25	41.67	8	13.33	2	3.33	0	0.00	4.22
Total Weighted Mean Score											4.17	

3. Wall light

Wall light that was handcrafted and hand-painted with primer and acrylic paint and can be hung on the wall of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. A wooden frame was provided on the back to help the lamp stay on the wall. A functional utility article for the home that has an aesthetic and minimalist look and will help to keep the space bright.

Type of Plastic: Polypropylene
(Container)

Price: ₹ 430



The data from Table 6 revealed that 53.33 per cent of the respondents agreed that the finishing of the wall light was satisfactory. 51.67 per cent of the respondents strongly agreed that the product was solving the purpose for which it was designed. While 50 per cent of the respondents strongly agreed that the price of the wall light was acceptable. Whereas, 48.33 per cent of the respondents strongly agreed that the light added aesthetic value to the space.

Based on weighted mean score of 4.16 it was concluded that the overall quality of the wall light was satisfactory.

Table 6: Frequency and percentage distribution of the respondents according to their opinion for the Wall light

Sr. No	Attributes of the Wall light	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the wall light is satisfactory.	28	46.67	32	53.33	0	0.00	0	0.00	0	0.00	4.47
2.	The size of light is big enough for its use.	27	45	30	50	3	5	0	0.00	0	0.00	4.4
3.	The product adds aesthetic value to the space.	29	48.33	25	41.67	4	6.67	2	3.33	0	0.0	4.35
4.	The product is solving the purpose for what it is designed.	31	51.67	27	45	2	3.33	0	0.00	0	0.00	4.48
5.	The wall light is not easy to clean.	11	18.33	10	16.67	9	15	20	33.33	10	16.67	2.87
6.	The overall quality of the product is satisfactory.	27	45	27	45	4	6.67	2	3.33	0	0.00	4.32
7.	The price of the product is acceptable.	30	50	18	30	7	11.67	4	6.67	1	1.67	4.2
Total Weighted Mean Score											4.16	

4. Table light

Table light that was handcrafted and hand-painted with primer and acrylic paints and can be put on the table. It will provide an aesthetic look to the space while illuminating the area as well. A functional utility article for the home that has an aesthetic and minimalist look and will help to keep the space bright. While illuminated, it creates a starry effect that is pleasant to look at.

Type of Plastic: Polypropylene
(Container) v

Price: ₹ 400



Plate 64: Table light

The data from Table 7 revealed that 58.33 per cent of the respondents strongly agreed that the price of the table light was acceptable. While it was observed that 53.33 per cent of the respondents strongly agreed that the finishing of the light was satisfactory and the size of the light was appropriate for its use. The data also revealed that 51.67 per cent of the respondents strongly agreed that the table light was solving the purpose for what it was designed.

Based on weighted mean score of 4.15 it was concluded that 50 per cent of the respondents strongly agreed that the light added aesthetic value to the space and overall quality of the light was satisfactory.

Table 7: Frequency and percentage distribution of the respondents according to their opinion for the Table light

Sr. No	Attributes of the Table light	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the table light is satisfactory.	32	53.33	22	36.67	6	10	0	0.00	0	0.00	4.43
2.	The size of the light is appropriate for its use.	32	53.33	24	40	3	5	1	1.67	0	0.00	4.45
3.	The product adds aesthetic value to the space.	30	50	22	36.67	6	10	2	3.33	0	0.00	4.33
4.	The product is solving the purpose for what it is designed.	31	51.67	24	40	4	6.67	0	0.00	1	1.67	4.4
5.	The product is not easy to clean with a damp cloth.	12	20	10	16.67	8	13.33	16	26.67	14	23.33	2.83
6.	The overall quality of the product is satisfactory.	30	50	25	41.67	2	3.33	3	5	0	0.00	4.37
7.	The price of the product is acceptable.	35	58.33	12	20	8	13.33	4	6.67	1	1.67	4.27
Total Weighted Mean Score											4.15	

5. Laundry basket

This (symmetrical, elegant, handcrafted, and hand-painted using oil paint) laundry basket will be perfect for the bathroom and laundry room. The jute work of this unique laundry basket adds elegance to the product and is enough to store laundry.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 700



Plate 65: Laundry basket

The data from Table 8 revealed that 58.33 per cent of the respondents strongly agreed that the basket size was appropriate for its use and 56.67 per cent of the respondents strongly agreed that the finishing of the basket was satisfactory. The data also revealed that 53.33 per cent of the respondents strongly agreed that the colour combination of the basket was appropriate for residential space and the price was acceptable.

Based on weighted mean score of 4.33 it was concluded that 51.67 per cent of the respondents strongly agreed that the overall quality of the basket was satisfactory.

Table 8: Frequency and percentage distribution of the respondents according to their opinion for the laundry basket

Sr. No	Attributes of the Laundry basket	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The size of the basket is appropriate for its use.	35	58.33	21	35	4	6.67	0	0.00	0	0.00	4.52
2.	The design of the basket reflects unity.	27	45	29	48.33	3	5	1	1.67	0	0.00	4.37
3.	The colour combination is appropriate for residential space.	32	53.33	23	38.33	4	6.67	1	1.67	0	0.00	4.43
4.	The overall finishing of the product is satisfactory.	34	56.67	17	28.33	6	10	2	3.33	1	1.67	4.35
5.	The basket is easy to clean with a damp cloth.	24	40	26	43.33	7	11.67	3	5	0	0.00	4.18
6.	The product is durable for its use.	25	41.67	23	38.33	8	13.33	4	6.67	0	0.00	4.15
7.	The overall quality of the product is satisfactory.	31	51.67	21	35	4	6.67	4	6.67	0	0.00	4.32
8.	The price of the product is acceptable.	32	53.33	19	31.67	7	11.67	1	1.67	1	1.67	4.33
Total Weighted Mean Score											4.33	

6. Pen stand

It was handcrafted and hand-painted with primer and acrylic paints and then varnished. The pen stand is simple and elegant for storing pens, pencils, note papers, name cards, and any other clutter. It can be placed in the living room, waiting room, bedroom, study area, etc.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 50



The data from Table 9 revealed that 58.33 per cent of the respondents agreed that the pen stand width was appropriate to hold pens and 51.67 per cent of the respondents agreed that the height of the pen stand was appropriate to hold the pens. While data table also showed that 48.33 per cent of the respondents agreed that the product was durable and overall quality of the product was satisfactory.

Based on weighted mean score of 4.1 it was concluded that 43.33 per cent of the respondents agreed that the price of the pen stand was acceptable.

Table 9: Frequency and percentage distribution of the respondents according to their opinion for the Pen stand

Sr. No	Attributes of the Pen stand	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The height of the pen stand is appropriate to hold the pens.	26	43.33	31	51.67	3	5	0	0.00	0	0.00	4.38
2.	The width of the pen stand is appropriate to hold the pens.	22	36.67	35	58.33	3	5	0	0.00	0	0.00	4.32
3.	The product is not serving the purpose for which it is designed.	15	25	10	16.67	8	13.33	17	28.33	10	16.67	3.05
4.	The product is durable for its use.	27	45	29	48.33	4	6.67	0	0.00	0	0.00	4.38
5.	The overall quality of the product is satisfactory.	25	41.67	29	48.33	3	5	3	5	0	0.00	4.27
6.	The price of the product is acceptable.	23	38.33	26	43.33	11	18.33	0	0.00	0	0.00	4.2
Total Weighted Mean Score											4.1	

7. Bird house

The bird house was handcrafted and hand-painted with primer and acrylic paints. The floral pattern was made using golden acrylic paint that creates a natural effect and adds aesthetic value to the article. It can be placed on the Balcony, open foyer area, etc.

Type of Plastic: Polyethylene terephthalate and Polypropylene (Bottle and container)

Price: ₹ 200



The data from Table 10 showed that 65 per cent of the respondents strongly agreed that the price of the bird house was acceptable and 60 per cent of the respondents strongly agreed that the colour combination was appropriate for residential space. The data also revealed that 58.33 per cent of the respondents also strongly agreed that the finishing of the bird house was satisfactory and it was solving the purpose for what it was designed.

Based on weighted mean score of 4.15 it was concluded that 55 per cent of the respondents strongly agreed that the design reflected unity and the overall quality of the product was satisfactory.

Table 10: Frequency and percentage distribution of the respondents according to their opinion for the Bird house

Sr. No	Attributes of the Bird house	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the product is satisfactory.	35	58.33	19	31.67	4	6.67	2	3.33	0	0.00	4.45
2.	The colour combination is appropriate for residential space.	36	60	15	25	7	11.67	1	1.67	1	1.67	4.4
3.	The design of the birdhouse reflects unity.	33	55	18	30	7	11.67	2	3.33	0	0.00	4.3
4.	The birdhouse is solving the purpose for what it is designed.	35	58.33	21	35	4	6.67	0	0.00	0	0.00	4.52
5.	The product is not durable for its use.	13	21.67	4	6.67	10	16.67	12	20	21	35	2.6
6.	The overall quality of the product is satisfactory.	33	55	19	31.67	4	6.67	3	5	1	1.67	4.33
7.	The price of the product is acceptable.	39	65	12	20	7	11.67	2	3.33	0	0.00	4.47
Total Weighted Mean Score											4.15	

8. Newspaper holder

The newspaper holder was handcrafted and hand-painted with primer and acrylic paint. A wooden frame was provided on the back to help it stay parallel to the wall. The rim was finished with jute rope to add an aesthetic look to the article. It can be placed outside the foyer area or at the front entrance of a residence.

Type of Plastic: Polyethylene terephthalate (Container)

Price: ₹ 110



The data from Table 11 revealed that 58.33 per cent of the respondents strongly agreed that the newspaper holder served the purpose for which it was designed and 53.33 per cent of the respondents agreed that the size of the holder was appropriate for use. The table also showed that 51.67 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory. While 48.33 per cent of the respondents also strongly agreed that the finishing of holder was satisfactory.

Based on weighted mean score of 4.35 it was concluded that 46.67 per cent of the respondents agreed that the price of the newspaper holder was acceptable.

Table 11: Frequency and percentage distribution of the respondents according to their opinion for the Newspaper holder

Sr. No	Attributes of the Newspaper holder	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the newspaper holder is satisfactory.	29	48.33	24	40	5	8.33	2	3.33	0	0.00	4.33
2.	The size of the product is appropriate for use.	27	45	32	53.33	1	1.67	0	0.00	0	0.00	4.43
3.	It serves the purpose for which it is designed.	35	58.33	21	35	3	5	1	1.67	0	0.00	4.5
4.	The design of the newspaper holder reflects unity.	27	45	24	40	8	13.33	1	1.67	0	0.00	4.28
5.	The overall quality of the product is satisfactory.	31	51.67	20	3.33	8	13.33	0	0.00	1	1.67	4.33
6.	The price of the product is acceptable.	24	40	28	46.67	7	11.67	1	1.6	0	0.00	4.25
Total Weighted Mean Score											4.35	

9. Ottoman

The ottoman was handcrafted and upholstered with black coloured velvet fabric. To provide a softer feel to the body of the ottoman 1inch thick polyethylene foam sheet was used to cover the body. Polyurethane foam sheet was used in seating for a soft feel. It can be placed in the living room, bedroom, and near the dressing area of a residence. It can also be used to store small items.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 1400



The data from Table 12 revealed that 78.33 per cent of the respondents strongly agreed that the finishing of the ottoman was satisfactory and 73.33 per cent of the respondents also strongly agreed that the colour combination was appropriate for the residential space and the design reflected unity. While 70 per cent of the respondents strongly agreed that ottoman could store small items easily and the overall quality of the ottoman was satisfactory'.

Based on weighted mean score of 4.34 it was concluded that the product served the purpose for which it was designed and the price was acceptable.

Table 12: Frequency and percentage distribution of the respondents according to their opinion for the Ottoman

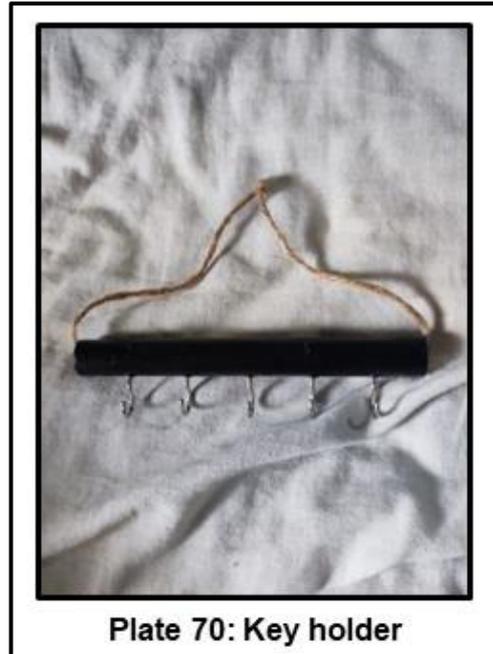
Sr. No	Attributes of the Ottoman	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the ottoman is satisfactory.	47	78.33	10	16.67	2	3.33	1	3.33	0	0.00	4.72
2.	The product serves the purpose for which it is designed.	40	66.67	17	28.33	2	3.33	1	1.67	0	0.00	4.6
3.	The colour combination is appropriate for residential space.	44	73.33	12	20	4	6.67	0	0.00	0	0.00	4.67
4.	The design of the product reflects unity.	44	73.33	13	21.67	2	3.33	1	1.67	0	0.00	4.67
5.	It can store small items easily.	42	70	11	18.33	6	10	1	1.67	0	0.00	4.57
6.	The product is safe for kids to use.	38	63.33	17	28.33	1	1.67	3	5	1	1.637	4.47
7.	It is not suitable as furniture.	11	18.33	6	10	10	16.67	5	8.33	28	46.67	2.45
8.	The overall quality of the product is satisfactory.	42	70	1	21.67	3	5	1	1.67	1	1.67	4.57
9.	The price of the product is acceptable.	39	65	10	16.67	8	13.33	0	0.00	3	5	4.37
Total Weighted Mean Score											4.34	

10. Key holder

Hand-crafted key holder using PVC pipe and was hand painted with primer and black acrylic paint. A decoration idea for the home that will organize the keys and will give an elegant and minimalist style to the place. Can be placed on the living room or foyer wall.

Type of Plastic: PVC - Polyvinyl chloride (Pipe)

Price: ₹ 180



The data from Table 13 revealed that 60 per cent of the respondents strongly agreed that the size of the key holder was appropriate and 56.67 per cent of the respondents also strongly agreed that the shape of the key holder was appropriate and the design reflected unity. The table also revealed that 46.67 per cent of the respondents strongly agreed that the overall quality was satisfactory and the price of the key holder was acceptable.

Based on weighted mean score of .96 it was concluded that the key holder served the purpose for which it was designed.

Table 13: Frequency and percentage distribution of the respondents according to their opinion for the Key holder

Sr. No	Attributes of the Key holder	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The size of the key holder is appropriate.	36	60	19	31.67	5	8.33	0	0.00	0	0.00	4.52
2.	It is not serving the purpose for what it is designed.	14	23.33	13	21.67	4	6.67	12	20	17	28.33	2.92
3.	The shape of the key holder is appropriate for use.	34	56.67	19	31.67	6	10	1	1.67	0	0.00	4.43
4.	The design of the key holder reflects unity.	34	56.67	20	33.33	3	5	2	3.33	1	1.67	4.4
5.	Facing difficulty using the key chain.	18	30	8	13.33	6	10	12	20	16	26.67	3
6.	The overall quality of the product is satisfactory.	28	46.67	23	38.33	6	10	2	3.33	1	1.67	4.25
7.	The price of the product is acceptable.	28	46.67	22	36.67	7	11.67	2	3.33	1	1.67	4.23
Total Weighted Mean Score											3.96	

11. Side table

The side table was handcrafted and upholstered with black coloured velvet fabric. The top of the table was made using 0.5 thick plywood. To soften the edge of the plywood it was upholstered with black velvet fabric. It can also be used to store small items. It can be placed in the living room, bedroom, and near the dressing area of a residence.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 1100



The data from Table 14 revealed that 68.33 per cent of the respondents strongly agreed that the price of the side table was acceptable and 65 per cent of the respondents strongly agreed that the size of the table was appropriate for its use and it was easy to maintain. the data from the table also revealed that 61.67 per cent of the respondents strongly agreed that the side table was suitable as furniture, could store small items and the overall quality was satisfactory

Based on weighted mean score of 4.53 it was concluded that the side table served the purpose for which it was designed.

Table 14: Frequency and percentage distribution of the respondents according to their opinion for the Side table

Sr. No	Attributes of the Side table	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	It serves the purpose for which it is designed.	35	58.33	22	36.67	3	5	0	0.00	0	0.00	4.53
2.	The colour combination is appropriate for residential space.	35	58.33	19	31.67	5	8.33	0	0.00	1	1.67	4.45
3.	The size of the side table is appropriate for its use.	39	65	16	26.67	5	8.33	0	0.00	0	0.00	4.57
4.	The side table is suitable as furniture.	37	61.67	22	36.67	1	1.67	0	0.00	0	0.00	4.6
5.	It can store small items easily.	37	61.67	18	30	5	8.33	0	0.00	0	0.00	4.53
6.	The side table is easy to maintain.	39	65	17	28.33	2	3.33	0	0.00	2	3.33	4.52
7.	The overall quality of the product is satisfactory.	37	61.67	17	28.33	6	10	0	0.00	0	0.00	4.52
8.	The price of the product is acceptable.	41	68.33	13	21.67	3	5	1	1.67	2	3.33	4.5
Total Weighted Mean Score											4.53	

12. Coaster

This beautiful piece of tea coaster set was hand-crafted and hand-painted with acrylic paints and then varnished. One side was covered with rexine that had a leather print finish. They Can be used for tea cups, coffee mugs, water glasses, juice tumblers, etc. they can perk up your home, coffee lounge, garden, patio, or office and it is great for everyday use. A storage pouch was also made to store the coasters using the same rexine fabric.



Type of Plastic: Polycarbonate (DVD)

Price: ₹ 350

The data from Table 15 revealed that 60 per cent of the respondents strongly agreed that the size of the coaster was big enough for its use. 55 per cent of the respondents strongly agreed that the price of the coaster was acceptable. The table revealed that 53.33 per cent of the respondents strongly agreed that the product served the purpose for which it was designed and 50 per cent of the respondents also strongly agreed that the thickness of the coaster was convenient to use.

Based on weighted mean score of 4.16 it was concluded that 45 per cent of the respondents strongly agreed that the design reflected unity and the overall quality of the product was satisfactory.

Table 15: Frequency and percentage distribution of the respondents according to their opinion for the Coaster

Sr. No	Attributes of the Coaster	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The size is big enough for its use.	36	60	21	35	3	5	0	0.00	0	0.00	4.55
2.	The design of the product reflects unity.	27	45	27	45	5	8.33	1	1.67	0	0.00	4.33
3.	The product serves the purpose for which it is designed.	32	53.33	23	38.33	5	8.33	0	0.00	0	0.00	4.45
4.	The thickness of the coaster is convenient to use.	30	50	24	40	4	6.67	1	1.67	1	1.67	4.35
5.	It is not easy to clean with a damp cloth.	14	23.33	9	15	10	16.67	14	23.33	13	21.67	2.95
6.	The overall quality of the product is satisfactory.	27	45	26	43.33	2	3.33	2	3.33	3	5	4.2
7.	The price of the product is acceptable.	33	55	20	33.33	3	5	1	1.67	3	5	4.32
Total Weighted Mean Score											4.16	

13. Stationary organizer

The stationary organizer was handcrafted and hand-painted with primer and acrylic paint and it has enough compartments to store stationary and saves space and has a versatile design that helps to organize desk stationery like pens, pencils, markers, rulers, erasers, scissors, paper clips, cutters, etc. the rounded edges make it is safe for the kids to use.



Type of Plastic: Polystyrene and Polyethylene terephthalate (Bottle and container lid)

Price: ₹ 160

The data from Table 16 revealed that 55 per cent of the respondents strongly agreed that the stationary organizer served the purpose for which it was designed. While 51.67 per cent of the respondents strongly agreed that the height of the organizer was appropriate for storing different items. 50 per cent of the respondents strongly agreed that the design of the product reflected unity and the size was appropriate. The data also revealed that 48.33 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory and the price was acceptable.

Based on weighted mean score of 4.33 it was concluded that the product was durable and sturdy.

Table 16: Frequency and percentage distribution of the respondents according to their opinion for the Stationary organizer

Sr. No	Attributes of the Stationary organizer	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The design of the product reflects unity.	30	50	27	45	3	5	0	0.00	0	0.00	4.45
2.	The size of the organizer is appropriate.	30	50	25	41.67	4	6.67	1	1.67	0	0.00	4.4
3.	The height is appropriate for storing different items.	31	51.67	21	35	6	10	0	0.00	2	3.33	4.32
4.	It serves the purpose for which it is designed.	33	55	21	35	4	6.67	1	1.67	1	1.67	4.4
5.	The product is durable and sturdy.	28	46.67	21	35	9	15	1	1.67	1	1.67	4.23
6.	The overall quality of the product is satisfactory.	29	48.33	22	36.67	7	11.67	1	1.67	1	1.67	4.28
7.	The price of the product is acceptable.	29	48.33	20	33.33	8	13.33	0	0.00	3	5	4.2
Total Weighted Mean Score											4.33	

14. Wall shelf

The wall shelf was handcrafted and hand-painted with primer and oil paint that has enough space to store small items. The rim was finished with jute rope. It has a simple and minimalistic look that adds aesthetic value to the article. Can be placed on the walls of the living room, bedroom, hallway, etc.



Type of Plastic: Polypropylene (Bucket)

Price: ₹ 250

The data from Table 17 revealed that 63.33 per cent of the respondents strongly agreed that the design of the wall shelf reflected unity and 58.33 per cent of the respondents strongly agreed that the size of the product was appropriate for small items. The data also revealed that 53.33 per cent of the respondents strongly agreed that the finishing of the shelf was satisfactory and 50 per cent of the respondents strongly agreed that the shelf was durable for its use. 48.33 per cent of the respondents strongly agreed that it served the purpose for which it was designed and the price was acceptable.

Based on weighted mean score of 4.19 it was concluded that the overall quality of the product was satisfactory.

Table 17: Frequency and percentage distribution of the respondents according to their opinion for the Wall shelf

Sr. No	Attributes of the Wall shelf	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The size of the shelf is appropriate for small items.	35	58.33	23	38.33	2	3.33	0	0.00	0	0.00	4.55
2.	The finishing of the wall shelf is satisfactory.	32	53.33	23	38.33	5	8.33	0	0.00	0	0.00	4.45
3.	The product serves the purpose for which it is designed.	29	48.33	28	46.67	1	1.67	2	3.33	0	0.00	4.4
4.	The design of the product reflects unity.	38	63.33	20	33.33	2	3.33	0	0.00	0	0.00	4.6
5.	The wall shelf is durable for its use.	30	50	23	38.33	5	8.33	0	0.00	2	3.33	4.32
6.	It is not easy to clean with a damp cloth.	7	11.67	10	16.67	14	23.33	19	31.67	10	16.67	2.75
7.	The overall quality of the product is satisfactory.	26	43.33	23	38.33	9	15	1	1.67	1	1.67	4.2
8.	The price of the product is acceptable.	29	48.33	22	36.67	5	8.33	2	3.33	2	3.33	4.23
Total Weighted Mean Score											4.19	

15. Toothbrush holder

It was handcrafted and hand-painted with primer and acrylic paints and then varnished. The rim was finished with golden acrylic paint. The toothbrush holder is simple and elegant and helps to store toothbrushes. It can be placed near the wash basin area for easy access.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 50



Plate 75: Toothbrush holder

The data from Table 18 revealed that 53.33 per cent of the respondents agreed that the size of the toothbrush holder was big enough for its use and the overall quality was satisfactory. 51.67 per cent of the respondents strongly agreed that per cent of the respondents strongly agreed that the design was appropriate for its use and 50 per cent of the respondents strongly agreed that the colour combination of the holder was appropriate for residential space.

Based on weighted mean score of 4.06 it was concluded that 45 per cent of the respondents agreed that the price of the product was acceptable.

Table 18: Frequency and percentage distribution of the respondents according to their opinion for the Toothbrush holder

Sr. No	Attributes of the Toothbrush holder	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The design is appropriate for its use.	31	51.67	26	43.33	3	5	0	0.00	0	0.00	4.47
2.	The size of holder is big enough for its use.	23	38.33	32	53.33	4	6.67	0	0.00	1	1.67	4.27
3.	The colour combination is appropriate for residential space.	30	50	25	41.67	4	6.67	0	0.00	1	1.67	4.38
4.	The toothbrush holder is not easy to maintain.	11	18.33	9	15	12	20	22	36.67	6	10	2.95
5.	The overall quality of the product is satisfactory.	19	31.67	32	53.33	6	10	0	0.00	3	5	4.07
6.	The price of the product is acceptable.	24	40	27	45	8	13.33	0	0.00	1	1.67	4.22
Total Weighted Mean Score											4.06	

16. Wine glass holder

The wine glass holder was handcrafted and hand-painted with primer and acrylic paint. A wooden frame was provided on the back to help it stay parallel to the wall. It has a simple and minimalistic design that helps to store wine glasses. It can be placed on the kitchen wall or near the wine cellar wall.



Plate 76: Wall mounted wine glass holder

Type of Plastic: PVC - Polyvinyl chloride (Pipe)

Price: ₹ 400

The data from Table 19 revealed that 58.33 per cent of the respondents strongly agreed that the finishing of the wine glass holder was satisfactory and price was acceptable. The table data also revealed that 56.67 per cent of the respondents strongly agreed that the product served the purpose for which it was designed and it was durable for its use. While 53.33 per cent of the respondents strongly agreed that the design of the product reflected unity.

Based on weighted mean score of 4.41 it was concluded that 50 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory.

Table 19: Frequency and percentage distribution of the respondents according to their opinion for the Wall mounted wine glass holder

Sr. No	Attributes of the Wall mounted wine glass holder	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The design of the product reflects unity.	32	53.33	25	41.67	3	5	0	0.00	0	0.00	4.48
2.	The size of the product is big enough for its use.	29	48.33	25	41.67	5	8.33	0	0.00	1	1.67	4.35
3.	The finishing of the glass holder is satisfactory	35	58.33	19	31.67	5	8.33	1	1.67	0	0.00	4.47
4.	It serves the purpose for which it is designed.	34	56.67	20	33.33	4	6.67	1	1.67	1	1.67	4.42
5.	The wall mounted wine glass holder is durable for its use.	34	56.67	20	33.33	6	10	0	0.00	0	0.00	4.47
6.	The overall quality of the product is satisfactory.	30	50	22	36.67	6	10	1	1.67	1	1.67	4.32
7.	The price of the product is acceptable.	35	58.33	17	28.33	6	10	0	0.00	2	3.33	4.38
Total Weighted Mean Score											4.41	

B. Décor article

17. Planter

The planter was handcrafted and hand-painted with primer and acrylic paint. To add a decorative element to the planter geometric patterns were created at the bottom using golden acrylic paint.

It has a simple and minimalistic

design and can be used to plant small plants. It can be placed on the table, balcony wall, or near window space.



Plate 77: Planter

Type of Plastic: Polypropylene (Container)

Price: ₹ 100

The data from Table 20 revealed that 56.67 per cent of the respondents strongly agreed that the finishing of the planter was satisfactory and agreed that the size was appropriate for its use. Whereas, 56.67 per cent of the respondents agreed that the size of the product was appropriate for its use. The data also revealed that 53.33 per cent of the respondents strongly agreed that the price of the planter was acceptable. 46.67 per cent of the respondents strongly agreed that the planter was easy to maintain.

Based on weighted mean score of 4.31 it was concluded that the overall quality of the planter was satisfactory.

Table 20: Frequency and percentage distribution of the respondents according to their opinion for the Planter

Sr. No	Attributes of the Planter	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the planter is satisfactory.	34	56.67	22	36.67	4	6.67	0	0.00	0	0.00	4.5
2.	The size of the planter is appropriate for its use.	22	36.67	34	56.67	3	5	1	1.67	0	0.00	4.28
3.	The design of the planter is appropriate for its use.	27	45	25	41.67	7	11.67	0	0.00	1	1.67	4.28
4.	The colour combination is appropriate for residential use.	25	41.67	31	51.67	4	6.67	0	0.00	0	0.00	4.35
5.	The planter is easy to maintain.	23	38.33	28	46.67	5	8.33	3	5	1	1.67	4.15
6.	The overall quality of the planter is satisfactory.	26	43.33	26	43.33	7	11.67	1	1.67	0	0.00	4.28
7.	The price of the product is acceptable.	32	53.33	19	31.67	5	8.33	4	6.67	0	0.00	4.32
Total Weighted Mean Score											4.31	

18. Hanging pot

The planter was handcrafted and hand-painted with primer and acrylic paint. Different parts were connected with the help of jute rope and hot glue to create a multilayer planter. It has a simple and minimalistic design and can be used to plant small plants. It can be hung in different residential areas like living rooms, bedrooms, balconies, etc.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 80



Plate 78: Hanging pot

The data from Table 21 revealed that 50 per cent of the respondents strongly agreed that the size of the pot was appropriate for its use and 48.33 per cent of the respondents strongly agreed that the finishing of the pot was satisfactory. The table also showed that 46.67 per cent of the respondents strongly agreed that the design of the pot was appropriate for its use, it added aesthetic value while serving its purpose and the overall quality was satisfactory.

Based on weighted mean score of 4.34 it was concluded that 45 per cent of the respondents agreed that the price of the product was acceptable.

Table 21: Frequency and percentage distribution of the respondents according to their opinion for the Hanging pot

Sr. No	Attributes of the Hanging pot	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The size of the pot is appropriate for its use.	30	50	26	43.33	4	6.67	0	0.00	0	0.00	4.43
2.	The design of the pot is appropriate for its use.	28	46.67	26	43.33	5	8.33	0	0.00	1	1.67	4.33
3.	The product adds aesthetic value while serving the purpose.	28	46.67	27	45	4	6.67	1	1.67	0	0.00	4.37
4.	The finishing of the pot is satisfactory.	29	48.33	24	40	4	6.67	2	3.33	1	1.67	4.3
5.	The overall quality of the product is satisfactory.	28	46.67	26	43.33	5	8.33	0	0.00	1	1.67	4.33
6.	The price of the product is acceptable.	26	43.33	27	45	4	6.67	2	3.33	1	1.67	4.25
Total Weighted Mean Score											4.34	

19. Artificial flower pot

The pot was handcrafted and hand-painted with primer and acrylic paint. Flowers were made using a 2mm foam sheet, black paint paper, green masking tape, and aluminum wire. A mixture of POP was used to make it sturdy and it also helped the flowers to stay in a position. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, pooja rooms, etc.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 170



Plate 79: Artificial flower pot

The data from Table 22 revealed that 68.33 per cent of the respondents strongly agreed that the overall quality of the flower pot was satisfactory and 65 per cent of the respondents strongly agreed that the design was appropriate for its use. The table also revealed that 61.67 per cent of the respondents strongly agreed that the size of the product was appropriate for its use. While 58.33 per cent of the respondents strongly agreed that the price of the pot was acceptable.

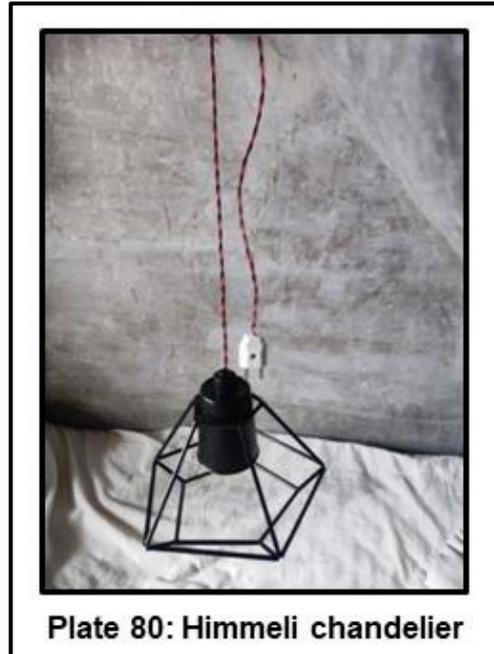
Based on weighted mean score of 4.47 it was concluded that 55 per cent of the respondents strongly agreed that the product added aesthetic value while serving the purpose.

Table 22: Frequency and percentage distribution of the respondents according to their opinion for the Artificial flower pot

Sr. No	Attributes of the Artificial flower pot	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The product adds aesthetic value while serving the purpose.	33	55	21	35	6	10	0	0.00	0	0.00	4.45
2.	The size is appropriate for its use.	37	61.67	20	33.33	3	5	0	0.00	0	0.00	4.57
3.	The design is appropriate for its use.	39	65	18	30	3	5	0	0.00	0	0.00	4.6
4.	The product is easy to clean with a damp cloth.	24	40	26	43.33	9	15	0	0.00	1	1.67	4.2
5.	The overall quality of the product is satisfactory.	41	68.33	13	21.67	6	10	0	0.00	0	0.00	4.58
6.	The price of the product is acceptable.	35	58.33	17	28.33	6	10	2	3.33	0	0.00	4.42
Total Weighted Mean Score											4.47	

20. Himmeli chandelier

Himmeli chandelier was handcrafted and hand-painted with primer and acrylic paint and can be hung on the ceiling of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. A functional utility article for the home that has a simple and minimalist look and will help to keep the space bright. A distinctive appearance was added by the geometric pattern.



Type of Plastic: Polypropylene (Container and pipe)

Price: ₹ 350

The data from Table 23 revealed that 51.67 per cent of the respondents strongly agreed that the size of chandelier was big enough for its use and the colour combination was appropriate for residential use. While, 50 per cent of the respondents strongly agreed that the product added aesthetic value while serving its purpose. The data also revealed that 46.67 per cent of the respondents strongly agreed that the price of the product was acceptable and agreed that the finishing of the chandelier was satisfactory.

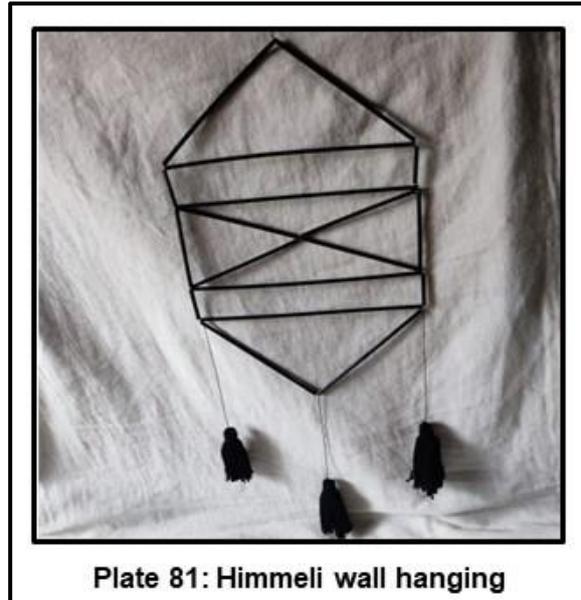
Based on weighted mean score of 4.16 it was concluded that the overall quality of the product was satisfactory.

Table 23: Frequency and percentage distribution of the respondents according to their opinion for the Himmeli chandelier

Sr. No	Attributes of the Himmeli chandelier	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The product adds aesthetic value while serving the purpose.	30	50	26	43.33	4	6.67	0	0.00	0	0.00	4.43
2.	The finishing of the chandelier is satisfactory.	27	40	28	46.67	5	8.33	0	0.00	0	0.00	4.37
3.	The size of chandelier is big enough for its use.	31	51.67	21	35	8	13.33	0	0.00	0	0.00	4.38
4.	The colour combination is appropriate for residential use.	31	51.67	22	36.67	6	10	1	1.67	0	0.00	4.38
5.	The product is not easy to clean.	11	18.33	11	18.33	15	25	14	23.33	9	15	3.02
6.	The overall quality of the product is satisfactory.	26	43.33	26	43.33	6	10	2	3.33	0	0.00	4.27
7.	The price of the product is acceptable.	28	46.67	23	38.33	7	11.67	2	3.33	0	0.00	4.28
Total Weighted Mean Score											4.16	

21. Himmeli wall hanging

Himmeli wall hanging was handcrafted using upholstery thread and hand-painted with acrylic paint and can be hung on the wall of residential spaces. It will add an aesthetic look to the space. A décor article for the home that has a simple and minimalist look. Woolen tassels are added at the bottom. A distinctive appearance was added by the geometric pattern.



Type of Plastic: Polypropylene (Straw)

Price: ₹ 50

The data from Table 24 revealed that 56.67 per cent of the respondents agreed that the price of the wall hanging was acceptable and 55 per cent of the respondents agreed that the overall quality of the product was satisfactory. While 50 per cent of the respondents agreed that the himmeli wall hanging added aesthetic value to the space while serving its purpose. 51.67 per cent of the respondents agreed that the finishing of the product was satisfactory and the design reflected unity.

Based on weighted mean score of 3.98 it was concluded that the overall quality of the wall hanging was satisfactory.

Table 24: Frequency and percentage distribution of the respondents according to their opinion for the Himmeli wall hanging

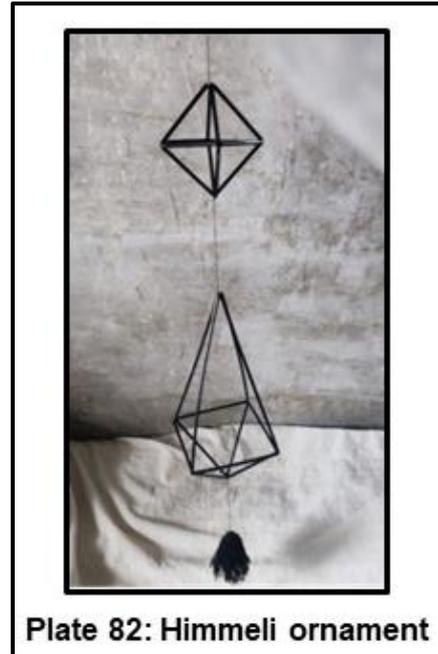
Sr. No	Attributes of the Himmeli wall hanging	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The himmeli wall hanging adds aesthetic value while serving the purpose.	25	41.67	30	50	4	6.67	0	0.00	1	1.67	4.3
2.	The finishing of the wall hanging is satisfactory.	21	35	31	51.67	7	11.67	1	1.67	0	0.00	4.2
3.	The design of the product reflects unity.	21	35	31	51.67	7	11.67	1	1.67	0	0.00	4.2
4.	The product is not easy to clean.	6	10	12	20	20	33.33	15	25	7	11.67	2.92
5.	The overall quality of the product is satisfactory.	19	31.67	33	55	8	13.33	0	0.00	0	0.00	4.18
6.	The price of the product is acceptable.	17	28.33	34	56.67	5	8.33	3	5	1	1.67	4.05
Total Weighted Mean Score											3.98	

22. Himmeli ornament

Himmeli ornament was handcrafted using upholstery thread and hand-painted with acrylic paint and can be hung on the wall of residential spaces. It will add an aesthetic look to the space. A décor article for the home that has a simple and minimalist look. A Woollen tassel was added at the bottom. A distinctive appearance was added by the geometric pattern.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 50



The data from Table 25 revealed that 53.33 per cent of the respondents agreed that the overall quality of the ornament was satisfactory and the price was acceptable. While 51.67 per cent of the respondents agreed that the product added aesthetic value while serving the purpose as a decorative article and the finishing of the ornament was satisfactory. While 48.33 per cent of the respondents agreed that the colour combination of the article was appropriate for residential space.

Based on weighted mean score of 3.98 it was concluded that the overall quality of the ornament was satisfactory.

Table 25: Frequency and percentage distribution of the respondents according to their opinion for the Himmeli ornament

Sr. No	Attributes of the Himmeli ornament	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The product adds aesthetic value while serving the purpose.	23	38.33	31	51.67	6	10	0	0.00	0	0.00	4.28
2.	The finishing of the ornament is satisfactory.	20	33.33	31	51.67	8	13.33	1	1.67	0	0.00	4.17
3.	The colour combination is appropriate for residential space.	23	38.33	29	48.33	5	8.33	2	3.33	1	1.67	4.18
4.	The product is not easy to clean.	9	15	8	13.33	20	33.33	15	25	8	13.33	2.92
5.	The overall quality of the product is satisfactory.	19	31.67	32	53.33	8	13.33	1	1.67	0	0.00	4.15
6.	The price of the product is acceptable.	20	33.33	32	53.33	5	8.33	3	5	0	0.00	4.15
Total Weighted Mean Score											3.98	

23. Painting

Canvas was used for the base structure. Golden-coloured uneven design was created using plastic straws. A décor article for the home that has a simple and minimalist look. Uneven design helps to create a unique appearance. It can be placed in different spaces like the living room, bedroom, study room, foyer, etc.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 300



The data from Table 26 revealed that 70 per cent of the respondents strongly agreed that the finishing of the painting was satisfactory and it served the purpose for which it was designed. While 68.33 per cent of the respondents strongly agreed that the product added aesthetic value while serving the purpose and the overall quality of the painting was satisfactory.

Based on weighted mean score of 4.56 it was concluded that 61.67 per cent of the respondents strongly agreed that the price of the painting was acceptable.

Table 26: Frequency and percentage distribution of the respondents according to their opinion for the Painting

Sr. No	Attributes of the Painting	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the painting is satisfactory.	42	70	12	20	6	10	0	0.00	0	0.00	4.6
2.	The product serves the purpose for which it is designed.	42	70	14	23.33	4	6.67	0	0.00	0	0.00	4.63
3.	The size of the product is big enough for its use.	35	58.33	18	30	6	10	1	1.67	0	0.00	4.45
4.	The product adds aesthetic value while serving the purpose.	41	68.33	14	23.33	4	6.67	1	0.00	0	0.00	4.58
5.	The overall quality of the product is satisfactory.	41	68.33	14	23.33	5	8.33	0	0.00	0	0.00	4.6
6.	The price of the product is acceptable.	37	61.67	17	28.33	5	8.33	1	1.67	0	0.00	4.5
Total Weighted Mean Score											4.56	

24. Candle stand

Candle stand that was handcrafted and hand-painted with primer and acrylic paint. Golden coloured rims were created at the top and bottom of the candle stand using a 2mm foam sheet. It will provide an aesthetic look while illuminating the space. A décor article that can be placed on the table.

Type of Plastic: Polypropylene
(Container)

Price: ₹ 30



The data from Table 27 revealed that 50 per cent of the respondents strongly agreed that the finishing of the candle stand was satisfactory and it added aesthetic value to the space. 48.33 per cent of the respondents agreed that the overall quality of the product was satisfactory. Whereas, 45 per cent of the respondents agreed that the price of the product was acceptable and 36.67 per cent of the respondents agreed that the product was suitable as candle stand.

Based on weighted mean score of 3.88 it was concluded that the overall quality of the product was satisfactory.

Table 27: Frequency and percentage distribution of the respondents according to their opinion for the Candle stand

Sr. No	Attributes of the Candle stand	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the candle stand is satisfactory.	30	50	24	40	4	6.67	2	3.33	0	0.00	4.37
2.	The product adds aesthetic value to the space.	30	50	23	38.33	6	10	1	1.67	0	0.00	4.37
3.	It is inconvenient to place and remove the candle.	18	30	11	18.33	6	10	18	30	7	11.67	3.25
4.	It is not suitable as a candle stand.	6	10	10	16.67	16	26.67	22	36.67	6	10	2.8
5.	The overall quality of the product is satisfactory.	23	38.33	29	48.33	7	11.67	1	1.67	0	0.00	4.23
6.	The price of the product is acceptable.	24	40	27	45	8	13.33	1	1.67	0	0.00	4.23
Total Weighted Mean Score											3.88	

25. Vase

Vases were handcrafted and hand-painted with primer and acrylic paint. To provide an aesthetic look jute rope was used around the vase body and golden paint was used to create design at the rim. A mixture of POP was used to make it sturdy. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, pooja rooms, etc.



Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 170

The data from Table 28 revealed that 65 per cent of the respondents strongly agreed that the vase was sturdy enough for its use. Whereas, 60 per cent of the respondents strongly agreed that the finishing of the vase was satisfactory and it added aesthetic value to the space. 63.33 per cent of the respondents strongly agreed that the product was serving the purpose for which it was designed. The table also showed that 61.67 per cent of the respondents strongly agreed that the price of the vase was acceptable.

Based on weighted mean score of 4.49 it was concluded that the overall quality of the product was satisfactory.

Table 28: Frequency and percentage distribution of the respondents according to their opinion for the Vase

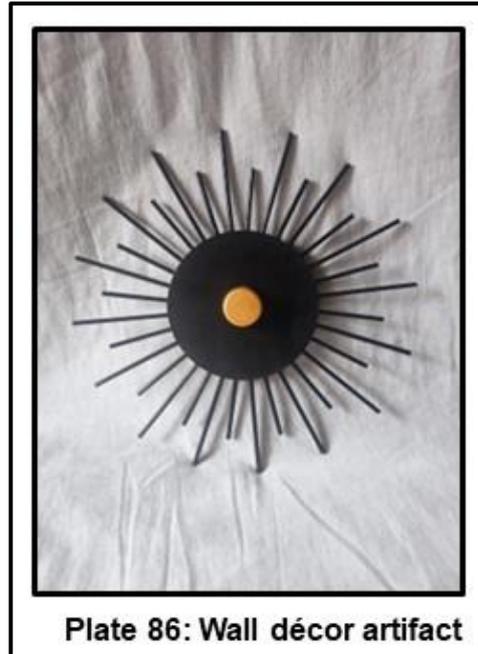
Sr. No	Attributes of the Vase	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the vase is satisfactory.	36	60	20	33.33	4	6.67	0	0.00	0	0.00	4.53
2.	It adds aesthetic value in space.	36	60	20	33.33	4	6.67	0	0.00	0	0.00	4.53
3.	It serves the purpose for which it is designed.	38	63.33	17	28.33	4	6.67	1	1.67	0	0.00	4.53
4.	The product is sturdy enough for its use.	39	65	16	26.67	5	8.33	0	0.00	0	0.00	4.57
5.	The overall quality of the product is satisfactory.	29	48.33	23	38.33	7	11.67	1	1.67	0	0.00	4.33
6.	The price of the product is acceptable.	37	61.67	16	26.67	6	10	0	1	1	1.67	4.47
Total Weighted Mean Score												4.49

26. Wall décor artifact

wall décor artifacts were handcrafted and hand-painted with primer and acrylic paint. To create a polar effect different sizes of plastic straws were placed in a circular motion from the center of the DVD. It has a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, foyers, hallways, etc.

Type of Plastic: Polypropylene and Polycarbonate (Straw and DVD)

Price: ₹ 170



The data from Table 29 revealed that 66.67 per cent of the respondents strongly agreed that the finishing of the product was satisfactory and 65 per cent of the respondents strongly agreed that the colour combination of the wall décor artifact was appropriate for the space. The table data also revealed that 58.33 per cent of the respondents strongly agreed that the artifact served the purpose for which it was designed. Whereas, 53.33 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory and the price was acceptable.

Based on weighted mean score of 4.44 it was concluded that the product was easy to maintain.

Table 29: Frequency and percentage distribution of the respondents according to their opinion for the Wall décor artifact

Sr. No	Attributes of the Wall décor artifact	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the wall décor artifact is satisfactory.	40	66.67	16	26.67	4	6.67	0	0.00	0	0.00	4.6
2.	It serves the purpose for which it is designed.	35	58.33	22	36.67	2	3.33	1	1.67	0	0.00	4.52
3.	The colour combination is appropriate for the space.	39	65	15	25	5	8.33	1	1.67	0	0.00	4.53
4.	The product is easy to clean.	28	46.67	26	43.33	6	10	0	0.00	0	0.00	4.37
5.	The product is easy to maintain.	24	40	30	50	4	6.67	2	3.33	0	0.00	4.27
6.	The overall quality of the product is satisfactory.	32	53.33	20	33.33	6	10	2	3.33	0	0.00	4.37
7.	The price of the product is acceptable.	32	53.33	21	35	7	11.67	0	0.00	0	0.00	4.42
Total Weighted Mean Score											4.44	

27. Sculpture

The sculpture was handcrafted and hand-painted with primer and acrylic paint. DVD is used for the base. The sculpture has a tower-like structure and a flower (created from polythene) was added on the top part to create a soft effect. It has a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, and was put on a table.

Type of Plastic: Polypropylene and Polycarbonate (Straw and DVD)

Price: ₹ 50



The data from Table 30 revealed that 51.67 per cent of the respondents agreed that the sculpture added aesthetic value to the space and 50 per cent of the respondents agreed that the overall quality of the product was satisfactory. While 48.33 per cent of the respondents agreed that the finishing of the product was satisfactory. 46.67 per cent of the respondents agreed and strongly agreed that the sculpture served the purpose for which it was designed and agreed that it was safe for the kids to use.

Based on weighted mean score of 4.08 it was concluded that 48.33 per cent of the respondents agreed that the price of the product was acceptable.

Table 30: Frequency and percentage distribution of the respondents according to their opinion for the Sculpture

Sr. No	Attributes of the Sculpture	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The sculpture serves the purpose for which it is designed.	28	46.67	28	46.67	4	6.67	0	0.00	0	0.00	4.4
2.	The product adds aesthetic value to the space.	24	40	31	51.67	5	8.33	0	0.00	0	0.00	4.32
3.	The finishing of the sculpture is satisfactory.	22	36.67	29	48.33	7	11.67	2	3.33	0	0.00	4.18
4.	It is safe for the kids to use.	23	38.33	28	46.67	8	13.33	1	1.67	0	0.00	4.22
5.	The sculpture is not easy to maintain.	5	8.33	14	23.33	15	25	20	33.33	6	10	2.87
6.	The overall quality of the product is satisfactory.	25	41.67	30	50	4	6.67	1	1.67	0	0.00	4.32
7.	The price of the product is acceptable.	24	40	29	48.33	6	10	1	1.67	0	0.00	4.27
Total Weighted Mean Score											4.08	

28. Windchime

The wind chime was handcrafted and hand-painted with acrylic paint. A container lid was used to create a suspension platform and pen barrels are used to create tubes. Black beads help to create an elegant appearance. It can be used as a décor artifact in a balcony area or the front part of a residence.

Type of Plastic: PPC - polypropylene copolymer (Pen)

Price: ₹ 110



The data from Table 31 revealed that 65 per cent of the respondents strongly agreed that the windchime added aesthetic value to the space while serving its purpose. While 63.33 per cent of the respondents strongly agreed that it was easy to maintain and the overall quality of the product was satisfactory. 61.67 per cent of the respondents strongly agreed that the finishing of the product was satisfactory and the shape was appropriate for its use.

Based on weighted mean score of 4.49 it was concluded that 60 per cent of the respondents strongly agreed that the price of the product was acceptable.

Table 31: Frequency and percentage distribution of the respondents according to their opinion for the Windchime

Sr. No	Attributes of the Windchime	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The product adds aesthetic value while serving the purpose.	39	65	15	25	5	8.33	1	1.67	0	0.00	4.53
2.	The finishing of the windchime is satisfactory.	37	61.67	16	26.67	6	10	1	1.67	0	0.00	4.48
3.	The shape of product is appropriate for its use.	37	61.67	14	23.33	7	11.67	1	1.67	1	1.67	4.42
4.	The windchime is easy to maintain.	38	63.33	18	30	4	6.67	0	0.00	0	0.00	4.57
5.	The overall quality of the product is satisfactory.	38	63.33	17	28.33	5	8.33	0	0.00	0	0.00	4.55
6.	The price of the product is acceptable.	36	60	15	25	5	8.33	3	5	1	1.67	4.37
Total Weighted Mean Score											4.49	

29. Flowers

The flowers were handcrafted using straw, black polythene, a 2mm golden foam sheet, and hot glue. They had simple and minimalistic design and were elegant in appearance. It can be used as a décor artifact by putting them in a vase.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 120



The data from Table 32 revealed that 66.67 per cent of the respondents strongly agreed that the finishing of the flower was satisfactory and 56.67 per cent of the respondents strongly agreed that the product served the purpose for which it was designed and the price of the flower was acceptable. While 55 per cent of the respondents strongly agreed that the product added aesthetic value to the space.

Based on weighted mean score of 4.18 it was concluded that 45 per cent of the respondents agreed and strongly agreed that the overall quality of the product was satisfactory.

Table 32: Frequency and percentage distribution of the respondents according to their opinion for the Plastic Flowers

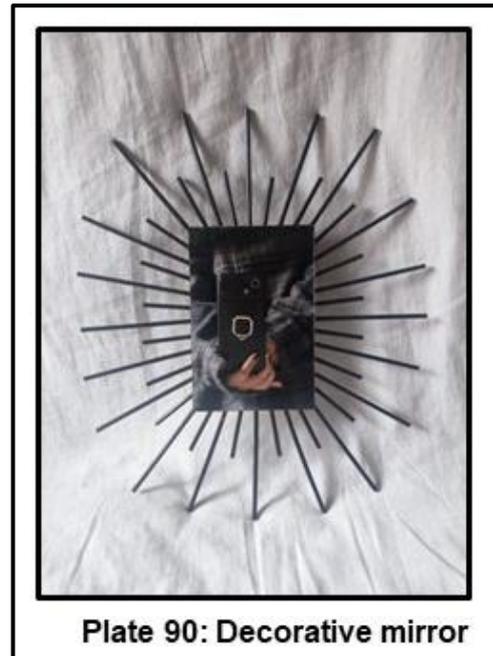
Sr. No	Attributes of the Flowers	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the flower is satisfactory.	40	66.67	17	28.33	3	5	0	0.00	0	0.00	4.62
2.	The product adds aesthetic value to the space.	33	55	21	35	6	10	0	0.00	0	0.00	4.45
3.	The product serves the purpose for which it is designed	34	56.67	21	35	4	6.67	0	0.00	1	1.67	4.45
4.	The product is not easy to clean.	8	13.33	11	18.33	10	16.67	22	36.67	9	15	2.78
5.	The overall quality of the product is satisfactory.	27	45	27	45	6	10	0	0.00	0	0.00	4.35
6.	The price of the product is acceptable.	34	56.67	20	33.33	4	6.67	2	3.33	0	0.00	4.43
Total Weighted Mean Score											4.18	

30. Decorative mirror

The decorative mirror was handcrafted and hand-painted with acrylic paint. To create a polar effect different sizes of plastic straws were placed in a circular motion from the center of the mirror. It had a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, foyers, hallways, etc.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 210



The data from Table 33 revealed that 60 per cent of the respondents strongly agreed that the price of the decorative mirror was acceptable. While 58.33 per cent of the respondents strongly agreed that the finishing of the decorative mirror was satisfactory, its design was appropriate for the use and it added aesthetic value to the space.

Based on weighted mean score of 4.2 it was concluded that 50 per cent of the respondents strongly agreed that the overall quality of the product was satisfactory.

Table 33: Frequency and percentage distribution of the respondents according to their opinion for the Decorative mirror

Sr. No	Attributes of the Decorative mirror	Respondents (n=60)										Weighted Mean (5-1)
		Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		
		f	%	f	%	f	%	f	%	f	%	
1.	The finishing of the decorative mirror is satisfactory.	35	58.33	22	36.67	3	5	0	0.00	0	0.00	4.53
2.	The design is appropriate for the use.	35	58.33	20	33.33	5	8.33	0	0.00	0	0.00	4.5
3.	The product adds aesthetic value to the space.	35	58.33	20	33.33	4	6.67	0	0.00	1	1.67	4.47
4.	The product is not easy to clean.	9	15	10	16.67	14	23.33	16	26.67	11	18.33	2.83
5.	The overall quality of the product is satisfactory.	30	50	24	40	5	8.33	1	1.67	0	0.00	4.38
6.	The price of the product is acceptable.	36	60	18	30	6	10	0	0.00	0	0.00	4.5
Total Weighted Mean Score											4.2	

Table 34: Weighted mean score of the opinion of the respondents regarding utility and décor articles

Sr. No	Developed Utility and Décor Article	Weighted mean (5-1)
1.	Painting	4.56
2.	Side table	4.53
3.	Vase	4.49
4.	Windchime	4.49
5.	Artificial flower pot	4.47
6.	Wall décor artifact	4.44
7.	Dustbin	4.41
8.	Wall-mounted wine glass holder	4.41
9.	Newspaper holder	4.35
10.	Ottoman	4.34
11.	Hanging pot	4.34
12.	Laundry basket	4.33
13.	Stationary organizer	4.33
14.	Planter	4.31
15.	Decorative mirror	4.2
16.	Wall shelf	4.19
17.	Flowers	4.18
18.	Hanging light (Pendant)	4.17
19.	Wall light	4.16
20.	Coaster	4.16
21.	Himmeli chandelier	4.16
22.	Table light	4.15
23.	Bird house	4.15
24.	Pen stand	4.1
25.	Artificial sculpture	4.08
26.	Toothbrush holder	4.06
27.	Himmeli wall hanging	3.98
28.	Himmeli ornament	3.98
29.	Key holder	3.96
30.	Candle Stand	3.88

According to table 34, the highest weighted Mean score was 4.56 for the painting among the articles developed for the residential spaces.

Conclusion:

From the data collected it was found that 66.67 per cent of the respondents belonged to the age group of 18 to 27 years with a mean age of 27 years and 55 per cent of the respondents were unmarried. Regarding the educational qualification it was observed that 71.67 per cent of the respondents completed education up to graduation level and very few (1.67%) of the respondents were educated up to diploma level. 45 per cent of the respondents were employed and unemployed. Whereas, 10 per cent of the respondents were self-employed. The family monthly income of 85 per cent of the respondents was between less than or equal to ₹1,00,000, while 6.67 per cent of the respondents had their family monthly income between ₹2,00,001 and ₹3,00,000. From the data collected regarding the opinion of the respondents based on the existing parameters of the designed and developed utility and décor articles namely size, quality, durability, proportion, convenience of use, colour combination and aesthetic value for residential use from plastic waste, the findings of the study depicted that the painting was the most liked article by the respondents with the weighted mean of 4.56. The colour combination of the developed utility and décor articles was appreciated by the respondents.

Plates for display of utility and décor articles for data Collection



Plate 91: Display of utility and décor articles for data collection purpose



Plate 92: Display of utility and décor articles for data collection purpose



Department of Family and Community Resource Management
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda
Vadodara



CATALOGUE OF DEVELOPED UTILITY & DÉCOR ARTICLES FOR RESIDENTIAL SPACES BY REUSING PLASTIC WASTE

Designed & Developed by: Ms. Roshni Sahani
Guided by: Dr. Urvashi Mishra

PREFACE

Plastics are a wide range of synthetic or semi-synthetic materials that use polymers as the main ingredient. Their plasticity makes it possible for plastics to be moulded, extruded or pressed into solid objects of various shapes. This adaptability, plus a wide range of other properties, such as being lightweight, durable, flexible, and inexpensive to produce, has led to its widespread use. Furthermore, reusing and recycling plastic reduces the need to produce new plastic.

Recycling plastic waste involves converting it into products that can be used. Various products are generated from recycling plastic waste. The catalogue has been prepared under the dissertation work for the partial fulfilment of the master's degree. The present catalogue has been prepared on theme-based designs for utility and decor articles made from plastic waste for residential use, with the cost of each developed article. It is hoped that this catalogue will help the manufacturer and retailers of the plastic industry, as the design developed can be used as an example of reusing the maximum amount of plastic waste to create handicrafts, furniture, and utility and decor articles from plastic waste from their outlet. The developed articles will also benefit interior design students as they can start their own businesses by designing similar kinds of handicrafts, and innovative products based on various themes.

Developed by: Ms. Roshni Sahani
Sr. M.Sc. Student

Guided by: Dr. Urvashi Mishra
Dissertation Guide

CONTENTS

Utility article

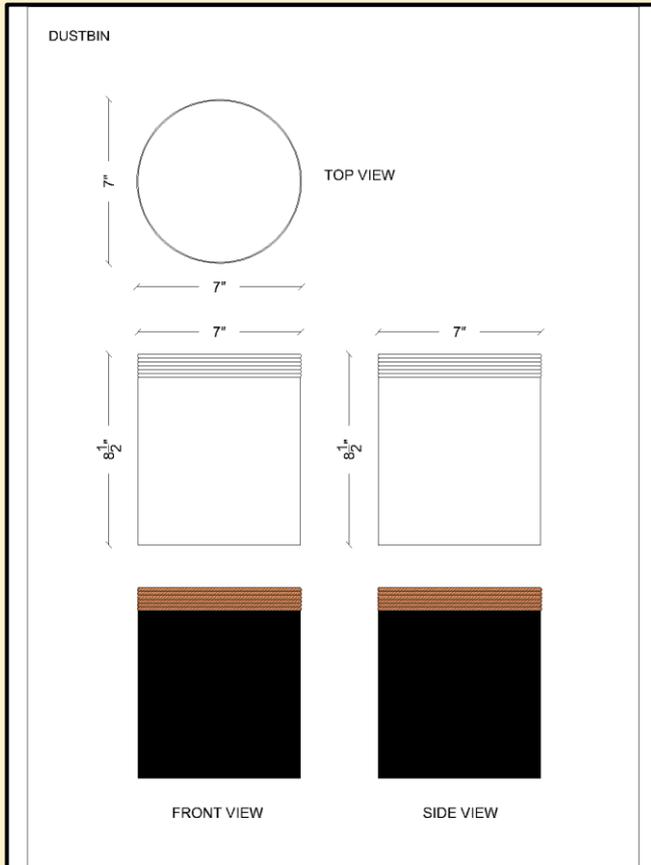
1. Dustbin
2. Hanging light (Pendant)
3. Wall light
4. Table light
5. Laundry basket
6. Pen stand
7. Bird house
8. Newspaper holder
9. Ottoman
10. Key holder
11. Side table
12. Coaster
13. Stationary organizer
14. Wall shelf
15. Toothbrush holder
16. Wall-mounted wine glass holder

Décor article

17. Planter
18. Hanging pots
19. Artificial flower pot
20. Himmeli chandelier
21. Himmeli wall hanging
22. Himmeli ornament
23. Painting
24. Candle Stand
25. Vase
26. Wall décor artifact
27. Sculpture
28. Windchime
29. Flowers
30. Decorative mirror

*Actual products may vary from the images.

PRODUCT: DUSTBIN



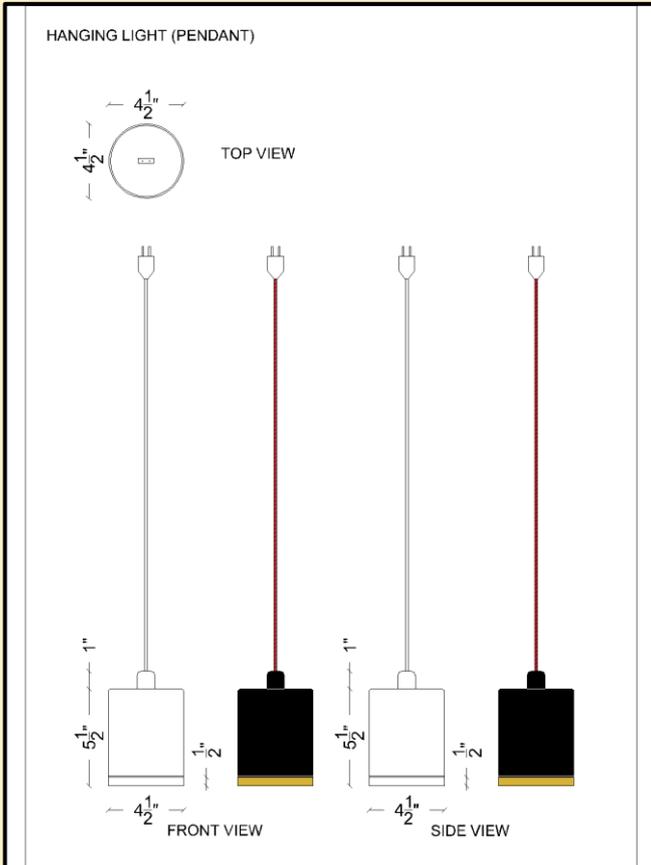
Product Description:

Plastic handcrafted dustbin that was hand painted with oil paint and to provide an aesthetic look the top edge was finished with multiple layers of jute rope. A functional utility article for the home that can be used to collect waste, has a refined, simple, and minimalist look, and will help to keep the space clean.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 200

PRODUCT: HANGING LIGHT (PENDANT)

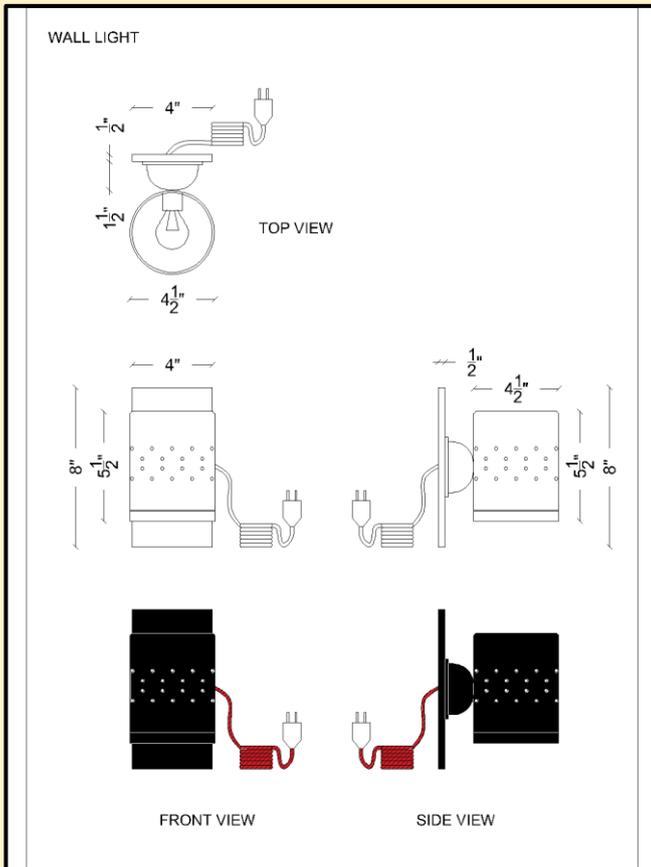


Product Description:

Hanging light that was handcrafted and hand-painted with primer and acrylic paints and can be hung on the ceiling of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. edge was finished with a layer of golden acrylic colour. A functional utility article for the home that has a simple and minimalist look and will help to keep the space bright. Type of Plastic: Polypropylene (Container)

Price: ₹ 370

PRODUCT: WALL LIGHT



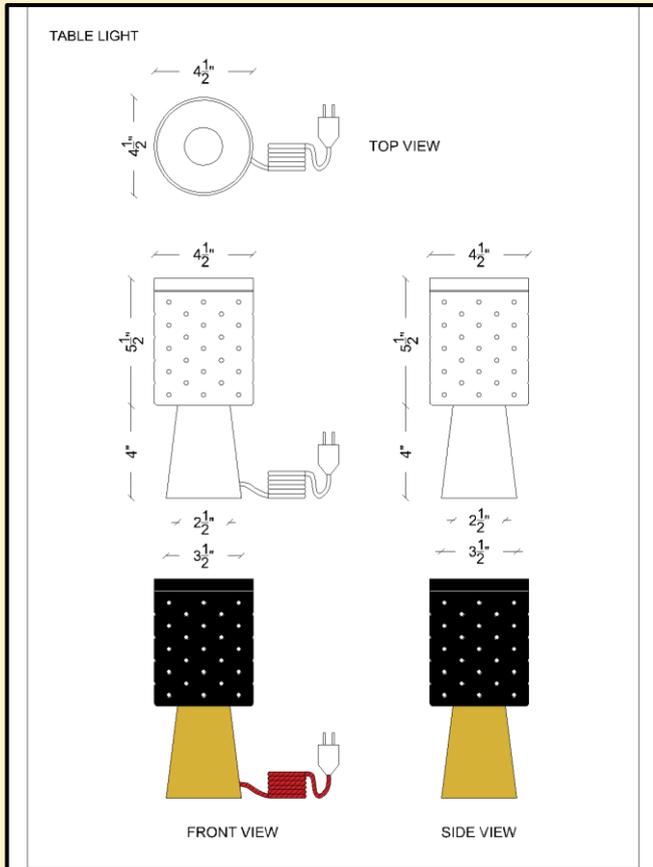
Product Description:

Wall light that was handcrafted and hand-painted with primer and acrylic paint and can be hung on the wall of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. A wooden frame was provided on the back to help the lamp stay on the wall. A functional utility article for the home that has an aesthetic and minimalist look and will help to keep the space bright.

Type of Plastic: Polypropylene (Container)

Price: ₹ 430

PRODUCT: TABLE LIGHT



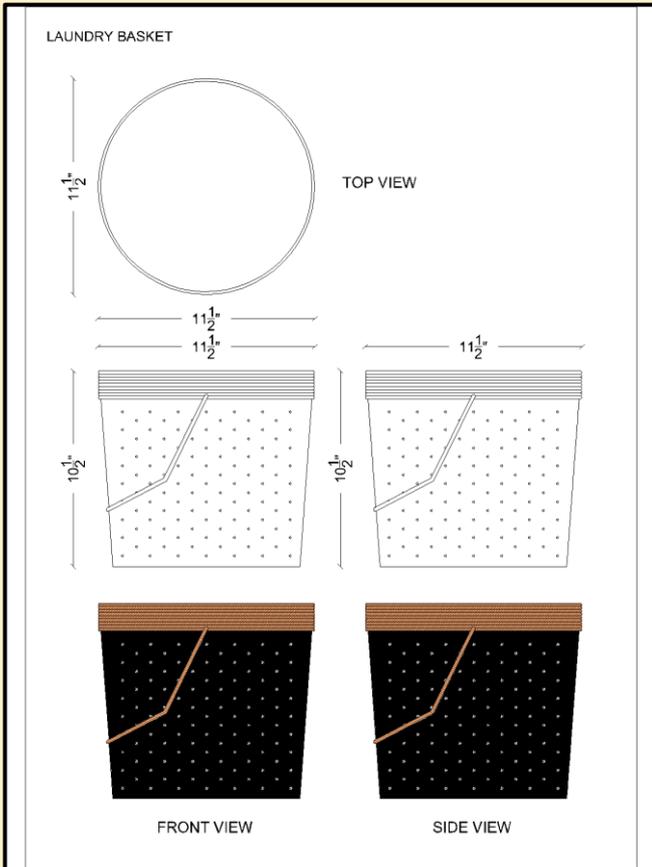
Product Description:

Table light that was handcrafted and hand-painted with primer and acrylic paints and can be put on the table. It will provide an aesthetic look to the space while illuminating the area as well. A functional utility article for the home that has an aesthetic and minimalist look and will help to keep the space bright. While illuminated, it creates a starry effect that is pleasant to look at.

Type of Plastic: Polypropylene (Container)

Price: ₹ 400

PRODUCT: LAUNDRY BASKET



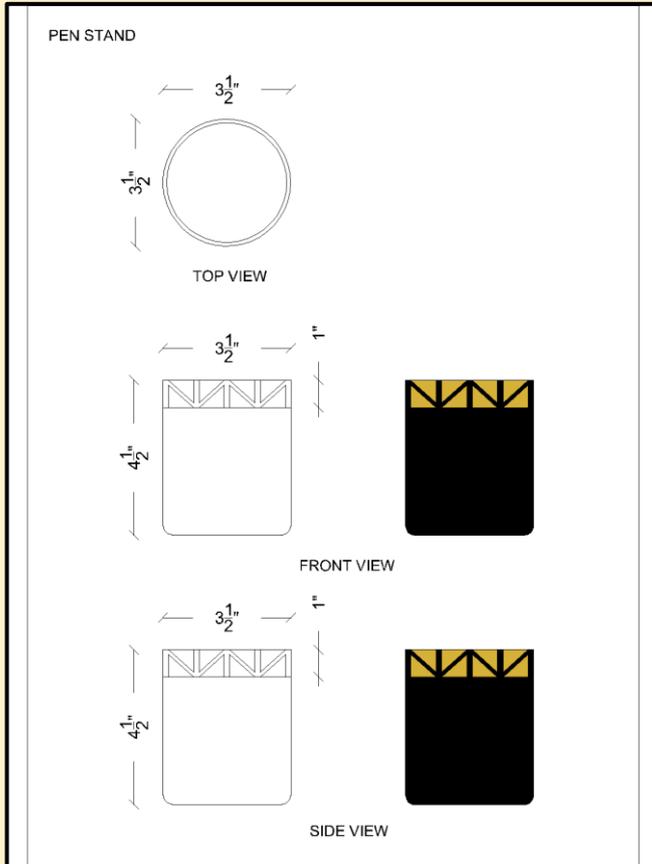
Product Description:

This (symmetrical, elegant, handcrafted, and hand-painted using oil paint) laundry basket will be perfect for the bathroom and laundry room. The jute work of this unique laundry basket adds elegance to the product and is enough to store laundry.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 700

PRODUCT: PENSTAND



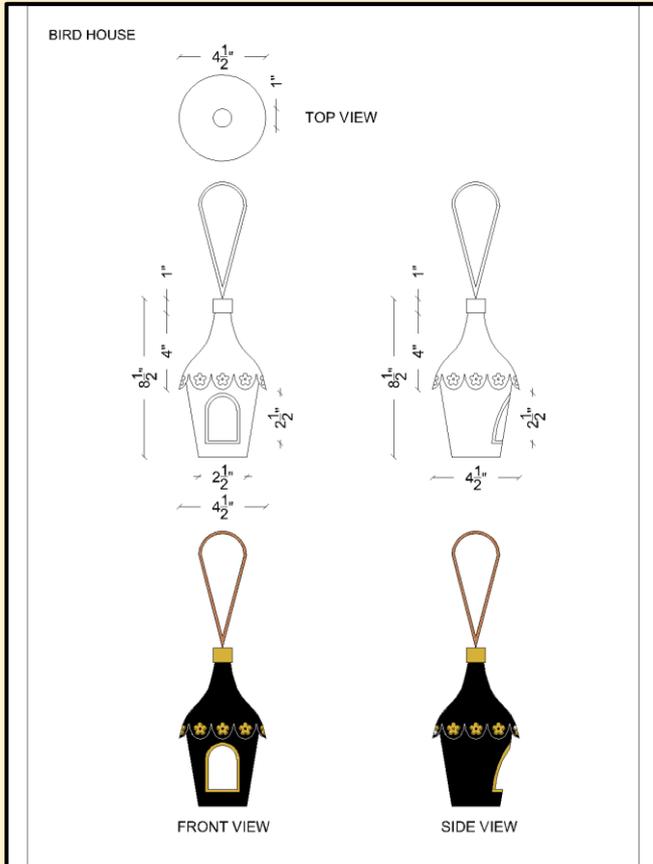
Product Description:

It was handcrafted and hand-painted with primer and acrylic paints and then varnished. The pen stand is simple and elegant for storing pens, pencils, note papers, name cards, and any other clutter. It can be placed in the living room, waiting room, bedroom, study area, etc.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 50

PRODUCT: BIRD HOUSE



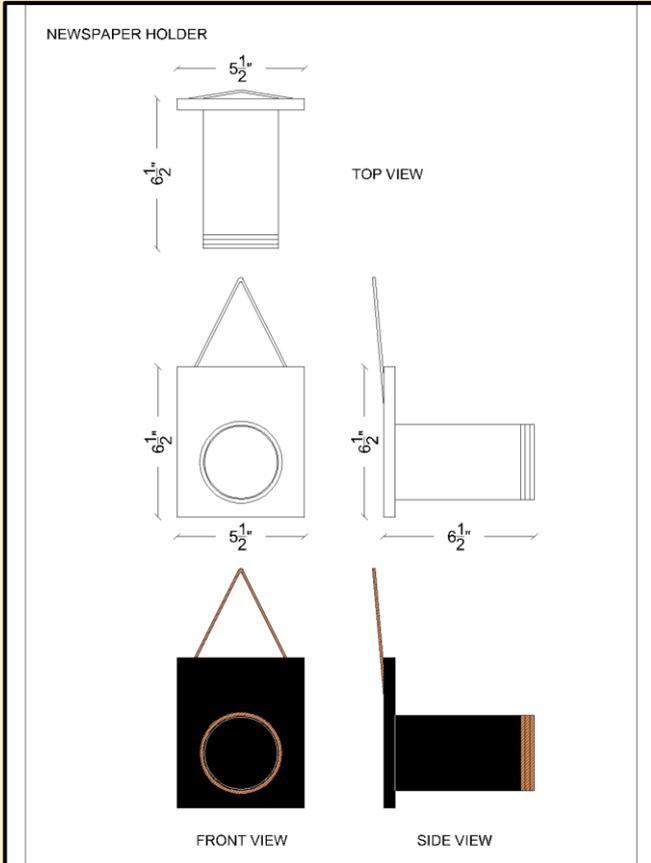
Product Description:

The bird house was handcrafted and hand-painted with primer and acrylic paints. The floral pattern was made using golden acrylic paint that creates a natural effect and adds aesthetic value to the article. It can be placed on the Balcony, open foyer area, etc.

Type of Plastic: Polyethylene terephthalate and Polypropylene (Bottle and container)

Price: ₹ 200

PRODUCT: NEWSPAPER HOLDER



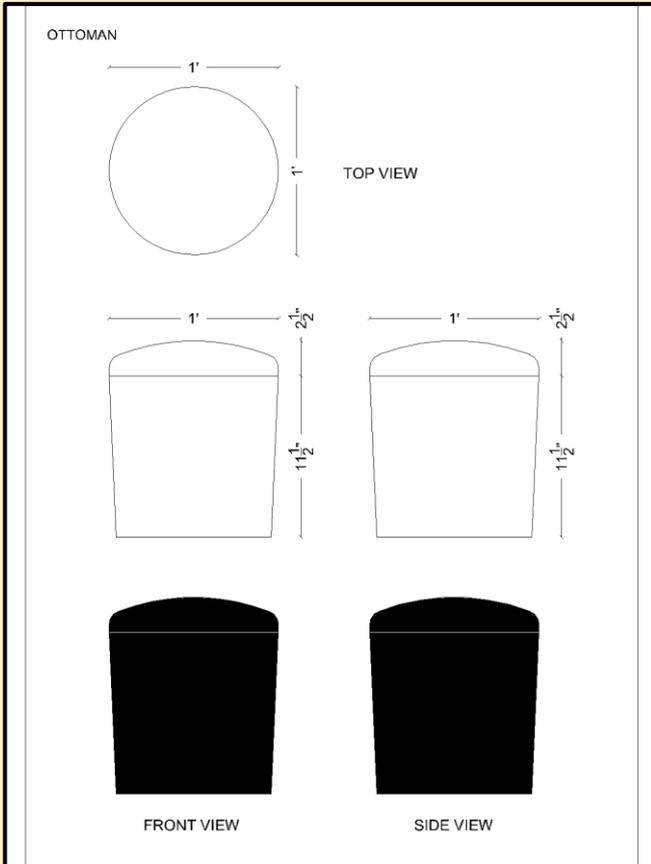
Product Description:

The newspaper holder was handcrafted and hand-painted with primer and acrylic paint. A wooden frame was provided on the back to help it stay parallel to the wall. The rim was finished with jute rope to add an aesthetic look to the article. It can be placed outside the foyer area or at the front entrance of a residence.

Type of Plastic: Polyethylene terephthalate
(Container)

Price: ₹ 110

PRODUCT: OTTOMAN



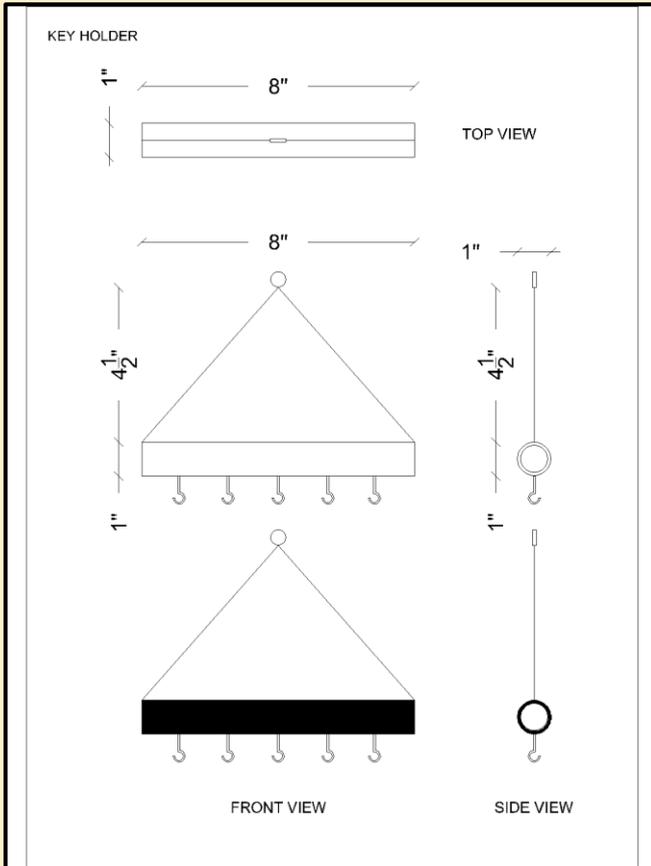
Product Description:

The ottoman was handcrafted and upholstered with black coloured velvet fabric. To provide a softer feel to the body of the ottoman 1inch thick polyethylene foam sheet was used to cover the body. Polyurethane foam sheet was used in seating for a soft feel. It can be placed in the living room, bedroom, and near the dressing area of a residence. It can also be used to store small items.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 1400

PRODUCT: KEY HOLDER



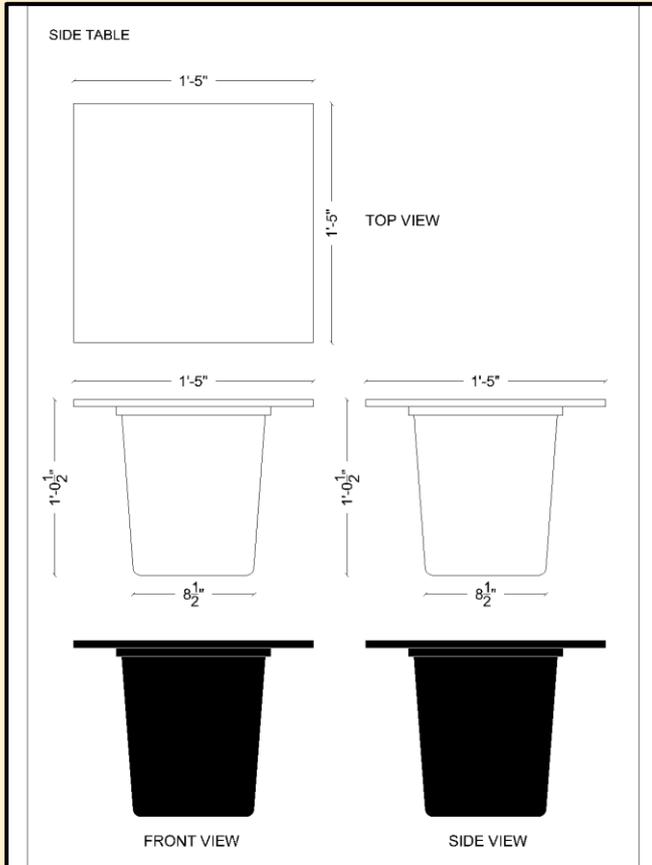
Product Description:

Hand-crafted key holder using PVC pipe and was hand painted with primer and black acrylic paint. A decoration idea for the home that will organize the keys and will give an elegant and minimalist style to the place. Can be placed on the living room or foyer wall.

Type of Plastic: PVC - Polyvinyl chloride (Pipe)

Price: ₹ 180

PRODUCT: SIDE TABLE



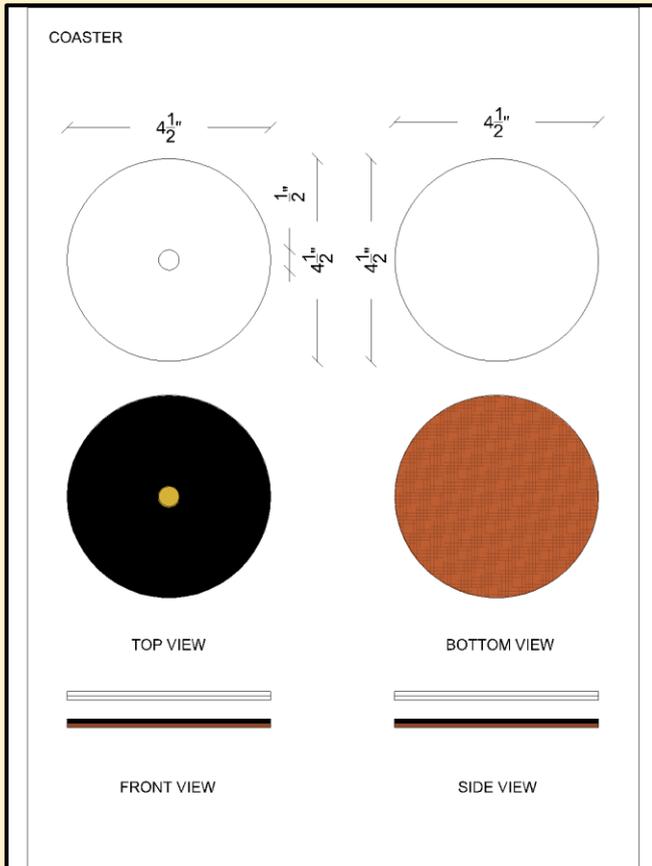
Product Description:

The side table was handcrafted and upholstered with black coloured velvet fabric. The top of the table was made using 0.5 thick plywood. To soften the edge of the plywood it was upholstered with black velvet fabric. It can also be used to store small items. It can be placed in the living room, bedroom, and near the dressing area of a residence.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 1100

PRODUCT: COASTER



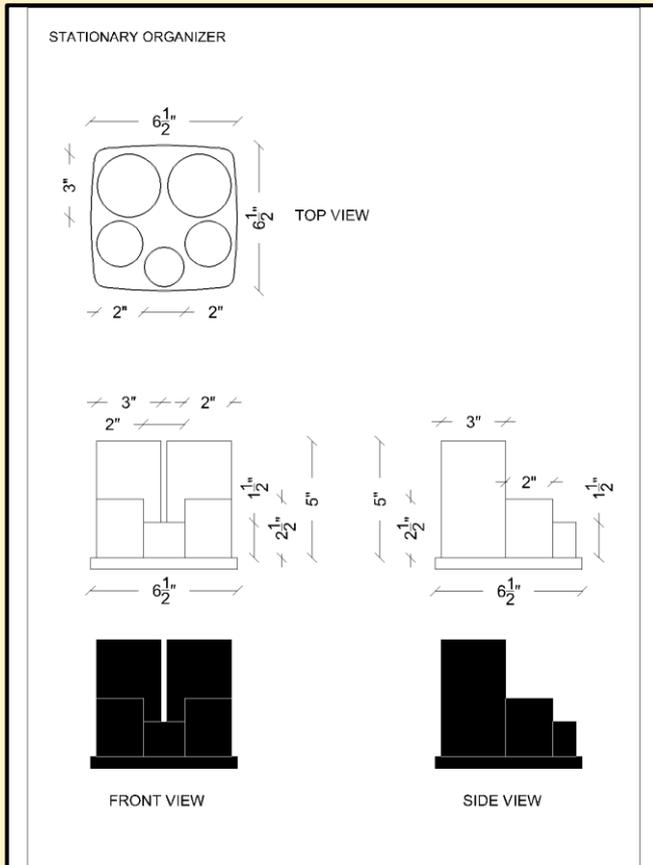
Product Description:

This beautiful piece of tea coaster set was hand-crafted and hand-painted with acrylic paints and then varnished. One side was covered with rexine that had a leather print finish. They Can be used for tea cups, coffee mugs, water glasses, juice tumblers, etc. they can perk up your home, coffee lounge, garden, patio, or office and it is great for everyday use. A storage pouch was also made to store the coasters using the same rexine fabric.

Type of Plastic: Polycarbonate (DVD)

Price: ₹ 350

PRODUCT: STATIONARY ORGANIZER



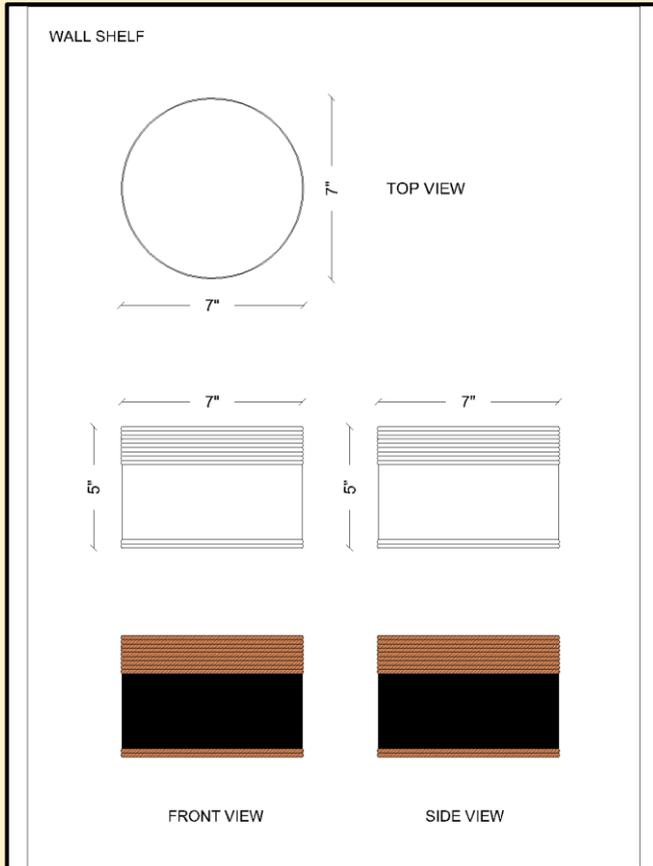
Product Description:

The stationary organizer was handcrafted and hand-painted with primer and acrylic paint and it has enough compartments to store stationery and saves space and has a versatile design that helps to organize desk stationery like pens, pencils, markers, rulers, erasers, scissors, paper clips, cutters, etc. the rounded edges make it is safe for the kids to use.

Type of Plastic: Polystyrene and Polyethylene terephthalate (Bottle and container lid)

Price: ₹ 160

PRODUCT: WALL SHELF



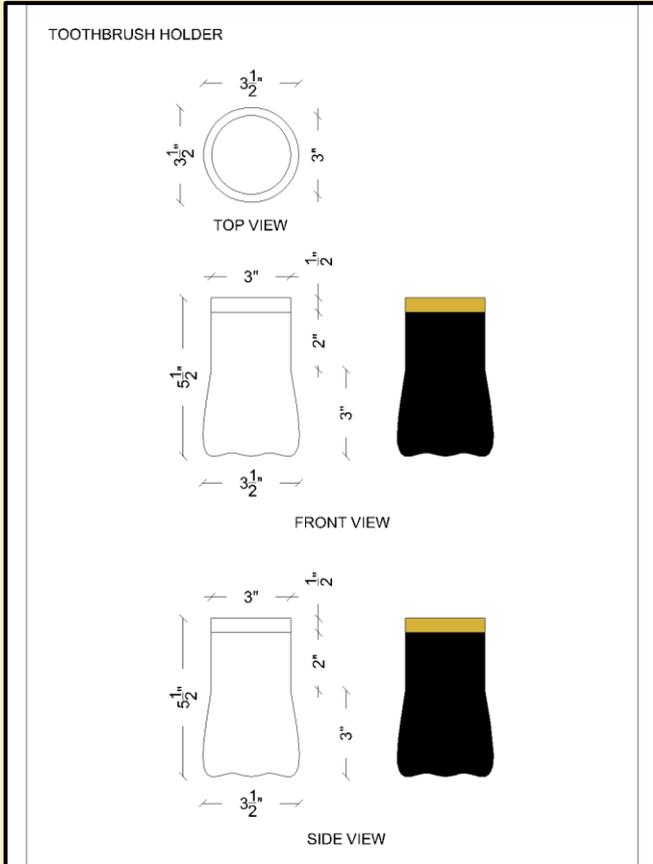
Product Description:

The wall shelf was handcrafted and hand-painted with primer and oil paint that has enough space to store small items. The rim was finished with jute rope. It has a simple and minimalistic look that adds aesthetic value to the article. Can be placed on the walls of the living room, bedroom, hallway, etc.

Type of Plastic: Polypropylene (Bucket)

Price: ₹ 250

PRODUCT: TOOTHBRUSH HOLDER



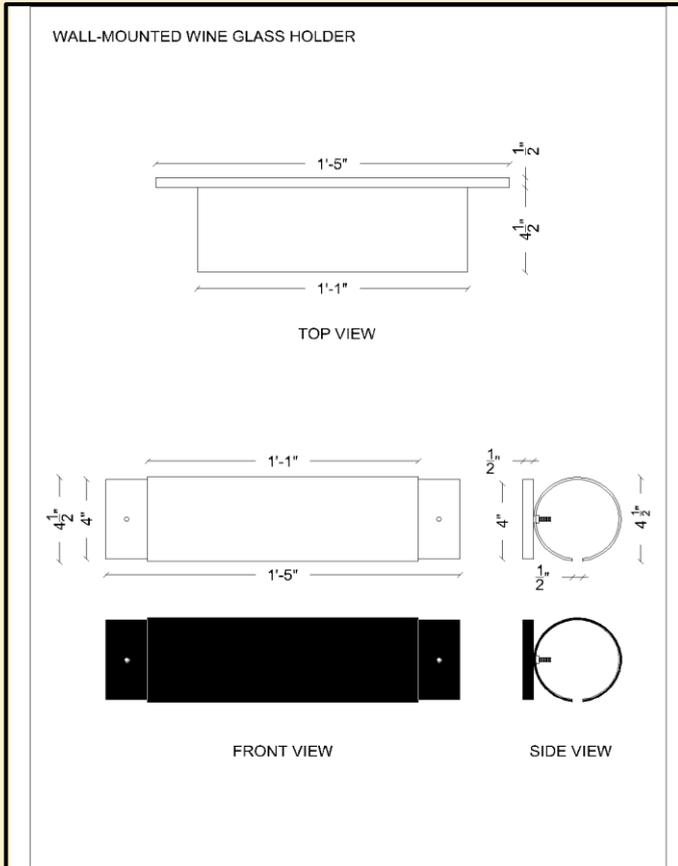
Product Description:

It was handcrafted and hand-painted with primer and acrylic paints and then varnished. The rim was finished with golden acrylic paint. The toothbrush holder is simple and elegant and helps to store toothbrushes. It can be placed near the wash basin area for easy access.

Type of Plastic: Polyethylene terephthalate (Bottle)

Price: ₹ 50

PRODUCT: WINE GLASS HOLDER



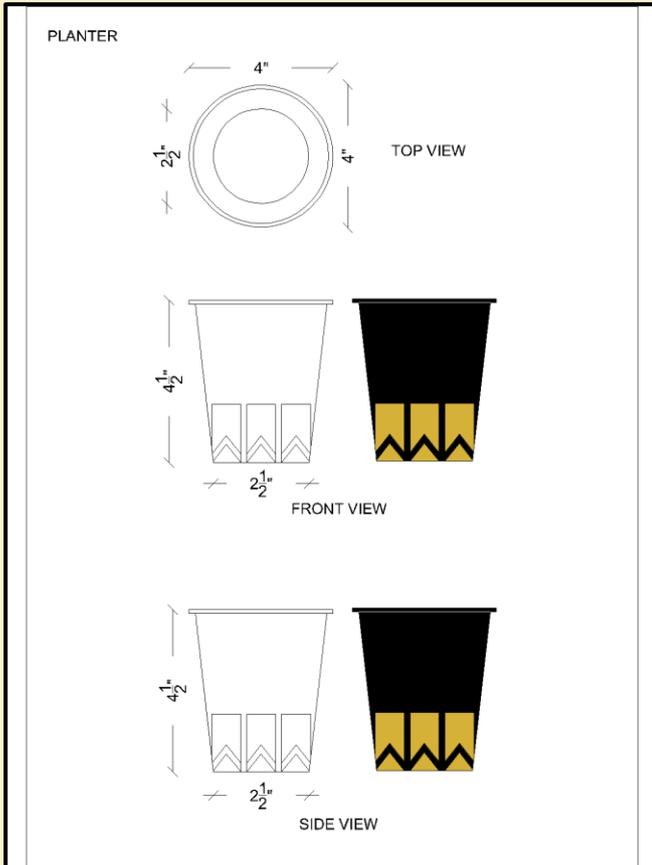
Product Description:

The wine glass holder was handcrafted and hand-painted with primer and acrylic paint. A wooden frame was provided on the back to help it stay parallel to the wall. It has a simple and minimalistic design that helps to store wine glasses. It can be placed on the kitchen wall or near the wine cellar wall.

Type of Plastic: PVC - Polyvinyl chloride (Pipe)

Price: ₹ 400

PRODUCT: PLANTER



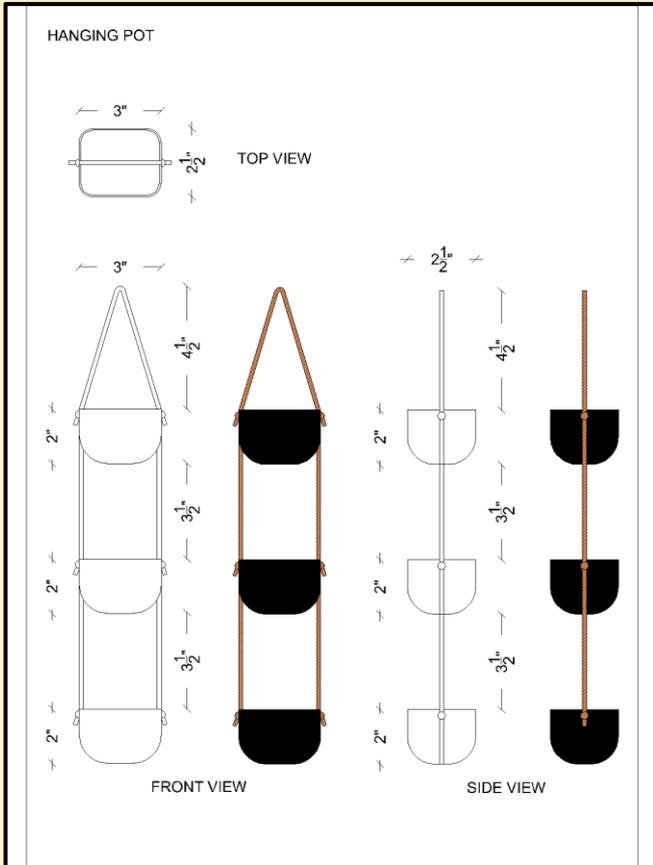
Product Description:

The planter was handcrafted and hand-painted with primer and acrylic paint. To add a decorative element to the planter geometric patterns were created at the bottom using golden acrylic paint. It has a simple and minimalistic design and can be used to plant small plants. It can be placed on the table, balcony wall, or near window space.

Type of Plastic: Polypropylene (Container)

Price: ₹ 100

PRODUCT: HANGING POT



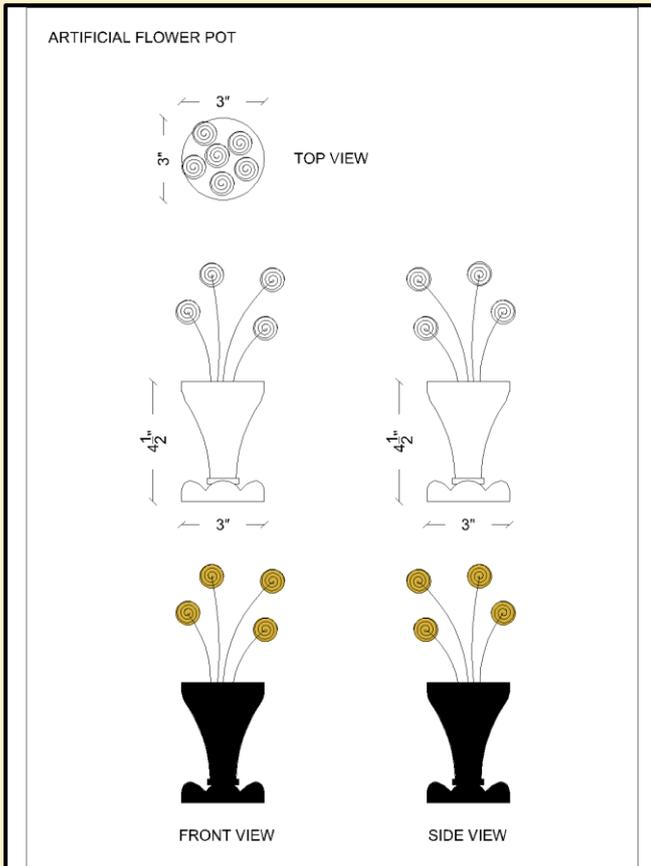
Product Description:

The planter was handcrafted and hand-painted with primer and acrylic paint. Different parts were connected with the help of jute rope and hot glue to create a multilayer planter. It has a simple and minimalistic design and can be used to plant small planters. It can be hung in different residential areas like living rooms, bedrooms, balconies, etc.

Type of Plastic: Polyethylene terephthalate
(Bottle)

Price: ₹ 80

PRODUCT: ARTIFICIAL FLOWER POT



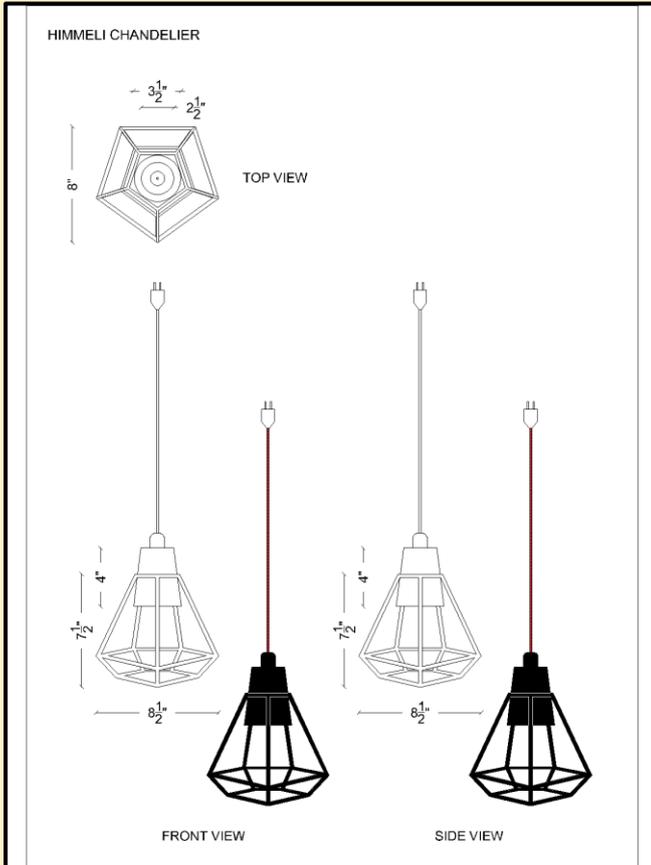
Product Description:

The pot was handcrafted and hand-painted with primer and acrylic paint. Flowers were made using a 2mm foam sheet, black paint paper, green masking tape, and aluminum wire. A mixture of POP was used to make it sturdy and it also helped the flowers to stay in a position. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, pooja rooms, etc.

Type of Plastic: Polyethylene terephthalate
(Bottle)

Price: ₹ 170

PRODUCT: HIMMELI CHANDELIER



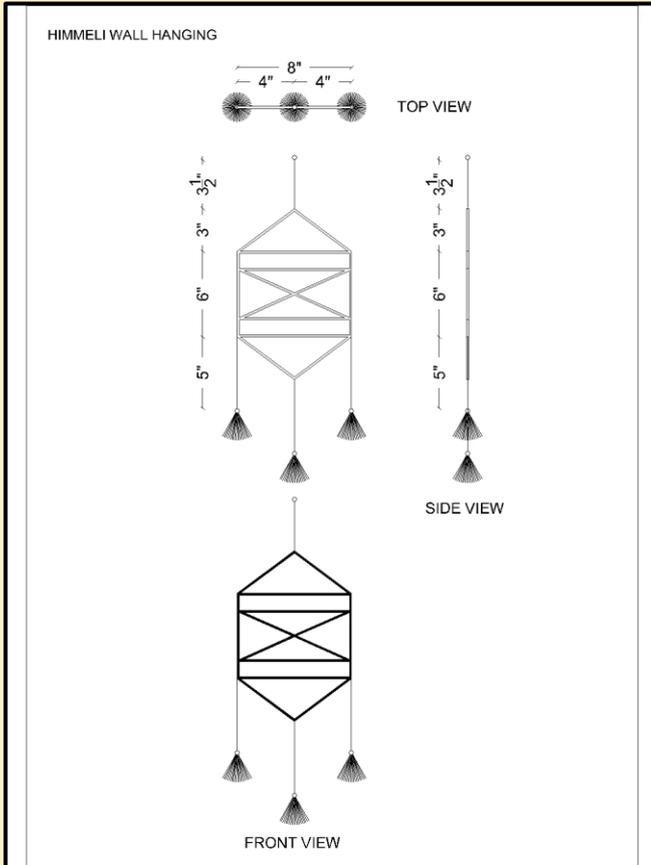
Product Description:

Himmeli chandelier was handcrafted and hand-painted with primer and acrylic paint and can be hung on the ceiling of residential spaces. It will provide an aesthetic look to the space while illuminating the area as well. A functional utility article for the home that has a simple and minimalist look and will help to keep the space bright. A distinctive appearance was added by the geometric pattern.

Type of Plastic: Polypropylene (Container and pipe)

Price: ₹ 350

PRODUCT: HIMMELI WALL HANGING



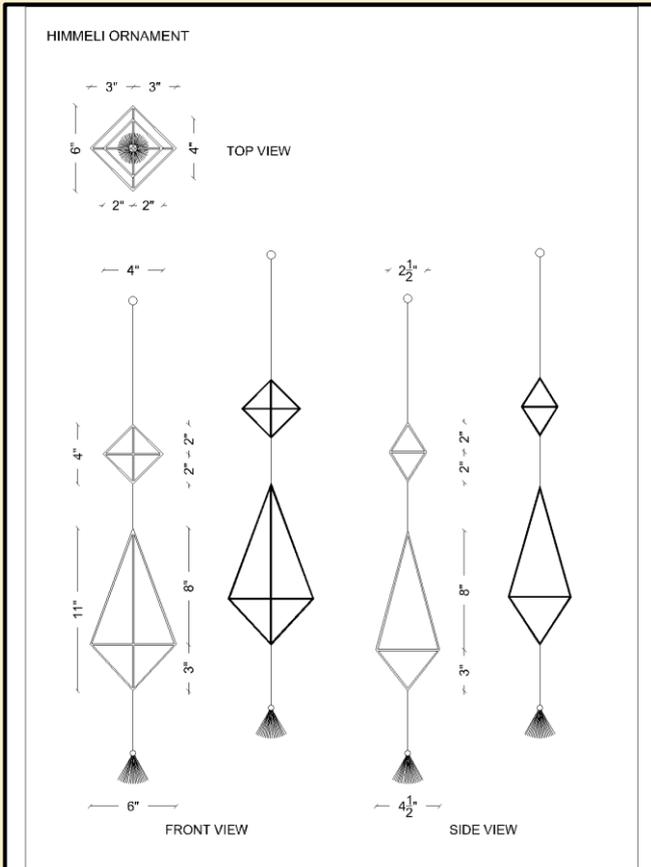
Product Description:

Himmeli wall hanging was handcrafted using upholstery thread and hand-painted with acrylic paint and can be hung on the wall of residential spaces. It will add an aesthetic look to the space. A décor article for the home that has a simple and minimalist look. Woolen tassels are added at the bottom. A distinctive appearance was added by the geometric pattern.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 50

PRODUCT: HIMMELI ORNAMENT



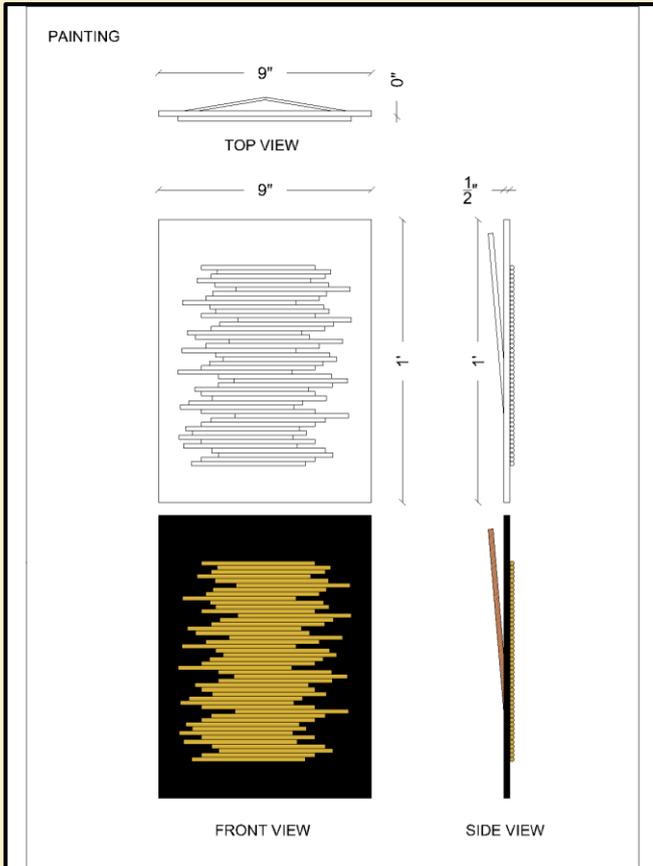
Product Description:

Himmeli ornament was handcrafted using upholstery thread and hand-painted with acrylic paint and can be hung on the wall of residential spaces. It will add an aesthetic look to the space. A décor article for the home that has a simple and minimalist look. A Woollen tassel was added at the bottom. A distinctive appearance was added by the geometric pattern.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 50

PRODUCT: PAINTING



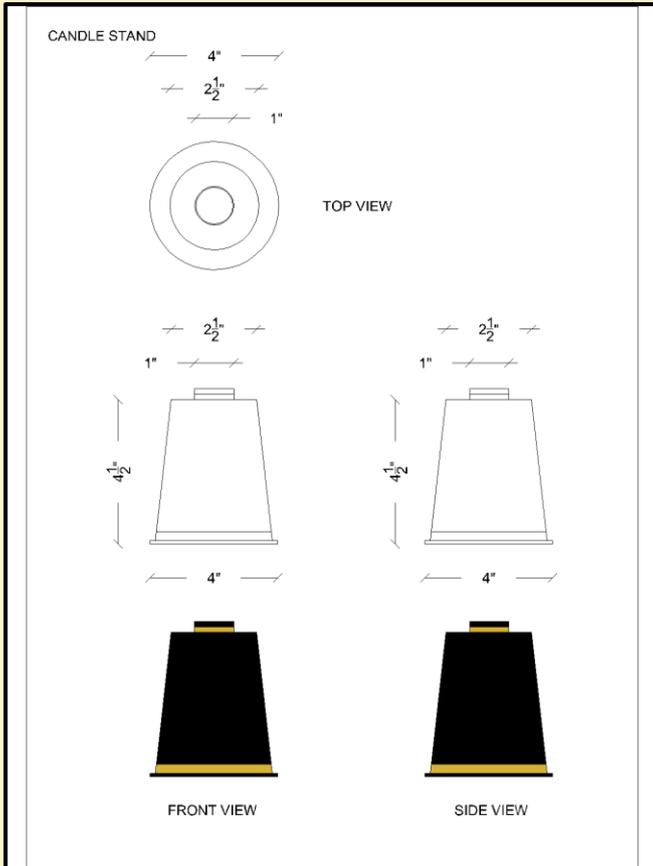
Product Description:

Canvas was used for the base structure. Golden-coloured uneven design was created using plastic straws. A décor article for the home that has a simple and minimalist look. Uneven design helps to create a unique appearance. It can be placed in different spaces like the living room, bedroom, study room, foyer, etc.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 300

PRODUCT: CANDLE STAND



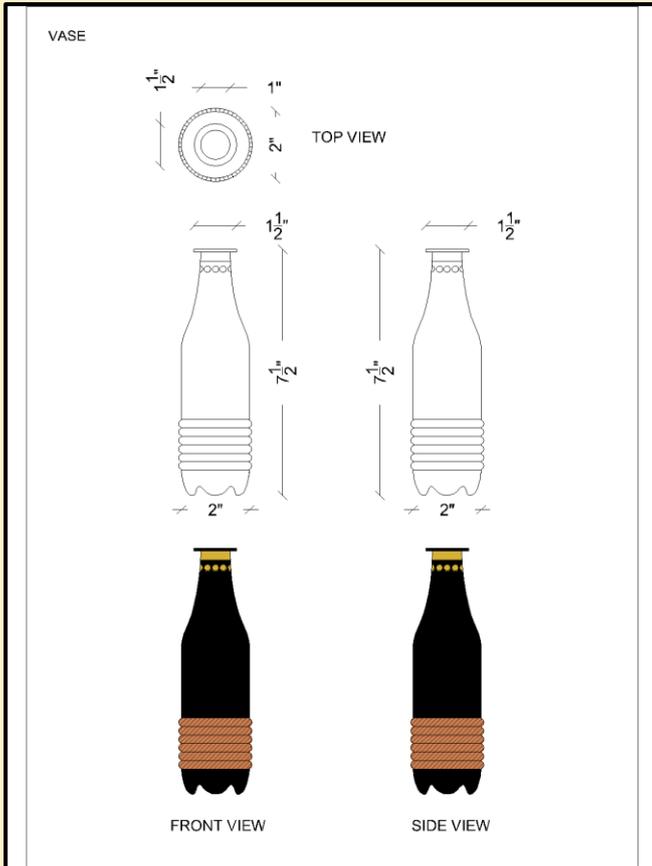
Product Description:

Candle stand that was handcrafted and hand-painted with primer and acrylic paint. Golden coloured rims were created at the top and bottom of the candle stand using a 2mm foam sheet. It will provide an aesthetic look while illuminating the space. A décor article that can be placed on the table.

Type of Plastic: Polypropylene (Container)

Price: ₹ 30

PRODUCT: VASE



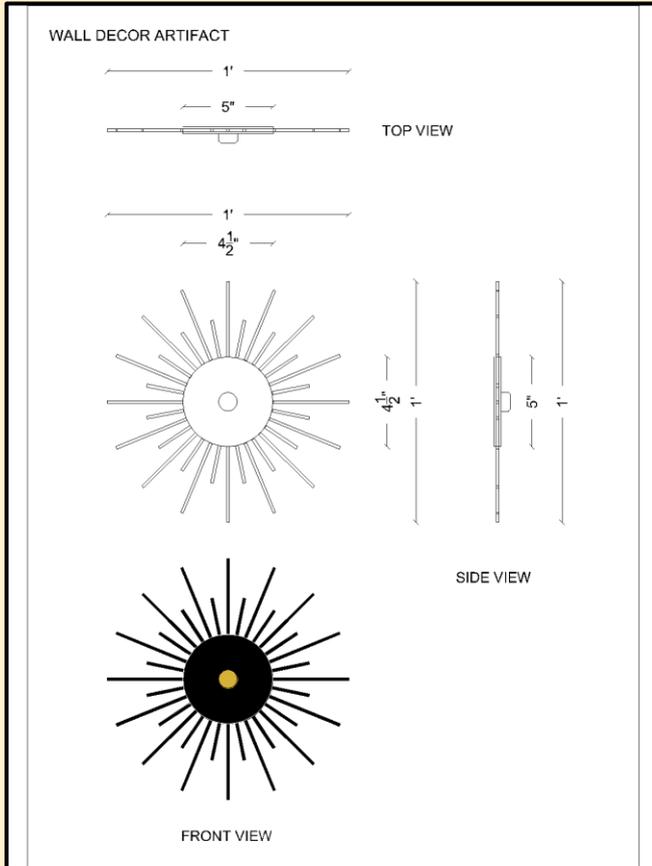
Product Description:

Vases were handcrafted and hand-painted with primer and acrylic paint. To provide an aesthetic look jute rope was used around the vase body and golden paint was used to create design at the rim. A mixture of POP was used to make it sturdy. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, pooja rooms, etc.

Type of Plastic: Polyethylene terephthalate
(Bottle)

Price: ₹ 170

PRODUCT: WALL DÉCOR ARTIFACT



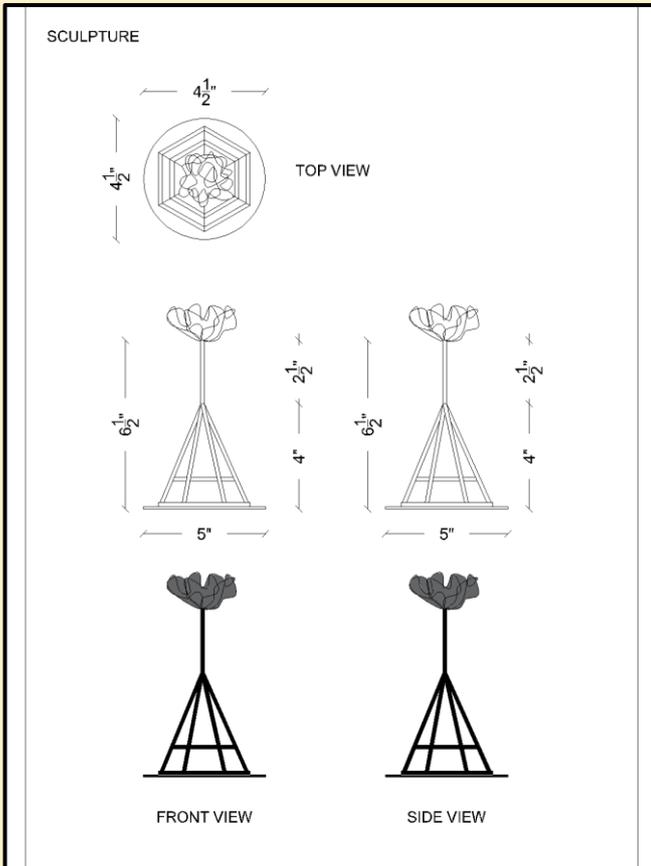
Product Description:

wall décor artifacts were handcrafted and hand-painted with primer and acrylic paint. To create a polar effect different sizes of plastic straws were placed in a circular motion from the center of the DVD. It has a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, foyers, hallways, etc.

Type of Plastic: Polypropylene and Polycarbonate
(Straw and DVD)

Price: ₹ 170

PRODUCT: SCULPTURE



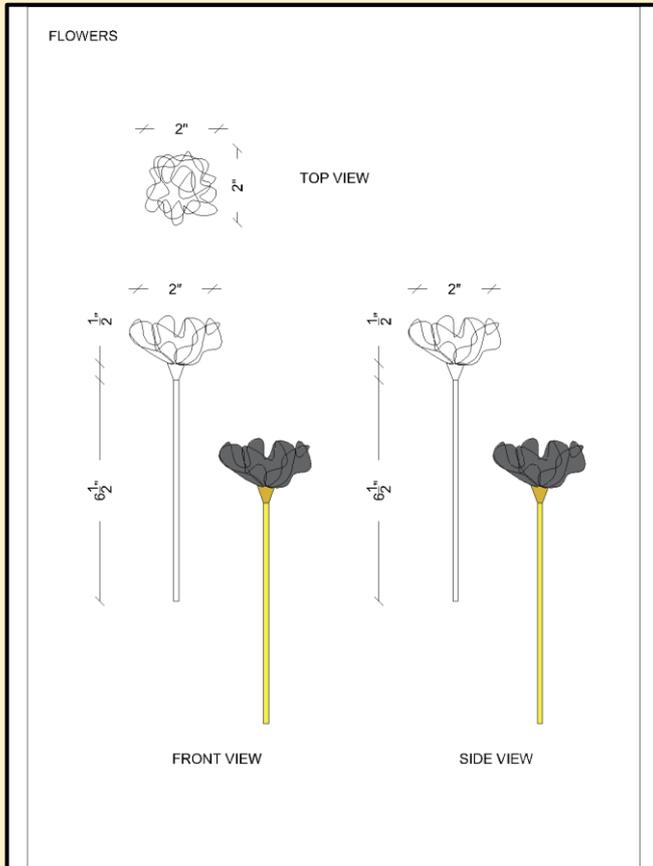
Product Description:

The sculpture was handcrafted and hand-painted with primer and acrylic paint. DVD is used for the base. The sculpture has a tower-like structure and a flower (created from polythene) was added on the top part to create a soft effect. It has a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, and was put on a table.

Type of Plastic: Polypropylene and Polycarbonate
(Straw and DVD)

Price: ₹ 50

PRODUCT: FLOWERS



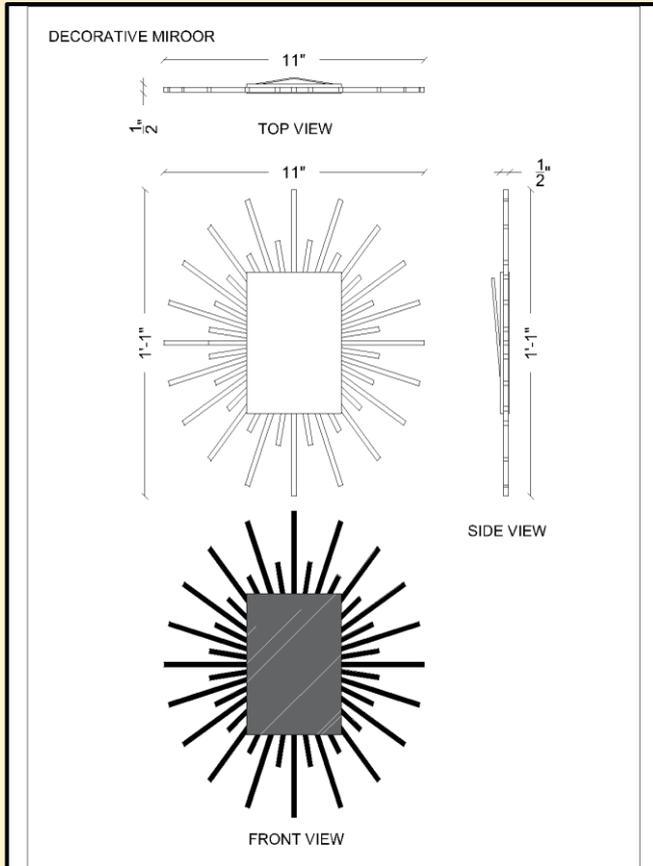
Product Description:

The flowers were handcrafted using straw, black polythene, a 2mm golden foam sheet, and hot glue. They had simple and minimalistic design and were elegant in appearance. It can be used as a décor artifact by putting them in a vase.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 120

PRODUCT: DECORATIVE MIRROR



Product Description:

The decorative mirror was handcrafted and hand-painted with acrylic paint. To create a polar effect different sizes of plastic straws were placed in a circular motion from the center of the mirror. It had a minimalistic appearance. It can be used as a décor artifact in different residential areas like living rooms, bedrooms, foyers, hallways, etc.

Type of Plastic: Polypropylene (Straw)

Price: ₹ 210

**SUMMARY, CONCLUSION
AND RECOMMENDATIONS**

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

Plastics are a wide range of synthetic or semi-synthetic materials that use polymers as the main ingredient. Their plasticity makes it possible for plastics to be moulded, extruded, or pressed into solid objects of various shapes. This adaptability, plus a wide range of other properties, such as being lightweight, durable, and inexpensive to produce, has led to its widespread use. The success and dominance of plastics have caused widespread environmental problems, due to their slow decomposition rate in natural ecosystems. The plastics industry promoted recycling in order to ease environmental concerns while continuing to produce virgin plastic and to push the responsibility of plastic pollution onto the consumer. Plastic collection and recycling are largely ineffective because of failures of contemporary complexity required in cleaning and sorting post-consumer plastics for effective reuse. Most plastic produced has not been reused, either being captured in landfills or persisting in the environment as plastic pollution. ^[1]

Plastic is a versatile material. Hence, plastic waste varies widely. Plastics take many decades to break down completely. It does not matter where the plastic is stored or kept; it will still take a long time to degrade. By recycling and reusing plastic raw materials and fashioning them into other products, consumers can effectively reduce plastic space taken up in landfills that can be used for biodegradable materials to save the environment. Plastic waste is a resource that is abundantly available and can be used either for material recycling or energy production, depending on the quality grade. (Thompson et al., 2009)

Recycling plastic waste materials help reduce the strain on the finite resources of the earth like natural gas, coal, plastic, and water. By reusing plastic instead of manufacturing the same grade of material every time, we are effectively reducing the footprint of plastic on dump sites across the globe reducing environmental pollution and, creating wealth and employment and thereby,

fostering economic development of the country. Reusing plastic waste can also help in healing the environment by lessening the damage that is already done. It can also be of great use to hike up the economy of the plastic industry. Reducing and reusing plastics is a sure way to protect our natural resources. However, reusing plastics also means that there is lesser plastic in landfills, rivers, forests, and oceans across the earth. (Thompson et al., 2009)

Objectives of the study

1. To prepare theme-based design for selected utility and décor articles to be developed from Plastic waste for residential spaces.
2. To assess opinions of interior designers, students of interior design specialization and homemakers regarding the aesthetic and functional aspects of selected utility and décor articles developed from plastic waste for residential spaces through display.
3. To prepare a cost estimate and catalogue for the designed utility and décor articles developed from plastic waste for residential use.

Delimitation of the study

1. The study was limited to those residences and scrap shops who gave plastic waste at minimal cost or free of cost.
2. The study was limited to those who were involved in homemaking and interior designing activity.
3. The present study was limited to those who gave consent to participate in the study.
4. The study was limited to the selected utility and decor articles for residential use namely:

Utility article

- Dustbin
- Hanging light (Pendant)
- Wall light
- Table light
- Laundry basket
- Pen stand
- Bird house
- Newspaper holder
- Ottoman
- Key holder
- Side table
- Coaster
- Stationary organizer
- Wall shelf
- Toothbrush holder
- Wall mounted wine glass holder

Décor article

- Planter
- Hanging pots
- Artificial flower pot
- Himmeli chandelier
- Himmeli wall hanging
- Himmeli ornament
- Painting
- Candle stand
- Vase
- Wall décor artifact
- Artificial sculpture
- Windchime
- Flowers
- Decorative mirror

Note - The development of the products was subjective to the availability of the plastic waste and financial considerations.

Methodology

The present study was undertaken to assess the opinion of the interior designers, students of interior design specialization and homemaker regarding the developed utility and décor articles for residential use from plastic waste.

Purposive sampling technique was used to select the respondents from Vadodara city as only those interior designers, students of interior design specialization and homemakers from Vadodara city were selected who were involved in interior designing and homemaking activities respectively and were willing to participate in the research study.

One of the prime objectives of the present study was to develop utility and décor articles from plastic waste and to assess the opinions of the respondents regarding the developed utility and décor articles from Vadodara city. Hence, in order to achieve this objective, the researcher collected data from the respondents through an interview schedule and analyzed the collected data. The interview schedule was divided into 3 sections, section-I dealt with the background information of the respondents, section-II dealt with their opinion regarding the utility articles and section-III dealt with their opinion regarding the décor articles for residential use developed from plastic waste.

The plastic waste was collected free of cost from residences and at minimal cost from scrap shops. According to the plastic waste procured from the

residences and scrap shops, the drawings of the utility and décor articles were prepared using AutoCAD 2020 software and were used for the development of articles. Cost estimation of the products was done based on material costs, labour charges, and profit. A catalogue was prepared mentioning the product description, namely product name, type of plastic used, size of the product, and price of the developed utility and décor articles.

For the establishment of the reliability and content validity of the prepared tool, the tool was given to a panel of judges containing experts from Family and Community Resource Management, and interior designers. Pretesting of the tool was done with 30 respondents.

The collected data was analyzed by calculating the weighted mean, frequency, and percentage.

Major findings of the study

Section I: Background information of the respondents

- It was found that 66.67 percent of the respondents were in the age group of 18 to 27 years with the Weighted Mean of 27 years.
- Regarding Marital Status, it was found that 55 percent of the respondents were unmarried.
- The data revealed that 71.67 percent of the respondents were qualified up to graduation level.
- the data revealed that 45 percent of the respondents were employed and unemployed respectively.
- 85 percent of the respondents had their family monthly income ranging from less than or equal to 1,00,000 with the mean income of 85,254.

Section II: Opinion of interior designers, students of interior design specialization and homemakers for the developed utility and décor articles

Opinion of the respondents was collected using interview schedule and based on the analysis of gathered data, it was found that:

- 63.33 percent of the respondents strongly agreed that the dustbin was solving the purpose for what it was designed.
- 60 percent of the respondents strongly agreed that the light was solving the purpose for what it was designed.
- 53.33 percent of the respondents agreed that the finishing of the wall light was satisfactory.
- that 58.33 percent of the respondents strongly agreed that the price of the table light was acceptable.
- that 58.33 percent of the respondents strongly agreed that the basket size was appropriate for its use.
- 58.33 percent of the respondents agreed that the pen stand width was appropriate to hold pens.
- 65 percent of the respondents strongly agreed that the price of the bird house was acceptable.
- 58.33 percent of the respondents strongly agreed that the newspaper holder served the purpose for which it was designed.
- 78.33 percent of the respondents strongly agreed that the finishing of the ottoman was satisfactory.
- 60 percent of the respondents strongly agreed that the size of the key holder was appropriate.
- 68.33 percent of the respondents strongly agreed that the price of the side table was acceptable.
- 60 percent of the respondents strongly agreed that the size of the coaster was big enough for its use.
- 55 percent of the respondents strongly agreed that the stationary organizer served the purpose for which it was designed.
- 63.33 percent of the respondents strongly agreed that the design of the wall shelf reflected unity.
- 53.33 percent of the respondents agreed that the size of the toothbrush holder was big enough for its use and the overall quality was satisfactory.
- 58.33 percent of the respondents strongly agreed that the finishing of the wine glass holder was satisfactory and price was acceptable.

- 56.67 percent of the respondents strongly agreed that the finishing of the planter was satisfactory.
- 50 percent of the respondents strongly agreed that the size of the pot was appropriate for its use.
- 68.33 percent of the respondents strongly agreed that the overall quality of the flower pot was satisfactory.
- 51.67 percent of the respondents strongly agreed that the size of chandelier was big enough for its use and the colour combination was appropriate for residential use.
- 56.67 percent of the respondents agreed that the price of the wall hanging was acceptable.
- 53.33 percent of the respondents agreed that the overall quality of the ornament was satisfactory and the price was acceptable.
- 70 percent of the respondents strongly agreed that the finishing of the painting was satisfactory and it served the purpose for which it was designed.
- 50 percent of the respondents strongly agreed that the finishing of the candle stand was satisfactory and it added aesthetic value to the space.
- 65 percent of the respondents strongly agreed that the vase was sturdy enough for its use.
- 66.67 percent of the respondents strongly agreed that the finishing of the product was satisfactory.
- 51.67 percent of the respondents agreed that the sculpture added aesthetic value to the space.
- 65 percent of the respondents strongly agreed that the windchime added aesthetic value to the space while serving its purpose.
- 66.67 percent of the respondents strongly agreed that the finishing of the flower was satisfactory.
- 66.67 percent of the respondents strongly agreed that the finishing of the flower was satisfactory.

Therefore, based on the calculated Weighted Mean score, it was concluded that the painting was the most liked article developed for residential spaces with the weighted mean score of 4.56.

Conclusion

From the data collected regarding the opinion of the respondents based on the existing parameters of the designed and developed utility and décor articles namely size, quality, durability, proportion, convenience of use, colour combination and aesthetic value for Residential use from plastic waste, the findings of the study depicted that the painting was the most liked article by the respondents with the weighted mean of 4.56. The colour combination of the developed utility and décor articles was appreciated by the respondents.

The implication of the study

For the field of Family and Community Resource Management

As the field of Family and Community Resource Management has interior design as a specialization subject and diploma course in hotel interior, the information collected in the study, such as different uses of plastic waste, developing theme-based designs for utility and décor articles and cost estimation will provide to be first-hand information for practical applications. The study will benefit other academic institutes offering courses in interior design.

For interior designers

The study will help interior designers to utilize the plastic waste from the construction and renovation sites and develop new products from it which can be used as décor or utility products for residential and commercial purposes.

For the manufacturer and retailers related to the plastic industry

The finding of the study would also be beneficial to the manufacturer and retailer of the plastic industry, as the design developed can be used as an example for reusing the maximum amount of plastic waste to create handicrafts, utility, and décor articles from plastic waste from their outlet.

Recommendations for future research

- A similar kind of design project can be conducted on designing office articles, toys, and small furniture for Pre-Schools.

- A similar kind of design research can be conducted on other groups of respondents like architects, product designers, furniture designers, and manufacturers.
- A study can be undertaken on different industries that use plastic waste and can manufacture new products.
- A similar study can be conducted on using other household or commercial waste like glass, wood, cardboard, etc. to turn them into usable objects.

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APPENDICES

APPENDIX -I



Institutional Ethics
Committee for Human
Research
(IECHR)

FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Ethical Compliance Certificate 2022-2023

This is to certify that **Ms. Roshni Sahani's** study titled, **Designing Utility & Décor Articles for Residential Spaces by Reusing Plastic Waste** has been approved by the Institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda. The study has been allotted the ethical approval number IECHR/FCSsc/M.Sc./2022/04.

Prof Shagufa Kapadia

Chairperson

IECHR

Prof Mini Sheth

Member Secretary

IECHR

APPENDIX –II

DATA COLLECTION TOOL

Interview schedule for utility and décor articles

Section I: Background Information

1. Name:

2. Age:

3. Marital Status:

4. Educational Qualification

- Secondary
- Higher Secondary
- Graduation
- Post-graduation
- Diploma
- Certification
- Ph.D.
- Any other (please specify):

5. Occupational status

- Unemployed
- Employed
- Self-employed
- Retired

6. Family Monthly Income (in ₹):

Section II

Interior designers, students of interior design specialization and homemakers' opinion scale regarding the designed utility articles from the plastic waste.

The following statements are developed to know the opinion of the interior designers, students of interior design specialization and homemakers regarding the usefulness of designed utility articles from plastic waste. The statements will be analyzed through a response structure "strongly agree, agree, undecided, disagree and strongly disagree".

(Keys: S.A - Strongly Agree, A - Agree, U - Undecided, D - Disagree, S.D - Strongly Disagree).

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
A.	Dustbin					
Aesthetic aspects						
1.	The design of the dustbin is appropriate for its use.					
2.	The size of the dustbin is appropriate for its use.					
3.	The design of the product reflects unity.					
4.	The product is solving the purpose for what it is designed.					
5.	The colour combination is appropriate for residential space.					
Functional aspects						
6.	The dustbin is easy to clean with a damp cloth.					
7.	The overall product is functional.					
8.	The overall quality of the dustbin is satisfactory.					
9.	The price of the product is acceptable.					
B.	Hanging light (Pendant)					
Aesthetic aspects						
1.	The finishing of the hanging light is satisfactory.					
2.	The size of the light is big enough for its use.					
3.	The product adds aesthetic value to the space.					

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
4.	The product is solving the purpose for what it is designed.					
Functional aspects						
5.	It is not easy to clean with a damp cloth.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
C.	Wall light					
Aesthetic aspects						
1.	The finishing of the wall light is satisfactory.					
2.	The size of light is big enough for its use.					
3.	The product adds aesthetic value to the space.					
4.	The product is solving the purpose for what it is designed.					
Functional aspects						
5.	The wall light is not easy to clean.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
D.	Table light					
Aesthetic aspects						
1.	The finishing of the table light is satisfactory.					
2.	The size of the light is appropriate for its use.					
3.	The product adds aesthetic value to the space.					
4.	The product is solving the purpose for what it is designed.					
Functional aspects						
5.	The product is not easy to clean with a damp cloth.					
6.	The overall quality of the product is satisfactory.					

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
7.	The price of the product is acceptable.					
E.	Laundry basket					
Aesthetic aspects						
1.	The size of the basket is appropriate for its use.					
2.	The design of the basket reflects unity.					
3.	The colour combination is appropriate for residential space.					
4.	The overall finishing of the product is satisfactory.					
Functional aspects						
5.	The basket is easy to clean with a damp cloth.					
6.	The product is durable for its use.					
7.	The overall quality of the product is satisfactory.					
8.	The price of the product is acceptable.					
F.	Pen stand					
Aesthetic aspects						
1.	The height of the pen stand is appropriate to hold the pens.					
2.	The width of the pen stand is appropriate to hold the pens.					
3.	The product is not serving the purpose for which it is designed.					
Functional aspects						
4.	The product is durable for its use.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
G.	Birdhouse					
Aesthetic aspects						
1.	The finishing of the product is satisfactory.					
2.	The colour combination is appropriate for					

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
	residential space.					
3.	The design of the birdhouse reflects unity.					
4.	The birdhouse is solving the purpose for what it is designed.					
Functional aspects						
5.	The product is not durable for its use.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
H.	Newspaper holder					
Aesthetic aspects						
1.	The finishing of the newspaper holder is satisfactory.					
2.	The size of the product is appropriate for use.					
3.	It serves the purpose for which it is designed.					
4.	The design of the newspaper holder reflects unity.					
Functional aspects						
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
I.	Ottoman					
Aesthetic aspects						
1.	The finishing of the ottoman is satisfactory.					
2.	The product serves the purpose for which it is designed.					
3.	The colour combination is appropriate for residential space.					
4.	The design of the product reflects unity.					
Functional aspects						
5.	It can store small items easily.					
6.	The product is safe for kids to use.					

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
7.	It is not suitable as furniture.					
8.	The overall quality of the product is satisfactory.					
9.	The price of the product is acceptable.					
J.	Key holder					
Aesthetic aspects						
1.	The size of the key holder is appropriate.					
2.	It is not serving the purpose for what it is designed.					
3.	The shape of the key holder is appropriate for use.					
4.	The design of the key holder reflects unity.					
Functional aspects						
5.	Facing difficulty using the key chain.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
K.	Side table					
Aesthetic aspects						
1.	It serves the purpose for which it is designed.					
2.	The colour combination is appropriate for residential space.					
3.	The size of the side table is appropriate for its use.					
Functional aspects						
4.	The side table is suitable as furniture.					
5.	It can store small items easily.					
6.	The side table is easy to maintain.					
7.	The overall quality of the product is satisfactory.					
8.	The price of the product is acceptable.					
L.	Coaster					
Aesthetic aspects						

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
1.	The size is big enough for its use.					
2.	The design of the product reflects unity.					
3.	The product serves the purpose for which it is designed.					
Functional aspects						
4.	The thickness of the coaster is convenient to use.					
5.	It is not easy to clean with a damp cloth.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
M.	Stationary organizer					
Aesthetic aspects						
1.	The design of the product reflects unity.					
2.	The size of the organizer is appropriate.					
3.	The height is appropriate for storing different items.					
4.	It serves the purpose for which it is designed.					
Functional aspects						
5.	The product is durable and sturdy.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
N.	Wall shelf					
Aesthetic aspects						
1.	The size of the shelf is appropriate for small items.					
2.	The finishing of the wall shelf is satisfactory.					
3.	The product serves the purpose for which it is designed.					
4.	The design of the product reflects unity.					
Functional aspects						
5.	The wall shelf is durable for its use.					

Sr.No	Criteria for day-to-day use Utility Articles	S.A	A	U	D	S.D
6.	It is not easy to clean with a damp cloth.					
7.	The overall quality of the product is satisfactory.					
8.	The price of the product is acceptable.					
O.	Toothbrush holder					
Aesthetic aspects						
1.	The design is appropriate for its use.					
2.	The size of holder is big enough for its use.					
3.	The colour combination is appropriate for residential space.					
Functional aspects						
4.	The toothbrush holder is not easy to maintain.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
P.	Wall mounted wine glass holder					
Aesthetic aspects						
1.	The design of the product reflects unity.					
2.	The size of the product is big enough for its use.					
3.	The finishing of the glass holder is satisfactory					
4.	It serves the purpose for which it is designed.					
Functional aspects						
5.	The wall mounted wine glass holder is durable for its use.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					

Section III

Interior designers, students of interior design specialization and homemakers' opinion scale regarding the designed décor Articles from the plastic waste.

The following statements are developed to know the opinion of the interior designers, students of interior design specialization and homemakers regarding the aesthetic aspects of designed décor articles from plastic waste. The statements will be analyzed through a response structure “strongly agree, agree, undecided, disagree and strongly disagree”.

(Keys: S.A - Strongly Agree, A - Agree, U - Undecided, D - Disagree, S.D - Strongly Disagree).

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
A.	Planter					
Aesthetic aspects						
1.	The finishing of the planter is satisfactory.					
2.	The size of the planter is appropriate for its use.					
3.	The design of the planter is appropriate for its use.					
4.	The colour combination is appropriate for residential use.					
Functional aspects						
5.	The planter is easy to maintain.					
6.	The overall quality of the planter is satisfactory.					
7.	The price of the product is acceptable.					
B.	Hanging pots					
Aesthetic aspects						
1.	The size of the pot is appropriate for its use.					
2.	The design of the pot is appropriate for its use.					
3.	The product adds aesthetic value while serving the purpose.					
4.	The finishing of the pot is satisfactory.					
Functional aspects						
5.	The overall quality of the product is					

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
	satisfactory.					
6.	The price of the product is acceptable.					
C.	Artificial flowerpot					
Aesthetic aspects						
1.	The product adds aesthetic value while serving the purpose.					
2.	The size is appropriate for its use.					
3.	The design is appropriate for its use.					
Functional aspects						
4.	The product is easy to clean with a damp cloth.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
D.	Himmeli chandelier					
Aesthetic aspects						
1.	The product adds aesthetic value while serving the purpose.					
2.	The finishing of the chandelier is satisfactory.					
3.	The size of chandelier is big enough for its use.					
4.	The colour combination is appropriate for residential use.					
Functional aspects						
5.	The product is not easy to clean.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
E.	Himmeli wall hanging					
Aesthetic aspects						
1.	The himmeli wall hanging adds aesthetic value while serving the purpose.					
2.	The finishing of the wall hanging is					

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
	satisfactory.					
3.	The design of the product reflects unity.					
Functional aspects						
4.	The product is not easy to clean.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
F.	Himmeli ornament					
Aesthetic aspects						
1.	The product adds aesthetic value while serving the purpose.					
2.	The finishing of the ornament is satisfactory.					
3.	The colour combination is appropriate for residential space.					
Functional aspects						
4.	The product is not easy to clean.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
G.	Painting					
Aesthetic aspects						
1.	The finishing of the painting is satisfactory.					
2.	The product serves the purpose for which it is designed.					
3.	The size of the product is big enough for its use.					
4.	The product adds aesthetic value while serving the purpose.					
Functional aspects						
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
H.	Candle stand					

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
Aesthetic aspects						
1.	The finishing of the candle stand is satisfactory.					
2.	The product adds aesthetic value to the space.					
Functional aspects						
3.	It is inconvenient to place and remove the candle.					
4.	It is not suitable as a candle stand.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
I.	Vase					
Aesthetic aspects						
1.	The finishing of the vase is satisfactory.					
2.	It adds aesthetic value in space while serving the purpose.					
3.	It serves the purpose for which it is designed.					
Functional aspects						
4.	The product is sturdy enough for its use.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
J.	Wall décor artifact					
Aesthetic aspects						
1.	The finishing of the wall décor artifact is satisfactory.					
2.	It serves the purpose for which it is designed.					
3.	The colour combination is appropriate for the space.					
Functional aspects						
4.	The product is easy to clean.					

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
5.	The product is easy to maintain.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
K.	Artificial sculpture					
Aesthetic aspects						
1.	The sculpture serves the purpose for which it is designed.					
2.	The product adds aesthetic value to the space.					
3.	The finishing of the sculpture is satisfactory.					
Functional aspects						
4.	It is safe for the kids to use.					
5.	The sculpture is not easy to maintain.					
6.	The overall quality of the product is satisfactory.					
7.	The price of the product is acceptable.					
L.	Windchime					
Aesthetic aspects						
1.	The product adds aesthetic value while serving the purpose.					
2.	The finishing of the windchime is satisfactory.					
3.	The shape of product is appropriate for its use.					
Functional aspects						
4.	The windchime is easy to maintain.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
M.	Flowers					
Aesthetic aspects						
1.	The finishing of the flower is satisfactory.					

Sr.No	Criteria for Décor Articles	S.A	A	U	D	S.D
2.	The product adds aesthetic value to the space.					
3.	The product serves the purpose for which it is designed					
Functional aspects						
4.	The product is not easy to clean.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					
N.	Decorative mirror					
Aesthetic aspects						
1.	The finishing of the decorative mirror is satisfactory.					
2.	The design is appropriate for the use.					
3.	The product adds aesthetic value to the space.					
Functional aspects						
4.	The product is not easy to clean.					
5.	The overall quality of the product is satisfactory.					
6.	The price of the product is acceptable.					

APPENDIX –III



Estd. 1949

NAAC Accredited “A” Grade

DEPARTMENT OF FAMILY AND COMMUNITY RESOURCE MANAGEMENT

FACULTY OF FAMILY & COMMUNITY SCIENCES

THE MAHARAJ SAYAJIRAO UNIVERSITY OF BARODA, VADODARA

CONSENT FORM FOR RESPONDENTS

Dear Respondent,

I am Roshni Sahani, Sr. M.Sc. year student of the Department of Family and Community Resource Management at the Maharaja Sayajirao University of Baroda, Gujarat. For the partial fulfillment of my master’s degree, I am conducting research on “Designing Utility & Décor Articles for Residential Spaces by Reusing Plastic Waste”. The purpose of the study is to “design and develop utility and décor articles and to assess the extent of user’s satisfaction”.

The objectives of the product design project are as follows:

4. To prepare theme-based design for selected utility and décor articles to be developed from Plastic waste for residential use.
5. To assess opinions of interior designers, students of interior design specialization and homemakers regarding the usefulness of selected utility and décor articles developed from plastic waste for residential spaces through display.
6. To prepare a cost estimate and catalogue for the designed utility and décor articles developed from Plastic waste for residential use.

Your opinion of the created utility and décor items is something that I am extremely interested in learning about. You will be required to complete the interview schedule if you accept to take part in this research project. Prior to that, I want to state that your participation in this study is entirely voluntary and that every precaution will be made to secure your identity and maintain the confidentiality of the data. The responses are only accessible to the researcher. Your personal identifying information will only be used to contact you and your name will not be associated with any research findings. You are free to exit the study at any time if you are uncomfortable for any reason while participating in it.

If you have any further questions concerning this study, please feel free to contact me through-
Phone no: 7016803683

Email ID: 2001roshni2001@gmail.com

To participate, please put (✓) tick mark on “I Agree” to complete the interview schedule for the research study.

Your participation will be greatly appreciated.

- I AGREE
- I DISAGREE

Name & signature of the respondent:

Research Guide:

Dr. Urvashi Mishra

M: 9825610363

FCRM Department

Research Student:

Roshni Sahani

M.Sc. (F.C.Sc.) FCRM Department

FFCSc, MSU

ABSTRACT

ABSTRACT

Plastic is a versatile material. Hence, plastic waste varies widely. Plastics take many decades to break down completely. Throughout the entire country, and particularly in urban areas, plastic bottles and sachets have become very common. Because the packaging revolt was not accompanied by an effective plastic waste management strategy, many Indian cities are now covered with plastic waste, which is harmful to the environment and poses severe health risks for the existing communities. Plastic recycling programs have been implemented in most developed nations due to rising environmental awareness and a shortage in landfill capacity. Yet, only 5 to 25 per cent of plastic waste is currently recycled in India. By recycling and reusing plastic raw materials and fashioning them into other products, consumers can effectively reduce plastic space taken up in landfills that can be used for biodegradable materials to save the environment. Plastic waste is a resource that is abundantly available and can be used either for material recycling or energy production, depending on the quality grade. Recycling plastic waste materials help reduce the strain on the finite resources of the earth like natural gas, coal, plastic, and water.

The objectives of the present study were to prepare theme-based design and develop utility and décor articles from plastic waste for residential use and assess opinions of interior designers, students of interior design specialization and homemakers regarding the usefulness of the articles and to prepare a catalogue with cost estimate for the designed utility and décor articles. The research design adopted for the study was descriptive in nature. The utility and décor articles were developed and the display of all the developed articles was done in the Department of Family and Community Resource Management. The data was collected through an interview schedule to assess respondents' opinions regarding the extent of expediency of the developed utility and décor articles. The data was analyzed by applying descriptive statistics, i.e., frequency, percentage, and weighted mean.

The major findings of the study revealed that 66.67 per cent of the respondents belonged to the age group of 18 to 27 years with the mean age of 27 years and 55 per cent of the respondents were unmarried. Regarding educational qualification, it was observed that 71.67 per cent of the respondents completed

education up to graduation. 45 per cent of the respondents were employed and unemployed. The family monthly income of 85 per cent of the respondents was between less than or equal to ₹1,00,000. From the data collected regarding the opinion of the respondents based on the existing parameters of the designed and developed utility and decor articles namely size, quality, durability, proportion, convenience of use, colour combination, and aesthetic value for residential use from plastic waste, the findings of the study depicted that painting was the most liked article by the respondents with the weighted mean of 4.56. The colour combination of the developed utility and décor articles was appreciated by the respondents.