



## Economic and Easy Do It Yourself (DIY) Safety Kit

**Yukta Chauhan**

*Chitkara University Institute of Engineering & Technology, Chitkara University, Punjab-140401, India*

Email: [yukta1582.cse19@chitkara.edu.in](mailto:yukta1582.cse19@chitkara.edu.in)

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### ABSTRACT

The main objective of this paper is to present a cost effective and efficient safety kit in order to help fulfill the scarcity of PPE kits during COVID-19 pandemic. These days it is quite essential to wear safety gears like masks, gloves, face shields etc. resulting in shortage of these items at some places and the second problem is that certain sections of people cannot afford to purchase these items. This paper presents methods to create cheap yet effective safety kits at home. The kit will require easily available material like cloth bag, biodegradable trash bag, polythene bag etc. and items like gown, cap, masks, and gloves can be made using these materials.

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## 1. Introduction

The project idea has been evolved from the urgent need of safety equipments for common people and the scarcity of PPE kits in India during this pandemic of COVID-19 [1]. In addition, some of the safety kits that are available in the market have negative effects like they are expensive and cost about INR 200 or more [2], they cause skin problems [3] and they are not made from biodegradable material and therefore are harmful for environment [4]. This paper has attempted to address some of these above-mentioned issues. Safety kit proposed in this work is going to be completely biodegradable, reusable, cheap, skin friendly and breathable and it will contain an overall gown, a mask, a cap,

gloves, organic non-alcoholic sanitizer and paper soap.

## 2. Methodology

In this section, the methods for making each of the aforementioned items of the safety kit have been discussed.

### 2.1. Material and Methods for Making Gown, Mask, Cap and Gloves

Cloth based shopping bag, biodegradable trash bags, polythene bags, polythene sheets or any such material (as in Fig. 1) are being proposed for making gowns, masks, caps and gloves. Nowadays cloth-based shopping bags are readily available and we recommend that cloth based



**Figure 1:** Cloth based shopping bag/ biodegradable trash bags/ polythene bags/ polythene sheets or any such material

shopping bags should be used for making these safety items. In order to make an overall disposable gown, the recommended biodegradable sheet needs to be cut into different parts and then sewed together. For making a head cap, biodegradable sheet is cut into circular shape as per the size of the head and a thread is attached along the circumference of the circular sheet. The ends of the thread are left open and pulling them will tighten the cap, in addition an elastic band can also be used to make a bouffant cap.

Gloves are made by cutting a sheet in a shape of hands, and in a slightly bigger size in comparison to the intended hands. For each hand two sheets need to be cut in exactly similar sizes and shapes and both the sheets are then glued to make a glove. In order to make a face mask, biodegradable sheet needs to be cut into rectangular shape of appropriate size in order to cover mouth and face properly. This is followed by making two to three pleats and gluing the ends of the pleats. Finally, a string or a thread is glued to the pleated mask.

## 2.2. Material and Method for Making Paper Soap

In order to make paper soap any type of paper be it a normal unruled paper, butter paper or wax paper may be used. The intended paper needs to be placed in a tray and liquid soap is poured into it. Soap should be evenly spread all over the paper and paper is then dried in sun. The sheet of paper soap is then cut into appropriate sizes for storing and for use.

## 2.3. Material and Method for Making Non-alcoholic Sanitizer

The proposed non-alcoholic sanitizer is a good alternative to alcoholic sanitizer, and it has good antibacterial properties. Proposed sanitizer is made using vinegar (acetic acid) which has good antibacterial properties [5]. In order to make sanitizer using vinegar, 30ml of white vinegar is mixed with 1 tablespoon of baking soda which is a good disinfectant [6]. A teaspoon of turmeric and lemon that respectively have good antiseptic and antibacterial property is added to the mixture [7, 8]. Half tablespoon each of glycerine and coconut oil is added which will help in preventing skin damage. The mixture is then poured into a bottle and can be used as hand sanitizer.

## 3. Results and Discussion

The proposed safety kit is going to benefit both the consumers as well as manufacturers. Since it is very simple to make kit, marginal and low-income group people looking for employment in these difficult times of COVID-19 can make them and sell them. NGOs can aid them in selling these kits through local chemists, retailers as well as through e-commerce platforms. Consumers will be benefitted as this is going to be a low-cost product, with the cost of complete kit is no more than INR 40.

## 4. Conclusion

Safety kit discussed in this paper is going to be extremely useful during the COVID-19 pandemic.

It is safe to use, safe to dispose, reusable and cost-effective kit that can be made in no time. It could prove to be a source of employment for low- and marginal-income group people and since it is low cost it will be within the reach of every consumer. A kit like this can help people stay safe during this COVID-19 pandemic.

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