



Learning can be Fun and Simple:

Science Experiments using easily accessible household items

Collaboration with Beyond Social Services

15.12.2018 and 16.12.2018

OG Department Stores - Mr Tay Tee Peng Distinguished Undergraduate Student Award AY2017/18

Organized By: Tay Hui Min (BS/Year 4)

Table of Contents

Project Overview	2
Project Outline	3
Saturday 15 December 2018: Biology Experiments	3
Sunday 16 December 2018: Chemistry Experiments	5
Photos from the event	7
Saturday 15th December 2018: Biology Experiments	7
Sunday 16th December 2018: Chemistry Experiments	8
Reflection	10
Acknowledgments	10

Project Overview

Title: Learning can be Fun and Simple

Science Experiments using easily accessible household items

Objective: To explore the exciting aspects of Science, so as to develop an interest in learning in daily activities

Target Audience: Underprivileged children* at Yio Chu Kang Community

Collaboration: Beyond Social Services*

**All the children are covered under Insurance Purchased by Beyond*

Number of Participants: 11 students aged 9 to 14 years old

Number of Volunteers: 4

Period of Project: 15th and 16th December 2018

Venue: Block 647 Study Corner Ang Mo Kio Avenue 6 S(560647)

Project Outline

Saturday 15 December 2018: Biology Experiments

Time	Event
2pm	<p>Report time for volunteers</p> <ul style="list-style-type: none"> ● Introduction of the event - Learning can be Fun and Simple: <ul style="list-style-type: none"> → Science Experiments using easily accessible household items → Objective - To explore the exciting aspects of Science, so as to develop an interest in learning in daily activities ● Briefing of today's experiments - Biology: <ul style="list-style-type: none"> → 1st Experiment: Senses → 2nd Experiment: Physiology - Physical and Chemical Digestion → 3rd Experiment: Anatomy - Blood ● Briefing of the flow: <ul style="list-style-type: none"> → Gather at the main table > Explain the background concepts > Move to the individual tables > Start of 1st experiment in small groups > Gather back to the main table for recap > Repeat the cycle for 2nd and 3rd experiments ● Allocate the no. of children/volunteer for the small group ● Time mark for the next experiment to gather at the main table (3.30pm, 4.30pm, 5.30pm) If finish early, please update me
3pm	<p>Report time for children</p> <ul style="list-style-type: none"> ● Attendance taking ● Icebreakers for the children and volunteers ● Introduction of the event - Learning can be Fun and Simple: <ul style="list-style-type: none"> → Science Experiments using easily accessible household items → Objective - To explore the exciting aspects of Science, so as to develop an interest in learning in daily activities ● Individual card for participants: <ul style="list-style-type: none"> → Experiments for the day - Biology → Writing their Name and Level
3.30pm	<p>Start of 1st Experiment: Senses Tasting apple and potato with our eyes and nose closed. Can we still differentiate them?</p> <ul style="list-style-type: none"> ● Explain the background concepts: <ul style="list-style-type: none"> → 5 different senses > See, Smell, Hear, Taste and Touch → Different senses involve when eating the food ● Explain the apple and potato experiment: <ul style="list-style-type: none"> → Ability to tell the difference just by seeing - both are cut into the same shape

	<ul style="list-style-type: none"> → Ability to tell the difference by touching and smelling ● Start of apple and potato experiment in small groups ● Recap of Senses: <ul style="list-style-type: none"> → With eyes and nose closed, can we still tell the difference? → Why it is harder? Nose (pharynx) and mouth (esophagus) are connected through the same airway > smell and taste food at the same time
4.30pm	<p>Start of 2nd Experiment: Physiology Physical and Chemical Digestion in our Mouth</p> <ul style="list-style-type: none"> ● Explain the background concepts: <ul style="list-style-type: none"> → Physiology = Function > Digestion > Physical and Chemical Digestion in Mouth > Teeth and Saliva ● Explain the cracker's experiment: <ul style="list-style-type: none"> → Differences between Physical and Chemical Digestion of Crackers → Crackers contain starch which can be detected using Iodine ● Start of cracker's experiment in small groups ● Recap of Physical and Chemical Digestion: <ul style="list-style-type: none"> → Differences observed - Physical = smaller pieces of crackers vs Chemical = paste-like, doesn't look like crackers anymore → Purpose of Iodine in differentiating Physical and Chemical Digestion
5.30pm	<p>Start of 3rd Experiment: Anatomy What is in our Blood? The different types of cells.</p> <ul style="list-style-type: none"> ● Explain the background concept: <ul style="list-style-type: none"> → Anatomy = Structure > Blood > Composition ● Demonstrate and Explain the blood experiment: <ul style="list-style-type: none"> → Blood > Plasma = Liquid part > Electrolyte, Red blood cells, White Blood cells → Percentage and Purposes of Red and White blood cells ● Start of blood's experiment in small groups
6.30pm	<p>End</p> <ul style="list-style-type: none"> ● Recap of the 3 Biology Experiments ● Short introduction for Sunday's Chemistry Experiments and Graduation Ceremony ● Confirm attendance for Sunday's Chemistry Experiments ● Feedbacks from children and volunteers

Sunday 16 December 2018: Chemistry Experiments

Time	Event
2pm	<p>Report time for volunteers</p> <ul style="list-style-type: none"> ● Briefing of today's experiments - Chemistry: <ul style="list-style-type: none"> → 1st Experiment: Matter - Freezing Point Depression and different states → 2nd Experiment: Acid Base Reaction → 3rd Experiment: Oxidation ● Briefing of the flow: SAME <ul style="list-style-type: none"> → Gather at the main table > Explain the background concepts > Move to the individual tables > Start of 1st experiment in small groups > Gather back to the main table for recap > Repeat the cycle for 2nd and 3rd experiments ● Allocate specific children to each volunteer ● Time mark for the next experiment to gather at the main table (3.15pm, 4.30pm, 5pm) If finish early, please update me
3pm	<p>Report time for children</p> <ul style="list-style-type: none"> ● Attendance taking ● Individual card for participants: <ul style="list-style-type: none"> → Experiments for the day - Chemistry → Writing their Name and Level ● Point system for prize: <ul style="list-style-type: none"> → Answer 1 question correct = 1 point → Misbehave (shouting and interrupting) = -1 point ● Prize Presentation and Graduation Ceremony at the end
3.15pm	<p>Start of 1st Experiment: Matter Freezing Point Depression - Ice cream making</p> <p>Solid, Liquid and Gas - Coke Float</p> <ul style="list-style-type: none"> ● Explain the background concepts: <ul style="list-style-type: none"> → Matter has mass and volume > Solid, Liquid and Gas > Freezing point and Melting point > Freezing point depression → Examples of Freezing point depression using salt in water > salting of road and ice cream making ● Explain the ice cream's experiment: <ul style="list-style-type: none"> → How to make ice cream without a machine like freezer? Using Freezing Point Depression! → Salt is added to lower the freezing point of water from 0°C to as low as -20°C ● Start of ice cream and coke float experiment in small groups ● Recap of Matter:

	<ul style="list-style-type: none"> → The different states of matter observed during ice cream making and coke float → Solid = Ice cream, Liquid = Coke, Gas = Bubbles from Coke
4.30pm	<p>Start of 2nd Experiment: Acid Base Reaction Volcano</p> <ul style="list-style-type: none"> ● Explain the background concepts: <ul style="list-style-type: none"> → Acid and Base > pH = scale used to measure acidity (pH 0 - 7 -14) > What happens when added together? > Neutralisation ● Explain the volcano's experiment: <ul style="list-style-type: none"> → Vinegar = Acetic acid = Acid → Baking soda = Sodium bicarbonate = Base → Vinegar + Baking soda = unstable carbonic acid that breaks apart into = carbon dioxide and water ● Start of volcano's experiment in small groups ● Recap of Acid Base Reaction: <ul style="list-style-type: none"> → The fizzy reaction giving rises to the volcano is a result of Vinegar and Baking Soda > Acid Base Reaction = carbon dioxide and water
5pm	<p>Start of 3rd Experiment: Oxidation Invisible Inks</p> <ul style="list-style-type: none"> ● Explain the background concept: <ul style="list-style-type: none"> → Oxidation = reaction with oxygen ● Explain the invisible ink's experiment: <ul style="list-style-type: none"> → Lemon = organic compound like potato and apple from Saturday's Biology Experiment > can oxidize and turn brown → Write with lemon juice on a piece of paper > let it dry and when heated (speed up oxidation) > turn brown and become visible ● Start of invisible ink's experiment in small groups ● Recap of Oxidation: <ul style="list-style-type: none"> → Oxidation is a reaction with oxygen. → Heat (fire) speed up oxidation > When lemon juice writing is heated up, it turns brown and becomes visible.
5.30pm	<ul style="list-style-type: none"> ● Recap of the 3 Chemistry Experiments ● Prize Presentation ● Graduation Ceremony - Lab Coat, Thank You and Photo-taking

Photos from the event

Saturday 15th December 2018: Biology Experiments



Picture 1:
Senses Experiment -
Tasting apple and potato
with our eyes and nose
closed.

Picture 2:
Physiology Experiment -
Physical and Chemical
Digestion.



Picture 3:
Blood Experiment



Picture 4:
Recap for Saturday's
Biology Experiment

Sunday 16th December 2018: Chemistry Experiments



Picture 5:
Matter Experiment -
Freezing Point Depression. Ice Cream Making

Picture 6:
Acid Base Experiment - Volcano





Picture 7:
Prize presentation

Picture 8:
Graduation Ceremony.
Students with lab coats.



Picture 9:
A student - Kathir
giving handmade Christmas
tree to all of us.

Reflection



Picture 10:

Selfie from the students, volunteers and Beyond staff

“ The smiles and enthusiasm, the laughter of joys and the enthrallment by discovery. They were all written on the faces of the children. Indeed, learning can be fun and simple! I believe I touched their hearts and minds. ”

Tay Hui Min, December 2018

Acknowledgments

I would like to express my deepest gratitude towards OG Department Stores - Mr Tay Tee Peng and College of Science for giving me this Distinguished Undergraduate Student Award, allowing me to organize Learning can be Fun and Simple for the underprivileged children at Yio Chu Kang Community. I would also like to thank the staffs at College of Science - Ms Irene Tay Lay Har and Ms Fransisca Lavinia Halim for their administrative support.

Furthermore, I would like to thank Beyond Social Services, especially Jasmine Chew Kah Mun, for the collaboration in this project.

Last but not least, I would like to thank all the volunteers - Hui Juan, George, Mark and Hui Qing, for helping out in this event. Without all of them, I would not be able to accomplish this event successfully.