

# Hwa Chong Institution

## Project Work

### Category 3 Inventions Log Book

Title of Project:	<b><u>Wow Box</u></b>
Group Name:	Wow Box
Group Members:	1)Cao Lu Qi (L) 2)Fan YiXiang 3)Liu Yiming 4)Xu Xiang Rui

# 1. Problem Finding

(The beginning...)

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

Some of the problems we have identified are tangled earpieces, which can bring much inconvenience for us when we want to enjoy music, phone screens cracking easily at the slightest impacts, people constantly on their phones, especially teenagers who are addicted to gaming, many people smoking which is both bad for the smoker and those around him, water and electricity wastage, which is rather problematic for a small country like Singapore with little natural resources, many people who are too lazy to sort out their recyclable trash, stress, which is a very common thing adults and students face, when making a phone call after exercising, the screens would be very wet from the sweat and be inconvenient and disgusting to some, forgetting to water your plants daily as a result of busy schedules which would cause them to die, forgetting to close the windows when leaving your home in a rush, the elderly risking to fall down from the stairs if they are not careful enough, after a shower, the floor may be very wet and may cause one to trip.

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

In the digital age that we are in now, stress is a very common problem, especially students and working adults. According to the Centre for Disease Control/National Institute on Occupational Safety & Health (CDC), 7 people die every 2 seconds as a direct result of stress. This is a tremendous number that should not be ignored. Too much stress can cause some negative effects such as headaches, sleeping problems, fatigue, anxiety and angry outbursts. All these effects will result in: students performing worse and worse studies, becoming more forgetful, and can result in depression. All these can be both mentally and physically bad for you. Sleeping problems can result in people being tired in the morning and not have enough energy to focus on work. If we are unable to cope with stress, all these problems would surface. This is why we are coming up with an invention that help everyone of all ages to cope with stress effectively.

**1 C List some problems your group would like to solve. List also the considerations for selection of problem 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 (weightage at the side of each consideration)

Considerations for Selection	Problems		
	Stress	Water and electricity wastage	Forgetting to water plants
Size of target audience	3 (3)	2 (2)	1 (1)
Feasibility	3 (9)	1 (3)	2 (6)
How much we can relate to the problem	3 (6)	1 (2)	2 (4)
Total Score	<b>18</b>	7	11

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

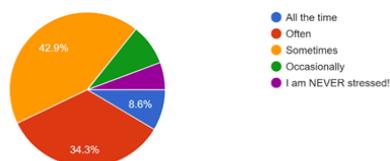
Now that the problem has been identified. It is important to gather information on the extent of the problem and/or evaluate the usefulness of existing solutions based on *some criteria*. You may need to conduct surveys and research on existing solutions.

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

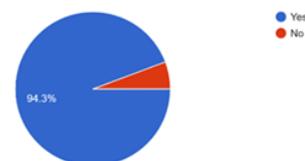
In the digital age that we are in now, almost everyone in the world experiences stress. Many secondary school students and working adults will often encounter too much stress and it may lead to some severe consequences. Here is a list of effects (not limited to) that too much stress can have on you: Headaches, sleep problems, fatigue, anxiety angry outbursts (aggressive behaviour) and social withdrawal. All these effects that too much stress can have on you will result in: students performing worse and worse in studies/examinations, we become more forgetful and sometimes even lead to depression. These effects of too much stress are severe and very bad for you (both in terms of health and in terms of studies or work). Having sleeping problems also causes big problems such as lack of sleep and tiredness which results in you not having energy to focus during lessons/work. This will again lead to worse performance in studies/work/examinations. Nobody wants that to happen right? If we are unable to cope or manage our stress, all these bad things will happen. This is why, we are coming up with an invention that will help everyone of all ages to cope with their stress effectively. Furthermore, according to the Centre for Disease Control/National Institution on Occupational Safety and Health, 110 million people die each year as a direct result of stress, which is 7 people every 2 seconds!

Based on a survey we conducted, most secondary school students agree that they experience stress often and would like a device they could make use of to help relieve stress.

Q1- How often do you feel stressed with school work? (homework, assignments and projects)  
35 responses



Q3 - If there is ONE object which contains many different ways of relieving stress, would you like to have it? (eg: memes and fidget buttons)  
35 responses



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

“Sona” tracks your stress level and helps you to reduce stress

“Pip” captures the changes of the skin pores on your fingertips and send feedback to you

“Face of The Moon Stress Ball” is a stress ball with a face and it changes expression as you squeeze it

“Face of the moon stress ball” is the most creative out of these 3 products as it is rather unique yet does not require any battery to power it. “The Pip” and “Sona” are relatively expensive and since

they are powered by electricity, they are vulnerable to water. However, “The Pip” is interesting as it is able to capture your stress level through your skin pore.

### **3. Your BIG IDEA<sup>#</sup>**

(Developing the idea....)

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

Our invention is going to be like a stress ball which people can squeeze to relieve stress.

It also contains funny cat pictures and memes to make people laugh, which helps to relieve their stress. Help other than just having funny images, our invention also has a fidgeting mechanism which allows users to use it as a fidget toy and to dispense the funny pictures.

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

The purpose of our invention is that our invention will relieve stress on people of all ages, and it will bring a smile on their face. Our invention will benefit users in the way that they will have less stress every day, and they will lead less-stressful lives. It also can be a fidget toy for kids or even adults at any time.

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

With many different ways of relieving stress in one single gadget, our invention will be very effective in relieving stress. As it is small and portable, carrying it around with you is very convenient and you can bring it almost wherever you go. Other than just being a gadget for stress management, our invention can also be used as a toy when you are bored, making it suitable for children as well.

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

Our prototype might be hard to construct as it combines all the methods of relieving stress. As our prototype would be a ball, it would be hard to fix on certain mechanisms.

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

We decided to change the shape of the product to a box from ball so it would better fit some of the parts yet still be able to function as intended. From there, we picked up pace and was able to fix a solid prototype.

***#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. Construction or Modelling Process\***

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

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

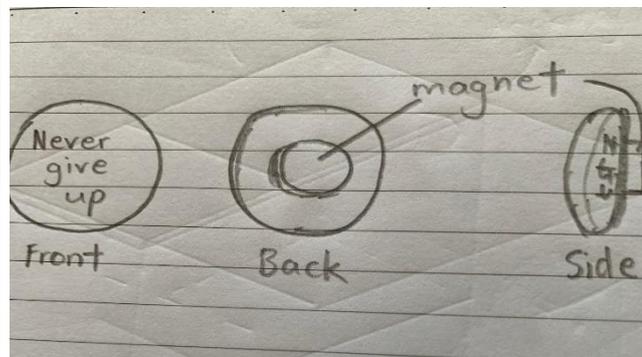
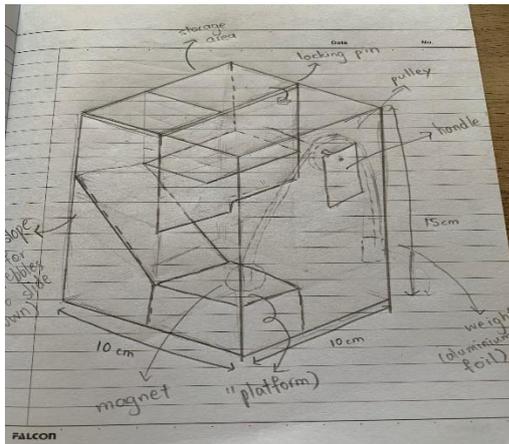
We chose cardboard to build our prototype as it is very commonly found around us. Also, as it is a recyclable material, so it is environmentally friendly. Other than that, we also used toothpicks and

bamboo skewers for part of the mechanism as they are both cheap and easy to obtain. Flat transparent pebbles are used because they are abundantly found and also, they are a good alternative to round marbles, which are unsuitable for our invention as our invention requires the pasting of pictures.

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

We used mainly cardboard for our prototype as we have the most of them. We also used other cheap materials and try to avoid using expensive materials. Some other materials for the prototype are string and bamboo skewer

#### 4 C Document the prototype/ product development stages. You may use drawings, photographs or videos.



#### 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. Modification and Evaluation

Upon the completion of your prototype/ product, you would need to see if it is working the way you want it to work. Check if your product has met the identified purpose and the user's need; and implement necessary modifications and improvements. This process may take several rounds.

#### 5 A Write down your prototype/ product test criteria and check against it if it works. Identify areas of weakness for modification. Indicate the test iteration and date of test.

After the mid-term evaluation, we decided to change up the mechanism used to dispense the pebbles. From a fishing kind of mechanism, we changed it into a spring mechanism so the pebbles could be taken out easily with a press. This is the new model:



Test Iteration: 3	Tick			Remarks
	Pass	Fail	Potential Failure	
Test Date: 28/7/19				
The pebbles do not fall out when turned over	✓			When shaken vigorously, there is a small chance of pebbles falling out
The pebbles are dispensed smoothly when button is pressed	✓			
The latch on the lid keeps the box close	✓			

## 6. 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.)**

Mayo Clinic Staff. (2016, April 28). How stress affects your body and behavior. Retrieved March 19, 2019, from <https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress-symptoms/art-20050987>

Slmainc. (2016, September 23). The Science of STRESS. Retrieved March 19, 2019, from <http://www.slma.cc/the-science-of-stress/>

The Health Nerd. (2016, April 15). 17 Science-Backed Ways to Relieve Stress Right Now! Retrieved March 19, 2019, from <https://www.youtube.com/watch?v=fAjdI7J4Gvo>

Kabir Sakhrani. (2017, 28 June). Do fidget spinners actually relieve stress? Retrieved March 19, 2019, from <https://thevarsity.ca/2017/06/28/do-fidget-spinners-actually-relieve-stress/>

Christian Nordqvist. (2017, August 15). Fatigue: Why am I so tired and what can I do about it? Retrieved March 19, 2019, from <https://www.medicalnewstoday.com/articles/248002.php>

