

Background Information for Teachers

Information on Learning Journeys Organisation

Name of organisation	<ul style="list-style-type: none">• National Parks Board (NParks)
When was the organisation founded?	<ul style="list-style-type: none">• 1990
Learning Objectives stated by the organisation	<ul style="list-style-type: none">• Combining the visual delights and rich biodiversity of our parks, gardens & nature reserve with thoughtfully planned recreational activities, NParks facilitates visitors' communion with Nature
What is the purpose of the organisation?	<ul style="list-style-type: none">• NParks conserves, creates, sustains and enhances the green infrastructure of our City in a Garden.• Responsible for providing and enhancing the greenery of Singapore• NParks also monitors and co-ordinates measures to ensure the health of Singapore's biodiversity.
What is the mission and vision of the organisation?	<ul style="list-style-type: none">• Mission: To create the best living environment through excellent greenery and recreation, in partnership with the community.• Vision: Let's make Singapore our Garden
How is the organisation so important to Singapore?	<ul style="list-style-type: none">• The organisation is important as National Parks Board (NParks) is responsible for providing and enhancing the greenery of the City in the Garden.• Beyond green infrastructure, NParks is committed to enhancing the quality of life through creating memorable recreational experiences and lifestyles.• NParks manages over 300 parks and 4 nature reserves. Adding to this is the extensive streetscape, or roadside greenery, that forms the backbone of our City in a Garden.• An island-wide Park Connector Network is also being developed to link major parks and residential areas.• As Singapore's scientific authority on nature conservation, NParks monitors and coordinates measures to ensure the health of Singapore's biodiversity.• This supports the overall thrust of our urban biodiversity conservation model, which aims to conserve representative eco-systems in land-scarce Singapore for future generations.• NParks is also the lead agency in the efforts to continually upgrade the Landscape Industry in Singapore.• It works closely with industry partners to

promote good work practices and create a thriving, innovative and professional industry that will support Singapore's aspirations of being a City in the Garden.

What are the NE messages / NE learning journey objectives that can be highlighted through this learning journey?

NE Messages:-

- Cultivate a sense of ownership for the environment where Singapore is our homeland, this is where we belong.
- Cultivate a sense of nationalism and pride in the students where we have confidence in our future.

Learning Objectives.

- Provide students with relevant knowledge on the importance of natural heritage in Singapore.
- Instil a sense of connection on how changes from the past influence our present.
- Understanding Singapore: Its constraints, Challenges and Opportunities that with the ever changing landscape, our natural history might disappear if no one spreads word of it

In what ways can the learning journey be relevant to students? (This can related to both personal experiences and curriculum matters)

The visit can be tied with:
Primary 4-6 Social Studies
Secondary 1-4 Geography

Theme:	Learning Journeys
Name of Activity:	A Walk In Our Ancient Forest
Venue/s:	Bukit Timah Nature Reserve
Duration:	1.5 – 2hrs
Level/s:	Primary 4-6, Secondary 1-4
Pre-requisite/s	Students should have completed the visit to Dairy Farm Nature Park

Introduction:

During the learning journey, students will learn about the history and the importance of the Bukit Timah Nature Reserve. Students will also find out about the changes that the surrounding area has undergone in the last 150 years. Despite this, the tropical rainforest in Bukit Timah Nature Reserve has been left almost undisturbed. With the rich history and nature that the nature reserve has to offer, students can interact with the natural vegetation of the forest and enhance their knowledge and interests in the biodiversity of flora and fauna found in Singapore. At the same time, they will also learn about the importance of conserving our natural heritage and develop a sense of commitment and ownership of the nature reserves and greenery.

Objectives of this Learning Journey:

1. Students will have fun as they walk and appreciate and at the same time learn about Singapore's natural heritage.
2. Students will be aware of the importance of natural reserves and the role they play in Singapore.
3. Students will gain greater awareness on Singapore's natural history and enhance their knowledge and interests in the various species of flora and fauna that exists in one of Singapore's natural reserve.
4. Students will learn about the importance of conserving our natural heritage, develop a sense of commitment and ownership of the parks and green, and to protect our home and rich history

National Education Message:

- The importance of national defence where Singapore is our homeland and we must ourselves defend Singapore as no one else will defend her for us.
- This is tied in with the need to protect the natural heritage of Singapore as well because it will be lost if we do not protect them.

Approaches

Programmes/Activities:

- Students will go on a learning journey to Bukit Timah Nature Reserve.
- Guides assisted by teachers from the school, will lead and direct students in making various observations on the natural heritage and the flora and fauna that exist here at Bukit Timah Nature Reserve
- This will allow students to learn more about the natural vegetation and flora and fauna to meet the above objectives.
- Students will complete worksheets and take primary data (e.g. note taking and photographing) of all information which is required for the completion of an assignment or project.

Deployment:

- Guides will do a live commentary on the visit to Bukit Timah Nature Reserve.
- School teachers are deployed to assist and also to help monitor and discipline students on

site.

Assessment and Review:

- Students will complete the worksheets and activities individually or as a group.
- Students will be debriefed after the learning journey.
- As a post-activity, students will complete a reflection on their learning journey.
- Students will complete a feedback form.
- Students will complete an assignment or project based on their learning journey.

Lesson	Outline of Lesson	Period/s	Resources	Remarks
Lesson Structure: Pre-Lesson Journey				
Lesson 1 Introduction	<p><u>Pre-requisite:</u></p> <ul style="list-style-type: none"> Students would have covered the topic on Natural Vegetation in their Geography syllabus Students are to recap on what they have learnt before on natural vegetation. <p><u>Worksheet Activity</u></p> <ul style="list-style-type: none"> Students are to work on the questions on nature reserves and pen down their answers in the worksheet provided. <p><u>Briefing on Learning Journey to Bukit Timah Nature Reserve</u></p> <ul style="list-style-type: none"> Students are given a briefing on the scenario and learning journey objective. 	2 (60mins)	Annex 1a	<ul style="list-style-type: none"> To enable students to draw on their prior knowledge. To enable students to learn more about nature reserves, its importance and the threats they face. To prepare students and to provide information on the nature reserve that they will be visiting.
Development	<p><u>Exploration of the features in Bukit Timah Nature Reserve</u></p> <ul style="list-style-type: none"> Students are divided into pairs/groups to research on Bukit Timah Nature Reserve. Teacher to show the video of 'Legend of Bukit Timah' to prepare students for the learning journey. <p><u>Discussion Questions</u></p> <ul style="list-style-type: none"> Each pair/group will work on the questions and pen down their answers in the worksheet provided. 	1 (30 mins)	http://www.youtube.com/watch?v=IE5D6VvMoLY Annex 1b	<ul style="list-style-type: none"> To enable students to have prior knowledge on Bukit Timah Nature Reserve before going on their learning journey. To motivate the students to learn and have a sense of ownership in their learning. To incorporate the elements of cooperative and collaborative learning.
Closure	<p><u>Reflections</u></p> <ul style="list-style-type: none"> Students to write down their thoughts and reflections on Bukit Timah based on the video they have 	10 mins		<ul style="list-style-type: none"> To sum up students' learning on Bukit Timah Nature Reserve.

	watched.			
Lesson Structure: During Learning Journey				
Lesson 2 Introduction	<p><u>Bukit Timah Nature Reserve</u></p> <ul style="list-style-type: none"> Students will read the factsheet on Bukit Timah Nature Reserve before commencing on their learning journey. Students will orientate themselves by viewing the self-guided exhibit at the Visitor Centre. 	10 mins	Annex 2	<ul style="list-style-type: none"> To enable the students to know more about the Bukit Timah Nature Reserve and what they can expect to see during the learning journey.
Development	<p><u>Breakup Session</u></p> <ul style="list-style-type: none"> Students are divided into different groups with the guides to explore the different features and areas of Bukit Timah Nature Reserve Teachers are to ensure that students ask the guides the relevant questions which are found in the worksheets. 	3 periods (90 mins)	Annex 3a and 3b	<ul style="list-style-type: none"> To enable students to explore Bukit Timah Nature Reserve.
Closure	<p><u>Reflection</u></p> <ul style="list-style-type: none"> Teachers to get students to share their thoughts on the visit. 	20 mins		<ul style="list-style-type: none"> To sum up students' learning at Bukit Timah Nature Reserve. To allow students to evaluate how their group works.
Lesson Structure: Post Learning Journey				
Lesson 3 Introduction	<p><u>After the visit</u></p> <ul style="list-style-type: none"> Students are to form into groups of 4-5 and discuss and reflect on what they have learnt. Discuss this using their post-visit reflection in Annex 5. <p><u>Role-Playing Activity</u></p>	2 periods (60 mins)	Annex 4 (Post-visit reflection) Annex 5	<ul style="list-style-type: none"> To allow students to sum up what they have learnt.

	<ul style="list-style-type: none"> Students to role-play on the future of Singapore in their groups. 			
Development	<p><u>Task</u></p> <ul style="list-style-type: none"> Each group is read the task and submit the report on their decisions and the reasons for their decisions. Rubrics for the submission of the report can be found in Annex 7. <p><u>Supplementary Worksheet</u></p> <ul style="list-style-type: none"> Students can work on the questions on the supplementary worksheet on “Where are the forests?” 	<p>6 period (180 mins)</p> <p>2 periods (60 mins)</p>	<p>Annex 6 (Task) Annex 7 (Rubrics)</p> <p>Annex 8</p>	<ul style="list-style-type: none"> To consolidate students’ learning through the completion of the allocated task. To further enhance students’ learning through the completion of the supplementary worksheet.
Closure	<p><u>Class Activity</u></p> <ul style="list-style-type: none"> Teachers are to go through the worksheet answers with students. 	15 mins	Annex 8 (Answers)	<ul style="list-style-type: none"> To sum up students’ learning.

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Annex 1a

1. Define 'nature reserve'.

Nature reserve is a natural area protected by law for the conservation and preservation of native flora and fauna. In the case of Singapore, the nature reserves are protected by the Parks & Trees Act 2005 (available on NParks' website).

2. There are 4 nature reserves in Singapore (as of 2002). Using your atlas,

a) name them and

b) label their locations in the map given below.



c) Identify the natural habitat of each nature reserve and fill in the table below.

NATURE RESERVE	HABITAT TYPE
<i>Bukit Timah Nature Reserve</i>	<i>Primary Tropical Rainforest</i>
<i>Central Catchment Nature Reserve</i>	<i>Secondary Tropical Rainforest</i>
<i>Labrador Nature Reserve</i>	<i>Tropical Coastal Forest & rocky shores</i>
<i>Sungei Buloh Wetland Reserve</i>	<i>Tropical Mangrove Forest</i>

3. List down 3 differences between a nature reserve and a park near your school.

A nature reserve has greater diversity of animals than a park.

A nature reserve contains more native flora and fauna than a park.

The nature reserve's main objectives are conservation and preservation whereas a park's objective is to provide recreational grounds for people.

Most recreational activities can be conducted in a park whereas only low impact recreational activities (like walking, hiking etc.) can be conducted in a nature reserve.

4. Do you think that the nature reserves are important? Give reasons for your answer.

Yes, this is because the nature reserves are habitats for our native flora and fauna. If the nature reserves are destroyed, our natural heritage will disappear together with it. In addition, the nature reserves like the forests contain many undiscovered medicinal miracles and cures for diseases. The nature reserves are also important as it helps to regulate the earth's climate, nutrient cycle, carbon cycle and prevents soil erosion/degradation.

Any plausible answers.

5. List down and explain the threats faced by tropical forests in the world.

The tropical forests are threatened by an increase in population resulting in increasing demands for food, housing and jobs. Therefore, more land is cleared to cultivate crops, build houses and factories. Though population increase in some areas are rare and seldom, these areas are fast urbanizing and developing. Urbanisation and development are threats to the tropical forests too as these demand for more land, so, more forests will be cleared.

Any plausible answers.

6. List down and explain 3 threats faced by the nature reserves in Singapore.

The nature reserves in Singapore are threatened by

- *microclimate of residential areas. These residential areas increase the edge effects at the forest fringes. Some of these effects cause the forest to dry up as the microclimate of the forest changes due to increase in temperature and wind and decrease in humidity.*
- *high visitorship, especially when visitors come in big groups. These large groups tend to make noise and therefore, disturb the native fauna and possibly displace the native fauna elsewhere.*
- *irresponsible behaviours of visitors. This is especially detrimental when the visitors do not abide by the rules and regulations set up to conserve and protect our natural heritage. Some of these visitors will feed the animals, like the monkeys, thus, altering their behaviour. The animals will then depend on human hand-outs instead of foraging in the forest to disperse the seeds in the forest for regeneration.*
- *Other irresponsible behaviours like poaching, going off the designated trails and trampling on native flora.*

Annex 3a

- Name of heritage tree: Terap Tree
- Spiny Terrapin feeds on fallen fruits and other vegetation

- Interesting fact about Keruing Tree: Used to make traditional torches
- Uses of *Licuala ferruginea*: Make beautiful ornamental plants at home.
- Are all snakes venomous: No. Only 10% of all snake species are venomous.

Annex 3b

- What to do if you encounter a snake in the reserve: Take one of two steps back and leave it alone
- Plants that grow on other plants for support are called: Climbers
- Two organisms that make up a lichen: Fungus and algae
- Why do some birds mimic others: To avoid being hunted
- Male insect that produced a buzzing sound to attract females: Cicadas

Annex 8

1. Countries: Tropic countries like Brazil, Indonesia, Malaysia
2. Why are tropical rainforests found in these areas: Tropical rainforests are warm, wet forests with many tall trees. It rains almost every day and the sun is very strong and shines about the same amount of time everyday all year long. Thus, the climate is kept warm and relatively stable.
3. a) Many countries make money by cutting down and developing rainforests areas. Roads are often built through the rainforest for oil and gas exploration, logging and mining.
3. b) The uncontrolled development results in deforestation, erosion and loss of biodiversity. One of the most damaging effects of development has been dividing the rainforest habitat into little patches of forest, resulting in fragmentation. Today, many species are isolated in these small areas of forest because they will not or cannot enter open habitats. The result is that species such as orangutans cannot connect with one another to mate and have babies.
4. Bukit Timah Nature Reserve, Lower Peirce, Bukit Batok Nature Park, Sungei Buloh Nature Reserve, Singapore Botanic Gardens, Labrador Park and Changi
5. Differences in vegetation map of Singapore between 1819 and 2002: Reduction
6. Reasons for the differences: Deforestation due to planting of crops in the early years and for resource, clearing of land due to urbanisation
7. Why are tropical rainforests in Singapore important: They help to act as a carbon sink and maintains the balance of gases in the atmosphere by allowing photosynthesis to occur.
8. Effects of climate change on tropical rainforests: This can lead to cascading effects on the ecosystem, destroying the flora and fauna living in the rainforests. For example, lesser rainfall will lead to higher temperatures and might leave rainforests vulnerable to forest fires and kill trees and the other flora and fauna living in them.
9. Why Is it important to protect the remaining rainforests in Singapore: We need to preserve the remaining rainforests as our national heritage and for their important value.