# Hwa Chong Institution Project Work Category 3 Inventions Log Book

Title of Project: Item Finder

Group Name: Item Finder

Group Members:

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| 2) | Tsun Yi Ming Ewan |
| 3) | Timothy Chan Wei Shyuan |
| 4) | Lai Wei Fang |

## Problem Finding

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) First aiders are unable to locate AEDs in time during an emergency, thus resulting in an inability to save the casualty in time.
-        References:
-        Statistics: Sudden cardiac arrest accounts for about 325 000 adult deaths in the U.S every year (half of all heart disease deaths). While 90% of people who suffer out-of-hospital cardiac arrests die, 45% of people who suffer out-of-hospital cardiac arrests but receive CPR and an AED survive.
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-        **1 B You should have selected a problem based on some considerations. Identify and
justify these considerations.**

1) Is the problem major enough/relevant?
-        Yes, we deemed that this problem is major enough given that it is one of the world's leading causes of death, with statistics from Mayo Clinic and the WHO (World Health Organisation) to prove it. In Singapore alone, 17 people die from heart disease and stroke each day.
 2) Is the problem something tangible (possible to solve?)
-        Yes, this is a problem which we should be able to tackle in a few different ways. Similar (albeit not identical) products have been attempted and implemented in other countries before, and the problem is narrow enough for us to act on.
3) Are there ethical/technical issues involved?
No, given that our project does not involve animal/human testing.

## Problem Evaluation Grid

*add more columns and rows where necessary

Considerations for Selection

| Problem | Scale/magnitude | Relevance (number of people affected) | Economic Impaxt |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *High number of people dying of heart attacks due to first aiders' inability/long time taken to find AED* | *3* | *3* | *1* |
| *Bleach has harmful effects on skin and environment.* | *2* | *1* | *2* |
| *Mosquito bites cause health issues such as zika and dengue fever, sometimes resulting in death.* | *1* | *2* | *3* |

Total score: Problem 1 (AEDs) - 7

     Problem 2 (Chemicals in bleach) - 4

     Problem 3 (Mosquitoes) - 6

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

| *Consideration for Solution* | *Solution 1 App to give directions on how to locate nearest AED* | *Solution 2 Micro:bits buzzer system to alert passers-by and allow them to locate AED* | *Solution 3 Installing new system for fire trucks to locate AEDs* |
|---|---|---|---|
| *1) Cost-effective* | *3* | *2* | *1* |
| *2) Easy to implement* | *2* | *3* | *1* |
| *3) Easy to use* | *1* | *3* | *2* |

Total Score:

1.   Micro:bits (8)
2.   App (6)
3.   Installing new system for fire trucks (4)

**Final verdict: As micro:bits is easier to code then an app, we eventually settled on it as our final product. Although it is less cost-effective, it can be implemented easily for public or commercial areas, and is the easiest to use out of the three solutions. Our invention will be explained further below.**
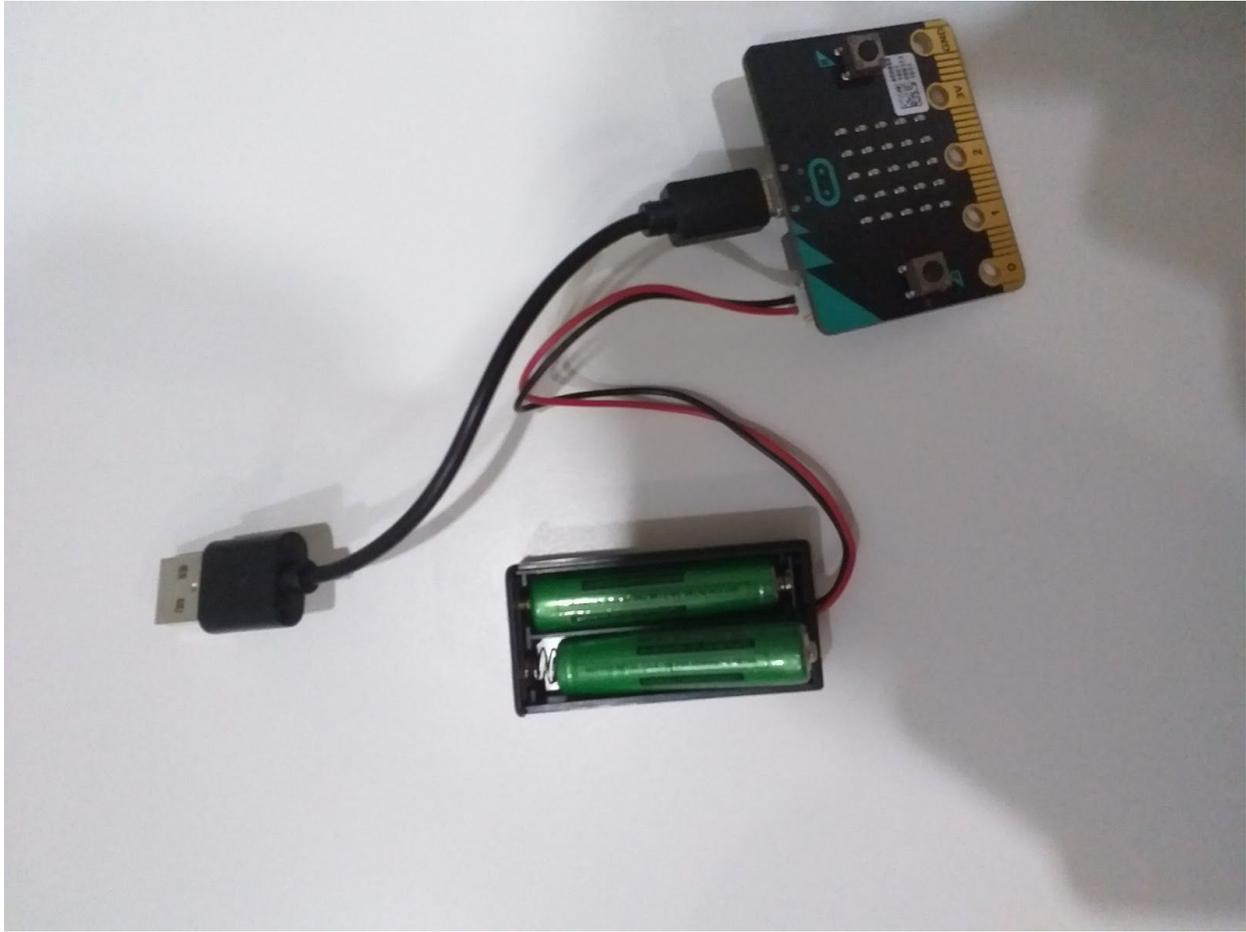
**2 B Compare and contrast the existing or similar solutions.** Currently, there are similar solutions that exist, such as apps that alert users to emergencies and allow firefighters or first aiders to alert others on duty when there is an emergency, but none of them are GPS/Google Maps based apps which give directions to the nearest emergency equipment. Our app aims to be similar to PokemonGo or Google Maps with landmarks marking out the nearest emergency service
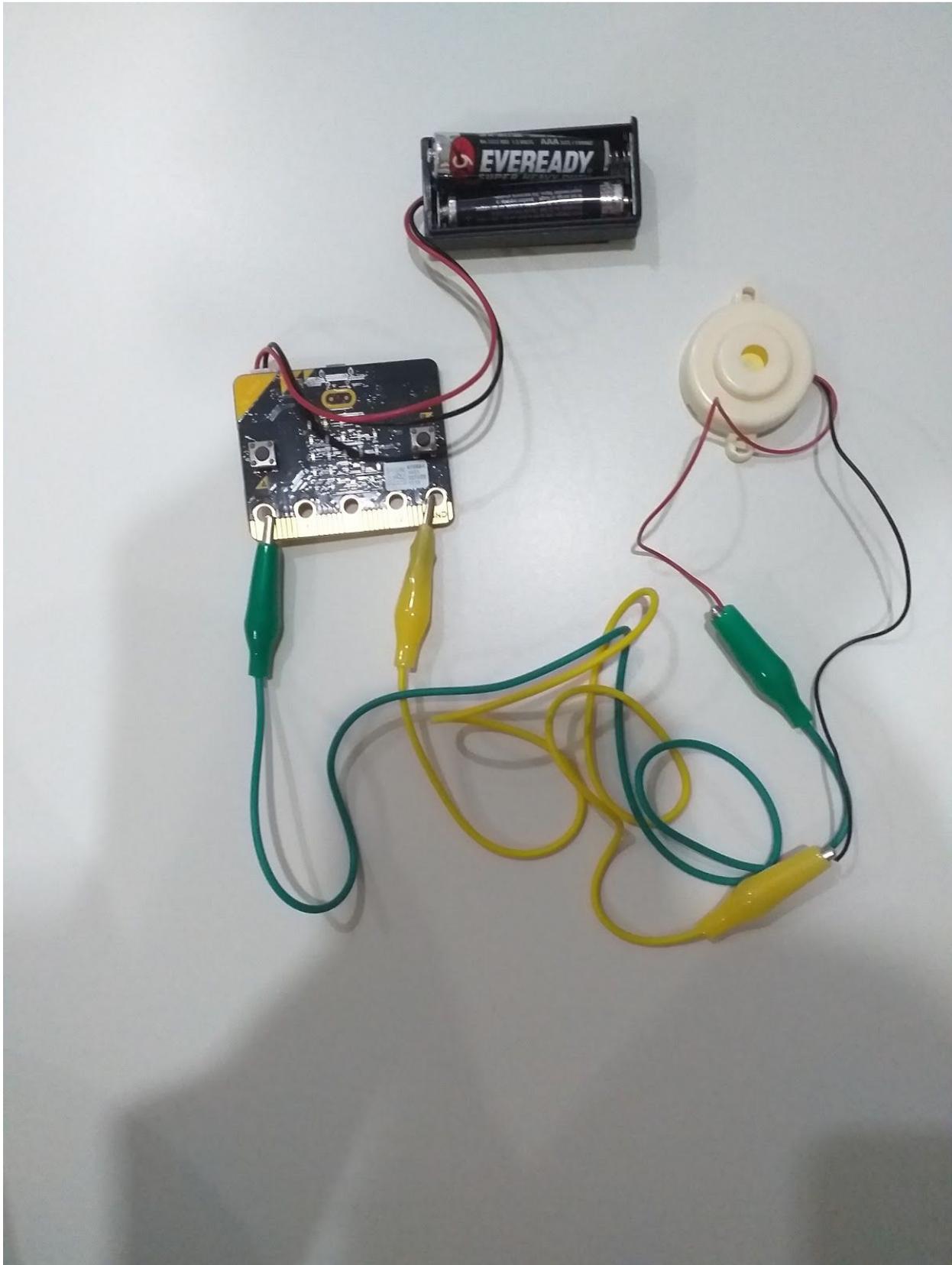
# 3. Your BIG IDEA#

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 is using a micro:bit to aid in the location of emergency services. The user (most likely a passer-by or first aider) will click one of the display buttons on micro:bit chip 1(either A, B or A+B, where each button represents an emergency service) which will then send a signal to other chips at the nearby emergency services. The signals will return to chip 1, which will then locate the nearest emergency service that the person has chosen and will plot a path to that service, through the 5x5 LED screen.

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

**users.** Our proposed invention aims to help the public locate emergency equipment efficiently in case of an emergency. This will benefit the general public in finding the nearest emergency service such as an AED, making it easier for the public to assist the casualty in time.

**3 C In what ways would your proposed invention be different and/or better than**

**existing solutions, if any?** Currently, there are no known people making use of micro:bits to locate emergency services. There are many such apps on the market, but most of these have vastly different functions, such as sending alerts to people when an emergency at their house has occurred. For instance, Bugle (an American app) is used to alert people to an emergency in their vicinity, but does not show directions to the nearest emergency service. On the other hand, our invention would be able to show the directions to the emergency service and this will make it easier for people to locate it.

**3 D What are some problems you expect in the course of your proposed invention?** While the micro:bit might be easy to use, we expect that most of our problems will stem from the distribution and advertising of such a product. As most adults and some children may have never seen the product before, we might have some trouble teaching the public how it works and allowing them to get used to our product. Moreover, micro:bits are a slightly more costly alternative to apps, making it an expensive solution to market. Nonetheless, by selling it in bulk, our micro:bits should still be a relatively cheap invention.

**3 E What and when are the major milestones (project timeline) in your invention?** *Solution brainstorming: 12/3; Prototype creation: 21/6; Test 1: 12/7; Test 2, 15/7: Test 3, 24/7*

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

**your invention** Although the price of micro:bits seemed to be an obstacle at first, we were able to find reasonably priced micro:bits that were good enough to use. Thus, we chose micro:bits as our product as it was easy to code and relatively cost-friendly. We were also unable to code an app as it was too complex for us to code during the time limit.

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

**product.** Our prototype must resemble the final product in usage and in look. It must be able to successfully find the emergency service, and also must be small enough to fit inside someone's pocket.

**4 C Document the prototype/ product development stages. You may use drawings,**

**photographs or videos.**

**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.**

| Test Date: 25/7 | Pass | Fail | Potential Failure | Remarks |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Able to buzz and alert passers-by | 1 | Nil | Not loud enough | |
| Able to locate emergency service | 1 | Nil | | |
| Screen lights up and shows directions to emergency service | 1 | Nil | Display is too small | |

*Add more rows for more criteria

** Repeat table for next test iteration

**OR** if you are creating an animation / video to show how your invention will work, write down the different possibilities / outcomes [success or failure) if a full-scale prototype is to be constructed.

# 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.)**

- URLhttps://www.straitstimes.com/singapore/man-dies-after-suffering-heart-attack-while-jogging-in-macritchie
- Website TitleThe Straits Times
- Article TitleMan dies after suffering heart attack while jogging in Macritchie
- Date PublishedAugust 13, 2017
- Date AccessedAugust 06, 2019

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- URLhttps://www.thehansindia.com/news/international/indian-man-dies-of-heart-attack-while-swimming-near-beach-in-dubai-538226
- Website TitleThe Hans India
- Article TitleIndian man dies of heart attack while swimming near beach in Dubai
- Date PublishedJune 16, 2019
- Date AccessedAugust 06, 2019

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- URLhttps://www.cdc.gov/heartdisease/facts.htm
- Website TitleCenters for Disease Control and Prevention
- Article TitleHeart Disease Facts & Statistics
- Date AccessedAugust 06, 2019
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- URLhttps://www.myheart.org.sg/my-heart/heart-statistics/singapore-statistics/
- Website TitleSingapore Heart Foundation
- Article TitleSingapore Statistics
- Date AccessedAugust 06, 2019
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