

Hong Kong Student Science Project Competition 2022

Template of Extended Abstract (Invention Design Proposal)

(Word Limit: 1,000 words, Pages: 2 pages only)

Team Number: SCBC241

Project Title: Purify the City

Project Type: Invention Design Proposal

To our best knowledge and after thorough literature research, as at 3 / 23 / 2022 , there are / are no* similar works. If there are, the reference links are as below:

<https://simplesolution.com/dog-odor-and-stain-remover/tough-odors/extreme-pet-stain-odor-remover-32oz>

<https://amzn.to/3PEJrYA>

The enhancement our project has made for the existing related products or research is summarized as below:

The product of our project will be more eco-friendly and at a lower cost than most dog urine neutralizer in current markets.

***Please delete if not applicable. HKSSPC values the originality of works. Students must conduct literature research thoroughly to ensure that their works are unique, and to list relevant reference materials to complement the research or invention.**

I. Background

- Provide background information as to learn about the audience for whom the project is addressing
- Provide highlights of the **literature review** and/or related technologies or devices, with the support of pertinent and reliable references
- Provide an overview of work, create a point of view as to define the needs and insights of the audience, and mention the **research or technology gap the project is trying to fill**

There are many dog owners who simply wash the urine their dog leaves behind with water. This always leaves a horrid scent and ruins the hygiene and health of Hong Kong citizens. Our product, which can eliminate the horrid scent and freshen the environment, will be more eco-friendly and at a lower cost than most products marketed. The current products in the market all contain ingredients that are expensive and are harmful to the environment, which is the flaw we are trying to improve on, so that our product can be widely used which solves the problem which we have observed in Hong Kong.

II. Objective(s)

- State the **aim(s)** of project

To produce a product that can remove odour of dog urine and kill bacteria. The product is both cost-and-eco-friendly.

III. Methodology

- List out and briefly describe the **approaches** that will be used to test the feasibility of the Invention e.g. use of equipment, materials, tests and related experiments
- Explain the selected implementation strategies with the **scientific theory**

We aim to remove the odour in dog urine and kill bacteria in dog urine in an eco-and-cost-friendly way.

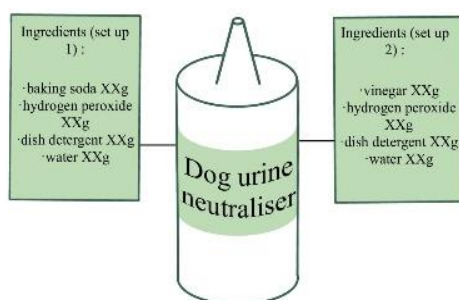
In order to remove odour, we have proposed the following solution for this design. First, prepare a test tube with 2 ml of dog urine. Then, add 1 ml of solution 1 and let the sample stay put for one minute. Afterwards, smell the sample and rate the odour with a scale from 1 to 15 (the higher the score, the more horrid the odour is). The same person should repeat step one to four with solution 2 instead of 1. The lower the score, the more effective the solution in removing the odour from dog urine.

For killing the bacteria, we have also proposed a solution. First, add 0.1ml of real dog urine onto the agar plate. Secondly, spread the real dog urine evenly on the plate. Then, prepare two filter paper disc and label them as solution 1 and solution 2. Afterwards, soak the discs in the solutions accordingly and place them in the agar plate with some distance apart. Finally, cover the plate and incubate it at 37°C for 24 hours. Clear zones should have formed around the discs if the solutions can kill the bacteria. Finally, compare the size of the clear zones. The larger the clear zone, the more effective the solution in killing bacteria.

IV. Design of Invention

- Describe the **design** and the **principle** of invention (e.g. The ideation of the projects or creative solution as far as applicable)
- Provide sketches or drawings of the invention

As dog urine contains ammonia which give the distinctive odour of dog urine, we planned to add vinegar or baking soda into our solution. Vinegar can neutralise ammonia due to their pH difference as vinegar is acidic with a pH at around 2-3, whereas ammonia is basic with a pH at around 11, and baking soda is a natural deodoriser, which can remove ammonia smell.



V. Application / Market Need

- Explain the area of **application** and **function** of invention
- Indicate the market need and **potential impact** of invention
- Discuss **limitation** and compare with existing related works (if any)

The product is used to remove odour of dog urine and kill bacteria.

It aims to solve hygiene problems caused by dog urine.

Compared to current products in the market, our product still has many flaws but an advantage our product holds is that we have thought of the harm it causes to the environment and the price of the ingredients, therefore our product is without doubt eco-and-price-friendly, which will be the factor that makes our product widely accepted and used by everyone.

VI. Conclusion

- Make a conclusion of the design project and the way forward of the invention process

The aim of our product is to remove odour and kill bacteria in dog urine so as to improve the hygiene on the street in an eco-and-cost-friendly manner, tackling the third and sixth SDGs. 2 solutions made by mixing different ingredients were proposed. The method to compare the amount of ammonia in the samples, as well as the components' concentration and the proportion in the two solutions need to be further investigated so that an effective solution can be developed.

□Our project is developed based on our school's previous project and the enhancement is as below:

N.A.