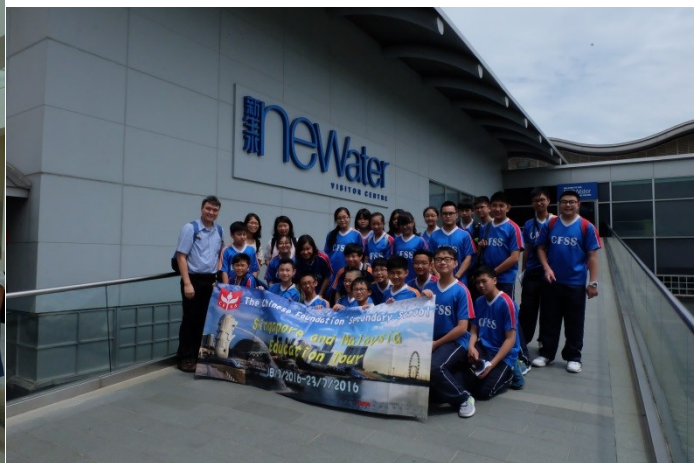


# Singapore and Malaysia Education Tour

18 July 2016 to 23 July 2016

## Report



# Major Learning Focuses

- ✧ Advanced technology
- ✧ Culture
- ✧ Sustainable development (Water)
- ✧ Biodiversity
- ✧ Education



# Itinerary

<b>18/7/2016</b>	<b>urban planning and culture</b>	<ul style="list-style-type: none"><li>● Hong Kong to Singapore</li><li>● Marina Barrage</li><li>● Kampong Glam, Little India</li></ul>
<b>19/7/2016</b>	<b>education and sustainable development</b>	<ul style="list-style-type: none"><li>● North Vista Secondary School</li><li>● NEWater Visitor's Centre</li><li>● China Town</li><li>● Spice garden in Fort Canning Park</li></ul>
<b>20/7/2016</b>	<b>advanced technology and biodiversity</b>	<ul style="list-style-type: none"><li>● The National University of Singapore</li><li>● Lookout Point for Jurong Island</li><li>● Fusionpolis</li><li>● Singapore Zoo</li></ul>
<b>21/7/2016</b>	<b>advanced technology and biodiversity</b>	<ul style="list-style-type: none"><li>● Samwoh Corporation PTE Limited</li><li>● Esplanade</li><li>● Gardens by the Bay</li></ul>
<b>22/7/2016</b>	<b>sustainable development and culture</b>	<ul style="list-style-type: none"><li>● Rubber Plant</li><li>● The Malay Village</li><li>● Fruit Farm</li><li>● Firefly exploration</li></ul>
<b>23/7/2016</b>	<b>biodiversity and culture</b>	<ul style="list-style-type: none"><li>● Maritime Experiential Museum</li><li>● S.E.A. Aquarium</li><li>● Singapore to Hong Kong</li></ul>

## Chapter 1 Advanced technology in Singapore

### **A. Fusionpolis**

Fusionpolis is a research and development complex located at One-North Business Park in Singapore. It houses various research organizations, high-tech companies, government agencies, retail outlets, and serviced apartments in one location.



During the visit, we experienced how new technology can be used in daily living. We saw and experienced the following inventions.

- Printed lighting: lighting which is versatile and economical  
<https://www.a-star.edu.sg/Portals/76/PRINTED%20LIGHTING.pdf>
- Brain computer interface: a system for people to access the computer or control device with their thoughts  
<https://www.a-star.edu.sg/LinkClick.aspx?fileticket=19XzVmgyFyc%3d&portalid=81>
- Light touch: using fingers to control the computer  
<https://www.a-star.edu.sg/Portals/76/LIGHT%20TOUCH.pdf>
- Eyefly 3D: nanoimprint-based 3D screen protector  
<https://www.a-star.edu.sg/Portals/76/EYEFly%203D.pdf>
- Heat absorbent in a shirt
- Speaker verification in a mobile phone



There are over 30 inventions in the exhibition centre. Due to the time constraint, we could only experience some of the inventions. The centre aims to promote innovation for youngsters. It stresses making things with simple materials. We were impressed by a video showing how a designer created paint for a ship using ideas from a crab shell. The centre also acts as a platform for manufacturers to display their ideas for future living. More descriptions on the inventions can be found on its webpage (<https://www.a-star.edu.sg/fusionworld/Exhibiting-Technologies/List-of-Technologies.aspx>).

After seeing and experiencing the new innovations, we were given the chance to visit their rooftop. It provides a green area for staff to take rest.



From the display board, we found that Fusionopolis was just a part in this one-north panorama. The panorama also included many famous companies and governmental organizations, such as PIXEL, Ministry of Education, The Star, ABB, etc.



## B. Samwoh Corporation PTE Limited

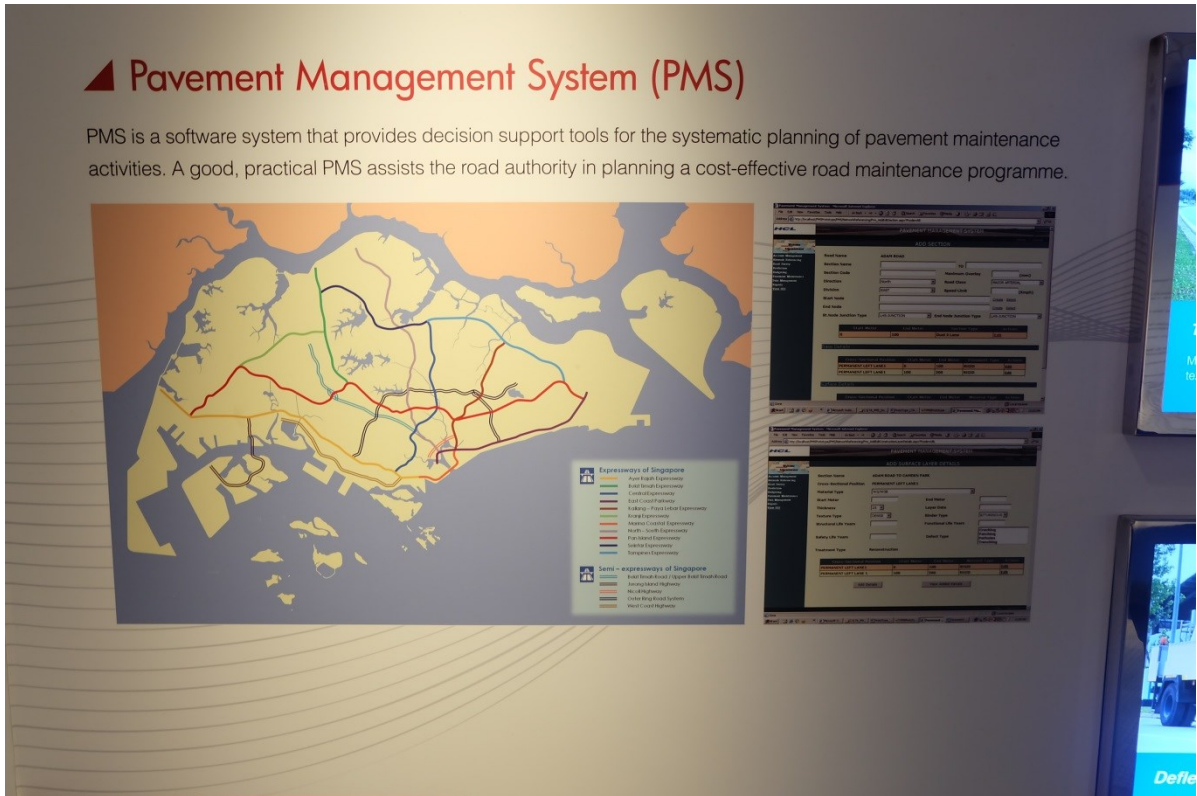
Samwoh is a market leader in construction and maintenance of roads, aircrafts and seaport pavements. The company is also at the forefront of providing civil engineering, infrastructural construction services, supply of building materials, offering of specialised blasting systems, recycling of construction and industrial wastes and consultancy services. The concept of a “one-stop service” has differentiated Samwoh from the others. In 2009 and 2010, the company was awarded the top winner in the Enterprise 50 Awards - Singapore’s most enterprising company. Over the years, it has been actively involved in the recycling of construction and industrial wastes in response to the government’s call to reduce, reuse and recycle wastes.



During our visit, the staff told us the difference of the rocks, and how rocks can be used to make concrete, and how construction materials can be recycled. As the resources of Singapore are limited, it hopes to reduce its dependence on rocks imported from the other countries, so they accepted the suggestion of using recycled construction materials in pavement construction. However, due to the uncertain durability of these construction materials in the long run, the recycled construction materials are not yet commonly used in constructing buildings. In order to prove recycled materials are safe for building construction, the headquarters of Samwoh, where we visited, was built from 100% recycled materials. So far, the building is in good condition.



The following picture shows the pavement management system of the company. It provides decision support tools for systematic planning of pavement maintenance activities.



The company emphasizes green practices, safe and healthy workplace environment.





### C. Jurong Island

Jurong Island is an artificial island located to the southwest of the main island of Singapore. It was formed from the amalgamation of seven offshore islands. This was done through land reclamation. Jurong Island forms a land area of about 32 km<sup>2</sup> created from an initial area of less than 10 km<sup>2</sup>, and is the largest of Singapore's outlying islands. Jurong Island's oil refineries process 1,300,000 barrels (210,000 m<sup>3</sup>) of crude oil per day, turning it into petrol, kerosene and jet fuel sold locally and abroad. It is home to many international companies such as Shell and Exxon Mobile.



After the terrorist attacks on 11<sup>th</sup> September 2001, Jurong Island was declared as a Protected Place. Access is limited to staff and visitors. In this tour, we were not allowed to visit the Island, but had the chance to observe from a lookout point. We were amazed by the oil refinery industry on the island. Singapore, with the area of around 700 km<sup>2</sup>, is even smaller than Hong Kong, but it emphasizes heavy industry. The site is well planned with heavy industry situated far away from residents to reduce the impact of pollution.



## Chapter 2 Culture in Singapore

### A. China Town, Kampong Glam, Little India

Singapore encourages cultural diversity. The four official languages are English, Malay, Mandarin and Tamil. About 74% of Singaporeans are Chinese, 13% are Malaysians and 9% are Indians. In this trip, we visited three important towns for major ethnic groups. China Town, Kampong Glam and Little India. Each town preserves the culture of its ethnic group. Also, the shops in each town sell products from their respective cultures.

The pictures below show the palace, temple and a street in Kampong Glam.



The pictures below show the streets and temples in Little India.



We also observed that the writing on government buildings was in four languages.



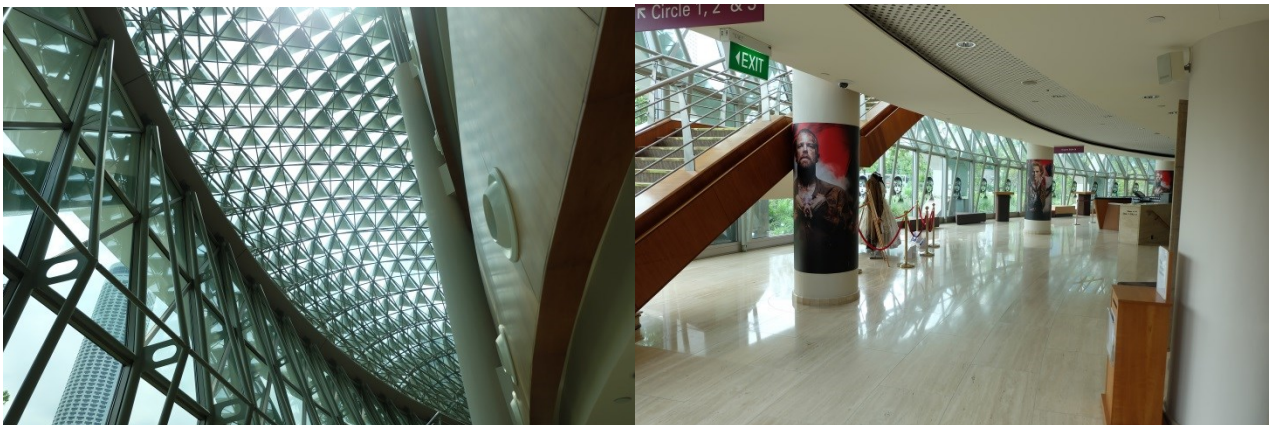
## B. Esplanade

Esplanade is an art centre that presents the best performing arts and has hosted a diverse range of dance, music and theatre performances, as well as visual arts exhibitions.

In 1989, the Advisory Council on Culture and the Arts produced a report assessing the status of arts in Singapore. The report formed the blueprint for cultural policy in Singapore, and led to the establishment of the National Arts Council and National Heritage Board. The report noted a lack of suitable performance arts venues and recommended that a new performing arts centre be built. In 1992, the Singapore Arts Centre was established to build the Esplanade. The Esplanade was completed in 2001.



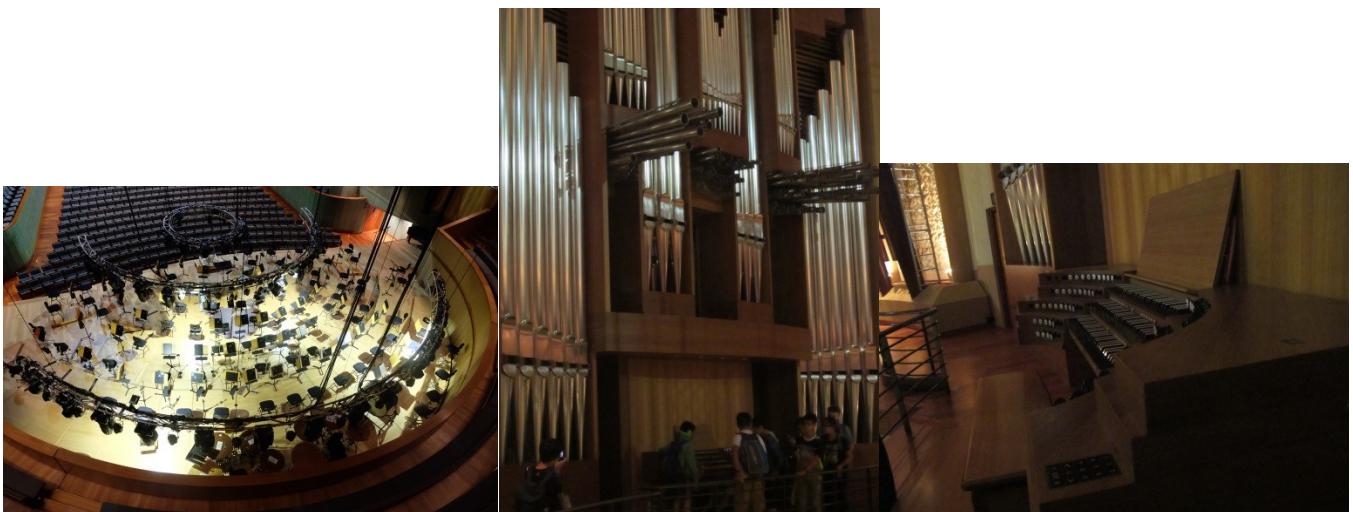
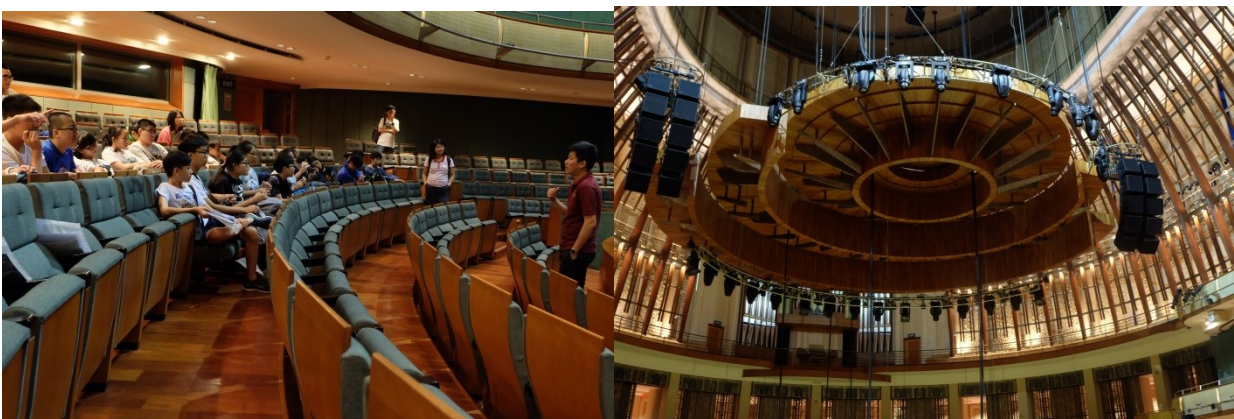
The building was designed by two architectural firms working together, DP Architects of Singapore and Michael Wilford & Partners from England. One company was established in Singapore and another outside Singapore, as it was the Singaporean Government's desire to cooperate with foreign companies to build an art centre. The design consists of two rounded space frames fitted with triangulated glass elements and sunshades, which balances outward views with solar shading. This unique architectural design has been said to have an appearance similar to a durian.



We visited the opera house and concert hall, and obtained a better understanding on the design of the two rooms. The opera house places greatest importance on the view for audiences to watch shows. The stage is very big and suitable for different performances, such as opera, ice-skating and dancing show. The colour of the chairs was carefully chosen to ensure audience can watch comfortably.



The concert hall emphasizes sound effect. It was designed so that no microphone is required during shows. The screen at the back can be moved to whatever angle is needed to create the best effects for the show.



The Esplanade has excellent facilities and is able to attract world-class performances. Performance art is being particularly promoted.

## Chapter 3 Sustainable development in Singapore (water)


Singapore's water resources come from four main sources: rainfall, imported water from Malaysia, NEWater and desalinated water.

### Collecting Every Drop of Rain

In the early years, the first reservoirs MacRitchie, Seletar and Peirce were constructed to maximise the storage of storm-water.


The local catchment area will increase from half to two-thirds of the island with the completion of Marina, Punggol and Serangoon reservoirs by 2011.

The community engagement approach has changed and water activities are now being encouraged in reservoirs. With greater involvement, people can better appreciate and cherish this precious resource by being guardians of water.



### Imported Water

In the years 1961 and 1962, Singapore signed two bilateral agreements with Johor to import water, expiring in 2011 and 2061 respectively.




### Using Each Drop More Than Once

NEWater is a product of advanced membrane technology which recycles treated used water to highly-purified reclaimed water. NEWater is ultra-clean, safe to drink and has passed more than 65,000 scientific tests, surpassing the World Health Organisation's requirements.

NEWater is ultra-clean, and ideal for industrial use especially for wafer fabrication and air-con cooling purposes. This frees up potable water for domestic use. A small percentage of NEWater is blended with reservoir water for indirect potable use.

Currently, all the NEWater plants can meet 30% of the nation's water needs.

By 2060, we plan to triple the current NEWater capacity so that NEWater can meet 50% of our future water demand.



### Sea! Another Source of Water


As an island surrounded by seas, desalination is naturally, an alternative water source for Singapore.

Desalinated water, similar to NEWater, is not dependent on rainfall. It can be used to provide water during dry spells and bring about further drought resilience of our water supply.

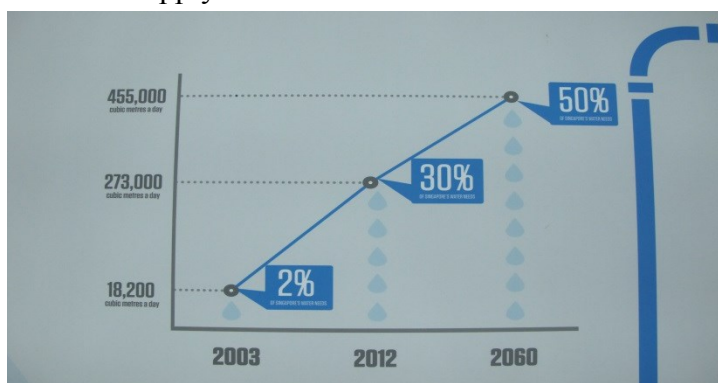
Singapore opened its first 30mgd\* desalination plant in 2005. The second 70mgd desalination plant will be completed in 2013.

By 2060, we intend to ramp up desalination capacity by almost 10 times so that desalinated water will meet at least 30% of our water demand in the long term.

\* million gallons per day

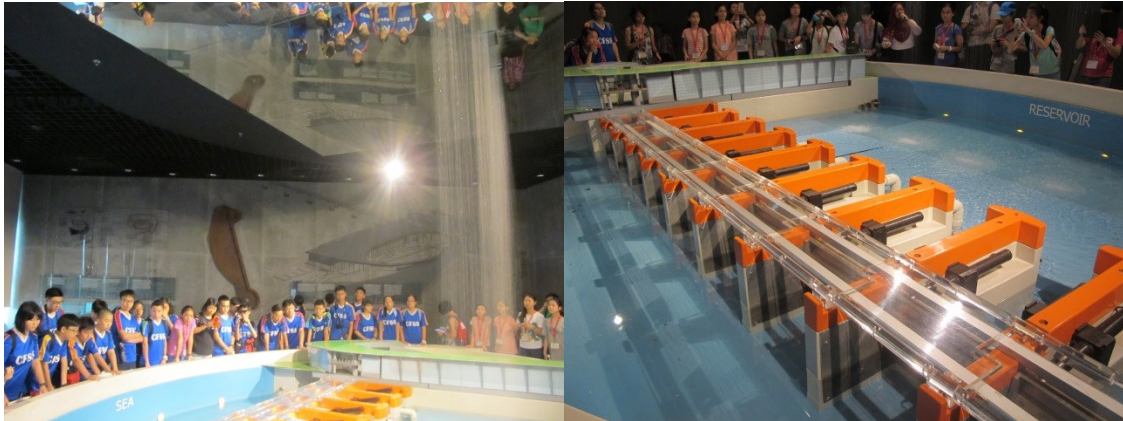


Due to the small size of Singapore and the desire to be less dependent on other countries, it was decided to increase the production of NEWater and desalinated water. It is hoped that by 2060, NEWater will compose 50% of Singapore's water supply.

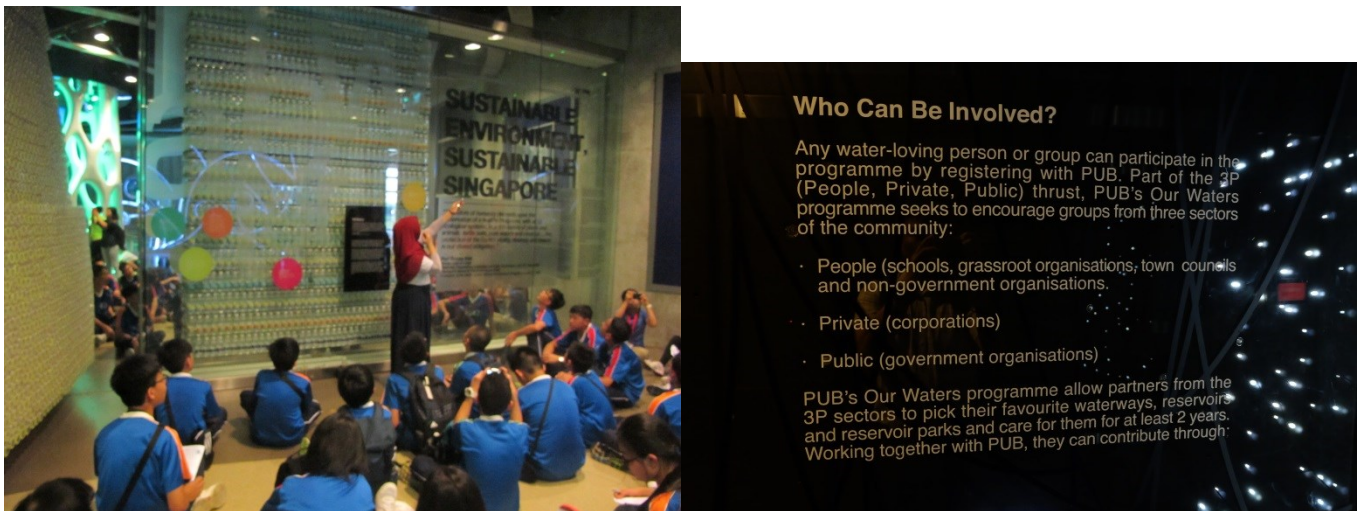


## A. Marina Barrage

The Marina Barrage is a dam in Singapore built at the confluence of five rivers, across the Marina Channel between Marina East and Marina South. It provides water storage, flood control and recreation. We learned how the dam operated allowing most of the water to be saved at the dam during heavy rainfall. The centre had an interactive model, with rain falling from the ceiling and dam moving, showing visitors the working mechanism.



We also learned an important message from the exhibition centre that we should learn to save water since it is precious. The centre promotes a sustainable environment and a sustainable Singapore. It believes that successful water management can be achieved by the 3Ps, including people, private corporations and the public.



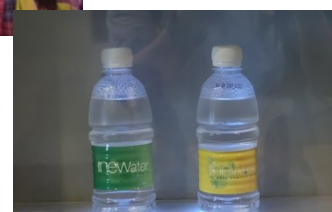
## B. NEWater Visitor's Centre

NEWater is treated wastewater (sewage) that has been purified using dual-membrane (via microfiltration and reverse osmosis) and ultraviolet technologies, in addition to conventional water treatment processes. The water is potable and fit for human consumption, but is mostly used by industries requiring high purity water.

During the visit, we learned how the water was treated.



Each of us was given a bottle of NEWater to try. We tasted it but we found it no difference from other fresh water.



## Chapter 4 Biodiversity in Singapore

Despite the small land area of Singapore, it stresses the promotion of biodiversity through the construction of zoos, aquariums and botanic gardens.

### **A. Singapore Zoo**

The Singapore Zoo occupies 28 hectares within Singapore's heavily forested central catchment area. There are over 300 species of animals in the zoo, of which about 16% are considered to be endangered species. The Wildlife Healthcare & Research Centre was opened in March 2006 as part of the zoo's efforts towards wildlife conservation. Singapore Zoo followed the modern trend of displaying animals as in their natural habitat, 'open' exhibits with hidden barriers and glass between the animals and visitors.



The pictures below showed some of the species that we saw in the zoo.





## B. Gardens by the Bay

Gardens by the Bay is a nature park spanning 101 hectares of reclaimed land in central Singapore, adjacent to the Marina Reservoir. Gardens by the Bay is part of a strategy adopted by the Singaporean government to transform Singapore from a "Garden City" to a "City in a Garden". The aim is to improve the quality of life by preserving and protecting the greenery and flora in the city.

The guide introduced a lot of interesting plants to us during the guided tour, including ferns, mushrooms and figs. After the tour, we might not remember the names of the plants one by one, but we appreciated the strong adaptability of plants, as well as the clever way of pollination by animals.



The pictures below are plants with interesting properties found in the garden.



## Chapter 5 Education in Singapore

### A. North Vista Secondary School

We visited North Vista Secondary School during the trip. The principal gave us an introduction on the differences between The Chinese Foundation Secondary School and North Vista Secondary School.



	CFSS	North Vista School
Uniform	Summer and winter uniforms	Summer uniform only
Term duration	September to July	January to October
School time	8:05 am – 3:55 pm	7:30 am – 2:30 pm
Lesson duration	55 minutes	40 minutes
Number of students	900	1300
Number of houses	4 houses	4 houses
Structure of secondary school	3 years (junior) + 3 years (secondary)	4 years (secondary school) + 2 years (college)

We were invited to join their students, to attend the lesson and visit the school. Their class size is around 40 to 50 students. Their recess and lunch hours vary for different classes. Their canteen provides a wide range of cuisines for students to choose.



## B. The National University of Singapore

We visited the National University of Singapore and learned that the Singaporean Government stressed on advanced technology. We visited a researcher working in the Department of Biological Science, Dr. Lau. He commented that the Singaporean Government was very supportive to research in terms of funding and resources. His research was about the working mechanism of stomata, and how the yield of rice can be increased in different weather conditions.



## **Chapter 6 Sustainable development in Malaysia**

We visited Johor Bahru, the second largest city of Malaysia. Johor Bahru is connected to Singapore through Johor–Singapore Causeway. Johor Bahru is one of the fastest-growing cities in Malaysia after Kuala Lumpur. It is the major commercial centre for Johor and is located in the Indonesia–Malaysia–Singapore Growth Triangle. Tertiary-based industry dominates the economy with thousands of Singaporeans and Indonesians and other international tourists visiting the city. It is the centre of financial services, commerce and retail, arts and culture, hospitality, urban tourism, plastic manufacturing, electrical and electronics and food processing.

Just separated by a river, Johor Bahru was very different from Singapore. Firstly, the words are mostly Malay. Secondly, more greenery lands and trees are found in Johor Bahru. During the one-day visit in Malaysia, we mainly visited the Malay Village, Rubber Plant, Fruit Farm and Firefly Park in Malaysia.

### **A. Rubber Plant**

Malaysia is one of the major producers of rubber in the world. It has a lot of rubber trees. Rubber is extracted from rubber tree. During the trip, we saw and experienced how rubber was extracted from the tree. We were amazed that actually rubber can be extracted from the trees easily. However, staff told us that the cutting is limited to the surface of the tree to avoid damage of the whole tree.



## B. The Malay Village

In the village, we painted pictures on a cloth. The patterns on the cloth were outlined from wax, and designed by the local people by hand. With the five simple colours and water, pretty art crafts were made.



We also could try the traditional Malaysian food. Most of them are spicy or crispy. With the rice and sweet milk tea, the spiciness was driven away effectively.



We visited the Malay House. In the past, most Malay houses were made of wood. The traditional house was built at a certain distance from the ground to prevent the attack of tigers. Also, the traditional house was well designed to allow good ventilation.



Finally, each of us was given a grasshopper made from banana leaves as a souvenir. It showed that Malaysians are good at using plants to make crafts.



### C. Fruit Farm

We had the experience to visit and learned how a fruit farm is maintained in Malaysia. The farm is very big and has a large variety of fruits. Finally, we could taste the fresh fruits and try the juices.



### D. Firefly Exploration

We went to the Kota Tinggi Firefly Park and rode on boats to observe the fireflies. There were thousands of fireflies flying over the river and resting on trees.



To sum up, we appreciated the effort of Johor Bahru in conserving the culture and environment despite the fast pace of development. We saw a lot of new buildings, but at the same time, a lot of greenery land in Johor Bahru. It tries to keep a good balance between development and conservation. It also tries to create income through agricultural activities and eco-tourism, but at the same time, teaches the youngsters to enjoy the nature and the culture.