

An illustration of two children on a zipline. The child in the foreground is wearing a yellow shirt and has a surprised expression. The child behind them is wearing a pink and white striped shirt. They are suspended by black ropes against a background of green foliage and trees. A white box with red text is at the top, and a white box with black text is at the bottom right.

**Teacher's Guide to Learning  
Trail @ MacRitchie Reservoir**

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## Objectives

**This outdoor experience aims to help children:**

- ✓ Develop a sense of appreciation and ownership of the environment and our waters.
- ✓ Promote and introduce the concepts of water conservation and the water cycle through hands-on activities.
- ✓ Promote teamwork and cooperation as they work together to complete a task.

## Educational Approach

**This trail uses experiential learning. Experiential learning is:**

- ✓ Learning through exploring, experiencing, creating and interacting with the world around children.
- ✓ Children have perceptually bound thinking and understand through their five senses.



## Details of Learning Trail

**Level:** Kindergarten 2 children (6 years old)

**Programme duration:** 1 hour 50 minutes

**Ratio of facilitator to children:** 1:10





### Things to do before the Learning Trail

- ✓ Make a trip to MacRitchie Reservoir and familiarize with the learning trail's route and station activities.
- ✓ Conduct the pre-trip lesson. Details of the pre-trip lesson can be found on page 7-8.
- ✓ Brief the children on items to bring and their attire.

### Wet Weather Procedures

- ✓ Check the weather and lightning forecast a few hours before the learning trail commences.

You may visit:

<http://www.nea.gov.sg/weather-climate/forecasts/2-hour-nowcast> and

<http://online.weather.gov.sg/lightning/lightning/lightningalertinformationsystem.jsp>

- ✓ Do not start the learning trail if there is a lightning alert or heavy downpour. Remain under the shelter at the Amenities Centre.
- ✓ If the lightning or heavy rain persists, stop the programme. Make transport arrangements to return back to school. If possible, plan for a make-up learning trail.
- ✓ If you encounter bad weather during the learning trail, lead the children back to the Amenities Centre or any sheltered area in a quick and safe manner.



## Summary of Learning Trail

### Station 1 “The Fairy Hunt Song” cum Safety Briefing



**Location:** Amenities Centre

**Duration:** 15 minutes

**Learning point:**

Introduction to the biodiversity at MacRitchie Reservoir through a song activity.

**Page number:** 9-10

**Materials needed:**

Vanguard sheet/Mahjong paper with the lyrics of the song.



### Station 2 DIY Filtration System



**Location:** Multi- Storey Car Park

**Duration:** 30 minutes

**Learning points:**

Understand how the bio-retention planters and filtration system works by creating a DIY filtration system.

Learn to work together as a team.

**Page no:** 11-12

**Materials needed:**

4 children to 1 set of materials. Each set of materials includes a bubble tea straw, a plastic cup, a small piece of stocking, a roll of scotch tape, a piece of plastic and a pair of scissors.

Teacher to prepare 1 bottle of dirty water. (Dirty water= Crushed green beans/gravel/sand + water)



### Station 3

#### What we see at MacRitchie Reservoir



**Location:** Starting point – Entrance of MacRitchie Reservoir  
End Point- Midway through Chemperai Trail

**Duration:** 50 minutes

**Learning points:**

Using our senses to observe the surroundings.

Learning to appreciate nature, importance of conserving water and keeping our waters clean to ensure the survival of plants and animals.

Learning about the water cycle.

**Page no:** 13-14

**Materials needed:** Pictures provided in Annex F, transparency image in Annex G.



### Station 4

#### Let's Reflect!



**Location:** Amenities Centre

**Duration:** 15 minutes

**Learning points:**

Recap on the activities completed during the learning trail.

Reflect on what was observed/what the children have learnt.

**Page no:** 15

**Materials needed:** 12 envelopes, picture cards provided in Annex H.



## Lesson plan for Pre-school Learning Trail

### Pre-trip lesson

#### Details

**Topic:** Why is water important?

**Duration:** 30 minutes

**Learning points:**

Understand and discuss the uses of water.

Water is essential for plants to grow.

#### Materials needed

**Tuning in activity: Why is water important?**

Laptop, portable speakers and mahjong paper (optional)

**Main activity: Make your own plant pal**

A plastic cup for each child, a container of soil, a bottle of water, markers, and wheat grass seeds

*(Seeds can be purchased from Easigarden. Distributor stores: <http://easigarden.com/distributors> or online at <http://www.ecocityhydroponics.com/hydroponics-sprouting-seeds-indoor-home-farming.html>)*

## Tuning In

### Why is water important? (5 mins)

1. Introduce to the children that they will be learning about the importance of water.
2. Show the YouTube video titled “All living things need clean water” by Sesame Street. (*Link to video:* <https://www.youtube.com/watch?v=-vm-FcK4FbI>)
3. Have a short discussion with the children. Ask the children questions such as: “Why do you think water is important? What are the uses of water?”
4. Create a mind map on a piece of mahjong paper/ whiteboard with the children’s answers.

## Main

### Make your own plant pal (20 mins)

1. The children to decorate the plastic cup with markers provided.
2. Fill half of the plastic cup with soil.
3. Distribute grass seeds to each child. Ask the children to plant the seeds into the soil and water it.
4. Show the children how it will look like after the grass grows. (*Refer to Annex B*)
5. Highlight the importance of water for plants to grow and survive.

## Closure

### Reflection (5 mins)

1. Discuss with the children on where water comes from.
2. Explain to them that local catchment is one of Singapore’s 4 National Taps.
3. Show the children pictures of MacRitchie Reservoir and tell them about the learning trail.
4. Brief the children on what to bring and wear for the learning trail. (*Refer to Annex A*)



## Station 1: “The Fairy Hunt Song” cum Safety Briefing

### Details

**Location:** Amenities Centre

**Duration:** 15 minutes

**Learning point:**

Introduction to the biodiversity at MacRitchie Reservoir through a song activity.

**Materials needed:** Vanguard sheet/Mahjong paper with the lyrics of the song.

### Introduction

1. Welcome the children to MacRitchie Reservoir.
2. Gather the children and ask them to sit down.
3. Give children an introduction on what to expect from this learning trail.
  - MacRitchie Reservoir is the first reservoir in Singapore.
  - There are many unique features in MacRitchie Reservoir and they will learning about them today.
  - There will be activities at different stations for the children to complete.
4. State some rules for the children to follow.
  - Raise your hands if you need help.
  - Listen to instructions given by your teacher.
  - Do not wander off on your own.

## **Activity- “The Fairy Hunt Song”**

1. Teacher to first introduce the song by showing children the lyrics on a vanguard sheet/mahjong paper. (*Refer to Annex C*)
2. Sing the song once to the children.
3. Sing the song again line by line and ask the children to repeat after you.

## Station 2: DIY Filtration System

### Details

**Location:** Multi- Storey Car Park

**Duration:** 30 minutes

**Learning points:**

Understand how the bio-retention planters and filtration system works by creating a DIY filtration system.

Learn to work together as a team.

**Materials needed:**

4 children to 1 set of materials. Each set of materials includes a bubble tea straw, a plastic cup, a small piece of stocking, a roll of scotch tape, a piece of plastic and a pair of scissors.

Teacher to prepare 1 bottle of dirty water. (Dirty water= Crushed green beans/gravel/sand + water)

### Activity- DIY Filtration System

1. Bring the children to the car park where the bio-retention planters and pipes can be seen.
2. Explain that rainwater will first enter the filtration system through the bio-retention planters at the top of the car park. The water then flows through the pipe and is filtered. The filtered water is then channelled to the reservoir for further treatment before it reaches our taps. (*Refer to Annex D*)
3. Split the children into groups of 4 to create their DIY filtration system.

4. When the DIY filtration system is completed, pour the “dirty water” through the bubble tea straw and ask the children to observe.
5. Explain to the children how the stocking acts as a filter and cleans the water.



### Station 3: What we see at MacRitchie Reservoir

#### Details

**Location:** Starting point – Entrance of MacRitchie Reservoir  
End Point- Midway through Chemperai Trail

**Duration:** 50 minutes (Spot me! – 40 mins, Learning about the water cycle- 10 mins)

**Learning points:**

Using our senses to observe the surroundings.

Learning to appreciate nature, importance of conserving water and keeping our waters clean to ensure the survival of plants and animals.

Learning about the water cycle.

**Materials needed:** Pictures provided in Annex F, transparency image in Annex G.

#### Activity- Spot me!

1. Group the children in pairs.
2. Introduce the activity “Spot me!” to the children.
3. The teacher will describe the features of a certain plant/animal/insect and the children will have to search for it in pairs.  
*(Refer to Annex F)*
4. Teachers can assist by showing pictures of the plant/animal/insect.

## Activity- Learning about the water cycle

1. Hold up the transparency with the water cycle printed/drawn against the backdrop of the reservoir. (*Refer to Annex G*)
2. Illustrate the water cycle:
  - The sun's heat will cause the water in the reservoir to become water vapour and rises up to the sky.
  - In the sky, the water vapour cools and come together to form clouds.
  - As more water vapour cools and joins together, the clouds get heavier.
  - It then rains when the clouds get too heavy.
  - Rain is collected in our reservoirs and waterways.
  - The water cycle repeats.

## Station 4: Let's Reflect!

### Details

**Location:** Amenities Centre

**Duration:** 15 minutes

**Learning points:**

Recap on the activities completed during the learning trail.

Reflect on what was observed/what the children have learnt.

**Materials needed:** 12 envelopes, picture cards provided in Annex H. *(1 picture to be placed in each envelope)*

### Activity- Let's Reflect!

1. Group the children in pairs.
2. Each pair will pick an envelope. Each envelope will include a picture of an animal, insect, plant or site that was seen/visited during the trail. *(Refer to Annex H)*
3. Children to share on what they have learnt that is related to the picture.
4. Wrap up the reflection and discuss with the children on ways they can save water at home, in school and how to keep our waters clean.

## Post-trip lesson

### Details

**Topic:** The impact of human actions on our waters and how everyone should act responsibly.

**Duration:** 30 minutes

**Learning points:**

Human actions have an impact on our waters.

The need to act responsibly to safeguard our waters so that there will be enough water for everyone.



### Materials needed

**Tuning in activity: Story time!**

Storybook titled “Watch over our water” by Lisa Bullard

**Main activity: Effect of pollution on our waters**

A container of water, a few plastic bottle cups, small pieces of scrap paper, a bottle of glitter, a container of soil, a pair of tongs, a small cup of oil, a tube of black poster paint, a banana peel, a few metal cans and writing/colouring materials

**Closure: Our Water Pledge**

Writing/colouring materials, Water pledge cards



## Tuning In

### Story time! (5 mins)

1. Read the book titled “Watch over our water” by Lisa Bullard. *(Book can be found in national libraries. Please visit:*

*[http://www.nlb.gov.sg/newarrivals/item\\_holding.aspx?bid=14227434](http://www.nlb.gov.sg/newarrivals/item_holding.aspx?bid=14227434))*

2. After reading the book, ask the children questions such as:

- Why is it important to save water?
- What are some of the ways we can help to save water?
- What do you think will happen if Earth ran out of fresh water?

## Main

### Effect of pollution on our waters (15 mins)

1. Arrange the children to sit in a semi-circle.
2. Place a container of water in the middle and introduce the activity.
3. Hand each child some “litter”. Examples of litter includes glitter, scrap paper, sand, soil, black poster paint, banana peels, plastic bags, tin cans.
4. The children will take turns to throw “litter” into the container of water.
5. Get a few children to clean the water with a pair of tongs.
6. Get the children to observe and compare the water before and after “littering”.
7. Highlight the impacts of water pollution and discuss how it affects creatures who depend on water for survival.

## Closure

### Our Water Pledge (10 mins)

1. Tell the children that they will now write a pledge to save water. *(Refer to Annex I)*
2. The children may also decorate their pledge card by adding their own drawings.

## Preparation brief for Learning Trail

### Suggested list of items for children:

- A small bag containing the following items:
  - ✓ Water bottle
  - ✓ Raincoat/poncho or foldable umbrella (in case of rain)
  - ✓ Insect repellent
  - ✓ Snacks (optional)
  - ✓ Cap (optional)

### Suggested attire for the children:

- T-shirt
- Shorts or long pants
- Covered shoes (no slippers or sandals)

### Suggested list of items for teachers:

- ✓ Water bottle
- ✓ First aid kit
- ✓ Teacher's guide
- ✓ Materials for different station activities

Activity: Make your own plant pal



## Lyrics to “The Fairy Hunt Song”

Sing to the tune of “We’re going on a bear hunt”.

(Link to the tune of the song, “We’re going on a bear hunt”: <https://www.youtube.com/watch?v=p4nOyi9HxAc>)

Verse 1: We’re going on a fairy hunt,

What do you see?

Spot the little dragonflies,

On the water brim.

Verse 4: We’re going on a fairy hunt,

What do you see?

Spot the buttress roots,

All so tall, strong and big.

Verse 2: We’re going on a fairy hunt,

What do you see?

Spot the sea apple trees,

Blowing in the breeze.

Verse 3: We’re going on a fairy hunt,

What do you see?

Spot the wild ixoras,

They’re a sight to see.



## Filtration system

Car park where bio-retention planters and filtration system are located



Area where children can sit down to make their own filtration system



Explanation on how the filtration system works



Rainwater falls into the planter boxes at the top level of the car park.

The water travels down to the first level through a pipe. The filter cleans the water and the filtered water is channelled to the reservoir.

### Instructions for DIY Filtration System

Cut the bubble tea straw into two. The end with the sharper tip should be longer.



Step 1: Attach the stocking to the flat end of the longer straw.



Step 2: Cover the plastic cup with a piece of transparent plastic bag and use scotch tape to secure it.



Step 3: Poke a hole with bubble tea straw.



Step 4: Place the end covered with stocking into the hole. Secure the bubble tea straw with scotch tape.



Final product:



Description and pictures of the plants/animals/insects for “Spot me!” activity

Starting point: Entrance of MacRitchie Reservoir



**1. Climbing bouhinia**

I am vine which bears red/orange flowers. I have a weak stem and thus, you can find me climbing on trees or even wooden structures. I am a climbing bouhinia. Can you spot me?

2<sup>nd</sup> point: Area after the climbing bouhinia



**2. Bodhi Tree**

I am a tall, big tree in front of the reservoir. I have green leaves that have a pointed tip at the end. I am a bodhi tree, can you spot me?



**3<sup>rd</sup> point: Submerged boardwalk**



**3. Beach Morning Glory**

I am a plant with fresh green leaves and purple flowers. I am a beach morning glory, can you spot me?



**4. Dragonfly**

I am an insect. I have a long thin body, 6 legs, 2 pairs of wings and 2 huge eyes. I usually fly above the surface of the water. I am a dragonfly. Can you spot me?

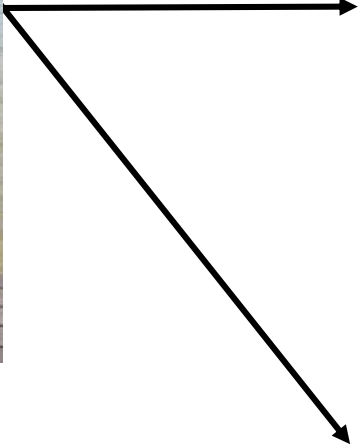
**4<sup>th</sup> point: Bandstand and Zigzag Bridge**



**5. Terrapin**

I have a shell and four legs. I can swim and you can usually find me swimming in the reservoir. I am a terrapin. Can you spot me?

**End point: Midway through Chemperai Trail**



**6. Long-tailed macaque**

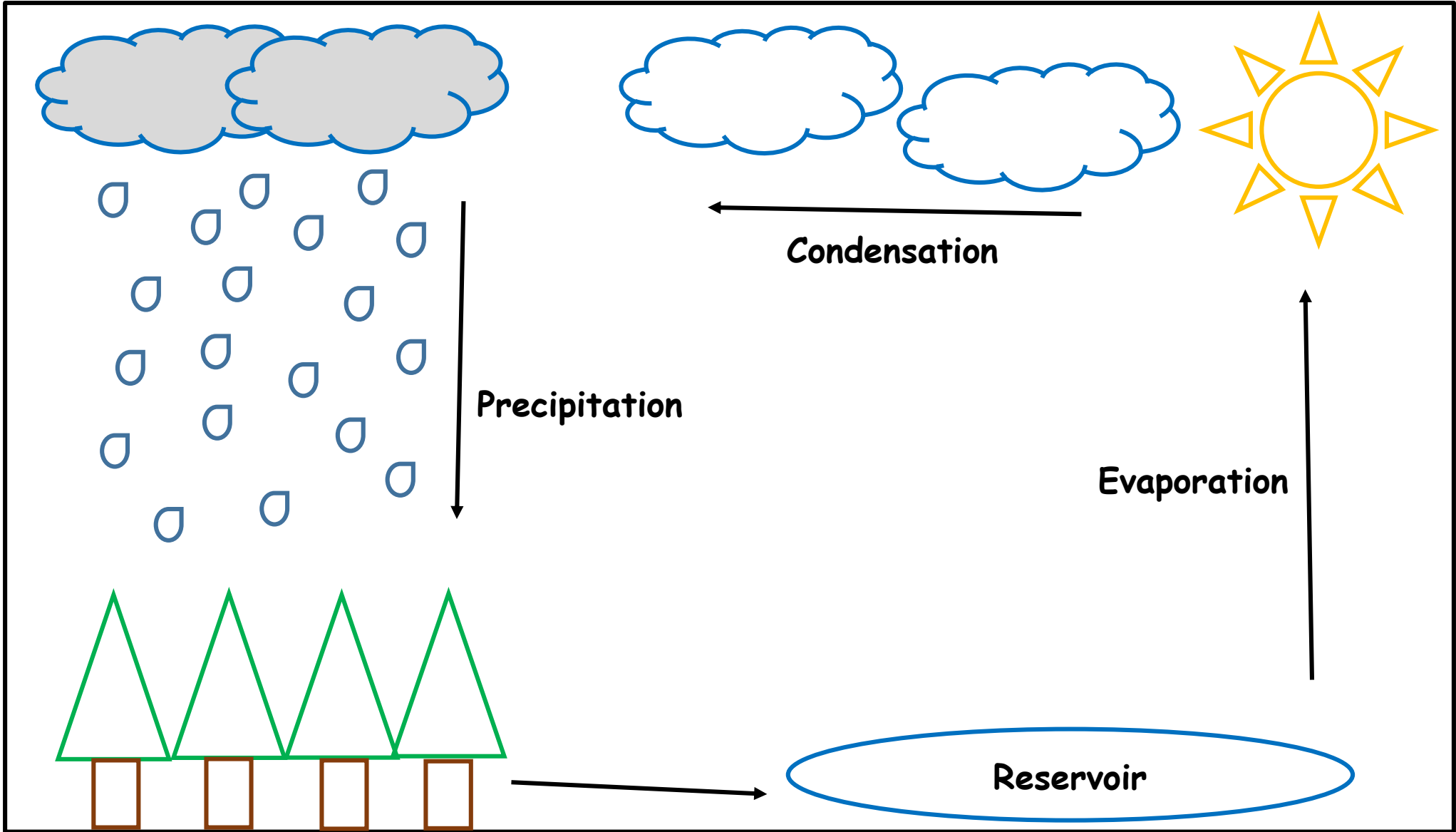
I look like a monkey. I am covered in fur, have two eyes and a long tail. I am a long-tailed macaque. Can you spot me?



**7. Sea Apple Tree**

I am a tree which leans towards the waters. I am commonly known as the “Leaning tree of Chemperai”. My branches stretch across the boardwalk. I am a sea apple tree. Can you spot me?

Template of water cycle to be drawn/printed on transparency





Picture cards to be placed inside the envelopes for “Let’s Reflect!” activity







Water Pledge

I pledge to save water by:

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Name: \_\_\_\_\_

Date: \_\_\_\_\_



### Map of MacRitchie Reservoir

**Station 3: What we see at MacRitchie - Chemperai Trail**



**Station 4: Let's Reflect!**



**Station 1: "The Fairy Hunt Song" cum Safety Briefing**



Credit: Map taken from [http://www.streetdirectory.com/sg/macritchie-reservoir-park/20001\\_1.html](http://www.streetdirectory.com/sg/macritchie-reservoir-park/20001_1.html)

**Station 3: What we see at MacRitchie - Submerged boardwalk**



**Station 3: What we see at MacRitchie - Bandstand and Zigzag Bridge**



**Station 2: DIY Filtration System**

