

**Hwa Chong Institution**  
**Project Work**  
**Category 3**  
**Inventions Log Book**  
**(Revised for 2020)**

Title of Project: <u>Inflatable Bubble Wrap</u>
Group Name: 03-36
Group Members: 1) Wong Lie Qi 2) Tang Xu Yuan 3) Justin Law

## **1. Problem Finding**

(The beginning...)

Identify a problem you would like to solve. You may want to brainstorm for problems using different approaches e.g. thematic, survey or general brainstorming etc.

**1 A Document a list of problems you have identified. Your documentation should show clearly how your group came up with the problems.**

1) Not being able to reach the chips at the bottom of a potato chips can and would often have to turn it over just to get it out, we got this idea when we were eating chips and found it very inconvenient to reach for the last few pieces of chips as our hands could not fit all the way and when we turned the can over, most of the crumbs from the chips just fell out.

2) Bubble wrap being wasted. Bubble wrap is made in large industrial amounts, however not all bubble wrap is reused and often after using it, it would be thrown away. This generates a lot of waste. Wanting to reduce such waste created, we decided to consider this as one of the problems

3) Making a device which could help in preventing phones from overheating when left out in the open.

**1 B You should have selected a problem based on some considerations. Identify and justify these considerations.**

To decide on which solution to use, we came up with a criteria. First is the feasibility of the idea, second is the significance of the problem, last is existing solutions. We rated the idea out of 3 with 3 being the highest score and then we took the project with the highest score overall score to be our project. We wanted the project to be feasible so that it would be possible for us to do. We also did not want there to be an existing product which was similar in idea to our idea. Last but not least, we wanted our project to be significant enough, allowing it to hopefully make an impact on the environment

**1 C List some problems your group would like to solve. List also the considerations for selection of problems in the evaluation grid below. Score the considerations, against the problems, with points 1 (least significant) to 4 (most significant). Sum up the total points for each problem. Identify that problem you would like to solve.**

Problem Evaluation Grid

\*add more columns and rows where necessary

Considerations for Selection	Problems		
	#1 Not being able to eat the chips out the can easily when its almost out	#2 Lots of bubble wrap not being recycled or reused and being thrown away	#3 Phones overheating
Consideration 1 Feasibility /3	3	2	1
Consideration 2 Significance /3	1	2	3
Consideration 3 Existing solution /3	2	3	1
Total Score	6	7	4

## 2. Define the Problem (This is one...)

Now that the problem has been identified. It is important to gather information on the extent of the problem and/or evaluate the usefulness of existing solutions based on *some criteria*. You may need to conduct surveys and research on existing solutions.

### **2 A Extent of problem (Research and discuss the problem and write down the problem statement)**

Only 24% of the world's Bubble wrap gets recycled. This is a huge amount of waste of bubble wrap which contributes to the earth's plastic waste. According to <https://www.todayifoundout.com/index.php/2011/11/bubble-wrap-was-originally-designed-to-be-used-as-wallpaper/>, about 10% of Sealed Air's revenue comes from Bubble Wrap, so around \$400 million worth of Bubble Wrap is sold annually. Not only that bubble wrap is not reusable, once it is popped there is no way of restoring it and is thrown out. It is very hard to store bubble wrap as heavy objects cannot be placed on and at the same time it takes up a lot of space when stored in large amounts. Thus, bubble wrap contributes to enormous amounts of plastic waste.

## **2 B Compare and contrast the existing or similar solutions.**

After doing some research, we realized that most of the products are a one time use item, these products are only able to inflate once and are not able to be deflated or reused. However our idea is being able to inflate and deflate the bubble wrap when needed and it is reusable, thus existing solutions are different from our's.

## **3. Your BIG IDEA**

(Developing the idea....)

Write down your proposed invention and why you want to do it. State also how you think your proposed invention is better.

### **3 A Describe your proposed invention.**

We want to use medium density polyethylene to make reusable and inflatable bubble wrap, although it is less flexible, however, it is much stronger and won't break as easily while still protecting the items, instead of the one-time use conventional bubble wraps we see everyday.

**3 B Explain the purpose of your proposed invention and the potential benefits to users.**

The purpose of this invention is to protect the items and prevent damage upon impact, it is also planned to be inflatable and deflatable so that it can be easily stored and reused to cut down on plastic waste.

**3 C In what ways would your proposed invention be different and/or better than existing solutions, if any?**

Most of the existing solutions are not reusable or deflatable. they are hard to store and are easily broken thus it cannot be reused and most people just throw them away.

**3 D What are some problems you expect in the course of your proposed invention?**

The medium density polyethylene may be hard to find and may not be able to be easily molded into the shape we want.

**3 E What and when are the major milestones (project timeline) in your invention?**

The first is when we decided on a project, the next would be finishing the model and the prototype and last is when we finally came up with the construction process.

***#must be able to be constructed based on current / emerging technologies, must not violate the laws of Science or go against the laws of nature.***

**4. Proposed Construction or Modelling Process\***

(This first... then that...)

You are now onto the fabrication of your prototype/ product. You need to select material and understand how to put them together so that your prototype/ product can perform its function.

**4 A Explain how and why the materials were chosen for the prototype/ product of your invention**

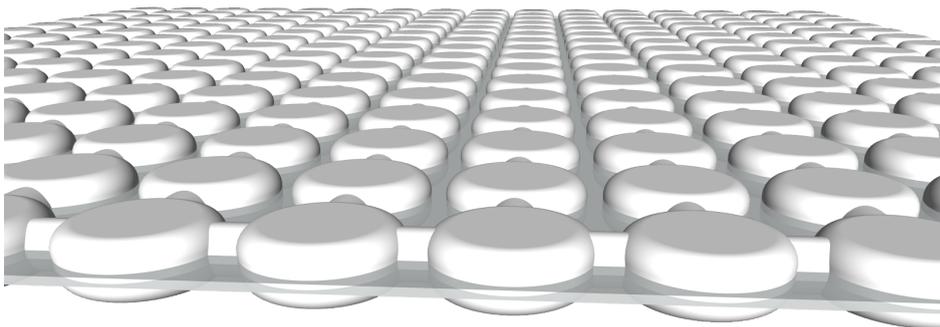
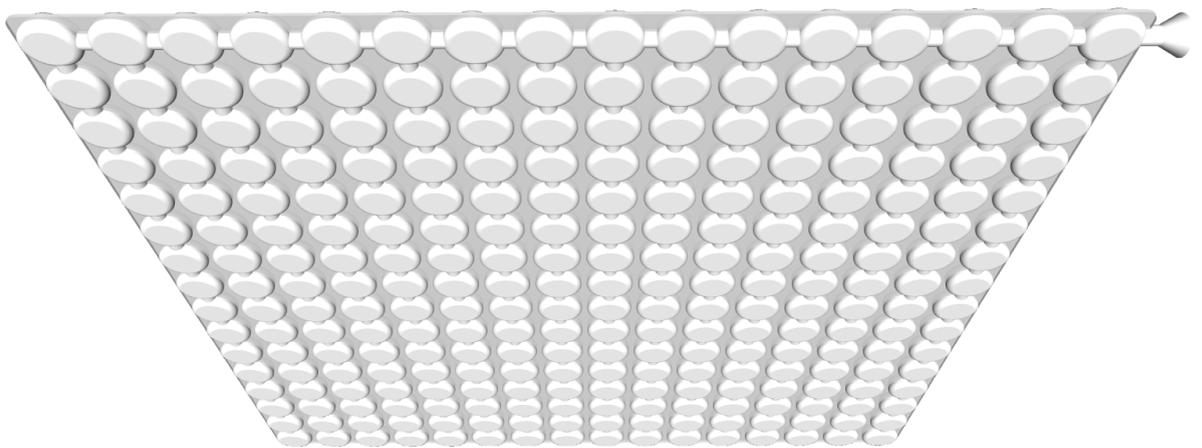
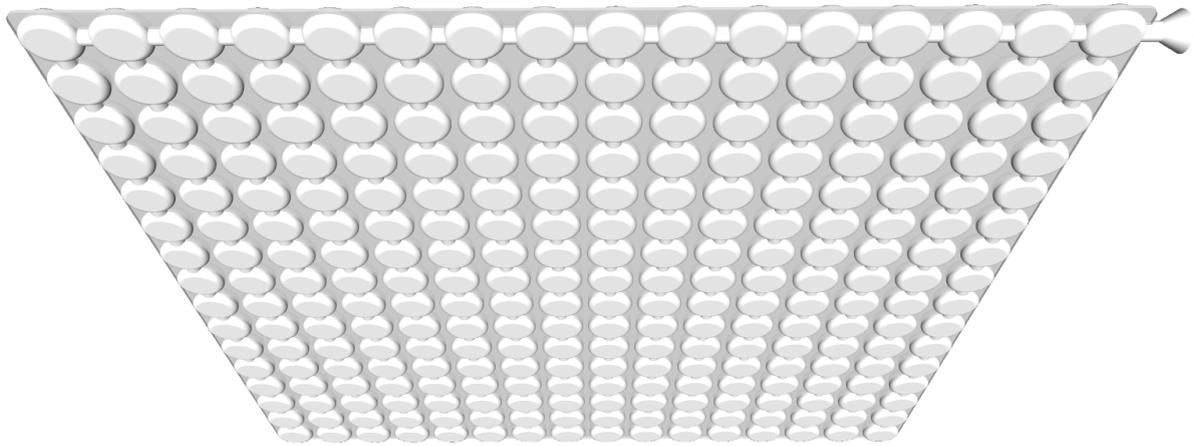
The materials are medium density polyethylene and rubber. Medium density polyethylene was chosen as it is sturdier than low density polyethylene while more flexible than high density polyethylene, at the same time, we are using rubber as it allows for a better grip on the items so the wrapping does not come off as easily.

**4 B Explore these considerations that may guide the construction of your prototype/ product.**

The base of the prototype will be made from rubber so that it stays on the object it is wrapped around while the outside will be made of medium density polyethylene as it will be able to withstand and absorb the impact for the object.

**4 C Propose how the prototype/ product will be constructed or developed. You may use drawings and photographs.**

**The rubber and medium density polyethylene will be molded and glued together.**



**OR**

If construction of the prototype is not possible, then you have to create an animation / as a proof of concept that it can be applied on a bigger scale.

**4A Explain why construction of a prototype is not possible and the proof of concept is needed in your case.**

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**4B Briefly explain how the video / animation can effectively show how your invention will work and the different considerations.**

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**Warning:**

- *Video / animated simulation only if prototyping is absolutely not possible.*
- *Video / animated simulation must be logical and convincing that the invention works.*
- *Constraints must be clearly included in the logbook or the project will be heavily penalized.*

## **5. References**

Read <http://www.bibme.org/citation-guide/apa/> on how to cite references.

**6 A Cite the references you have used for your project work. Your source of reference should come from different types (eg books, magazine, websites, journal articles, interview, photographs, product brochure, reviews etc.)**

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