



## A Visit to Lower Peirce Reservoir Park

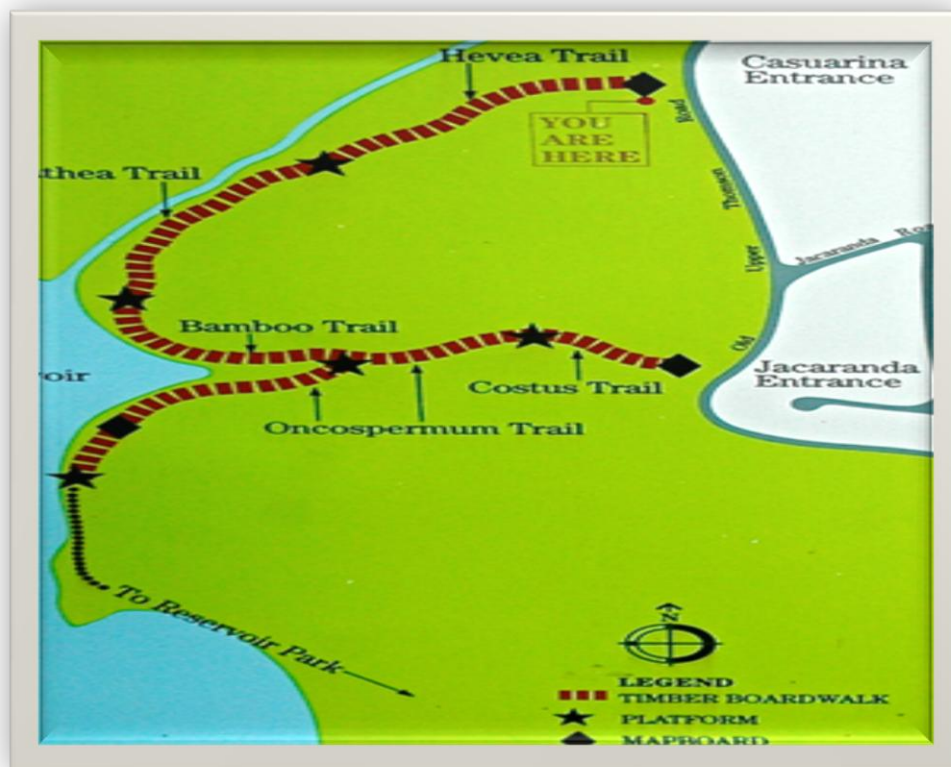


Pre-Learning Journey Worksheet: Lower Peirce Reservoir Park Annex 1

Did you know? Originally known as the Kallang River Reservoir, Singapore's second reservoir was impounded across the lower reaches of the Kallang River in 1910. In 1922, it was renamed Peirce Reservoir in commendation of the services of Robert Peirce, who was the municipal engineer of Singapore from 1901 to 1916.



A Map of Lower Peirce Reservoir Park



## Research on the features of Lower Peirce Reservoir Park

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



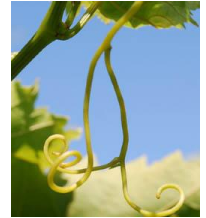
A large empty rectangular box for writing a list of features, with a blue pen icon at the bottom right corner.

**Pre-Learning Journey Worksheet: Growth of Plants**

**Annex 1a**

Before setting off on our learning journey, let's find out more about what plants need to grow.

Plants need water, air, nutrients, and sunlight to grow. The energy from sunlight is used to chemically change water and carbon dioxide (air) into sugar. This process is called photosynthesis. A



waste product from photosynthesis is oxygen. Water is also essential for a healthy plant cell to function. Plants need nutrients to perform metabolic processes. They get nutrients through the soil. Nutrients are things we get from the food we eat that helps our bodies grow and stay healthy. Plants also need nutrients to grow. They get their nutrients from the soil. They are absorbed through their roots and transported through the plant's vascular system (the xylem and the phloem).

What are the 4 things that plants need to grow?

.....

.....

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.....

## Sun Experiment

Read the following instructions on how you can grow your own radish plant.

1. Plant radish seeds in small flat. You will need two flats.
2. Space out the seeds by having using popsicle sticks, or something to mark where the last seed was placed, and a ruler to measure where the next seed will go.
3. Place one flat in a sunny place while placing the other in a dark cupboard.
4. Water both flats and make sure that they get equal amounts of water.
5. Watch each flat grow and compare. Record your findings below.

### Plant Checklist

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Sunny	..... cm	..... cm	..... cm	..... cm	..... cm	..... cm	..... cm
Shade	..... cm	..... cm	..... cm	..... cm	..... cm	..... cm	..... cm
Watering Before Recess (Put a tick in the box if done)							
Watering After Recess (Put a tick in the box if done)							

Why did the plants in the cupboard not grow?

.....

.....

This is the site of one of Singapore's last remaining mature secondary forests and along the edge of Lower Peirce reservoir. There are rubber trees and oil palms within the reserve as the plot of land adjacent to the reserve was formerly a rubber plantation. This area is not only known for its rubber plantations but the existing Old Upper Thomson Road used to be Singapore's first race track.

The forest is home to more than 840 flowering plants, 100 ferns and 250 animal species. One will encounter a wide range of wildlife, from forest to aquatic creatures. These include endangered animals such as the Lesser mousedeer, Malayan pangolin or Scaly anteater and the Culogo or Flying lemur. Common creatures that can be seen here include the Clouded monitor lizard, squirrels. Long-tail macaques and even the Twin-barred tree snake. Many species of forest birds like the Drongo, babblers, barbets, cuckoos, flowerpeckers and sunbirds are sighted as well. Dragonflies, pond-skaters, butterflies and other small creatures are also abundant in the colourful wild vegetation that crowd the water's edge. Some of the flora that can one can see are pitcher plants, Macaranga (Ant plant) and Nibong palms

**Fauna species around Lower Peirce Reservoir Park**



**Plantain Squirrel and Slender Squirrel**

The Plantain Squirrel (*Callosciurus notatus*) and Slender Squirrel (*Sundasciurus tenuis*) belongs to the ..... family. The Plantain Squirrel is found in Indonesia, Malaysia, Singapore and Thailand in a wide range of habitats which includes forests, mangroves, parks, gardens and agricultural areas. In Singapore, they are widely seen in parks, gardens and the nature reserves. The Slender Squirrel is a slightly ..... creature, with a more slender tail. Its body is brown on the ..... part and light grey on the ..... side.

Its diet consists mostly of leaves and ..... but it also eats insects and bird eggs. It can eat fruits much bigger than them, such as mangoes, jackfruits or coconuts. Unlike the Plantain Squirrel, the Slender Squirrel is not common and can only be found in more mature forests like the nature reserves.

**Clouded Monitor Lizard**

The Clouded Monitor Lizard (*Varanus nebulosus*) can be spotted ..... for food among the leaf litter on the forest floor. Its sharp claws make it a good climber and one would not be surprised to see a large lizard climbing up a tree.

**Malayan Water Monitor**

The Malayan Water Monitor (*Varanus salvator*) is a ..... swimmer as well as an agile climber. In water, it glides gracefully and can remain submerged for a long while. It is distinguished from other monitors by the position of its

..... which lie near the tip of the snout. It can grow up to more than 2 metres long and is often mistaken for a .....

### **Long-tailed Macaque**

The Long-tailed Macaque (*Macaca fascicularis*) is also known as the Crab-eating Macaque. They are distinguished by their extraordinary ..... tails. Long-tailed Macaques live in primary, secondary, coastal, mangrove, swamp and riverine forests. They are wild animals and are therefore able to find food in the forests. It is important to remember not to feed them as doing so will alter their natural behaviour and make them ..... on people for food. The macaques are also very important to the forests as they are the only remaining large seed ..... If the macaques do not forage in the forest, the forest will have difficulty regenerating.

### **Common Sun Skink**

The Common Sun Skink (*Eutropis multifasciata*) can often be seen ..... among the undergrowth and leaf litter. In Singapore it is widespread in wooden areas, mangroves and parks. The skink has a ..... body, covered with shiny, smooth scales. It can move very ..... and is generally shy, scurrying away quickly if you are noisy. On a nice sunny day, you are very likely to spot them basking contentedly in the sun.

### **Giant Snakehead**

The predatory Snakehead (*Toman Channa micropeltes*) species are able to breathe out of the water for a considerable time, and are known to move from one water body to another across ..... vegetated land. Younger snakehead travel in shoals and may be easily seen in the ..... of the reservoir.



### **Asian Arowana**

The Asian Arowana (*Arowana Scleropages formosus*) species is also known as the dragon fish and this stems from their resemblance to the ..... The adults feed on other fish while the juveniles feed on .....

### **Dragonflies and Damselflies**

Various species of dragonflies and damselflies are found along the lake's edge. This is their preferred habitat since the females ..... their eggs in ..... waters and the larvae or nymphs spend the first phase of their life fully ..... The winged adults are colourful insects and are quite .....

### **Did you know?**

There are many forest birds and other creatures that can be seen at the reservoir. These include the Greater Racket-tailed Drongos (*Dicrurus paradiseus*), babblers, barbets, cuckoos, flowerpeckers, sunbirds and raptors or birds of prey that soar above the canopy. One of Singapore's largest birds of prey, the White-bellied Fish Eagle (*Haliaeetus leucogaster*) and Brahminy Kite (*Haliastur indus*), also known as the Red-backed Sea Eagle, can sometimes be seen flying majestically over the reservoir. Kingfishers can be heard calling nearby. While the birds feed on fish, they are also known to feed on geckos, mantids and other creatures more typically associated with the forest. Frogs and toads are hidden by the leaf litter in the forest.

**Flora species around Lower Peirce Reservoir Park**

The most attractive plant species found here are the various Ferns which thrive along the small stream and the water-logged areas.



**Tree Ferns**

The *Cyathea latebrosa* is a type of tree fern that can be easily seen around the reservoir. It can reach ..... metres in height and some specimens in Malaysia can reach up to ten metres in height. These ferns can be identified easily as they have a ..... tall stem.



The Fish-tail Palm *Caryota* sp. can be found here as well.

It is so called because of the distinctive shape of its .....

..... These are planted as ornamental trees in other countries. Another fern, the branching fern, *Gleichenia truncate*, is also commonly found.



**Nibong Palm**

The Nibong Palm (*Oncosperma tigillarum*) has many thorns on its trunk. It is called a multi-purpose tree due to the many uses it has.

List some of the uses of the Nibong Palm below.

.....  
.....

.....  
.....

### Leaf Litter Plant

The Leaf Litter Plant (*Agrostistachys longifolia*) is a fascinating tree of the forest. This amazing under-storey "....." with a single trunk has long, narrow and spirally arranged leaves that trap falling leaves. As the fallen leaves ....., the nutrients released are absorbed directly into the plant for its .....

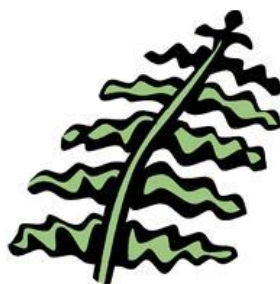
### Mahang

The Mahang (*Macaranga bancana*) or Ant plant, is a ..... for ants. The ant and this plant have a ..... relationship. The ant ..... on this plant for its food while the plant is protected from being eaten up by other insects by the resident ant.

### Lianas

Lianas are woody ..... that can be found in plenty at the reservoir. These are only found in ..... forests.

**Did you know?** A colony of Raffles Pitcher Plant *Nepenthes rafflesiana* used to be found along the Cyathea Trail but it has been virtually destroyed by the public





What is one feature that you like most in Lower Peirce Reservoir Park? Why?

How do you think the features in Lower Peirce Reservoir 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:**

Recently, there are plans for a proposed golf course to be built at Lower Peirce Reservoir. This would mean that the rich biodiversity of tree and plant species are being threatened with destruction.

**Your Roles are:**

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

**Your Task:**

As students of Lower Peirce Primary School and members of the school's Nature Club, write a formal letter to the Nature Conservation Society and provide reasons why you think the area should be conserved and plans to build a golf course there should be scrapped.

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

1. What is the role and purpose of Lower Peirce in Singapore?
2. Why is Lower Peirce important in Singapore?
3. Why should we visit Lower Peirce?
4. What are some of the important features that can be found in Lower Peirce?
5. What are the changes that Lower Peirce has gone through over the years?
6. What can be done for the future of Lower Peirce?

**Process:**

Assigning specific roles for each member of the team

**Example**

1. Group Leader (Lead and co-ordinate, conceptualize ideas)
2. Writer (Recording information and writing the letter)
3. Researcher (Searching for information on the history, flora and fauna, what to look out for at the park etc.)
4. Editor (Editing the letter)
5. Logistics and Map reader (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=naturereserves&id=50&Itemid=75](http://www.nparks.gov.sg/cms/index.php?option=com_visitorsguide&task=naturereserves&id=50&Itemid=75)
2. <http://www.ecologyasia.com/html-loc/lower-peirce.htm>
- 3.

Group Members: .....

.....

.....

.....

CATEGORY	4	3	2	1
Sentences & Paragraphs	Sentences and paragraphs are complete, well-constructed and of varied structure.	All sentences are complete and well-constructed (no fragments, no run-ons). Paragraphing is generally done well.	Most sentences are complete and well-constructed. Paragraphing needs some work.	Many sentence fragments or run-on sentences OR paragraphing needs lots of work.
Salutation and Closing	Salutation and closing have no errors in capitalization and punctuation.	Salutation and closing have 1-2 errors in capitalization and punctuation.	Salutation and closing have 3 or more errors in capitalization and punctuation.	Salutation and/or closing are missing.
Grammar & spelling (conventions)	Writer makes no errors in grammar or spelling.	Writer makes 1-2 errors in grammar and/or spelling.	Writer makes 3-4 errors in grammar and/or spelling	Writer makes more than 4 errors in grammar and/or spelling.
Ideas	Ideas were expressed in a clear and organized fashion. It was easy to figure out what the letter was about.	Ideas were expressed in a pretty clear manner, but the organization could have been better.	Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was about.	The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the letter was about.
Length	The letter is 10 or more sentences.	The letter is 8-9 sentences.	The letter is 5-7 sentences.	The letter is less than 5 sentences.

Capitalization and Punctuation	Writer makes no errors in capitalization and punctuation.	Writer makes 1-2 errors in capitalization and punctuation.	Writer makes 3-4 errors in capitalization and punctuation.	Writer makes more than 4 errors in capitalization and punctuation.
Format	Complies with all the requirements for a friendly letter.	Complies with almost all the requirements for a friendly letter.	Complies with several of the requirements for a friendly letter.	Complies with less than 75% of the requirements for a friendly letter.
Content Accuracy	The letter contains at least 5 accurate facts about the topic.	The letter contains 3-4 accurate facts about the topic.	The letter contains 1-2 accurate facts about the topic.	The letter contains no accurate facts about the topic.



### **Copyright Acknowledgements:**

- Information in Annex 1 is taken from <http://hiddenvillaclassroom.org/curriculum/for-english-language-learners/1st-grade/what-plants-need-to-grow>
- Information in Annex 3a and 3b is taken from <http://www.ecologyasia.com/html-loc/lower-peirce.htm>
- Cliparts and graphics in Annex 1,1a, 3a and 3b are taken from <http://office.microsoft.com/en-us/images/>
- Rubrics found in Annex 6 is created from Adapted from [rubistar.4teachers.org](http://rubistar.4teachers.org)
- All other information, resources, pictures and photographs are adapted from the National Parks Board and NParks Flora and Fauna websites.

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