

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 1-6 English

Primary 4-6 Science

Secondary 1-4

Theme:	Learning Journeys
Name of Activity:	National Orchid Garden Orchid Tour
Venue/s:	National Orchid Garden
Duration:	1 –1.5 hrs
Level/s:	Primary 1-6, Secondary 1-4
Pre-requisite/s	Nil

Introduction:

During the learning journey, students will gain an insight more than 700 species and 3,000 hybrids of orchids from tropical regions around the globe are showcased here. Given the rich variety of orchids and plants found here, students can interact with nature and enhance their knowledge and interests in them. 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 parks and greenery.

Objectives of this Learning Journey:

1. Students will have fun as they walk and appreciate and at the same time learn about nature.
2. Students will get to learn about the wide variety of orchids that can be found in Singapore and around the world.
3. Students will gain knowledge of the history behind the names of some of the famous orchids around the world.
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 National Orchid Garden.
- Guides assisted by teachers from the school, will lead and direct students in making various observations on the flora and fauna that exist here at to the National Orchid Garden. This will allow students to learn more about the nature 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 the National Orchid Garden.
- 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>Students will be introduced to the world of orchids.</p> <p><u>Worksheet Activity</u></p> <ul style="list-style-type: none"> Students are to conduct a research on trees and rainforests and answer the questions on trees. <p><u>Briefing on Learning Journey to the National Orchid Garden</u></p> <ul style="list-style-type: none"> Students are given a briefing on the scenario and learning journey objective. 	30mins	Annex 1a, 1b	<ul style="list-style-type: none"> To enable students find out about orchids. To enable students to learn more about orchids. To prepare students and to provide information on the garden that they will be visiting.
Development	<p><u>Exploration of the features in National Orchid Garden</u></p> <ul style="list-style-type: none"> Students are divided into pairs/groups to research on National Orchid Garden. <p><u>Discussion Questions</u></p> <ul style="list-style-type: none"> Each pair/group will work on the question and pen down their answers in the worksheet provided. 	20 mins	Annex 1	<ul style="list-style-type: none"> To enable students to have prior knowledge on National Orchid Garden 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 share their thoughts and reflections on National Orchid Garden. 	10 mins		<ul style="list-style-type: none"> To sum up students' learning on National Orchid Garden.
Lesson Structure: During Learning Journey				
Lesson 2 Introduction	<p><u>National Orchid Garden</u></p> <ul style="list-style-type: none"> Students will read the factsheet on National Orchid Garden before commencing on their learning journey. 	10 mins	Annex 2	<ul style="list-style-type: none"> To enable the students to know more about the National Orchid Garden 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. Teachers are to ensure that students ask the guides the relevant questions which are found in the worksheets. 	2 periods (60 mins)	Annex 3 , 3a and 4	<ul style="list-style-type: none"> To enable students to explore National Orchid Garden.
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 National Orchid Garden. 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. Students are to discuss this using their post-visit reflection worksheet found in Annex 5. 	1 period (30 mins)	Annex 5 (Post-visit Reflection)	<ul style="list-style-type: none"> To allow students to sum up what they have learnt.
Development	<p><u>Task</u></p> <ul style="list-style-type: none"> Each group is read the task in Annex 6 and submit the collage on National Orchid Garden. Rubrics for the submission of the collage can be found in Annex 7. 	4 periods (120 mins)	Annex 6 (Task) Annex 7 (Rubrics)	<ul style="list-style-type: none"> To consolidate students' learning through the completion of the allocated task.

Closure	<u>Class Activity</u> <ul style="list-style-type: none"> Teachers are to go through the worksheet answers with students. 	1 period (30 mins)	Annex 8(Answers)	<ul style="list-style-type: none"> To sum up students' learning.
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Annex 1

List down the information in the boxes below.

<p>Orchid Diversity</p> <ul style="list-style-type: none"> • Belongs to the Orchidaceae family • 2nd largest flowering plant family • Approx. 25,000 species in 880 genera discovered • 200–300 new species discovered annually • Over 300,000 hybrids created since 19th century • Relatively slow growers but can live for years 	<p>Where do they grow?</p> <p>Wide range of habitat</p> <ul style="list-style-type: none"> • Tropical rain forest • Alpine meadows • Bogs (soft wet spongy ground) • Semi–desert areas • Sea level to high mountains • Except Arctic and Antarctica
<p>Orchid Fruits & Seeds</p> <ul style="list-style-type: none"> • Contain many seeds but not all are viable • Orchid seeds are the smallest in the world • Almost no food reserves 	<p>Uses of Orchids</p> <ul style="list-style-type: none"> • Vanilla – Ice Cream

Annex 3

Golden Shower or Dancing Lady Orchid

- Lasting, blooms

Why is the *Oncidium Goldiana* known as the Dancing Lady Orchid?

- Dancing Lady refers to the floral parts of the individual flowers that resemble a lady in a gorgeous ballroom dress-dancing.

Tiger Orchid

- Largest, epiphyte, lithophytes, seasonal

Why is the *Grammatophyllum speciosum* known as the Tiger Orchid?

- Tiger Orchid, refers to its flowers that are vividly coloured and marked like the coat of a tiger.

Gingerbread Tree

- Stem, rare

What are some of the uses of the Gingerbread Tree?

- Ancient Egyptians regarded it as a sacred plant and its seeds were often used as burial offerings for Pharaohs. Its fruits and unripe kernels are edible, and the thin dried brown fruit

peel is used for making molasses, cakes, and sweetmeats. Herbal tea can also be made from it, while the shoots of germinated seeds are eaten as a vegetable.

Vanda Miss Joaquim

- Hybrid, Agnes Joaquim

Why was the Vanda Miss Joaquim selected to be the National Flower of Singapore?

- It was selected for its beauty, resilience and year-round blooming quality.

Annex 3a

VIP Orchid Garden

- Foster, honour

List down some of the VIP Orchids on display.

- Dendrobium Margaret Thatcher, Renantanda Akihito, Dendrobium Masako Kotaishi Hidenka, Dendrobium Elizabeth, Paravanda Nelson Mandela, Mokara Laura Bush and Renantanda Kofi Anan.

Tan Hoon Siang Mist House

Fill in the information on the two interesting orchid species in the table below.

Vanda Mimi Palmer	Vanilla planifolia
<ul style="list-style-type: none"> • Fragrant orchid hybrid. • Emits a very sweet and chocolate-like fragrance that is particularly strong in the morning. 	<ul style="list-style-type: none"> • Most well-known species amongst the vanilla orchids. • Vanilla species occur mostly in the tropical and subtropical regions of the world, from tropical America to tropical Asia, New Guinea and West Africa • Vanilla flavouring is actually derived from the seedpods of these orchids • Commercially grown for their seedpods

Montane Forest

What is a Montane forest?

- Montane forests of the tropics have a cool climate and high rainfall throughout the year.

Bulbophyllum echinolabium

Fill in the information about the Bulbophyllum echinolabium in the box below.

It has the largest flowering in its genus. Native to Sulawesi and Borneo, it has spectacular blooms that can measure up to 30cm long and that last for about 10 days, only to be succeeded by yet another flower. This amazing orchid is able to remain in bloom successively for up to two months.

Annex 4

Yuen-Peng McNeice Bromeliad Collection

What is one well-known bromeliad and who was it discovered by?

- The pineapple, a well-known bromeliad, was discovered by Christopher Columbus in 1493 on the Caribbean island of Guadeloupe.

Where do Bromeliads grow at and what kind of climates can they grow in?

- Bromeliads grow at places of elevation ranging from sea level to over 4,000m. Some species can withstand temperatures near freezing level while others can survive on hot sands and blistering rocks in desert regions.

Carnivorous plants

What are some of the survival techniques for these carnivorous plants?

- Having bold colours, nectar secreting glands, traps with trigger mechanisms and pitchers filled with dissolving enzymes are all part of survival techniques for these plants

How do these carnivorous plants trap its prey?

- It lures its prey into its pitcher using its colours and nectar scent. The prey is unable to escape as the inner walls of the pitcher are slippery. Enzymes secreted by a special gland quickly digest the fallen insect and the nutrients are absorbed by the walls.

Elephant Creeper

- Leaf, aesthetic

What types of insects are attracted to the pink flowers of the Elephant Creeper?

- It attracts large Carpenter Bees which pollinate it.

Nibung Palm

What are some of the uses of the Nibung Palm?

- The stems are hardy and rot-resistant, and are commonly used in the construction of houses, fishing stakes and kelongs (wooden structures built above the sea and used for commercial fishing).
- The thin, black spines are used by tribal communities as blowpipe darts for hunting and the leaves as roof thatching material.

Group Discussion Activity

Discuss the following questions with your group members and write down your answers in the spaces provided.

a. What is biodiversity why is it important?

- Biodiversity refers to the natural species composition of organisms (both plants and animals) in a given ecosystem.
- If all these species are present in a given ecosystem, this indicates conditions are optimal for the healthy functioning of the ecosystem. All life on earth is dependent on these ecosystem processes, therefore, maintenance of biodiversity is an essential and worthwhile endeavor.

b. Why do we need to conserve orchids?

- When rare plants are protected, distinctive populations of species are preserved along with their genetic variation within their natural habitat. Because orchids are the most evolved of all flowering plants, they are very site-specific and need optimum conditions to thrive in a given ecosystem. If orchids are present in an ecosystem, this is a good indicator of a healthy, functioning ecosystem. Additionally, many orchid flowers and their habitats are beautiful, and provide pleasure to those who seek out these unique members of the plant kingdom.

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