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Pusat Asasi

Lumi Lamp

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ABSTRACT

The Lumi Lamp is a multifunctional night lamp that allows users to enjoy soft luminous lighting. The Lumi Lamp is a versatile product as it may function as a night lamp, a reading lamp, and even a simple decoration or toy for children. For instance, students often need to read their textbooks or articles, complete their assignments, and prepare for major exams. While some prefer studying during the daytime, many have no choice but to study at night due to work or personal obligations and this can lead to excessive electricity usage. To address this issue, Lumi Light is a product created that uses strontium aluminate which requires natural or specifically, UV light instead. This product saves energy and is an ideal choice for those who share a room with others as it provides lighting that is rather calming, hence, causing zero disturbance to fellow roommates who are trying to get their beauty sleep. Lumi Light aims to become the go-to product for parents, children, and students across Malaysia, in protecting the environment as well as for the convenience of its users.

Keywords: Night lamp; strontium aluminate; UV light; environment

INTRODUCTION

As the day transitions into night, everything around a person grows dark. Some individuals may appreciate the peace and quiet of the night, while others may fear it, particularly young children. To provide comfort in dark environments, a night lamp was invented and is now commonly used. Additionally, due to the availability of night lamps in various sizes and colors, they are also used as decorations in homes and offices, adding aesthetic appeal to the space [2]. However, most night lamps require electricity or batteries to function correctly, making them a costly option for individuals who cannot afford one, especially students. As most students can only complete their tasks after their daily classes, they tend to use their room lights more often at night. If they share a room, they must work quietly in the dark to avoid disturbing their roommate. This limitation can cause difficulties for students who need to finish their assignments or tasks on time. The Lumi Lamp, a more cost-effective and environmentally friendly option, is an appropriate choice for students who need a night lamp.

The Lumi Lamp is a modified night light that produces a blazing light without the usage of electricity or batteries by mainly relying on luminescent pigment, also known as a glow-in-the-dark pigment, such as strontium aluminate powder. The lamp's ability to glow on its own after being exposed to either natural or artificial light is made possible by this pigment. Unlike dyes, pigments do not dissolve in mediums; instead, they form a suspension that might be either more or less stable depending on the size of the pigment's particles and the level of viscosity of the medium [1]. Once it has been exposed and finished charging under direct sunlight, the Lumi Lamp will begin to shine especially during the night. The lamp has an extended self-glow time

of up to 12 hours after charging. Without significantly reducing the luminescence qualities, the charging and illuminating cycle can be repeated many times. On top of that, strontium aluminate is a non-toxic substance and, chemically and physiologically inert [3]. The colours of strontium pigments can range from light green to dark blue. Green emits a brighter glow than blue, which has the longest glow period. Last but not least, Lumi Lamp is offered in a variety of shapes, designs, and patterns that are ideal for different age groups and different uses.

On a final note, our team wishes that Lumi Lamp's goal of being the preferred product for parents, kids, and students throughout Malaysia as this night lamp has many advantages. Moreover, Lumi Light is an environmentally friendly night light alternative. Additionally, it requires neither electricity nor batteries to operate, and the Lumi Lamp only needs energy obtained through renewable sources, such as natural sunlight from the sun. In light of this, we think that our product will enable consumers to save money while simultaneously minimizing environmental pollution.

INNOVATION DEVELOPMENT

The Lumi Lamp has two components, one of the components is the object that is painted on, and the other is the strontium aluminate mixture that provides the glow of the lamp. The object is painted with the mixture which later it has to dry before it can be charged by any UV light, preferably under the sun. The mixture consists of 60% strontium aluminate powder, 30% water and 10% white acrylic paint. The colour of the glow produced depends on the strontium aluminate powder used in the mixture. This allows a lifespan of up to 10 years as strontium aluminate can be reused over and over again with little change in its quality. Lumi Lamp is also safe around children as strontium aluminate, which is the main substance used in developing the product, is biologically inert, non-toxic and non-flammable. Finally, the glow provided by the lamp can last up to 7 hours after a charging time of about 3 hours in the sunlight.

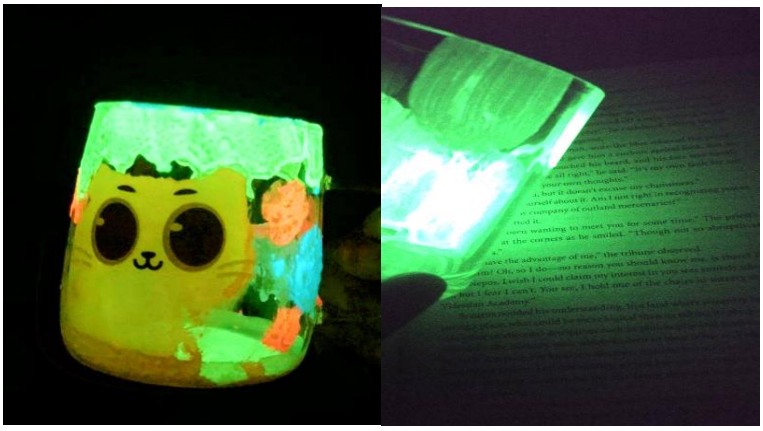

Figure 1: Lumi Light design and function

COMMERCIAL POTENTIAL

First of all, Lumi Lamp was developed with the intention to solve the problem that most people are facing which is the high electricity bills due to excessive usage of the light during the night whereby some people have difficulties with sleeping if the lights are off. This resulted in why Lumi Lamp heavily relies on strontium aluminate as the major substance because it works as lighting that can minimize electricity usage for a normal LED lamp and also can minimize excess light pollution [5]. By minimizing light pollution, it will contribute to a more beneficial

outcome for people and for the surrounding ecosystems such as in decreasing the electricity bills up to 10% to 20% per month [8].

Moreover, Lumi Lamp helps to save the environment without using electricity and only using the renewable energy which is the sun in order to charge the lamp intensity. As mentioned, the sun is the main source of charging the strontium aluminate for it to glow in the dark. This is due to strontium aluminates being considered non-toxic and are biologically and chemically inert that was proven by LTS Research Laboratories, Inc. in regards to strontium aluminate substance [7].

Additionally, the Lumi Lamp is designed to function without overheating. Traditional lamps utilize an incandescent bulb that heats up a filament through the use of an electric current. While the filament's glow produces light, significant heat is required to heat up the filament, causing the incandescent bulb to feel hot to the touch [6]. In contrast, the Lumi Lamp emits bright light without emitting any heat into the environment. It gradually dims on its own.

Furthermore, Lumi Lamp's target customers are all people of all ages such as students, workers that work at night and also housewives. For instance, as a student they can use the lamp to study at night and will not disturb their roommates who are sleeping at that time. Second, a housewife can use the lamp as a decoration in the living room or in the bedroom. Lastly, Lumi Lamp can be a toy for children at the age of 3 and above and can be a light source to accompany them to sleep. In short, our product can be multifunctional depending on who the consumer is.

Table 1: Lumi Light Expenses

Number	**Item**	**Price (RM)**	**Quantity**	**Total (RM)**
1.	Mug	12.90	1	12.90
2.	Strontium aluminate (10g)	5.13	1	5.13
3.	Brush	2.30	1	2.30
4.	White acrylic paint	2.30	1	2.30
Total Price				**22.54**

Above is the table for the modal Lumi Lamp, which is the total expenses for one Lumi Lamp is RM22.53. From the total amount, our team has decided to sell the lamp for RM30.00. Hence, by selling one Lumi Lamp we can get back the profit amount of RM7.47.

CONCLUSION

In conclusion, in consideration of the fact that the threat and pollution to the earth are far worse now than they were in previous decades, it is crucial for everyone to do their part in protecting the Earth. Everyone has a duty to preserve the environment since it is crucial to do so in order to avoid more catastrophic problems such as excessive air, water, and land pollution.

Since our product, Lumi Lamp, to be a more environmentally friendly alternative to the night lamps that are currently used in most households, this innovation will help to protect the environment. In order for this product to reach its goal, which is to provide a light source during the night or as house decorations, detailed research was conducted so that the lamp will not be relying on non-renewable energy sources like batteries.

Although this product appears to be ideal, we must acknowledge that product improvisation and future suggestions must be taken into account. Future recommendations for this product would be in terms of the manufacturing aspect so that it will be in a variety of shapes and colours in response to consumers' demands. It is hoped that this product would benefit the consumers and encourage the adoption of a more environmentally friendly night lamp in an effort to protect the environment.

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