



## 2023 SEAMEO-Japan ESD Award

Theme: Promoting Environmental Education through Utilizing Renewable Energy

### SUBMISSION FORM

The submission deadline is **15 August 2023**

Full Information: <https://link.seameo.org/2023SEAMEOJapanESDAward>

- To participate in the 2023 SEAMEO-Japan ESD Award, please submit the information of your school’s programme on “Promoting Environmental Education through Utilizing Renewable Energy” by using this template of Submission Form on or before 15 August 2023.
- The **digital format of this Submission Form** can be downloaded from the SEAMEO website: <https://link.seameo.org/2023SEAMEOJapanESDAward> or request through email: [seameojapan.award@seameo.org](mailto:seameojapan.award@seameo.org)
- The **guidelines for submission** and the **judging criteria** are detailed in page 8-10 of this document.
- **How to Submit the Entry:** Please send the completed submission form of 2023 SEAMEO-Japan ESD Award and a link of 3-minute video clip together with supporting documents to the following google form:



<https://link.seameo.org/2023SEAMEOJapanESDAward/submission>

- Important Note: to align with the ESD practices and to save the environment and energy, the Committee **WILL NOT** accept the entry in hard/printed copies.
- More information, please visit: <https://link.seameo.org/2023SEAMEOJapanESDAward> or contact the SEAMEO Secretariat’s email: [seameojapan.award@seameo.org](mailto:seameojapan.award@seameo.org) or Tel. +66-2391-0144.

#### PART I: DETAILS OF YOUR SCHOOL

1. Name of your school SJK (C) CHUNG SIN, TANJONG MALIM
2. Full address SJK (C) Chung Sin, 121 - 122, Jalan Ketoyong, 35900, Tanjung Malim, Perak,  
MALAYSIA
3. Postcode 35900 4. Country MALAYSIA
5. School’s telephone number (country code+city code+telephone number) +605-448 1287
6. School’s Email Address abca005@moe.edu.my ; g-52171973@moe-dl.edu.my (Teacher in-charge)
7. School website (if available) https://www.facebook.com/SJKCChungSin ; https://sites.google.com/view/sikcchungsin/home

8. Approximate number of teachers participated in this programme ..... 2 Teacher Coordinators .....

9. Approximate number of students participated in this programme 3 Main & 69 Year 6 [age 11-12] Students .....

## PART II: INFORMATION ABOUT THE SCHOOL'S PROGRAMME

The information of part II from no.1 to 14 should not be over five (5) pages long of A4 in total. The information should be written in Times New Roman/Calibri font, font size 11.

1. Title of the school's programme

The Making of Eternal Flame Candle via Used Cooking Oil and Recycled Materials: An Innovative STEM programme

2. Summary of the programme (maximum of 300 words)

Innovation in recycling is important to save the environment for our new generations. Hence in this waste to wealth programme, used cooking oil is utilised where we processed them to become candles which we named it Eternal Flame Candle. In Malaysia, candles are widely used during power outage as light energy and festival events such as during *Hari Raya*, Mooncake Festival and Deepavali. In this innovation, the eight STEM practices by Ministry of Education, Malaysia were implemented and followed throughout this programme. The main objective of this innovative STEM programme is to develop an innovative eternal flame candle via used cooking oil and recycled materials in the field of science that can help the community for recycling & reusing the used cooking oil and recycled glass as well as generating side incomes. This programme also aimed to investigate the relationship between burning time and intensity of light produced by candle made from different sources of used cooking oil (household, canteen and restaurant). Three pioneer students: Tho Qi Yuan (Team Leader), Farisya Rania Mohd Syahrman, and Celine Phee Yan Xin for conducting the experiments and process of making best eternal flame candles had been guided, discussed and presented to the two teacher coordinators and experts from Sultan Idris Education University. In conclusion, we successfully reduced the waste cooking oil and glass to help the environment and generated money for our school during the school events. Based on the scientifically experiments, the longer cooking time of used cooking oil from canteen and restaurant were chosen as it is more stable burning and had good light intensity. In addition, all Year 6 students need to learn the making candle via used cooking oil during their school time. In the implication, this project has a great impact on the environment, learning process and society.

3. Objectives/goals of the school's programme

The main objective of this innovative STEM programme is to develop an innovative eternal flame candle via used cooking oil and recycled materials in the field of science that can help the community for recycling & reusing the used cooking oil & recycled glass as well as generating side incomes for school.

4. Period of the time when the programme has been started

This STEM programme had been discussed during the school calendar management on 17 March 2023 by science teachers and the related topic is taught in the science materials, topic wastes in Year 6 (Promoting Environmental Education). After school lesson, student sold their products in school events Fun Run Programme (*Hari Merentas Desa SJKC CHUNG SIN 2023*) on 24<sup>th</sup> June 2023 and Sport Day on 5<sup>th</sup> August 2023. Thus, the whole duration of the implementation time is about six months.

5. Activities (strategies/activities of implementation, and brief information of each activity)

This project followed the eight STEM practices promoted and implemented by the Ministry of Education, Malaysia (CDD, 2016). We focus on developing an innovative eternal flame via recycled oil in the field of science that can help the community for recycling and reusing the used cooking oil as well as generating side incomes.

**1. Asking Questions and Defining the Problem**

For this stage, we need to ask questions and find a problem by referring to science learned in the classroom and relating it to science in daily life.

**2. Developing and Using Models**

We heated the used cooking oil 200ml and palm wax 100g in a saucepan; we stirred constantly until the wax dissolves. We held the piece of string or candle wick set upright using tweezers in the middle of the jar. We poured the wax mixture in. We left it plain without any scent. As we learned the science materials, topic wastes in Year 6 (age 11-12).

### **3. Planning and Carrying Out Investigations**

For the first investigation:

- i. Four types of candles namely eternal flame via recycled oil are made based on the household used cooking oil that are cooked 20 minutes, 40 minutes, 60 minutes, 80 minutes and a control experiment (fresh cooking oil).
- ii. Each experimental of candle is set to 10 grams.
- iii. Two questions are determined in this investigation: What type of candle produces the most light? How stable the candle flame? These candles have lighted in a dark space and then the data of light intensity were collected by using free mobile apps (Physics Toolbox Suite: Light meter) and the duration of burning time as well as the stability of burning based on observation.
- iv. Select one stable burning candles from household used cooking oil for second investigation.

For the second investigation:

- v. Four types of candles namely eternal flame via recycled oil are made based on the used cooking oil that are from household (selected from first investigation), canteen school, restaurant and a control experiment (fresh cooking oil).
- vi. Each experimental of candle is set to 10 grams.
- vii. Two questions are determined in this investigation: What type of candle produces the most light? How stable the candle flame? These candles have lighted in a dark space and then the data of light intensity were collected by using free mobile apps (Physics Toolbox Suite: Light meter) and the duration of burning time as well as the stability of burning based on observation.

### **4. Analysing and Interpreting Data**

According to variety data such as light intensity and duration of burn time; we are going to select the best cooked oil for our experiment to make the best eternal flame via recycled oil. The results need to refer supporting document of Table 5-8 in the Result and Discussions.

### **5. Using Mathematics and Computational Thinking**

We analysis our data by a scatter graph to investigate the burn time and intensity of candle light make as well as the stability of burning.

### **6. Constructing Explanations and Designing Solutions**

We have to list down the problems faced of using used cooking oil for producing eternal flame candles including the design solutions to do refinements for future plans.

### **7. Engaging in Argument from Evidence**

We start to engage in the argument for the explanations we construct, defend our interpretations and advocate the proposed of used cooking oil based on the evidence. We argued based on findings and hypotheses as well as discussed with experts.

### **8. Obtaining, Evaluating, and Communicating Information**

We choose to present this project to the committee members with collaboration to Sultan Idris Education University and discuss the strengths and weaknesses of our design. Based on expert feedback, we would like to produce the eternal flame candle via used cooking oil that is more stable burning and high intensity of light. We designed and decorated the eternal flame candles and sell it to the communities as a festival gifts in school events or festivals such as Teachers' Day, Parents' Day, Moon Cake Festival, *Hari Raya Aidilfitri*, Christmas and birthday. We can earn some money for our school and promote this innovative idea to the community for helping them to generate the side incomes as well. In addition, this innovative learning is shared to all Year 6 student [age 11-12] and they need to learn the making candle via used cooking oil during their school time.

## **6. Teaching and learning approaches/strategies that the school has integrated into the programme**

- i) The school management: school received SEAMEO-Japan ESD award from UPSI and website [https://www.seameo.org/Main\\_programme/414](https://www.seameo.org/Main_programme/414) on 21 June 2023 and gave this task to science teacher (Madam Fong Thai Kuan as in-charge person). During the discussion, they decided to use the eight STEM practices (CDD, 2016) for empowering the student learning process and relating the daily life activity as well as overcoming the environmental issues. Several school events had been discussed for selling the

candles in this year such as Canteen Day, Fun Run Programme, Sports Day, Teachers' Day or even open sales in Shoppe or Lazada account in the future.

ii) Science teacher and students: the science teacher will apply the eight STEM practices as learning and teaching strategy in her classroom during school calendar management. With the ideas of empowering the student learning process according to daily life activity and overcoming the environmental issues, an innovative idea for making Eternal Flame Candle via Recycled Materials using eight STEM practices (CDD, 2016) had been discussed and three students had been selected as pioneers to participate into this innovation competition. This making of eternal flame candle via used cooking oil and recycled materials is related to the topic of science materials, topic wastes in Year 6 [age 11-12]. Therefore, all Year 6 student [age 11-12] need to learn the making candle via used cooking oil during their school time and the candle were sold during the school events such as Sports Day which are involving the parents and community.

#### 7. Engagement with the community and sharing of school practices to the community

Collaboration Elements: an invitation had been sent out to Faculty Science and Mathematics, UPSI (as community and nearest university) for obtaining the expert idea and related design. Three associate professors had been invited as project advisers and evaluators as listed in table below:

Name	Expertise
Associate Professor Dr. Tho Siew Wei	Science and Physics Education, STEM Innovation, & Educational Technology
Associate Professor Dr. Faridah Lisa Bt. Supian	Nano Physics, Solid State Physics, & Physics Education
Associate Professor Dr. Lee Tien Tien	Science and Chemistry Education

Besides, the school events such as Fun Run Program and Sports Day involved the school staff, parents and community. During the event, an exhibition count was set to promote this innovative STEM programme and sell the related candle.

#### 8. Monitoring and evaluation mechanisms

The monitoring and evaluation mechanisms are using 1) experimental data, 2) three associate professors had been invited as programme evaluators and then 3) customer feedbacks mechanism: Survey using Google form to gain customer feedback.

#### 9. Measurable achievement of the school's programme to students, teachers, parents, and wider community

Students sold their products in school events Fun Run Programme and SportS Day and finally it had been successfully obtained about RM500 [about 15500 Japanese Yen]. Besides, we received responses from the expert and customer and most of the feedback are positive regarding the recycling idea, appearance and price. Based on the suggestions, they hope to add some natural fragrance oil or ingredients for good smelling and more colourful design.

#### 10. Plan for future

This STEM programme recommends further research on promoting the making of candle via used cooking oil to rural area and producing longer burning time and brighter candle. Teaching and sharing this innovative idea can help the environment and a comprehensive experiment with changing ingredients on both longer burning time and brighter candle needs to be conducted and recorded the data to enhance the quality of candles. Additionally, it is also recommending adding fragrance oil that can remove cooking oil smell and create our own unique scent which lasts even longer. Furthermore, the produce is not only will sell through school community, but a larger platform or online shop such as *Lazada* and *Shopee* will be created to help promote and commercialize our candle product.

#### 11. Interrelationship of the school's programme with other Sustainable Development Goals (SDGs) (Please refer to page 2 in the Information Note or <https://sustainabledevelopment.un.org/sdgs>)

**SDGs Goals 4: Quality Education** – Apply STEM practices via STEM programme for ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all.

**SDGs Goals 7: Affordable & Clean Energy** – Waste to light energy for ensuring access to affordable, reliable, sustainable and modern energy for all.

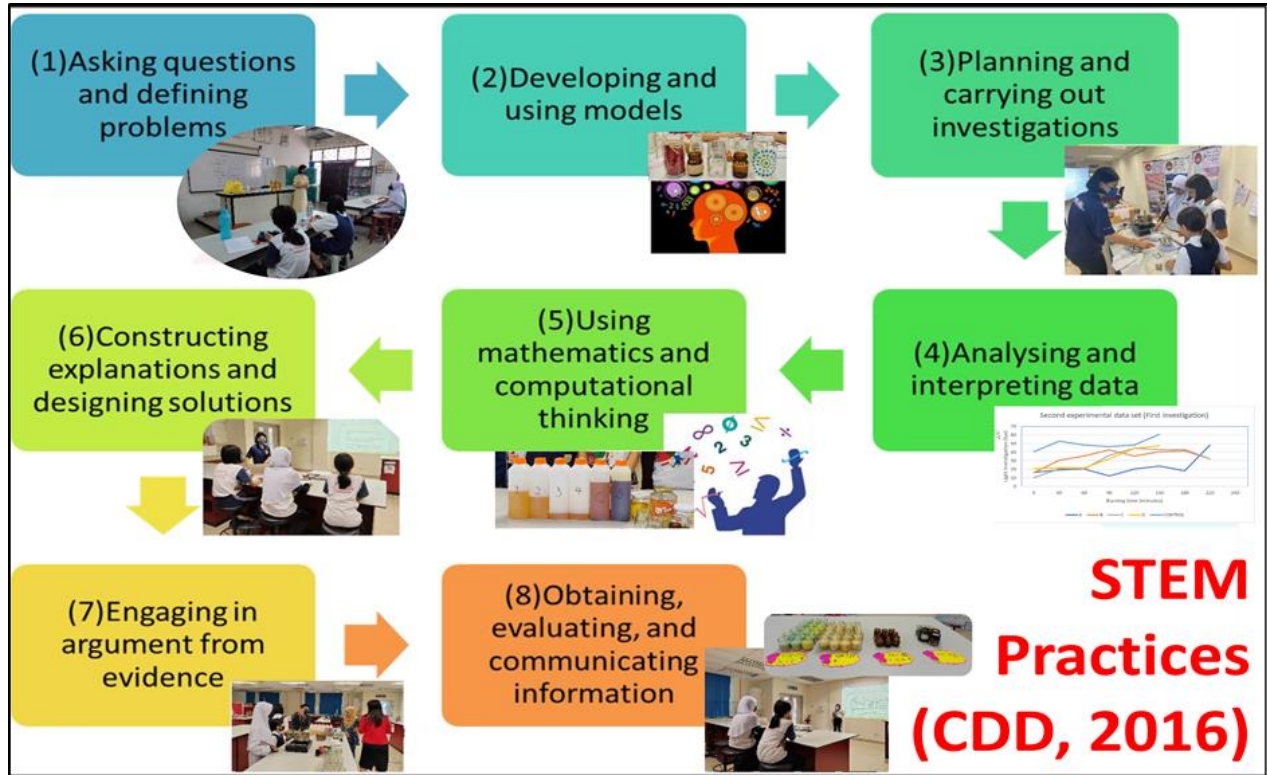
**SDGs Goals 15: Life on Land** – Reuse the use cooking oil and Reduce pollution problems for protecting, restoring and promoting sustainable use of terrestrial ecosystems.

12. Link(s) to the information of school's programme in social media platforms such as facebook, website, youtube

YouTube Movie Link: <https://youtu.be/v9qrPbBqRfA>

13. Photos related to the activity/programme (Maximum of five (5) photos with captions in English)

Photo1



(The Flowchart of STEM Programme via Eight STEM Practices for Student Learning)

Photo 2



(Designing Experiments & Candle Guided from Teacher Coordinators & UPSI Experts)

Photo 3



(Final product of Eternal Flame Candle via Used Cooking Oil and Recycled Materials)

Photo 4



(Promoting Save Environment & Selling Their Candle to the Community During Fun Run Program)

Photo 5



moreover we have the opportunity to introduce our idea

(All Year 6 Student [Age 11-12] Making Their Own Candle Using Used Cooking Oil)