SELF-GUIDED LEARNING JOURNEYS

A resource for Primary and Secondary School Teachers



NATIONAL PARKS
LET'S MAKE SINGAPORE OUR CITY IN NATURE

What are Self-Guided Learning Journeys?

Self-guided learning journeys help teachers use parks as outdoor classrooms. Through observation, discussion and inquiry, students can connect what they learn in school with Singapore's urban ecosystems.

Flexible: Teachers choose the stops and activities suitable for their students.

Curriculum-linked: Park features are connected to Science, Geography, Social Studies and Character and Citizenship Education.

Inquiry-based: Students learn by observing, questioning and discussing.

Using Inquiry Questions

Observe: What do you notice?

Compare: What is similar or different?

Explain: Why might this be happening?

Evaluate: What are the benefits?

Act: What could individuals or communities do?

Singapore: A City in Nature

At 744 km², Singapore is considered a small city-state with limited land. Despite this, Singapore has an abundance of nature in the form of nature reserves, nature parks, planted streetscapes, skyrise greenery, parks, and gardens. Unlike larger countries where nature is distinct from urban developments, Singapore has gone to great lengths to integrate nature as part of its cityscape, creating an interlinked network of green spaces throughout the country that support a complex web of plants and animals in an interconnected urban ecosystem.

Many of these green spaces are uniquely Singaporean, each with their own stories to tell. We hope that by exploring a nearby park or garden, teachers and students will be able to bring textbook lessons to life, and appreciate how their local environment was shaped to benefit both people and the biodiversity that call Singapore home.



The Importance of Urban Ecosystems

Urban parks and gardens in Singapore are designed for a wide variety of functions. In addition to providing habitats for animals, they can also help to cool surrounding neighbourhoods, manage runoff, act as carbon sinks, and serve as recreational spaces.



Place-based learning in urban parks is an accessible way to apply concepts from the classroom in the real world. Students can attempt to observe local wildlife to build a food web, consider how parks can absorb urban runoff, reflect on how memories and culture are tied to physical landmarks, and practice responsible behaviour.

Explore a park with our self-guided learning journeys today!



Self-Guided Learning Journey

Bishan-Ang Mo Kio Park

Exploring rivers, floodplains, and community spaces
For Primary and Secondary School Teachers

About This Learning Journey

This self-guided learning journey invites teachers to explore Bishan–Ang Mo Kio Park as an outdoor classroom, discovering how nature can be integrated with urban functions to create a more liveable and resilient environment.

Through observation, discussion and inquiry, participants will explore the characteristics of an urban ecosystem, and discover how the park's river, ponds and floodplain support biodiversity, manage water, and provide spaces for people to enjoy.

Why Bishan-Ang Mo Kio Park?

Key habitat: River and floodplain

The park provides opportunities to explore:

- Freshwater habitats and food webs
- Interactions within ecosystems
- Naturalised rivers and flood management
- Community recreation and inclusive spaces
- Environmental stewardship

Plan your visit

Choose a journey based on your learning objectives, students' needs and available time.

Short Journey
Approximately 40 mins
Complete 3 checkpoints
Focus on how naturalisation of the Kallang River impacted people and animals.

Core Journey
Approximately 1 hour
Complete 5 checkpoints
Cover the key themes of freshwater habitats, river restoration, and biodiversity.

Extended Journey
Approximately 1.5 hours
Explore additional checkpoints
Includes Riverside Gallery and the Butterfly Habitat.



Suggested Timing

- Introduction and safety briefing: 10 minutes
- Each checkpoint: 5 to 10 minutes
- Walking between checkpoints: 5 to 10 minutes
- Reflection and wrap-up: 5 minutes

Park Route at a Glance

The whole park is approximately 6 km long and takes about 2 hours to walk in its entirety. Teachers with less time can explore Pond Gardens or River Plains separately, with each area taking about 1 hour.

What to Bring?

Teachers

Route Map



Charged Mobile Phone



First-Aid Supplies



Emergency Contact List



Printed/Digital Activity Sheets



Wet-Weather Plan



What to Bring?

Students

Water Bottle



Hat or Cap



Comfortable Footwear



Insect Repellent



Raincoat or Poncho



Clipboard and Pencil





*Optional Binoculars and Magnifying Glass



Teacher Planning Checklist

Before the visit

- [ ] Select the relevant curriculum outcomes
- [ ] Choose the stops suitable for the class
- [ ] Conduct a teacher recce where possible
- [ ] Check park notices and weather conditions
- [ ] Prepare student groupings and activity sheets
- [ ] Brief students on safe and responsible behaviour
- [ ] Prepare a wet-weather alternative

After the visit

- [ ] Consolidate observations
- [ ] Address questions students could not answer on site
- [ ] Complete the selected follow-up activity
- [ ] Encourage students to reflect on responsible action

DESIGN RECOMMENDATION

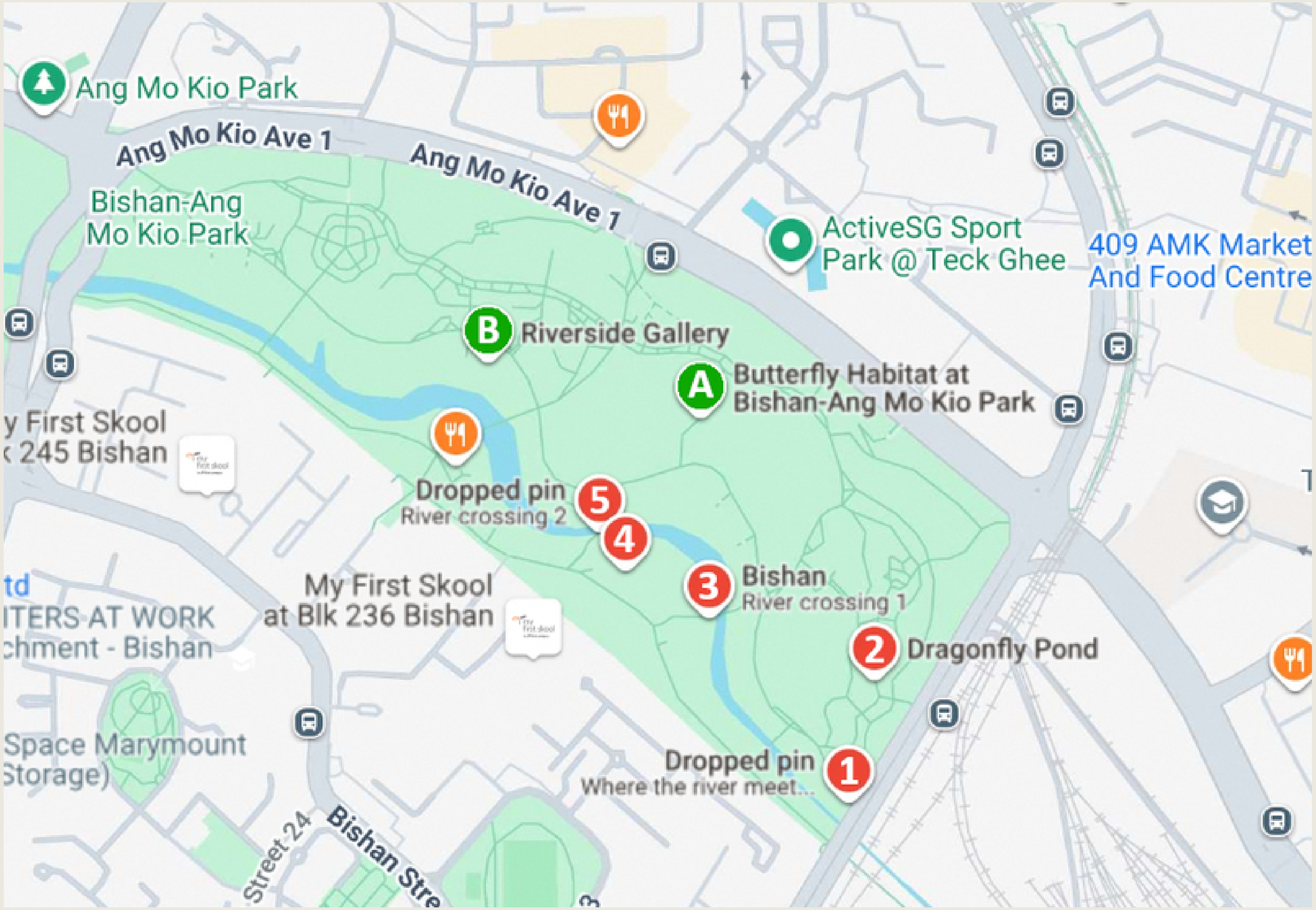
For each location, maintain the same repeating format:

- **Discover**: What is this place?
- **Observe**: What should participants look for?
- **Question**: What should they discuss?
- **Connect**: Which part of the syllabus does it support?

Bishan-Ang Mo Kio Map

1) Junction between concrete drain and the naturalised river
2) Dragonfly pond
3) River Crossing 1
4) Recycle Hill
5) River Crossing 2
A) Butterfly habitat
B) Riverside Gallery

Key:
1, 3, 4: Short journey
1-5: Core journey
1-5, A & B: Extended journey



By the end of the journey, participants should be able to:

- Compare river, pond and floodplain habitats
- Explain how the naturalised river supports flood management and biodiversity
- Identify ways plants and animals are adapted to freshwater environments
- Discuss how parks are designed for people, nature and changing environmental conditions

Themes covered in this learning journey:

Primary Science

- Diversity of living things
- Plant parts and functions
- Plant and animal adaptations
- Habitats and communities
- Food chains and food webs
- Interactions within the environment

Geography

- Rivers and water
- Human impact on water quality
- Sustainable management of water
- Physical and built environments
- Sustainable and liveable cities

Social Studies

- Community use of green spaces
- Considering the needs of different park users
- Balancing different uses of shared spaces
- Community participation and involvement

Secondary Science

- Biotic and abiotic factors
- Adaptations and survival
- Ecosystem interactions
- Biodiversity and environmental change

Character and Citizenship Education (CCE)

- Environmental stewardship
- Caring for shared spaces and nature
- Taking responsibility for one's actions
- Making responsible choices for people and the environment

OVERVIEW OF CONTENT

Checkpoint	Geography	Science	Social Studies	Character & Citizen Education
1) Concrete Drain and Naturalised River	How has the Kallang River changed?	How did naturalisation create habitats?	Why redesign a river?	How can we care for a shared waterway?
2) Dragonfly Pond	How is a pond different from a river?	How are plants and animals adapted to still-water habitats?	How should limited park space be used?	How can we observe and enjoy wildlife responsibly?
3) River Crossing 1	Where does the water flow fastest and slowest?	How do organisms avoid being swept away?	How do everyday actions affect a shared water system?	What should responsible citizenship look like upstream?
4) Recycle Hill	How has the material from the old canal been reused?		How do landmarks preserve stories and create identity?	How can we practise thoughtful consumption?
5) River crossing 2	How do rainfall and floodplains affect river levels?	How can monitoring systems detect environmental change?	How should access and safety be balanced?	How do we enjoy nature mindfully?
A) Butterfly Habitat	How are habitats connected to the wider urban landscape?	Why do butterflies need different plants at different life stages?		What does sustained community care look like?
B) Riverside Gallery	How do people use floodplains?	How do organisms cope with alternating wet and dry conditions?	How should cities design for environmental uncertainty?	

CHECKPOINT 1: CONCRETE DRAIN AND NATURALISED RIVER

At this stop, observe the contrast between the concrete canal and the naturalised Kallang River. Discover how the river has changed over time and how its naturalisation has made Bishan-Ang Mo Kio Park more biodiverse and one of the most beloved parks in Singapore.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
How has the Kallang River changed?

Social Studies:
Why redesign a river?

Science:
How did naturalisation create habitats?

CCE:
How can we care for a shared waterway?

BACK TO MENU

Geography

Checkpoint 1: Concrete Drain and Naturalised River

How has the river changed?

Key teaching points

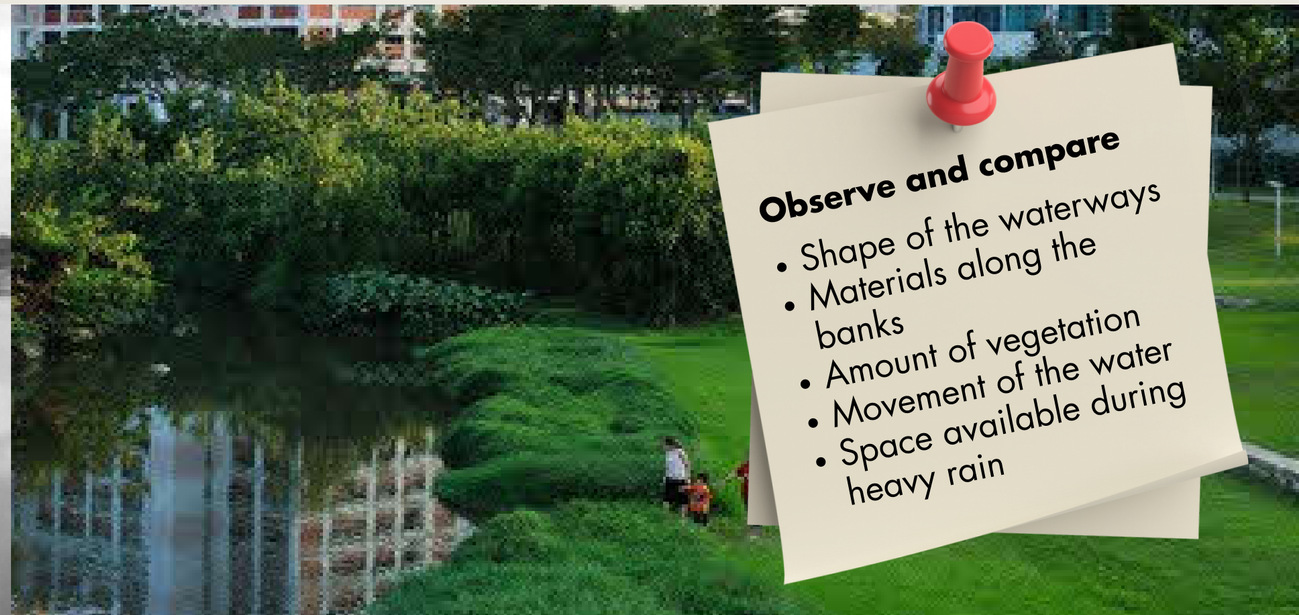
- The Kallang River was previously straightened and channelled to move water efficiently through urban and industrial areas.
- In 2007, NParks and PUB began naturalising the river by replacing concrete banks with soil, rocks and vegetation.
- Bends were added to slow water movement, while a floodplain provided more space for water during heavy rain.
- Today, the naturalised river provides both habitats for biodiversity and is a popular spot for recreation in the heartlands of Singapore.

Geography inquiry questions

- How do the width, materials and shape of the two river sections differ?
- Why might a city build a naturalised waterway instead of a concrete canal?
- How do you think people feel about the change from a concrete canal to a naturalised river?



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Science

Checkpoint 1: Concrete Drain and Naturalised River

How did naturalisation create habitats?

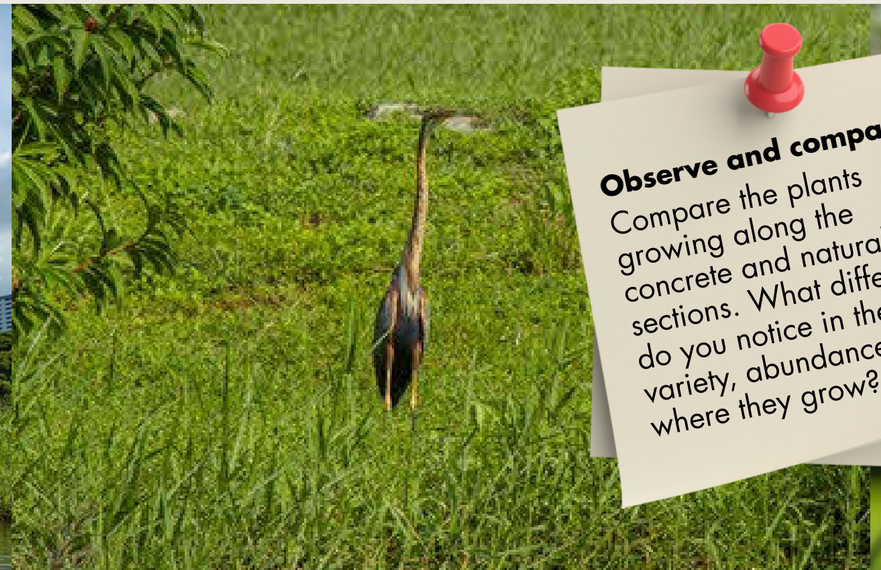
Key teaching points

- Concrete canals tend to be hard to live in as the water can quickly sweep both plants and animals away, with nothing to hide behind or hang on to.
- Rocks, soil and vegetation were added as part of naturalisation to create a more complex habitat, which in turn supported more interactions among plants, animals, and the physical environment, creating more resilient ecosystems.
- Post-naturalisation, many more animals moved into the park. The number of Cichlids in the water increased, which fed larger predators like Grey Herons (*Ardea cinerea*), and eventually even Smooth-Coated Otters (*Lutrogale perspicillata*)!

Science inquiry questions

- How does the diversity of plants help to support more kinds of animals?
- If you were a fish, which section would be better for you to live in and why?
- What do larger predators need to survive and establish in a habitat?





Observe and compare

Compare the plants growing along the concrete and naturalised sections. What differences do you notice in their variety, abundance and where they grow?



Social Studies

Checkpoint 1: Concrete Drain and Naturalised River

Why redesign a river?

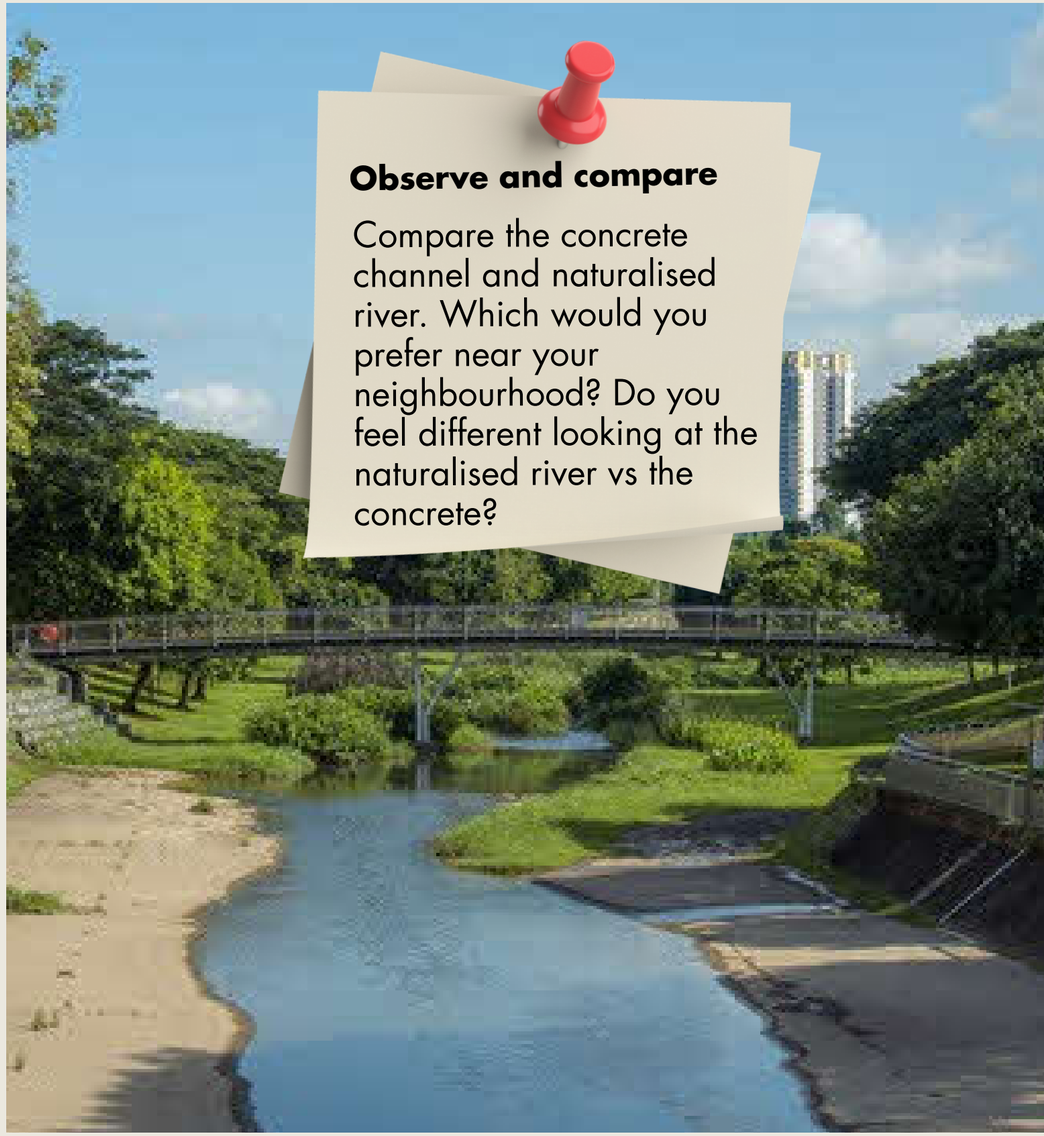
Key teaching points

- The Kallang River has served different purposes over time, with settlements, industry, and warehouses all occupying its banks. It was eventually converted into a concrete canal to channel runoff into the Kallang Basin.
- The canal was naturalised in the early 2000s when the park was revamped. The concrete was removed, and soil, plants and meanders were added back to the river.
- Today, the naturalised river also provides spaces for recreation and supports a wide range of biodiversity.
- Urban waterways must serve several needs at once. Their design has to balance flood management and public safety with recreation, nature and the costs of maintaining the space.
- Different stakeholders may have different priorities. Residents and park users may value how the space makes them feel calm, conservationists may focus on how animals use the space, while planners and engineers must also consider safety and drainage.

Social Studies inquiry questions

Can you think of how other rivers in Singapore were used? Have they also changed over time?

Should more concrete canals in Singapore be naturalised? What benefits or limitations should be considered?



BACK TO MENU

CCE

Checkpoint 1: Concrete Drain and Naturalised River

How can we care for a shared waterway?

Key teaching points

- In the 1970s and 80s, Singapore made great efforts to clean up its polluted waterways, which were heavily impacted by intense industrialisation and farming activity. Debris like abandoned boats and litter had to be removed, and proper sewerage systems were installed to stop further pollution.
- Today, many urban waterways have clean, clear water, and animals have moved back in. Clean water is important to most animals, so having a regular source allows many animals to thrive in urban habitats.

Observe and compare

Observe how people use the river. Which behaviours help or harm the shared space?



DID YOU KNOW?

The Kallang River is the longest river in Singapore! It runs from Pierce Reservoir (on the other side of Bishan-Ang Mo Kio Park) to Nicoll Highway

CCE inquiry questions

- What does responsible behaviour beside a river look like?
- Why do people like having clean and green spaces?
- Do you feel different in a park or along the road? Why or why not?

CHECKPOINT 2: DRAGONFLY POND

Unlike the flowing Kallang River, the Dragonfly Pond is a still freshwater habitat, with minimal water flow and a muddy bottom.
At this stop, students can compare how different water conditions create different habitats, and how plants and animals adapt to live in them. They can also gather inspiration for how they can recreate this habitat in school, and what value it brings to urban spaces.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
How is a pond different from a river?

Social Studies:
How should limited park space be used?

Science:
How are plants and animals adapted to still-water habitats?

CCE:
How can we observe and enjoy wildlife responsibly?

BACK TO MENU

Geography

Checkpoint 2: Dragonfly Pond

How is a pond different from a river?

Key teaching points

- A pond generally contains still or slow-moving water.
- A river has water moving continuously along a channel.
- Water movement affects sediment, vegetation and the types of organisms that can survive.
- Human-made ponds can provide habitat while also contributing to the landscape and visitor experience.

Geography inquiry questions

- What evidence suggests that the water is relatively still?
- Where does mud and silt accumulate?
- What is the source of the pond water? How does the water level change over time?



Science

Checkpoint 2: Dragonfly Pond

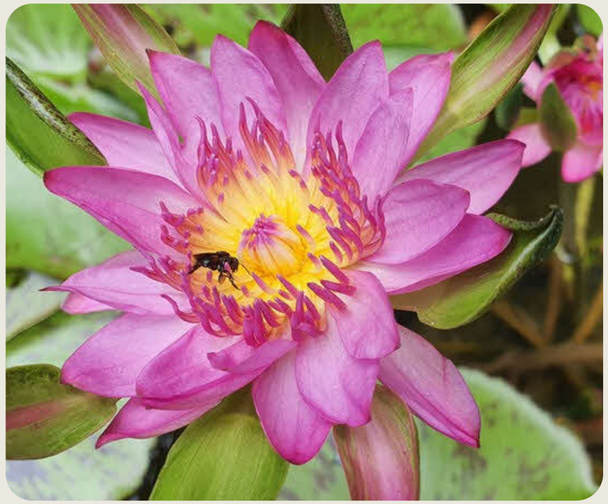
How are plants and animals adapted to still-water habitats?

Key teaching points

- The Dragonfly Pond is an urban freshwater habitat with largely still water and a bottom dominated by mud and silt. It is isolated from the river, making it a distinct habitat.

Plant and Animal Adaptations

- Water Lilies have large leaves that float on the surface of the water. The stems holding the leaves snap easily, which is why the plant grows in still water bodies with no current.
- White-breasted Waterhens (*Amaurornis phoenicurus*) are found near water bodies, where they hunt fish and small insects. Their huge feet distribute their weight, allowing them to walk on lily pads without sinking.
- Dragonflies have aquatic larvae that are carnivorous. They require habitats with slow-moving or still water with plants to hunt in before they metamorphise into adult dragonflies.





Science inquiry questions

- How are ponds different from rivers as a habitat?
- How are plants and animals adapted to living in and around ponds?
- How do animals use plants in the pond habitat?

Observe and compare

- What animals can you observe in or around the pond? Do you see them in areas with no water?

BACK TO MENU

Social Studies

Checkpoint 2: Dragon fly Pond

How should limited park space be used?

Key teaching points

- Land in Singapore is limited, including land within parks.
- A pond may support biodiversity, learning and enjoyment.
- An open lawn or recreational facility might serve other community needs.
- Choosing one use can mean giving up some benefits of another use.

Decision-making scenario

The pond can be retained, converted into an open lawn or replaced with a recreational facility. Which option would you recommend?

Students should consider:

- Who benefits?
- What could be lost?
- Can there be compromises?
- What evidence supports the recommendation?



BACK TO MENU

CCE

Checkpoint 2: Dragonfly Pond

How can we observe and enjoy wildlife responsibly?

Key teaching points

- Observe wildlife quietly and from a suitable distance.
- Avoid catching animals, plucking plants or entering the pond.
- Patience often leads to better wildlife observations.
- Respectful observation protects animals and allows other visitors to enjoy them.

CCE inquiry questions

- How do loud noises affect wildlife?
- What should we do if an animal moves away or towards us?
- How do I feel while watching wildlife?



CHECKPOINT 3: RIVER CROSSING 1

Rivers are bodies of continuously moving freshwater. Unlike organisms in a pond, plants and animals living in a river must be able to survive the current. Although some parts of the river flow more slowly, the water in the middle generally moves faster. Plants and calmer pockets of water provide places where smaller animals can avoid being swept away.
Students will learn about how the river flows, and consider how their actions can have a large and unseen impact.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
Where does the water flow fastest and slowest?

Social Studies:
How do everyday actions affect a shared water system?

Science:
How do organisms avoid being swept away?

CCE:
What should responsible citizenship look like upstream?

BACK TO MENU

Geography

Checkpoint 3: River Crossing 1

Where does the water flow fastest and slowest?

Key teaching points

- River water flows at different speeds, generally faster in the middle and slower near the riverbank.
- By observing and comparing different parts of the river, students can explore how water flow varies and affects the river environment.
- Faster-moving water can contribute to erosion along the riverbank.
- Plants such as Taro (*Colocasia esculenta*), Alligator Flag (*Thalia geniculata*) and Crepe Ginger (*Cheilocostus speciosus*) have strong roots that anchor them when water levels rise and currents become stronger.

Geography inquiry questions

- How does water from the surrounding urban areas enter the Kallang River?
- What features along the river show that it receives runoff from nearby areas?
- Where does the water appear fastest?



BACK TO MENU

Science

Checkpoint 3: River Crossing 1

How do organisms avoid being swept away?

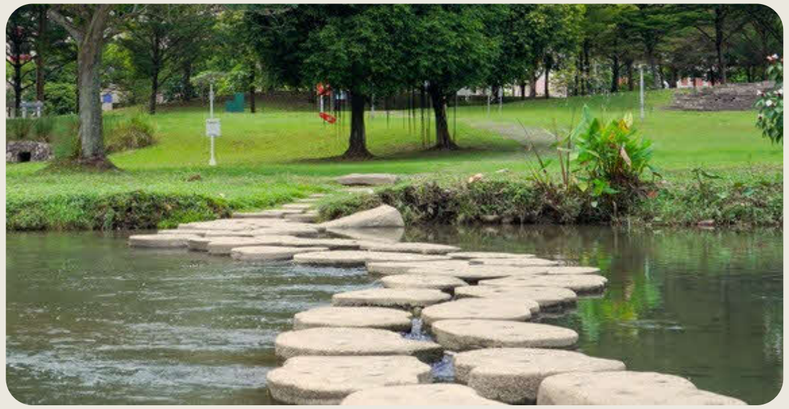
Key teaching points

- River organisms must be adapted to survive in flowing water.
- Larger and stronger animals, like Monitor Lizards, can swim against the current.
- Smaller animals, such as dragonfly larvae, need plants or pockets of calm water to hold on to.
- Plants provide shelter and prevent animals from being swept away, allowing planted water bodies to support more life.
- Plants like Taro (*Colocasia esculenta*), Alligator Flag (*Thalia geniculata*) and Crepe Ginger (*Cheilocostus speciosus*) along the embankment need strong roots and stems to endure currents and floods.

Science inquiry questions

- How do plants help animals survive in moving water?
- Why would plants like Water Lilies survive better in a pond than in a river?
- Would it better for a big fish to be in a small pond or a large river?







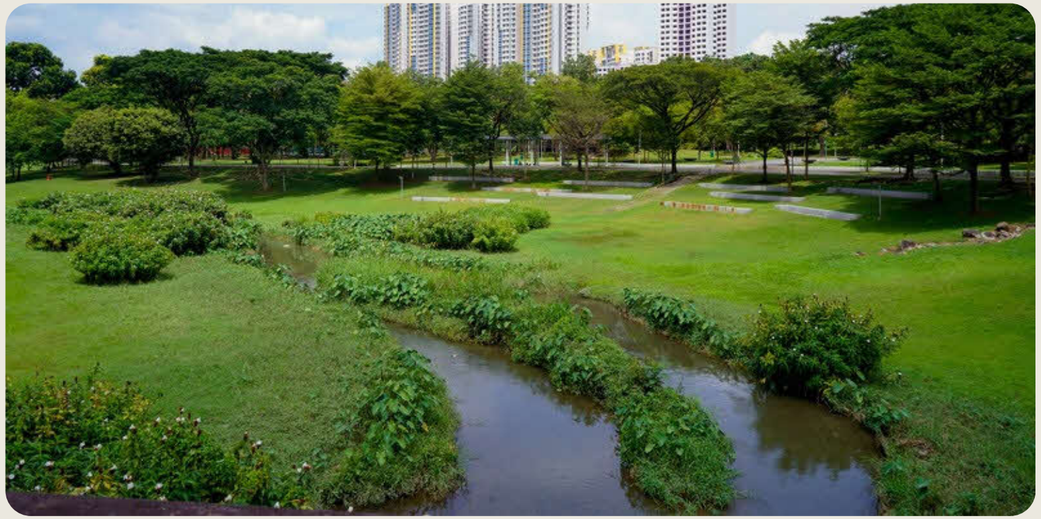
Social Studies

Checkpoint 3: River Crossing 1

How do everyday actions affect a shared water system?

Key teaching points

- Runoff can transport litter, sediment and pollutants into rivers.
- Pollution affects downstream environments and communities.
- Waterway management involves individuals, businesses and public agencies.
- Responsible citizens can avoid littering, participate in clean-ups and report suspicious discharge.



Source-based discussion

Ask students what each observation might indicate and what a responsible response would be.

Present three hypothetical observations:

- Clear water after a dry week
- Plastic waste near an outlet
- Coloured water with an unusual smell



BACK TO MENU

CCE

Checkpoint 3: River Crossing 1

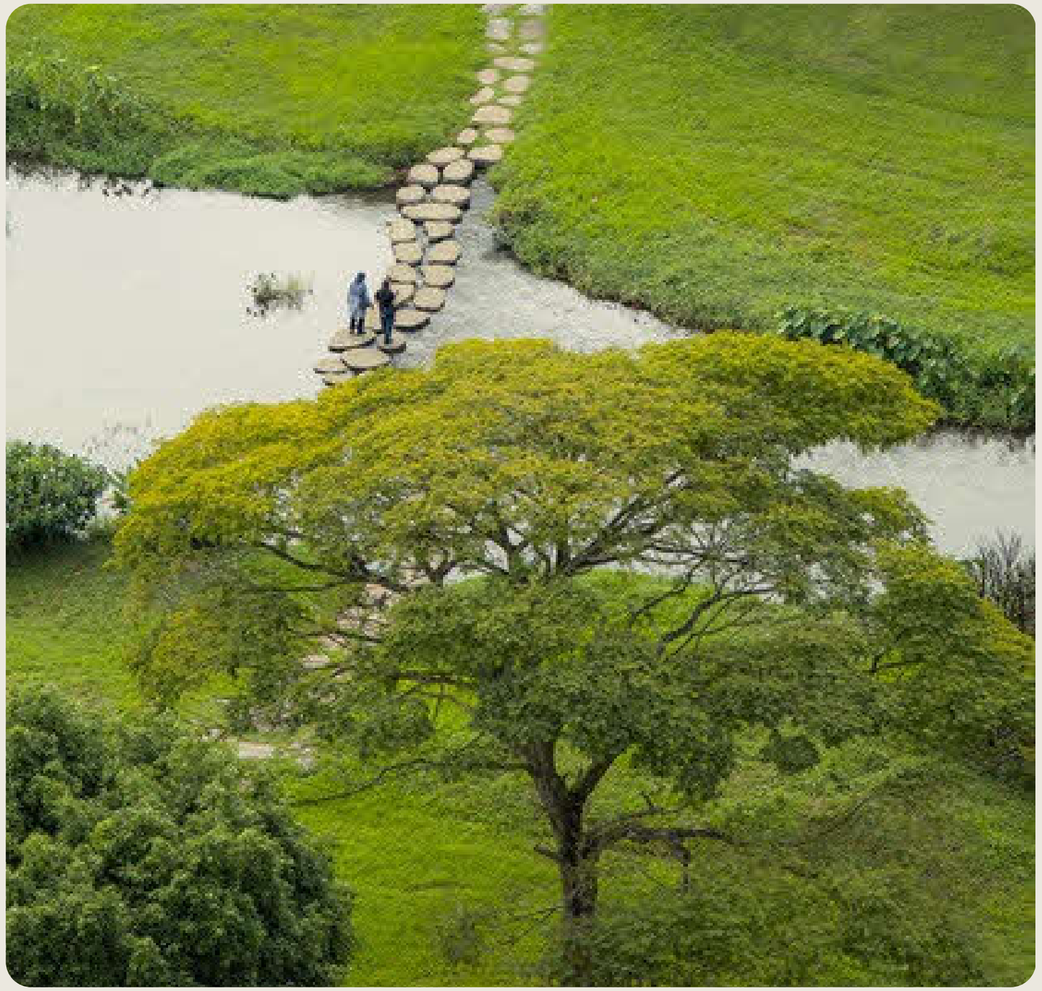
What should responsible citizenship look like upstream?

Key teaching points

- Actions taken far from the river can still affect it through the drainage system.
- Responsible behaviour includes thinking about consequences beyond one's immediate surroundings.
- Caring for waterways is both an individual and collective responsibility.

CCE inquiry questions

- Who may be affected by litter entering a drain?
- Why should we act responsibly even when nobody is watching?



CHECKPOINT 4: RECYCLE HILL

Recycle Hill is made using concrete slabs salvaged from the old Kallang canal, which can be seen on the steps and at the top of the hill. These materials give a new purpose to part of the river's past.

The hill now serves as a landmark and lookout point within the park, while reminding visitors of how different the river used to be. It also shows how stories and history can contribute to placemaking and make places more meaningful.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:

How has the material from the old canal been reused?

Social Studies:

How do landmarks preserve stories and create identity?

CCE:

How can we practice thoughtful consumption?

BACK TO MENU

Geography

Checkpoint 4: Recycle Hill

How has the material from the old canal been reused?

Key teaching points

- A landmark helps people recognise, remember and navigate a place.
- Elevated land provides a different view of the surrounding landscape.
- Reusing elements from the old canal preserves a visible connection with the site's past.
- Placemaking combines physical design, meaning and community experience.

Geography inquiry questions

- What can you see from the top that is not visible below?
- How does the hill help visitors understand the park?
- Would the place feel different without this feature?



BACK TO MENU

Social Studies

Checkpoint 4: Recycle Hill

How do landmarks preserve stories and create identity?

Key teaching points

- Physical features can preserve memories of how a place once looked and functioned.
- Heritage is not limited to old buildings. It can include landscapes, materials, activities and community memories.
- Public spaces become more meaningful when people understand their stories.



Source-based discussion

Should every old structure be removed when a place is redeveloped?

Consider:

- Safety
- Cost
- Historical meaning
- Environmental impact
- Future community needs

BACK TO MENU

CCE

Checkpoint 4: Recycle Hill

How can we practice thoughtful consumption?

Key teaching points

- Before discarding something, consider whether it can be repaired, repurposed or reused.
- Responsible consumption involves considering the resources and energy used to produce an item.
- Creative reuse can give old materials a new purpose and story.

CCE inquiry questions

Ask students to identify one discarded school item that could be:

- Reused for the same purpose
- Repurposed for a new purpose
- Recycled only if reuse is unsuitable



CHECKPOINT 5: RIVER CROSSING 2

Bishan-Ang Mo Kio Park is one of the few places where visitors can get up close with a river. Water levels can range from around 30 cm during the dry season to 3 m during torrential rain.
Interacting with the river itself encourages biophilia, while a river monitoring system, warning signs, red markers and life buoys help to keep visitors safe.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
How does rainfall and floodplains affect water levels?

Social Studies:
How should access and safety be balanced?

Science:
How do changing water levels affect plants and animals?

CCE:
How do we enjoy nature mindfully?

BACK TO MENU

Geography

Checkpoint 5: River Crossing 2

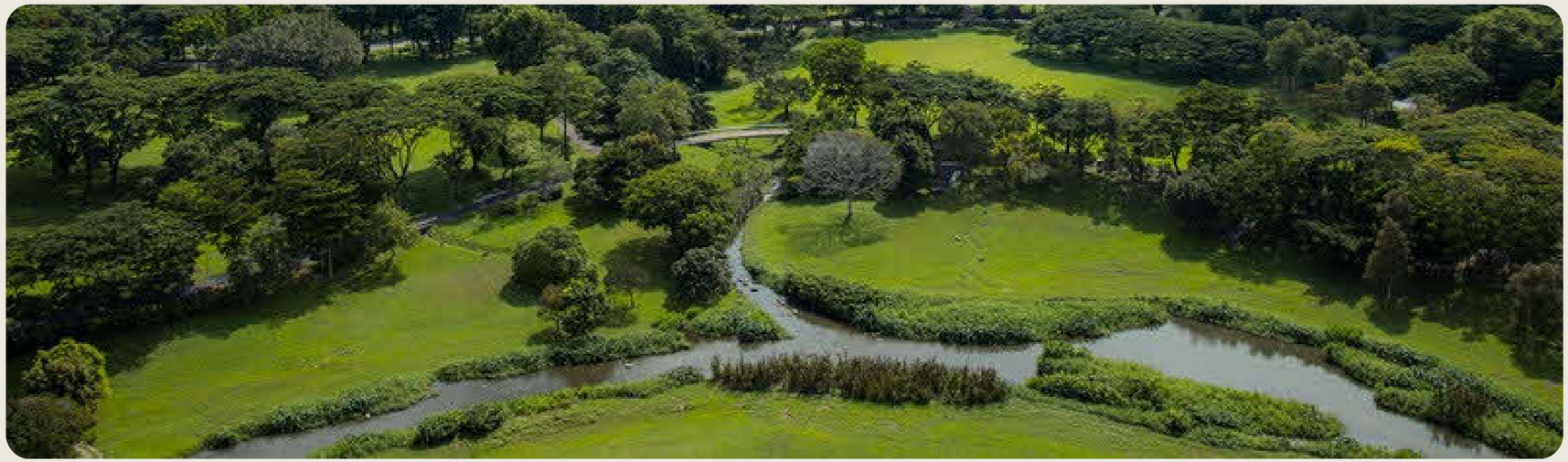
How do rainfall and floodplains affect river levels?

Key teaching points

- Rainfall during the monsoon can cause river levels to rise quickly.
- A floodplain provides additional space for water to spread temporarily.
- By holding the additional water, floods are prevented in the more urban areas downstream.
- Weather, upstream runoff and channel capacity all influence flood risk.

Geography inquiry questions

- What signs show that the river may occupy a wider area during heavy rain?
- Why would the water level rise even if it is not raining directly overhead?
- How does the floodplain reduce pressure on the main channel?



Observe

- Identify the current water level and look for evidence of where higher water may have reached previously.

BACK TO MENU

Science

Checkpoint 5: River Crossing 2

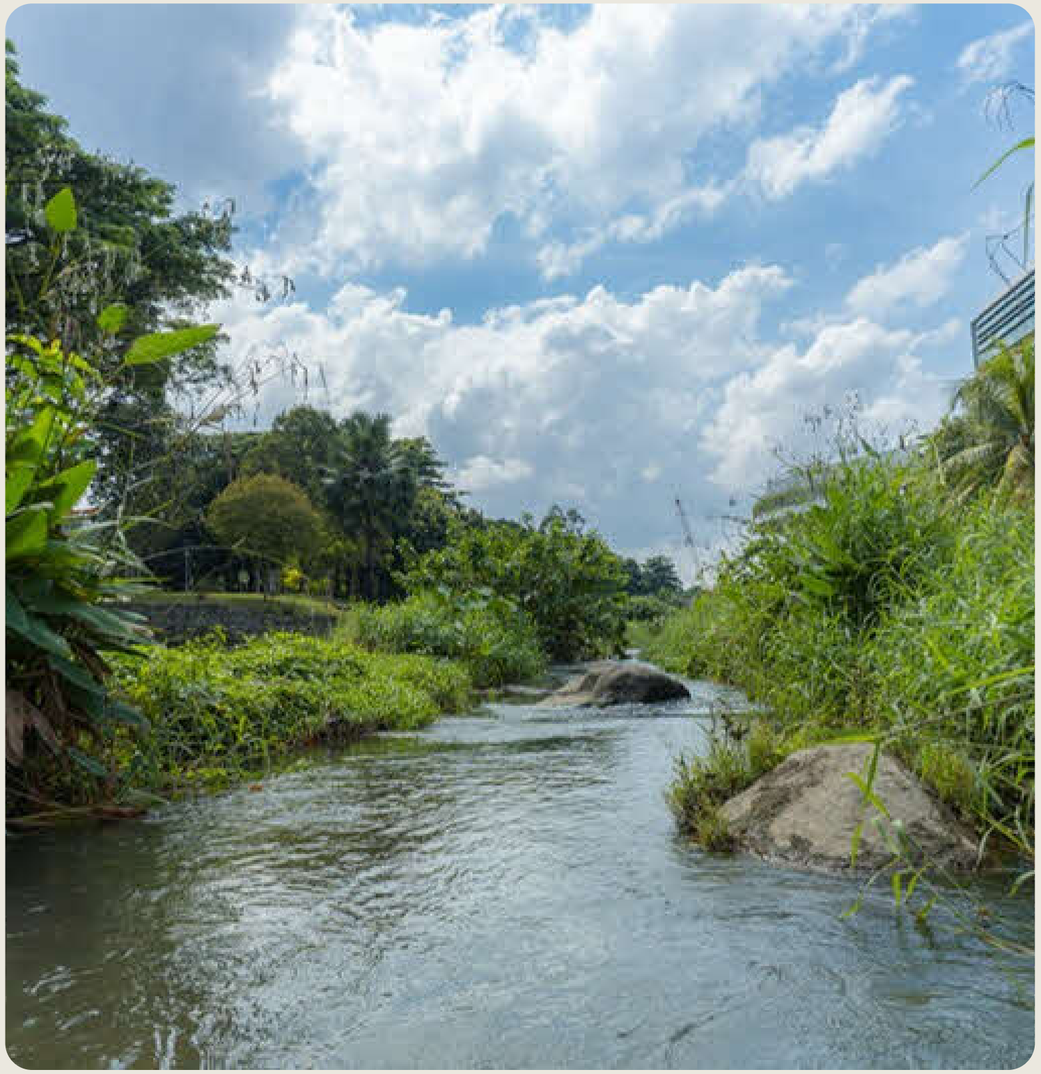
How do changing water levels affect plants and animals?

Key teaching points

- River conditions change with rainfall, with water levels rising from around 30 cm in dry conditions to 3 m during torrential rain. Sometimes the water level can stay at 3 m for a few days during the rainy season!
- Plants along the riverbank can survive being submerged for some time.
- Some of them like Kang Kong (*Ipomoea aquatica*) will have stems that break off and regrow downstream. Many of the plants like the Sea Hibiscus (*Hibiscus tiliaceus*) have seeds that float, and rely on flowing water to disperse their seeds.
- Aquatic animals like Cichlids and Dragonfly larvae will sometimes get swept downstream. If conditions are good, they will establish a new population. This is also a form of dispersal!

Science inquiry questions

- How does heavy rainfall change the water level and flow of the river?
- Do plants at the riverbank count as submerged or emersed? Why?
- Can you think of another habitat that has regularly changing water levels?



BACK TO MENU

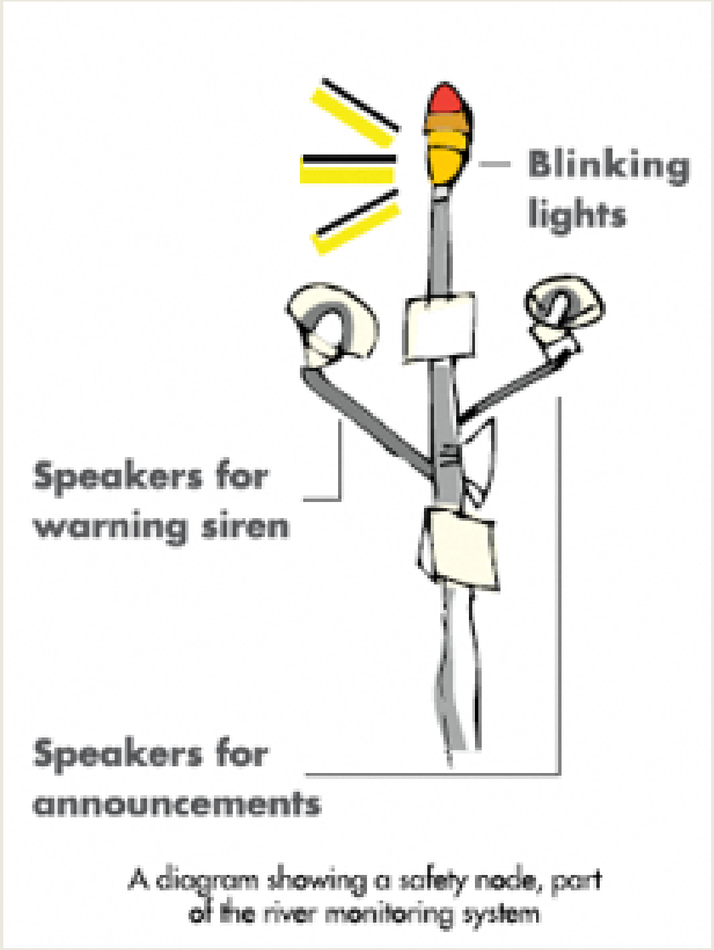
Social Studies

Checkpoint 5: River Crossing 2

How should access and safety be balanced?

Key teaching points

- The river can be dangerous when water levels rise. Fast-moving water can sweep animals, plants, and people away!
- Close access to the river can support recreation, learning and connection with nature.
- To keep park users safe, there is a river monitoring system that will sound alarms in the event of impending rain and rising water levels. Warning signs, red markers and life buoys can also be found across the river.
- Designing public spaces involves balancing freedom, benefit, risk, and responsibility.



A diagram showing a safety node, part of the river monitoring system

Source-based discussion

Do you think it is a good idea to be able to interact with the river? Why or why not?

- Position A: Greater access helps people appreciate nature.
- Position B: The river is dangerous when it floods. Access should be restricted for safety.
- Position C: Conditional access is suitable when monitoring and warnings are present.

BACK TO MENU

CCE

Checkpoint 5: River Crossing 2

How do we enjoy nature responsibly?

Key teaching points

- Follow warning signs even when the river appears safe.
- Leave the river immediately when alarms sound or conditions change.
- Do not encourage risky behaviour for photographs or entertainment.
- Help younger students or vulnerable users move to safety.

What would you do ?

A friend says, “The water is still low, so we can stay.”

How would you respond if you knew that water levels can rise quickly during heavy rain? What signs or warnings would you look out for?



CHECKPOINT A: BUTTERFLY HABITAT

The Butterfly Habitat is a butterfly garden planted and managed by Friends of Bishan-Ang Mo Kio Park, a volunteer group that works with NParks to care for the park. The garden features caterpillar host plants and nectar-providing plants, supporting butterflies at different stages of their life cycle. It can also provide inspiration for creating habitat gardens in schools.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
How are habitats connected to a wider urban landscape?

Science:
Why do butterflies need different plants at different life stages?

CCE:
What does sustained community care look like?

BACK TO MENU

Geography

Checkpoint A: Butterfly Habitat

How are habitats connected to a wider urban landscape?

Key teaching points

- Designing a space specifically to help wildlife is called Habitat Enhancement. This can include growing specific plants, or installing structures to support animals.
- Butterflies must move between places to find food, shelter and suitable host plants.
- Roads, buildings and large open areas may affect movement.
- Gardens, parks, and nature ways function as stepping stones across an urban landscape by providing food and shelter for target species.

Geography inquiry questions

- How are butterflies affected by the urban environment?
- What do animals need in their environment to move between spaces?
- Can you think of how this landscape was designed to teach people about butterflies?



Science

Checkpoint A: Butterfly Habitat

Why do butterflies need different plants at different life stages?

Key teaching points

- Caterpillars feed on the leaves of particular host plants.
- Adult butterflies drink nectar from flowers.
- Butterfly gardens need a good mix of host and nectar plants to support both caterpillars and adult butterflies. Dense planting is also important for insects to hide from predators like birds or lizards.
- Butterflies are a popular subject for citizen science. Counting them helps us know what environments they prefer, whether their numbers change over seasons, and how many species are present.

Science inquiry questions

- Are there other animals that can use this habitat?
- Can you have a butterfly garden without caterpillars?
- Can you spot any host plants that also provide nectar? Can a tree be a host or nectar plant?



BACK TO MENU

CCE

Checkpoint A: Butterfly Habitat

What does sustained community care look like?

Key teaching points

- Public spaces can be supported through partnerships among agencies, volunteers and park users.
- Volunteers may contribute through planting, maintenance, citizen science, and public engagement.
- Community projects involve patience, cooperation and learning from setbacks.
- Sustained participation can strengthen people's sense of belonging and collective ownership.

CCE inquiry questions

- Why would people volunteer to care for a public garden?
- What support would volunteers need, and which responsibilities should remain with trained professionals?
- How should a team divide the work fairly and respond when the garden does not develop as expected?



CHECKPOINT B: RIVERSIDE GALLERY

The floodplain alongside the Kallang River increases the river's capacity while creating a habitat that shifts between wet and dry conditions. These changes allow students to explore how organisms adapt to their environment, and how floodplains and river bends influence water flow and habitats.

Explore this location through different subject lenses. Click on a subject to continue.

Geography:
How do people use floodplains?

Social Studies:
How should access and safety be balanced?

Science:
How do organisms cope with alternating wet and dry conditions?

BACK TO MENU

Geography

Checkpoint B: Riverside Gallery

How do people use floodplains?

Key teaching points

- A floodplain is low-lying land beside a river that may be covered with water when the river floods.
- The floodplain soil tends to be fertile as the river deposits sediments during floods
- Water-loving plants grow quickly along the banks and the floodplain, making it a unique and diverse habitat for animals, and valuable farming land for people

Geography inquiry questions

- Which areas appear most likely to flood first?
- Can you name some famous rivers with floodplains used for cultivation?
- What would happen if buildings occupied the entire floodplain?



BACK TO MENU

Science

Checkpoint B: Riverside Gallery

How do organisms cope with alternating wet and dry conditions?

Key teaching points

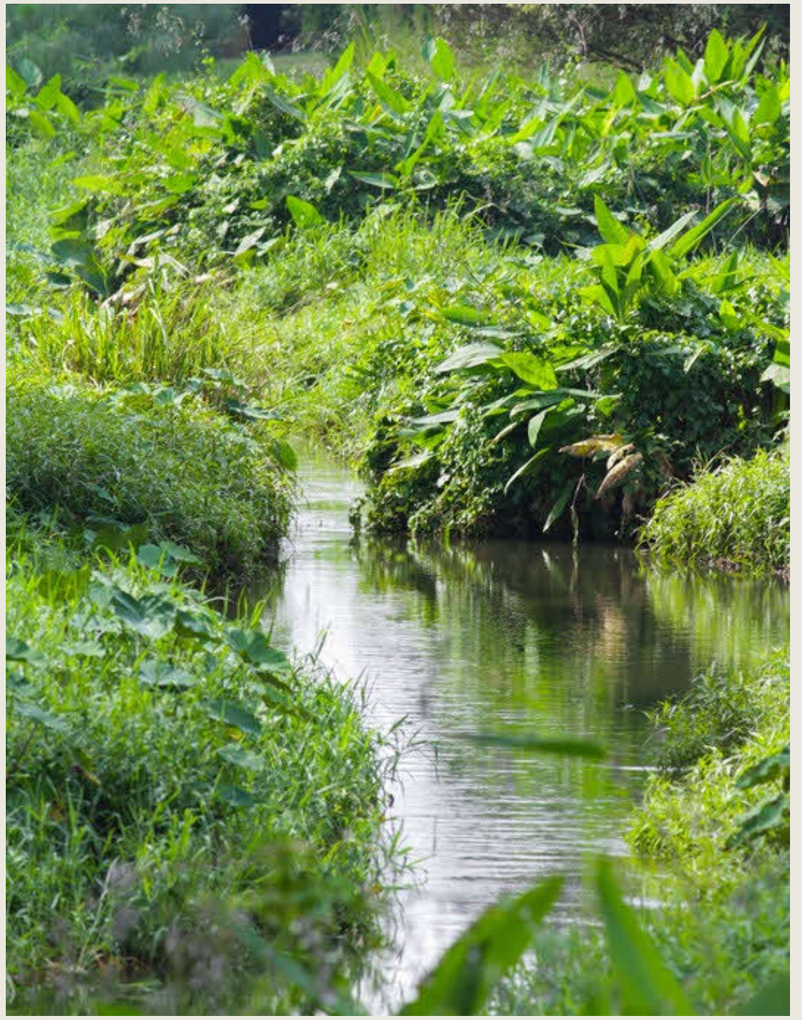
- Animals and plants along the floodplain need to survive being submerged in the wet season, and exposed in the dry season. Puddles are also left on the floodplain as the water recedes.
- Puddles can provide breeding or feeding opportunities to animals that can move between pools of water and the main river.
- Puddles may also dry out, so organisms must adapt to survive. Examples include Common Snakeheads (*Channa striata),* a fish that can breathe air and drag itself across land to move between water bodies, and Painted Chorus frogs (*Microhyla butleri*), which rely on puddles as tadpoles, and are able to move on land as adults.

Science inquiry questions

- Name some animals that spend only part of their life cycle in the water. Did you see them in the park?

- Are the plants on the floodplain the same as the plants in the rest of the park?

- Is there another fish in the mangrove habitat that can move between bodies of water? What is it called?



BACK TO MENU

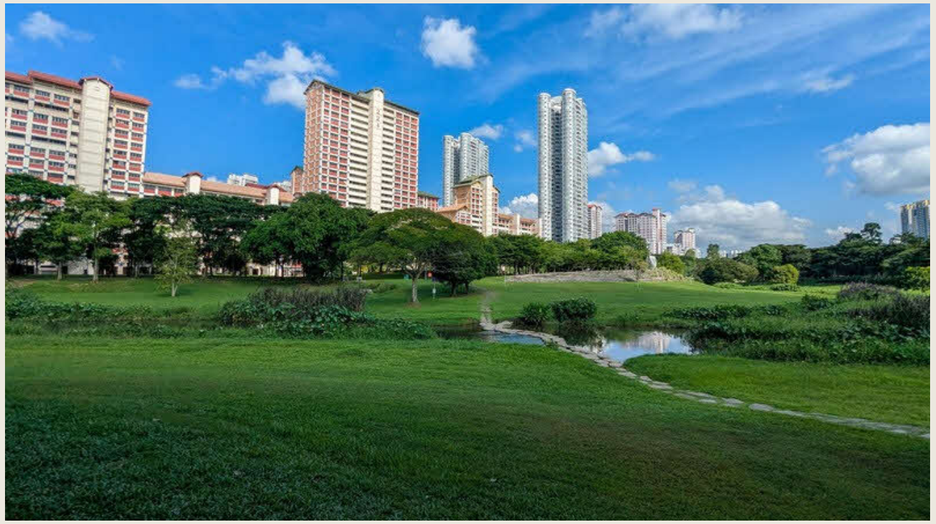
Social Studies

Checkpoint B: Riverside Gallery

How should cities design for environmental uncertainty?

Key teaching points

- Cities must prepare for changing weather and environmental conditions.
- Resilient design can serve more than one purpose, such as water management, biodiversity and recreation.
- A design may provide everyday benefits while remaining ready for less frequent extreme events.



Source-based discussion

Can you explain how Bishan-Ang Mo Kio Park helps manage the effect of climate change on the surrounding housing estates?

- Absorbing runoff and rainfall
- Reducing the Urban Heat Island Effect
- As a carbon sink
- As a refuge for biodiversity

Reflection

- What helps communities adapt to unexpected situations?
- What practices help students respond constructively to change?
- How can we bring the benefits of greenery to more urban spaces?

ANNEX: COMMON PLANT SPECIES



The plants listed here are adapted to growing in freshwater habitats. In addition to providing food and shelter for animals, they also prevent soil erosion and help to absorb nutrients from the water, keeping it clean.

Click on the plant to learn more.

Water Lily
(*Nymphea* sp.)



Crepe Ginger
(*Cheilocostus speciosus*)



Alligator Flag
(*Thalia geniculata*)



Taro
(*Colocasia esculenta*)



Sea Hibiscus
(*Hibiscus tiliaceus*)



Kangkong
(*Ipomoea aquatica*)



Photo Credits: Shi Biying (Water Lily), Vicky Lim (Crepe Ginger), Jennie Tang (Alligator Flag, Kang Kong), Jacqueline Chua (Taro, Sea Hibiscus)

ANNEX: COMMON FRESHWATER SPECIES



Bishan-Ang Mo Kio Park is home to a wide variety of animals that hunt, live, and breed in freshwater. See if you can spot them in the pond, river, or floodplain!

Click on the animal to learn more.

Common Parasol
(*Neurothemis fluctuans*)



White-breasted Waterhen
(*Amaurornis phoenicurus*)



Malayan Water Monitor
(*Varanus salvator*)



Grey Heron
(*Ardea cinerea*)



Cichlid*
(family Cichlidae)



*no page available yet

Smooth-coated Otter
(*Lutrogale perspicillata*)



Photo Credits: Ganesh (Smooth-coated Otter) Jacqueline Chua (All other animals)

ANNEX: COMMON URBAN SPECIES



The animals are generally found in parks and green spaces throughout Singapore.
How many have you seen before?

Click on the animal to learn more.

Plantain Squirrel
(*Callosciurus notatus*)



Plain Tiger
(*Danaus chrysippus chrysippus*)



Tawny Coster
(*Acraea terpsicore*)



Ornate Sunbird
(*Cinnyris ornatus*)



Broad-handed Carpenter Bee
(*Xylocopa latipes*)



Changable Lizard
(*Calotes versicolor*)



Photo Credits: Flora & Fauna Web (Tawny Coster) Jacqueline Chua (All other animals)

Resources

Additional references and materials to enhance your self-guided tours

- Bishan-Ang Mo Kio Park
- NParks Learning Resources
- BiodiversitySG
- NParks Learning Videos
- NParks Publications and Resources
    a. Research on Biophilia
    b. Handbook on Habitat Restoration

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