



LET'S MAKE  
SINGAPORE  
OUR GARDEN

## A Visit to Admiralty Park



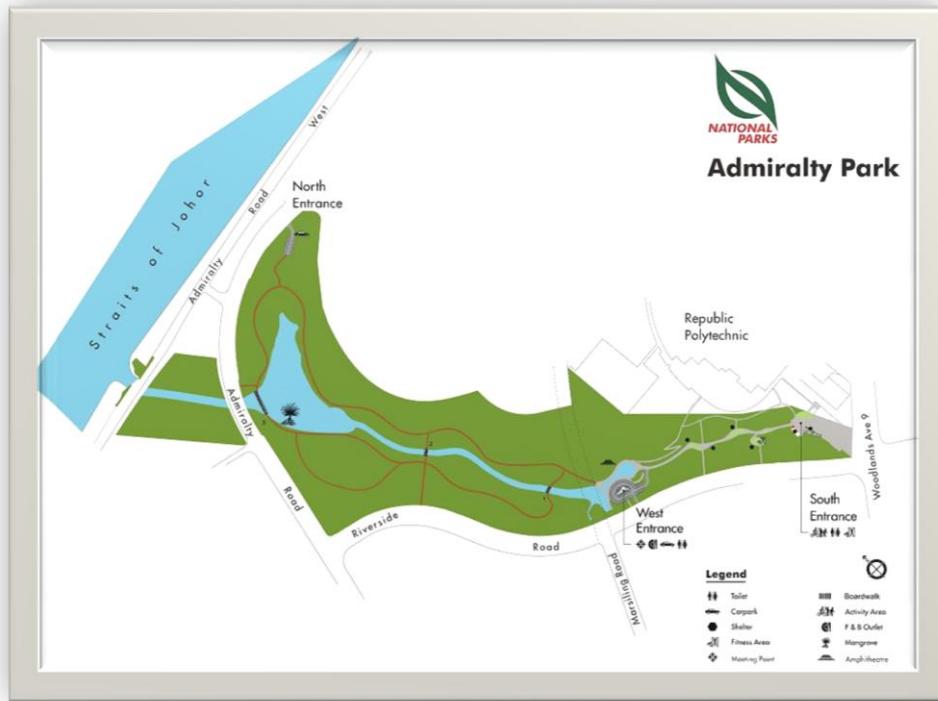
## Pre-Learning Journey Worksheet: Admiralty Park

Annex 1

Did you know? Sungei Cina is a river that flows through Admiralty Park. It used to be called Sungei China. The area around the river used to be called Tan Chu Kang, named after the owner of the plantation.



### A Map of Admiralty Park



### Research on the features of Admiralty Park

Based on your research, make a list of the some features that you can find in Admiralty Park.

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## Pre-Learning Journey Worksheet: Creating leaves

Annex 1a

The Plant Kingdom is made up of a large variety of plants that use different methods according to the habitats they thrive in for survival. Different plants have adapted to the environment to ensure successful growth and reproduction.

Before setting off on our learning journey, let's find out about one of the many different adaptations of plants. What are adaptations? Adaptations are special features that allow a plant (or animal) to live in a particular place or habitat.

Read through the description of each plant adaptation. Then draw what you think the leaves would look like.

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|--|---|
| A. I have a waxy coating that helps me retain water. | B. My leaves curl. On cool and dry days, I don't lose too much water. |
| C. I taste bad so animals will not eat me.           | D. My leaves enable rain drops to run off quickly.                    |

## Factsheet: Admiralty Park

## Annex 2

Admiralty Park is 27 hectares (ha) in size which comprises of a 7-ha urban garden and a 20-ha nature area. It is unique as it is the largest park in the north with a river, Sungei Cina, flowing through it. The main nature path is aligned along the valley where you can enjoy scenic landscapes while trekking through the five natural habitats found in the area.

The nature area has a rich variety of animals and plants and it is the biggest nature area within a park in Singapore. Amenities include three boardwalks and a 2-km nature trail for visitors to enjoy its rustic surroundings.

All of the boardwalks span over the river Sungei Cina, thus allowing visitors to appreciate the beauty of the river at different water levels. The third boardwalk is within the mangrove forest, giving visitors the opportunity to observe the mudskippers and birds in the mudflat.

Some of the flora and fauna that one can see in Admiralty Park include otters, horse-shoe crabs, dragonflies, butterflies, birds, mangrove Rattan and rare Fish-killer tree.

### Sungei Cina

The course of the river used to be a winding loop all the way in and out into Johor Straits. However, the Public Utilities Board (PUB) has got rid of the loop and made the river straight by dredging it.

The river is an ..... river, which means sea-water comes in to ..... with the freshwater ..... times a day and the river has varying amounts of ..... in its water during the ..... .

The ..... here has a special function of ..... the sediments as well as ..... the flow. It is maintained by the PUB whenever necessary.



### Nypah Palm

The Nypah Palm is also known as *Nypah fruticans*. It is one of the most useful plants that can be found in the mangroves. Almost every part of the plant can be used.

List down the uses of the Nypah Palm in the boxes below.

**Leaves**

**Flower stalk**

**Seeds**

The Nypah Palm has many special adaptations. As you will learn and see, this plant is well-adapted to the mangroves. It can be seen grow in large areas of the mangrove.

List down two adaptations of the Nypah Palm in the boxes below.

**Fruit**

**Stem**

### *Mikania micrantha*

The *Mikania micrantha* is also known as the "Mile-A-Minute". It is a weed because it is so adaptable and successful that it has managed to crowd out the local species of flora. It can even climb over trees by means of its tendrils and kill the trees by covering them. This weed has adapted well to the survival game by growing 27mm in a day and by dispersing its seeds through the air.

List down two interesting facts about the *Mikania micrantha* in spaces below.

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### Pong Pong

The Yellow-eyed Pong Pong tree is a common tree in parks and along the roads. The fruits are dispersed by water. Only the seeds of the Pong Pong fruit are poisonous and no other part of the plant is toxic.

List some uses of the Pong Pong tree.

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Did you know? Another species of the Pong Pong is the rare and beautiful Pink-eyed Pong Pong tree. It can be seen on the sea shores and coastal forests.

### **Simpoh Air**

The Simpoh Air is commonly found in Singapore. It has large glossy green leaves, cheery yellow flowers and pink star-shaped 'fruits'. The leaves are used by tailorbirds to sew together into a pouch for their tiny nests. Unfortunately, after they fall to the ground, the large leaves also hold shallow pools of rainwater in which mosquitoes breed. Thus, areas with Simpoh Air are often mosquito-infested.

List some uses of the Simpoh Air tree.

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### **Bird's Nest Fern**

The Bird's nest fern is a huge rosette of large and fresh green fronds. It is commonly found wedged in the branches of large trees along the roadside, forests and amongst mangrove trees. It is not a parasite and does not draw any water or nutrients away from the host tree. In fact, it is self-sufficient in food and water supply although it lives high up from the ground. Being such a rich source of water and nutrients, it is not surprising that other ferns and plants grow on it.

List some of the uses of the Bird's Nest Fern.

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### Characteristics of a Secondary Forest

A secondary rainforest is a forest ..... in some way, either ..... or ..... These are by means of forest fires or being artificially cleared by people. Scientists are still not clear whether a secondary forest can revert back to a primary forest. The age of a typical primary forest is actually about a few ..... years old.

List down the characteristics of a secondary rainforest in the boxes below.

|                               |                                       |
|-------------------------------|---------------------------------------|
| No complete continuous canopy | Thick undergrowth at the bottom layer |
| Younger trees                 | Lesser biodiversity                   |



### ***Syzygium lineatum***

The *Syzygium lineatum* is also known as the ..... . The young shoots can be ..... with ..... and the ..... are used as ..... for ..... . This tree can ..... waterlogged conditions and can be ..... by stem cuttings.

### **Fishtail Palm**

The Fishtail Palm is the only palm ..... found in the secondary forest and in back mangroves. It is easily identified by the '.....' of its leaves which are made up by its leaflets. The fluff scraped off its leaves and sheaths are used as ..... . The pith (tissue) of the trunk is extracted for a kind of sago flour. The fruit wall and sap contain needle-like crystals which may be irritatin to the skin.

### ***Macaranga Gigantea***

The Macaranga Gigantea is commonly found in the nature reserves in Singapore, growing along the edge of the forest as well as in clearings. It is also known as ..... or Giant Mahang. This tree may be recognised by its very large leaves with ..... main ..... and ..... smaller ones near the leaf base. The back side of the leaf resembles a spiderweb network.

### **Malayan Mistletoe**

The Malayan Mistletoe (*Dendrophthoe pentandra*) is a common ..... plant that attaches to the branches of many trees. Mistletoes are plants that are not welcomed in most people's gardens. They grow on the branches of woody

plants such as a tree or shrub. A mistletoe plant ..... itself into a plant and leeches nutrients from its host to supplement what is produced from its own photosynthetic process. The vigour of plants that have mistletoes growing on them may be ..... and they can be killed if there is a heavy infestation. Although mistletoes are pests, they have an important role to play in the garden.

The Malayan Mistletoe is known to be a butterfly ..... plant to the beautiful ..... butterfly that has bright yellow and orange colours on its wings. The larvae of this butterfly feed on the leaves of this mistletoe. The plant can become totally ..... if there are a large number of caterpillars. Thus, a whole clump of mistletoe can be ..... in this way and perhaps this is how the population of mistletoes is controlled.

### Lianas

They are ..... vines that can only be found in ..... forests.

### Terrestrial Algae

Trentepohlia abietina or Orange Felt is an algal species that forms bright orange ..... on tree trunks. The colour is due to the ..... pigments contained in the algae, the same pigment found in ..... They occur on trees near river banks or trees at wet and humid areas.

## Exploring the Mangroves in Admiralty Park

Annex 5a

What are mangroves?

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List down some interesting facts about mangrove trees below.

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### Mangrove roots

Mangrove roots not only provide support in unstable soils to withstand currents and storms, but also help to breathe in oxygen.

Explain how mangrove roots do this.

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### Salt excretion

All mangroves trees stop much of the salt from entering their systems at the root level, and they can tolerate more salt in their tissues than "normal" plants.

Explain how these mangrove trees achieve this.

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### Vivipary

Mangroves have one of the most unique reproductive methods in the world of plants. Like most mammals, mangroves are viviparous (bringing forth live young), rather than producing dormant resting seeds like most flowering plants.

Explain how these mangrove trees do this.

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**Noni Tree (*Morinda citrifolia*)**

Native to Southeast Asia, this tree was first cultivated by the Polynesians and can be found along rivers and coastal habitats. The Noni fruit is extremely ..... when ripe and can be eaten or made into juice used in dyes or fed to livestock. The tree is also useful for its ..... qualities and is used in traditional .....

**Fish Killer Tree (*Barringtonia racemosa*)**

The Fish Killer Tree is endangered in Singapore as its back mangrove habitat is threatened by urban development. This tree contains a ..... called ..... that can stun fish in the water. Its flowers are arranged in a string-like fashion called "raceme" from which the plant got its scientific name. The flowers, when in bloom, are beautifully pink and delicate.

**Hedgehog Rattan (*Calamus erinaceus*)**

Rattans are actually ....., like the more familiar Coconut Palm and Nypah Palm. But unlike these palms, rattans are ..... and clamber over other trees, using them as a source of ..... to reach the sunlight. To climb, they have ..... all over the place. The leaves, tips of the leaves and its stems are lined with grappling .....

### Grassland

The grassland is actually not climatic vegetation, meaning that it will slowly change into forest over time. Hence, it is not a stable vegetation type. The grassland at Admiralty Park mainly has tall Napier Grass (*Pennisetum purpureum*). This habitat provides food in the form of grass seeds to the grassland bird species like the Scaly-breasted Munia, Yellow-bellied Prinia, Baya Weaver and Paddyfield Pipit which are found in the park. The habitat also provides nesting sites for some of these birds.

List down some interesting information about the grassland habitat.

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## Reflection Time

## Annex 7



What is one feature that you like most in Admiralty Park? Why?

How do you think the features in Admiralty Park have benefitted visitors to the park?

What other features would you like to see in the park?

As students, what is one thing you can do to help make the park a better place for park users?

Without NParks, what do you think Singapore will be like?

How do you feel about working in a group? What has your group done well? What can be improved?

**Introduction:**

You are members of your school's Photography club. Your team has been asked by your teacher to come up with a multimedia storyboard on the history, the flora and fauna found in Admiralty Park.

**Your Roles are:**

1. To understand and appreciate history, flora and fauna in Admiralty Park.
2. To learn about the importance of the mangroves in Admiralty Park.
3. To learn about the biodiversity of flora and fauna found in Admiralty Park.
4. To promote Admiralty Park as a park with rich biodiversity to all walks of life.

**Your Task:**

At the end of your visit to Admiralty Park, your team is to complete the multimedia storyboard on your findings.

**Some useful questions to guide your team:**

1. What is the role and purpose of Admiralty Park in Singapore?
2. Who is the organisation behind the management of Admiralty Park today?
3. Why is Admiralty Park important in Singapore?
4. Why should we visit Admiralty Park?
5. What are some of the important features that can be found in Admiralty Park?
6. What are the changes that Admiralty Park has gone through over the years?
7. What can be done for the future of Admiralty Park?

**Process:**

Assigning specific roles for each member of the team

## Example

1. Group Leader (Lead and co-ordinate, conceptualize ideas)
2. Scribe (Recording information, preparing the storyboard and script)
3. Videographer / Photographer (Take and edit video and photos)
4. Researcher (Searching for information on the history, flora and fauna, what to look out for at the park etc.)
5. Logistics and Map reader (Prepare the equipment, map reading if they are carrying out the task without a guide)

## Websites:

1. [http://www.nparks.gov.sg/cms/index.php?option=com\\_visitorsguide&task=parks&id=3&Itemid=73](http://www.nparks.gov.sg/cms/index.php?option=com_visitorsguide&task=parks&id=3&Itemid=73)
2. <http://wildshores.blogspot.com/2009/04/mangroves-of-admiralty-park.html>
3. <http://cbsingapore.blogspot.com/2011/05/admiralty-park.html>

Group Members: .....

.....

.....

.....

| CATEGORY                      | 4  | 3   | 2   | 1   |
|-------------------------------|--|---|---|---|
| <b>Clarity and Neatness</b>   | Storyboard is easy to read and all elements are so clearly written, labeled, or drawn that another student could create the presentation if necessary. | Storyboard is easy to read and most elements are clearly written, labeled, or drawn. Another person might be able to create the presentation after asking one or two questions. | Storyboard is hard to read with rough drawings and labels. It would be hard for another person to create this presentation without asking lots of questions.  | Storyboard is hard to read and one cannot tell what goes where. It would be impossible for another person to create this presentation without asking lots of questions. |
| <b>Use of Time</b>            | Used time well during each class period (as shown by observation by teacher, and documentation of progress in journal) with no adult reminders.        | Used time well during most class periods (as shown by observation by teacher, and documentation of progress in journal) with no adult reminders.                                | Used time well (as shown by observation by teacher and documentation of progress in journal), but required adult reminders on one or more occasions to do so. | Used time poorly (as shown by observation by teacher and/or documentation of progress in journal) in spite of several adult reminders to do so.                         |
| <b>Cooperation</b>            | Worked cooperatively with partner all the time with no need for adult intervention.  | Worked cooperatively with partner most of time but had a few problems that the team resolved themselves.  | Worked cooperatively with partner most of the time, but had one problem that required adult intervention.   | Worked cooperatively with partners some of the time, but had several problems that required adult intervention.   |
| <b>Spelling &amp; Grammar</b> | No spelling or grammatical mistakes on a storyboard with lots of text.   | No spelling or grammatical mistakes on a storyboard with little text.   | One spelling or grammatical error on the storyboard.  | Several spelling and/or grammatical errors on the storyboard.   |

|                          |   |   |   |   |
|--------------------------|---|---|---|---|
| <b>Content</b>           | All content is in the students' own words and is accurate.                      | Almost all content is in the students' own words and is accurate.     | At least half of the content is in the students' own words and is accurate. | Less than half of the content is in the students' own words and/or is accurate. |
| <b>Required Elements</b> | Storyboard included all required elements as well as a few additional elements. | Storyboard included all required elements and one additional element. | Storyboard included all required elements.                                  | One or more required elements was missing from the storyboard.                  |

### **Copyright Acknowledgements:**

- Information on Macaranga is adapted from  
<http://www.florasingapura.com/Euphorbiaceae.php>
- Information on Pong Pong, Simpoh Air and Bird's nest fern is adapted from  
<http://www.naturia.per.sg>
- Information on Fishtail palm and mangroves is adapted from  
<http://www.wildsingapore.com/>
- Information on Malayan Mistletoe is adapted from  
<http://gardeningwithwilson.com/tag/dendrophthoe-pentandra/>
- Information on Vivipary is adapted from <http://www.nhmi.org/mangroves/rep.htm>
- Cliparts and graphics in Annex 3, 4a and 5a are taken from  
<http://office.microsoft.com/en-us/images/>
- All other information, resources, pictures and photographs are adapted from the National Parks Board and NParks Flora and Fauna websites.
- Rubrics found in Annex 6 is created from Adapted from rubistar.4teachers.org

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