

Hwa Chong Institution
Project Work
Category 3 Inventions Log Book

Title of Project: Sleep Write Bag

Group Name: 3-09

Group Members:

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- 2) Ang Jia Hong (1)
- 3) Dan Ming Zhen (6)
- 4) Lim Zi Jun (15)

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.

Some of the problems that we have identified are:

1. Students not being able to sleep comfortably and not being able to do homework on train/bus rides,
2. Baby being too heavy during overseas trips
3. Elderly having poor eyesight
4. Picnic goers forgetting their picnic stuff
5. People tend to forget to water their plants, especially before they go overseas
6. Elderly have trouble walking up and down stairs
7. Shoes getting wet during rain or after washing it

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

- 1. Students not being able to sleep comfortably in train/bus rides, not being able to do homework**
 - A bag with a comfortable cushion to rest a person's head on and a flat surface on the bag to act as a table to do homework
- 2. Baby being too heavy during overseas trips**
 - A luggage that can act as a pram
- 3. Shoes getting wet during rain or after washing it**
 - A cabinet that can dry up shoes

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.

*add more columns and rows where necessary

Problem Evaluation Grid

Considerations	Problems found		
	Students not being able to sleep comfortably in train/bus rides, not being able to do homework	Baby being too heavy during overseas trips	Shoes getting wet during rain or after washing it
How much it impacts others	9	10	7
Solvability	9	6	8
Does it make life easier after it is solved?	9	9	8
Total score	27	25	23

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)

1. Students need rest after a long day of school
2. Sleeping in the MRT or bus can be quite uncomfortable at times
3. The back of the bag can be uncomfortable
4. Students want to do homework in the MRT sometimes, but they either do not have a flat surface to write on, or taking out a flat surface from their back is troublesome
5. The sleeping posture of those who want to sleep in the bus/MRT is not right, this might hurt their backs if they continue with the bad sleeping posture

2 B Compare and contrast the existing or similar solutions.



After doing research, we found this item on the internet. This bag does not have a price yet, and like our product, it is also targeting students.

Pros: The entire bag is made out cushioning, and it looks comfortable. Not only that, it allows the

student to maintain an upright posture.

Cons: This product can only be used with a support at the back, and it does not have other benefits other than the cushioning.

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.

Our invention is called the sleep, write bag. It is a bag that has a comfortable cushion on its back, attached to Velcro, it is also adjustable. The comfortable cushioning would allow the students to have a good rest before returning home. Underneath the pillow would be a plastic board, which has the qualities of a clipboard. Since the pillow is adjustable, students could move the pillow to the front of the bag to use the board for work.

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

Our invention has a cushion to act as cushioning for the user of the bag, so as to allow the user to carry it around comfortably. It can also be adjusted in a way that can allow the user to rest his/her head so that the user can have more energy to carry out other activities at home such as studying or revision after school. It is also designed in a way that would get the user to sleep with the correct posture. The flat surface that is inside the bag acts as a clipboard so that the student using it can do his/her homework or even revision on their way back home.

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

Compared to the existing product above, our invention is better as our bag can benefit more towards students, and maybe even adults as well. At the same time, the person using the bag to rest does not need to have a support at the back of the chair to rest, which means the user could just rest anywhere conveniently.

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

The weight of the bag might be a problem for us as the board might be a little heavy and uncomfortable for carrying. Arranging the cushion in a way that it would not affect the user's posture is also a possible challenge for us.

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

1. Late January, brainstorming of ideas, trying to find problems to solve
2. Jan 30st – thought of 2 ideas to use
3. Feb 4th – approval of project
4. Feb 20th –decided to use the other idea
5. Feb 27th –approval of the 2nd project
6. Late March – Preparing slides and presentation
7. May Holidays - discussion of project work and working on slides
8. Late July - Completion of slides
9. August 12th - final evaluation of our project

#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

1. For the fabric on the bag, we plan to use **cotton canvas**. First of all, Cotton Canvas is a comfortable type of fabric. According to Google, it is known for being durable, sturdy, and heavy-duty and it is also washable, requiring no special care. Last but not least, cotton canvas is also affordable.
2. For the board at the back of the bag, we plan to use **plastic (Acetal)** It is strong, has high strength and is stiff. It has excellent wear properties in both wet and dry environments. It is lightweight and also cheap. It is also waterproof.

3. For zipping of the bag: **Metal Zips** are used in normal bags. It is durable and is also affordable. It is used for the bag and for the zipping of the cushioning
4. **Velcro** : (made out of nylon, the typical fabric used to make velcros.) It is durable and can last for a decent amount of time. It is cheap too. It is used to stick the cushioning at the front of the bag

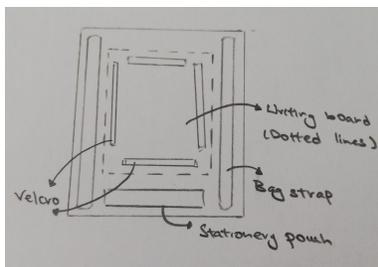
4 B Explore these considerations that may guide the construction of your prototype/ product.

1. Cotton Canvas: **It's comfortable** → Allows user to carry the bag comfortably
Sturdy, durable and heavy-duty → Allows the bag to last
Washable → Allows it to be cleaned if dirty
Affordable → Allows many people to own the bag
2. Acetal: **Strong, has high strength and is stiff** → Able to support writer's weight when writing.
Excellent wear and tear properties → Lasts long
Lightweight → Would not add much weight to bag
Cheap → Would not make bag too pricey
Waterproof → Would not get wet
3. Metal Zips: **Durable and Affordable**
4. Velcro: **Durable and Cheap**

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

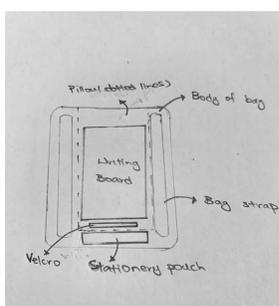
In order to install the acetal board on the bag, we decided to:

1. Attach the board to the bag with velcro.
2. 4 pieces of velcro will be stuck to both the board, and the bag on all sides.
3. This allows the board to have similar functions to a clipboard, also allowing it to be detached and attached when needed.



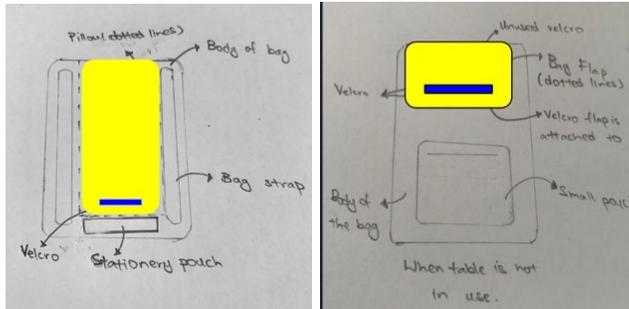
In order to install the velcro and stationary pouch we decided to

- Stitch the velcro on the bag in this pattern
- We will then stitch a small cloth pencil case at the bottom part of the bag.



Instillation of the pillow:

1. The pillow would be sewn to the top of the bag.
2. There is also a piece of velcro on the top of the pillow at the **FRONT OF THE BAG** (*the yellow part is the pillow and the blue is the velcro*)
3. There is also another piece of velcro on the top of the pillow at the **BACK OF THE BAG** (*the yellow part is the pillow and the blue is the velcro*)



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.)

References:

1. Acetal: <https://www.curbellplastics.com/Research-Solutions/Applications/Strong-and-Stiff>
2. Cotton canvas: <https://sewguide.com/best-bag-making-fabric/>
3. Pillow Bag: <https://ifworlddesignguide.com/entry/74905-pillow-bag>