

THE CAT HOUSE PROJECT

By GO STEM!

PROJECT INTRODUCTION

PARTICIPANTS: Primary 3 to 5 students of Pui Kiu Primary School

AIMS OF THE PROJECT:

- to cultivate students' loves and cares to animals
- to develop students' interests in STEM
- to provide chance to students to use their STEM knowledge in solving daily problems

CONTENT OF THE PROJECT:

FIVE workshops were conducted in the April and May. Students have created their own cat houses according to their ideas. A logbook was also created by the group for students to record their own experience and learning.

STEM ELEMENTS OF THE PROJECT:

- S (SCIENCE):**
- Understanding behaviours of cats in workshops and research
 - Choosing of suitable materials in constructing the cat houses
- T (TECHNOLOGY):**
- Demonstration of some hands-on making with the use of Internet
 - Using of portable glue gun and melting of polymorph
- E (ENGINEERING):**
- Hands-on activities such as making of cat house and water dispenser
- M (MATHEMATICS):**
- Ideas of geometry and measurement in constructing cat houses

DESIGN RATIONALE

Making cat houses provides students with the unique hands-on experience for integrating and applying the interdisciplinary knowledge and skills. In order to cultivate student's awareness on animals care, the cat house project was launched in which students have to design and cooperate with one another by themselves to cater for the needs of cats with applying STE(A)M elements. Students' understandings on cats could be raised, while positive attitudes on treating animals could also be cultivated. Therefore, learning elements in these areas were covered in different workshops. The following summarizes the content of each workshop given to the students.

- WORKSHOP I:** Introduction of the project and distribution of log books
Preliminary design of cat house (ARTS)
Investigation on behaviours of cats (SCIENCE)
- WORKSHOP II:** Introduction of Polymorph (SCIENCE)
Preliminary design of water container by the use of clay (ENGINEERING)
- WORKSHOP III:** Assembly and decoration of cat house (ENGINEERING)
Choosing materials for the interior design of cat house (SCIENCE)
Making water container by the use of polymorph (SCIENCE)
- WORKSHOP IV:** Making water dispenser by the use of hot-melt adhesive
(SCIENCE, TECHNOLOGY AND ENGINEERING)
- WORKSHOP V:** Modifications of water dispenser (SCIENCE);
Presentation on different cat houses

CONCLUSION AND RECOMMENDATIONS

The project was successful in providing experience of STEM education to students. They were able to learn some new science knowledge, which is shown in the final presentation done in the last workshop. As the participating students have been joining different STEM activities in school, they were able to apply the knowledge and skills learnt before when participating in the workshops. The students also showed their willingness and joy during the workshops, which created a fruitful and remarkable experience for all of us.

For recommendations, it would be better if students in different grades can be grouped together for collaboration. It will provide an occasion for students to learn how to learn from others and improve their communication and collaboration skills.

In addition, it may be better if collaboration can be done with secondary schools that have 3D printer. Before the workshops, we planned to make use of 3D-printing technology for making some interior materials in the cat house so as to enhance the technological elements in the workshops. However, due to certain limitation, it cannot be done so 3D-printing were not use in the workshop. Earlier communication between different parties should be made if the project does not involve only one party.

Moreover, it was a that no organization can be contacted to provide cats for us to experience the use of cat house. For recommendations, different animal organizations can be contacted earlier, so that we can consider the making of houses for other animals so that students can test their products after making and carry out modifications afterwards.

LIMITATION AND DIFFICULTIES

POLYMORPH --- It is a substance which soften upon heating and harden upon cooling. It is thus a great material for the primary students to hand-make something. We tried to use the polymorph before the workshop and it was a success. However, during the second workshop, the polymorph were not softened, which was out of our expectation. As a result, only limited amount of polymorph were distributed to the students, which forced us to postpone the making of polymorph container. In order to use the polymorph smoothly in the next workshop, each of our group members took a box of polymorph back home and molded into larger pieces so that we could soften them again easier in the third workshop.

WATER DISPENSER --- In the 4th workshop, a water dispenser was made with the idea of air pressure. Two holes were made on the lid of a bottle, and a straw was inserted into each of the holes respectively. The end of one straw was fixed to another lid to ensure that no air can enter the bottle by using hot-melt adhesive. However, leakage occurred in our product even when the lid was tightly fixed. Air entered the bottle from cracks between the hot-melt adhesive. The water dispenser was then redesigned to a simple one. Holes were made only on the upper part of a bottle, when water leaks out and the water level is the same of those holes, it stopped dispensing water. Students were guided to modify their original product and their problem-solving skills were developed.

INDIVIDUAL REFLECTIONS

ALEX: The programme provides us a chance in getting along with students. It is an useful experience for us as pre-service teachers, as we may also have to design STEM activities for our students later. In the workshops, we face different unexpected scenarios, which allow us to train and apply our problem-solving skills to a large extent.

ALFRED: The activity gave me a great chance to communicate with young kids. I am so impressed by passion and creativity of the primary students. :)

CONNIE: It is a precious experience to work with the kids. It is glad to see that they can construct their own products based on what they have learnt and their creativities. It also provides a chance for us to think thoroughly how to design a suitable STEM activities for students with different learning styles and abilities.

MIKI: It did give me a practical experience to see how STEM elements are promoted in school setting. As a prospective teacher, it is vital to remind myself that guiding student's thinking without much interventions throughout the process.

YANNY: Throughout the five workshops, the programme gave me a precious opportunity to hold lessons for primary school students and maintain classroom order. Besides, we have came across different obstacles, like the failure of water dispenser, it trained my problem-solving skill as well. All in all, the five workshops gave me a memorable and beneficial experience.