

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

Title of Project: <u>Project Drying Umbrellas</u>
Group Name: Project Drying Umbrellas
Group Members: 1) Tan Jing Jie (Leader) 3P3 2) Matthias Ong 3P3 3) Zhang Hanxin 3P2 4) Herald Yar 3P2

## 1. Problem Finding

(The beginning...)

Identify a problem you would like to solve. You may want to brainstorm for problems using different approaches eg 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. Bubble Tea uses way too much plastic.

- Cup, Straw, Bag to carry
- Bringing your own cup? Not a lot of people do this.
- Own cup has issues with capacity... inconvenient... washing etc.
- Paper straw? feasible but already in use

2. Water pipes at home leak and we have no idea it is happening until a lot is wasted, have experience. (Have something to test for leaks and sound an alarm?)

- Too complicated
- We will need many resources

3. Pill Boxes may cause inconvenience

- People with Parkinsons
- NORMAL pill case unscrew a big round cap and pour. If the hand shakes so much accidents can happen such as too many pills being poured out, or even spilt onto the floor.
- Box that automatically spits one pill periodically?
- Too complicated

4. Nowhere to leave umbrellas to dry

- Umbrellas are usually left to dry (open) in the kitchen or right outside one's door
- Obstruction of paths, tough to maneuver around umbrellas as they are large when open
- May cause wet floors, potential accidents
- Homes do not have plastic umbrella holder

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

Problems	Feasibility Of Solution	Will people buy our product?
Nowhere to dry wet umbrellas	(Cheap Umbrellas dryer for domesticated use) 9/10	Yes, little competition in market and could be in demand
Bubble tea cup result in overuse of plastic	(silicon cup) 2/10	No. Already products in use, and lack of production methods can be a problem.
Leaky pipes get discovered too late	(Long absorbable material attached to pipes which get wet when leaky? too simple) 3/10	No, people could just use their own tissue.

**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		
	Umbrella	Bubble tea	Pills
Impact	4 (Everyone uses umbrella)	3 (A lot of people drink bubble tea)	1 (Elderly with Parkinsons)
Availability of Solution	3 (Not many feasible solutions)	2 (Metal straws, bring own cups)	3 (Pill packages)
Feasibility	4 (Solution is not difficult to make, simple materials)	2 (Intricate designs)	2 (Small and precise)
Total Score	11	7	6

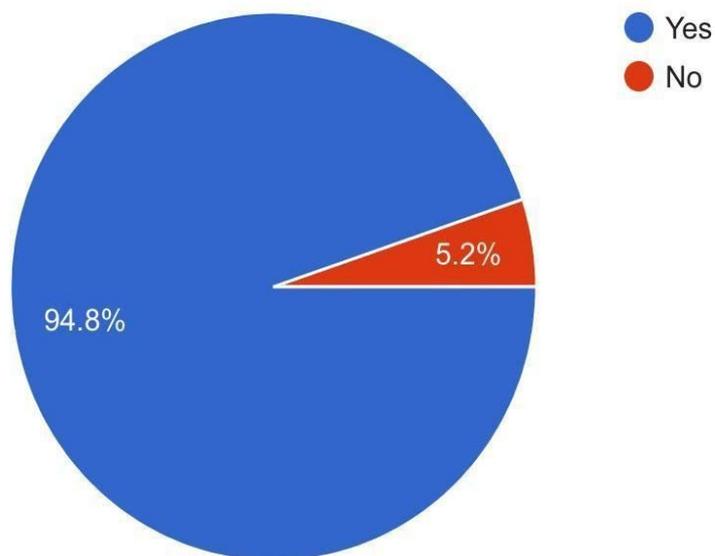
## 2. Define the Problem (This is one...)

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)

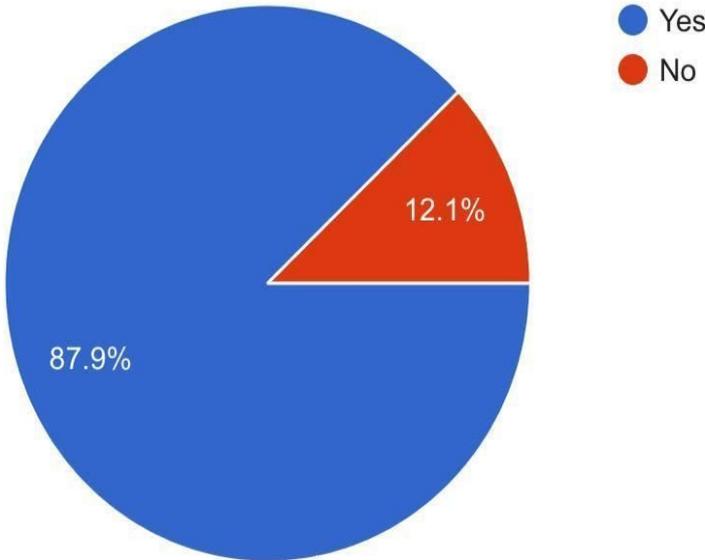
After reading the description above, do you find this a problem as well??

58 responses



# Have you faced this problem before??

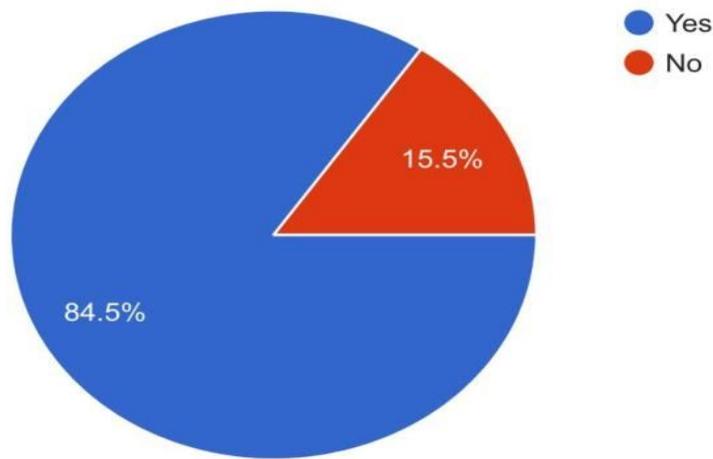
58 responses



If we invent a portable umbrella rack that can help dry the umbrellas easily and can also collect the water easily to be disposed, would you use it?? (Legitimately)



58 responses



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

Product	Cost	Speed of drying (exposed	Convenient/Ease of use	Total /15

		surface area)		
Alibaba umbrella rack	1	2	4	7
Taiwontech umbrella dryer	1	5	3	9
Lazada Ouken umbrella rack	4	1	5	10
Our product	4	5	5	14

- Alibaba umbrella rack.  
Simple design, convenient,
  - does not help dry umbrella
  - costly (>\$200)



## 2. Umbrella Dryer

Material dries umbrella quick

- Expensive (\$66)
- Cannot store umbrellas



## 3. Lazada umbrella rack

Easy, Cheap,

- low drying speed
- low capacity



## 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.**

Light, reasonably priced, umbrella rack that can be hung on windows or doors, or just placed on the ground. It allows umbrellas to be hung half open, increasing exposed surface area to speed up drying. With a towel on the bottom to catch water droplets that will save some maintenance efforts.

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

It will allow for users to easily dry their own umbrellas as soon as they reach home. It will not obstruct homes or pathways as many leave their umbrellas out in the open to dry. This is imperative as it reduces inconvenient instances, as well as slip accidents due to wet umbrellas being left outside. It also saves space, as it can be hung on windows or doors, where spaces are not normally used. It is also convenient to use as it is meant to be placed right at the door.

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

Much cheaper than all other products, perfect for Singaporean citizens as many live in HDB and it allows to save space while being convenient and efficient in drying wet umbrellas. Current solutions are not commonly used in households at all.

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

Allowing the joints at the sides to work, requires the correct material, which needs to be carefully chosen, in order to ensure an affordable price while at the same time ensuring functionality, keeping the best of both worlds.

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

We discussed many designs, including one which could stand (like a shoe rack), but ultimately came across the idea about having a design that is collapsible, to make it easy to keep.

**#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**

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Material	Cost	Waterproof	Strength	Total
Wood(Chengal wood planks)	0 (~\$10/7cmx120cm board)	2	5	8
Plastic(recycled PET)	5 (~\$0.40/kg)	4	3	12
Metal(stainless steel)	3 (~\$2.50/kg)	5	5	13

We chose to use a combination of plastic and stainless steel for our prototype. Plastic for its price, and stainless steel for its durability. The frame will be made of plastic while the bars to hook umbrellas will be made of steel.

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

1. Cost, we want it to be affordable such that every household can have such a product.
2. Durability, we do not want a flimsy rack that cannot hold many umbrellas.
3. Size, we want it to be compact but big enough to hold umbrellas, mainly the small ones which are more popular.

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

**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.**

Due to the pandemic situation, we were unable to meet up and attempt to construct a prototype together. Furthermore, most of us do not have the necessary tools and materials to construct a prototype in our own homes, hence we were unable to construct the prototype.

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

This animation will show how the prototype looks and functions, as well as a clearer view of how the product will look and function in a 3D rendering software. It will also show the material used in different colours, and how it is hung on windows and doors.

**Warning:**

- *Video / animated simulation only if prototyping is absolutely no 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.

**5 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.)**

Taken from: Alibaba umbrella dryer ,  
On Saturday 4th April, available at:

[https://www.alibaba.com/product-detail/Hotel-Lobby-Wheeled-Metal-Wet-Umbrella\\_60730234160.html?spm=a2700.7724857.normalList.1.452015e4jhscYp&s=p&fullFirstScreen=true](https://www.alibaba.com/product-detail/Hotel-Lobby-Wheeled-Metal-Wet-Umbrella_60730234160.html?spm=a2700.7724857.normalList.1.452015e4jhscYp&s=p&fullFirstScreen=true)

Taken from: Taiwontech eco umbrella dryer, On Saturday 4th April, available at:

<https://www.taiwontech.net/ecoumbrelladryershop>

Taken from: Lazada umbrella dryer, On Saturday 4th April, available at:

<https://www.lazada.sg/products/ouken-4-slots-wet-umbrella-stand-indoor-plastic-wet-umbrella-holder-stand-removable-absorbing-water-drip-tray-compact-rain-umbrella-stand-organizer-i603444232-s1759000438.html?spm=a2o42.searchlist.list.127.475e5a19jXxdZn&search=1>