

Inventors' Logbook

Title of Project: Temperature Scanner for Infants
Group Name: 3-22
Group Members: 1) Anderson Poh 2) Warren Ng 3) Gerard Qiu 4) Shiong Kai

February 11> Emailed Mrs Ng, our mentor, and gave her our proposal.

February 13> Mrs Ng got back to us via email and expressed her interest in meeting our group.

February 17> We met with Mrs Ng at the fish tank at exactly 2.15 pm. We discussed the probability of our project and how we were going to achieve the goal.

February 21> Our second meeting with Mrs Ng at 2 pm. We discussed the few places of the body that we were going to place our temperature scanner at. Did some research on the possible body parts and which part could yield the most accurate results. Decided it could be either the neck or forehead.

February 24> Anderson registered our group on ISP and Mrs Ng accepted us under her mentorship as a project group. Decided to regularly meet up every week at 2 pm on Monday.

March 2> Started to work on our proposal slides, did some research on how temperature strips work and how to incorporate it into our product.

March 9> Around a quarter done with our proposal slides but we were quite stuck and were unsure of how to proceed so we consulted our mentor. She gave us ideas to prompt us in the right direction by telling us that we had to include how the temperature scanner can benefit the customers.

March 11> Created a google form (survey) and disseminated it to our friends and parents to collate responses and understand how much this product would benefit them. Until we had around 45 responses, we included the results into our slides.

March 23> Presented our slides to our mentor and she gave us constructive feedback to help us improve on our presentation.

July 6> Started to work on final evaluation slides as prototypes, posters or video are not needed this year. Didn't complete the slides very fast because we were busy with common test preparation.

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.

- **Parents' busy work schedules amidst COVID 19 as they have to stay home and work, which they are not used to.**
- **Young infants and the elderly are unable to express their discomfort because most infants and some elderly are unable to speak coherently.**
- **Parents are unable to take care of their children and elderly 24/7 so our product would be useful.**

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

It is very difficult for parents to take care of their children while working at home as they would be very busy working. For example, I have a 4-year-old brother at home. He is unable to fully take care of himself. However, my parents have to work at home and are constantly busy while I have to do HBL at home. Thus, it is difficult to draw time out to specially take care of the child.

1C. 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		
	May not work effectively	May cause discomfort to the child or elderly	The child might take it off
No time for parents to take care of their children.	3	2	2
Young infants and elderly unable to express their discomfort.	1	2	3
Total Score	4	4	5

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 the problem (Research and discuss the problem and write down the problem statement)

The COVID 19 pandemic is current and still going on and the product will assist greatly, making it urgent, timely and more appreciated by others. Even without the pandemic, the common cold and flu will impact us and this product will be of great assistance in this matter.

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

Now there are a few current solutions to this problem. Thermometers such as ear, infrared and oral will help to measure the temperature of the person but they are incompetent because they have a few disadvantages. Firstly, in common, all thermometers are unable to measure the temperature of the person all day long as it is impossible to put a thermometer to your head all day long. For the ear thermometer, it has to be inserted into the ear to take the temperature thus it may damage the baby's fragile ears. For the oral thermometer, the

baby might fidget and choke on the thermometer. It may not be convenient for the elderly as it requires sanitisation after every use. The infrared thermometer may not be fully accurate as it only measures surface temperature. My temperature will differ when I am scanned by 2 different thermometers in the same shopping mall at the same time.

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 proposed invention will be a temperature strip incorporated into a comfortable headband. It will take the temperature of the person wearing it once a minute. The data will be synced with an app in real-time. The app will be installed on the caregiver's phone. When the temperature of the person exceeds 37.5 degrees Celsius, the app will send a notification to the caregiver's phone.

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

Our purpose is to constantly measure the temperature of the person wearing the headband and provide real-time data so the caregiver will be alerted of the temperature of the person at all times. If the patient falls sick (gets a fever), the caregiver will be alerted at the fastest time so immediate action will be taken.

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

Our proposed invention will be better in the aspect that it can provide real-time monitoring of temperatures, unlike conventional thermometers which cannot. For example, oral, ear and infrared thermometers only measure the temperature at the moment and not 24/7. Thus our invention will help in this aspect of full-time monitoring.

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

Some people might not appreciate the product and it is only useful for caregivers, infants and the elderly. The material of the headband is very hard to decide because some materials might cause discomfort to some people, especially infants' sensitive skin.

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

The proposal, final evaluation presentation, preparation of logbook and written report.

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

We chose cotton because it is a comfortable material and will not cause discomfort to the infants' sensitive skin. Cotton would not cause itch to the skin.

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

What people want and appreciate is important in our consideration. If we make something that the public does not appreciate, then our product would not be of any use.

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

It will be a temperature strip incorporated into a headband. The data will be synced with an app on the caregiver's phone.

Additional information

- We decided to incorporate thermochromic paint into the headband so it is able to change colour to red when a fever arises.
- From the prototype, we improved in many aspects like the incorporation of an app that syncs the temperature collected to the caregiver's phone, which I feel is an improvement in our product.

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.)

Pictures in our slides presentation

https://www.google.com/search?q=baby&sxsrf=ALeKk00kVEeA28Pb49dApz2At_WVJ5jtHQ:1596337758327&source=lnms&tbm=isch&sa=X&ved=2ahUKEwj075rlxfvqAhV_H7cAHUHECoQQ_AUoAXoECCAQAaw&biw=1366&bih=657#imgrc=jl0QXIIKUqZNFm

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https://www.google.com/search?q=temperature+strip&sxsrf=ALeKk03AkHMfkl63vZlcKSB5PGtNoUdDNg:1597025291302&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjarL3pxo_rAhWTT30KHYYXAN0Q_AUoAXoECA0QAaw&biw=1366&bih=657#imgrc=vMirRUulhY8YpM

https://www.google.com/search?q=temperature+strip&sxsrf=ALeKk00gg-jvzUsgpBPo8hs_pH5M_WUbkW:1596532842230&source=lnms&tbm=isch&sa=X&ved=2ahUKEwj3s7unnlHrAhXbT30KHQmADnIQ_AUoAXoECA0QAaw#imgrc=km6dvE3zassp6M

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https://www.google.com/search?q=headband&sxsrf=ALeKk01icBOZ4iUEwoymZVzW5tY51bot-A:1597025476596&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjM7erBx4_rAhVZXSsKHWBCu0Q_AUoAXoECA0QAaw&biw=1366&bih=657#imgrc=LF2kxQC3NhS_OM

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Our Reflections after project work

Anderson: This project work helped me to understand more of the challenges and difficulties that people are facing during COVID 19. A lot of people have been affected during this pandemic and it is vital and crucial to be able to keep them safe by using our product. It will be good for us to help them in any way we can to assist them and help them through these difficult times. Our product can ensure their health safety and if they do fall sick, the vulnerable such as the infants and elderly will receive medical treatment at the first instance. I can also empathise more with parents/caregivers. I wish to help society and make a greater difference in our lives, so it can change for the better. As one of our school mottos are 饮水思源, I think that it is really important to give back to the community and help others, making their lives more convenient. I am enlightened about the many struggles of many people and hope to be able to do greater things for the community in my following projects. Thank you!! :D

Warren: This project has given me another perspective of the world and has made me more aware of the existing problems in the community. We have constructed this product in hopes that it will change society for the better, especially during this COVID-19 crisis. Our team really put in a lot of effort into this project and we have achieved our goal! Thanks to the school for giving us this opportunity to learn more about the economy :)

Shiong Kai: I have learnt a lot from this project. Not only does it promote teamwork, but it is also held at such an occasion- During a COVID-19 pandemic. In most projects, we would merely be creating a product that helps to improve people's daily lives, but in this project, we are creating products to **SAVE** people's lives. Without a thermometer, we wouldn't be able to detect a person's temperature. This puts everyone around him/her at risk- the risk of contracting the virus. This got me thinking- what if Thomas Edison did not invent the lightbulb, perhaps we would still be living in a dark world. What if Karl Benz and Henry Ford did not invent cars, we would probably still be riding horses, and going from one place to another would be very inconvenient, etc. Only with problems come solutions. Hence I sincerely hope that the product that we invented would benefit everyone on this planet, as we fight this pandemic united as one. Thank you!