

Wetland Footprints

Learning Activity Resource Package
Education Bureau
Teacher's Guide



Education Bureau



Agriculture, Fisheries and
Conservation Department

VII Activity Plans

A. Life Zone

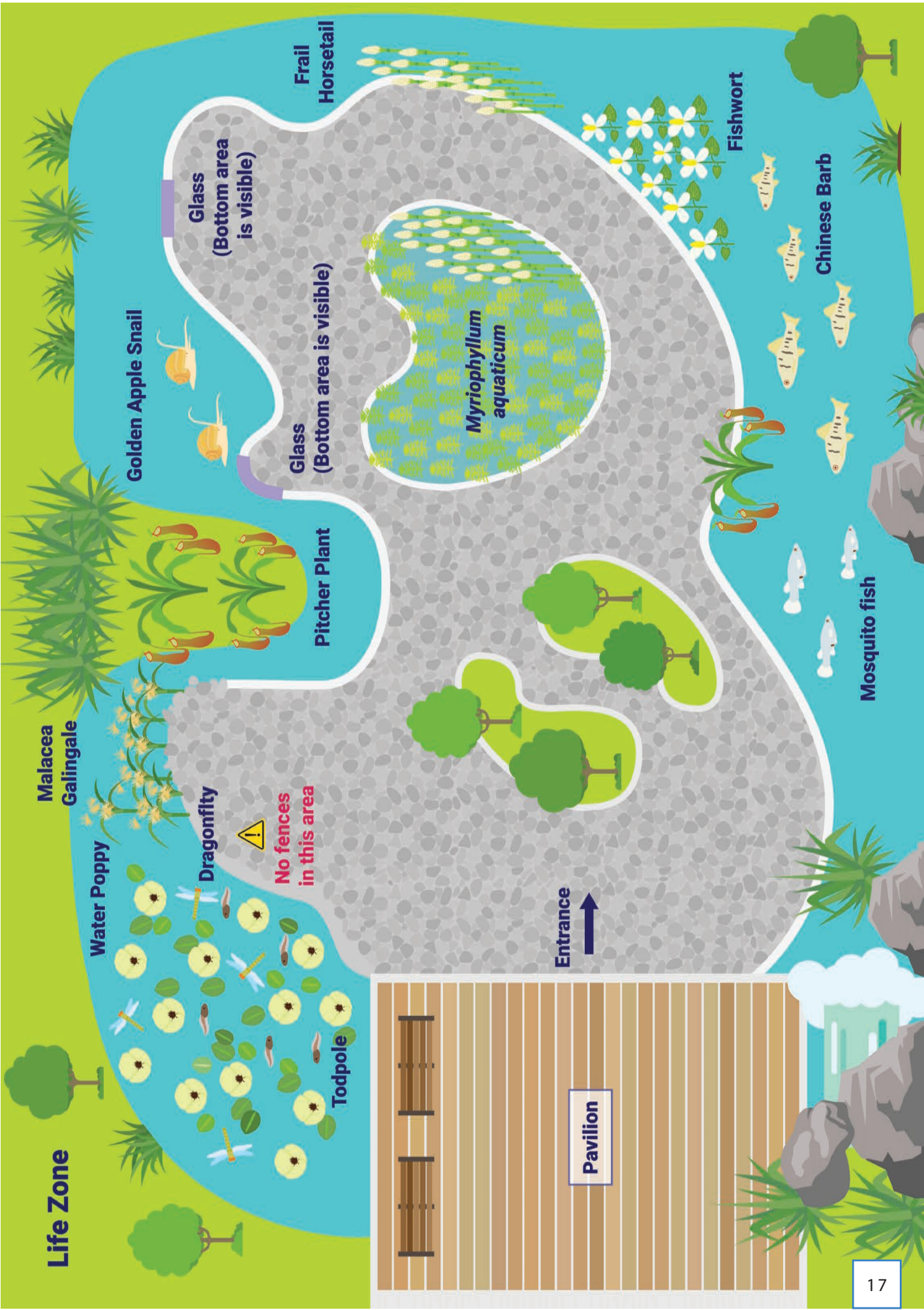
Activities “Who Lives Here” and “Underwater Friends” can be conducted in this area.

Area Introduction	<ul style="list-style-type: none"> • Pond is a kind of wetlands. Life Zone simulates a pond habitat, with shallow water and the bottom usually covered with soil. • Over 100 species of aquatic plants grow in the Hong Kong Wetland Park. These plants are distributed in different living environments according to their living habits. Several special aquatic plants can be found in the Life Zone such as Frail Horsetail, <i>Myriophyllum aquaticum</i>, Malacea Galingale, Water Poppy, Water Shamrock, and Small Yellow Bladderwort, etc. Ring-shaped ponds are home to many different kinds of small aquatic animals, the most common ones are Golden Apple Snails (invasive alien species), dragonflies, damselflies, Water Skater, tadpoles and different freshwater fish such as Chinese Bard, Mosquito fish, etc. Sunlight can penetrate directly to the bottom of the pond, allowing aquatic plants to conduct photosynthesis to produce nutrients. This provides comfortable habitats and food for small animals living therein. • In addition to aquatic plants, herbs are also planted, such as Fishwort and Pitcher Plant. The unique appearance of these plants can easily arouse children’s interest in learning and curiosity about nature.
Safety Precautions	<ul style="list-style-type: none"> • Teachers should remind children to give due regard to safety when approaching the water’s edge without fences. • When doing observation near the water’s edge, let children squat down side by side and remind them to observe order so as to avoid accidents. • Beware of uneven and slippery ground.
Design Rationale	<ul style="list-style-type: none"> • Make good use of resources from the Hong Kong Wetland Park and encourage children to freely explore the surrounding environment in the Life Zone. Teachers should make good use of children’s learning characteristics like their curiosity, love of questioning and exploratory spirits as a bridge to arouse their interest in exploring nature through stories, questions and games, and learn to use their senses and tools to explore the surroundings. • In the first activity “Who Lives Here”, children can get to know the wetland plants and their relationship with our daily lives, as well as to learn how to protect the environment through discussions and sharing. • In the second activity “Underwater Friends”, children can observe small aquatic animals from different angles, for example, from the water surface or through the transparent glass at the side of the pond. Children can also have an opportunity to use assisting tools to get a closer look at the underwater environment. Through discussions and sharing, children can get to know the small aquatic animals in wetlands and their relationship with our daily lives, as well as the relationships among small aquatic animals, plants and water, so that children can learn how to treasure water resources.

Teaching Skills

- “Plants” are often encountered in children’s daily lives and commonly used as a theme in the curriculum. Therefore, children have the basic knowledge of plants to certain extent and teachers can arrange the visits as appropriate.
- Prior to the activity, teachers should introduce the Hong Kong Wetland Park and the highlights of Life Zone to children.
- If children discover small aquatic animals during the first activity “Who Lives Here”:
 - Option 1- follow up immediately because the Hong Kong Wetland Park has a lot of scenery and children easily forget what they just saw.
 - Option 2- teacher can flexibly jump to the activity “Underwater Friends” if children are generally more interested in exploring small aquatic animals.
- If “Underwater Friends” is adopted as the first activity, teachers should introduce the Paper Puppet “Dragonfly Dow” before kicking off the activity.
- In the Life Zone, apart from the small aquatic animals to be mainly explored in this activity, children may discover some common wetland insects such as dragonflies, damselflies, butterflies and bees, etc. Teachers may refer to the Teacher’s Supplementary Information Booklet and randomly introduce them. Teachers can also search for related information on the Internet.
- Teachers should allow each group of children to freely decide the quantity of small aquatic animals to be found according to time and progress of activity.
- If various sounds are heard, such as birds singing, cicadas chirping, dragonflies buzzing, etc., teachers can discuss with children about who Dow’s friends are, or conduct discussion and exploration according to children’s interests.
- As a supplementary measure and for reference only, all of the reference questions for teachers do not have “model answers” and can be adapted according to children’s ability.
- Teachers can trim down the activity content according to children’s performance and context.
- According to actual situations and children’s interests, teachers may conduct extended activities at school.





Activity 2: Underwater Friends

Proposed Class Level	K1
Name of Area	Life Zone
Proposed Number of Participants	6 people in a group
Duration	Around 30 minutes
Teaching Aids/ Materials	Prepared by teachers: <ul style="list-style-type: none"> Paper Puppet “Dragonfly Dow” (Appendix 1)
Children’s Developmental Characteristics 3-4 years old	<ul style="list-style-type: none"> Show curiosity about surroundings, able to learn through various senses, enjoy exploration and hands-on experience Start developing the ability to distinguish the differences in appearances of objects
Proposed Learning Objectives	<p>[Knowledge] Children are able to briefly know various small aquatic animals</p> <p>[Skill] Children are able to use their sense of sight to observe the appearance and characteristics of small aquatic animals</p> <p>[Attitude] Children are able to care for small aquatic animals</p>
Focus of Activity	Enable children to use sense of sight to observe, explore and get to know the ecosystem in water in order to arouse their interest, so as to nurture their care for various small aquatic animals.
Proposed Activity Plan (Procedures)	<p>Introduction</p> <ul style="list-style-type: none"> Teacher continues to use the Paper Puppet “Dragonfly Dow” to accompany children to visit other friends in the Life Zone. Dow guides children to get near the pond for exploration and observe the small aquatic animals. It says, “I have some good friends living in the water, do you know what small aquatic animals are? Their talent is swimming. Have you seen insects before? I am an insect and my babies live in water, too. Now I would like to give you a small task, help me find my aquatic friends. Can you guess who they are? Please look for them quietly because my friends and babies are extremely afraid of noise. They would run away if they hear sounds.

Proposed Activity Process

Plan (Procedures)

- In the course of exploration, teacher should remind children of the following codes to help them understand the methods of protecting small aquatic animals and pay attention to safety:
 - ▶ Speak softly
Reason: Small aquatic animals will be disturbed.
 - ▶ Do not touch or capture the small aquatic animals
Reason: That will cause harm to small aquatic animals.
 - ▶ Keep your mouth away from pond water
Reason: Pond water may contain a lot of germs.
 - ▶ Do not go into the pond
Reason: The small aquatic animals need clean water source. They would not be able to survive if the water was polluted. It is also very dangerous for children to play in the pond as they may get drowned.
- Children can start performing the small task of looking for the friends in Life Zone freely after understanding the codes.
- Based on the children's responses, teacher can make use of the "Reference Questions for Teachers" in this activity to encourage children to look for small animals from water's edge, surface, or other places in the area, as well as encourage them to proactively share their observation findings and feelings, and raise questions.

Conclusion (Sharing)

- Teacher leads children to the pavilion and let them share how they discovered the small animals.
- Invite children to give a brief account of the living environment of small aquatic animals. For example: there are aquatic plants, clean water, and soil, etc. Teacher highlights that plants can provide food to small animals and clean water source enables them to live healthily, so we must protect nature. And some small aquatic animals are very useful to human beings. For example, Dragonfly Dow is a carnivorous insect which catches mosquitoes, flies and aphids for food. Therefore, it plays an important role in maintaining the ecological balance.
- Finally, teacher invites children to talk about how they protected the small aquatic animals and kept the pond water clean during the activity. (Children answer freely) Teacher praises them.
 - ▶ Speak softly
 - ▶ Do not touch or capture the small aquatic animals
 - ▶ Do not pollute the pond water by throwing rubbish into it

Possible Adjustments

Small animals are too small in size that children may have difficulty in focusing on observation. Teachers can use interesting methods or simple hints to guide the children to observe, such as for the appearances of small animals, children can look at the animals' body, colour, eyes, ears, mouth, nose, etc. For living habits, children can observe their feeding, walking and sleeping habits, etc. Children can also observe the similarities and differences of two kinds of small animals by comparing and contrasting their external features, sounds, living environments, and walking / swimming postures.

Reference Questions for Teachers

(Select questions according to circumstances and in line with the proposed learning objectives)

According to children's prior knowledge and skills on the activity, teacher guides them in thinking and questioning gradually and progressively.

Before the Activity

- Do you know what small aquatic animals are? Where did you see them?
- Have you seen insects before?
- What colours are insects/small aquatic animals?

During the Activity

- Is there anything moving/swimming in the pond?
- What do you see?
- Can you guess what they are?
- Where are their hands and feet?
- Where are their homes? Are there any differences between their homes and yours?
- Do they have ears? Are their ears same as ours?

After the Activity

- Do they look different from you? What are the differences?
 - Do they eat? If yes, what do they eat?
 - How do they eat?
 - Can they hear our voices?
 - How do they walk? Are there any differences from us?
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Extended Activities

Based on the rationale of this activity, teachers may develop other extended activities to fit into the themes of the school based-curriculum, for example:

- Children can circle the small animals/plants that they saw today and colour their favourite ones in the Children Activity Booklet.
 - Teachers can use storybooks, picture books or pet fish to help children observe and understand the characteristics of small aquatic animals.
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Proposed Class Level	K2
Name of Area	Life Zone
Proposed Number of Participants	6-8 people in a group
Duration	Around 30 minutes
Teaching Aids/ Materials	Free loan from Hong Kong Wetland Park through advance registration: <ul style="list-style-type: none"> • An underwater scope Prepared by teachers : <ul style="list-style-type: none"> • Paper Puppet “Dragonfly Dow” (Appendix 1)
Children’s Developmental Characteristics 4-5 years old	<ul style="list-style-type: none"> • Able to ask questions and express their views when they encounter interesting things during exploration • Able to use simple words and phrases to express opinions
Proposed Learning Objectives	<p>[Knowledge] Children are able to briefly know the habitats and living conditions of small aquatic animals</p> <p>[Skill] Children are able to use simple language to express the exploration results and their ideas on finding the small aquatic animals and making simple comparisons</p> <p>[Attitude] Children are able to care for small aquatic animals and protect water resources</p>
Focus of Activity	Enable children to observe the habitats and living conditions of small aquatic animals through sense of sight and different tools, briefly describe the similarities and differences of appearances and characteristics among small aquatic animals, so as to nurture children’s attitude of care for small aquatic animals and protection of water resources.
Proposed Activity Plan (Procedures)	<p>Introduction</p> <ul style="list-style-type: none"> • Teacher continues to use the Paper Puppet “Dragonfly Dow” to accompany children to visit other friends in the Life Zone. • Dow leads children to get near the pond and asks, “Children, do you know what small aquatic animals are? Which are they? Can you give some examples?” (Children answer freely) • Teacher says, “Yes, small fish and turtles are both small aquatic animals.” Teacher asks further, “Do you know what insects are?” (Children answer freely) Teacher says, “Yes, the majority of insects usually fly in the sky but actually there are insects living in water. Have you seen them? Where did you see them?” • Teacher invites children to complete a small task which is to explore freely in the area and find aquatic animals /insects.

Proposed Activity Plan

(Procedures)

Process

- In the course of exploration, teacher should remind children of the following codes to help them understand the methods of protecting small aquatic animals and pay attention to safety:
 - ▶ Speak softly
Reason: Small aquatic animals will be disturbed.
 - ▶ Do not touch or capture the small aquatic animals
Reason: That will cause harm to small aquatic animals.
 - ▶ Keep your mouth away from pond water
Reason: Pond water may contain a lot of germs.
 - ▶ Do not go into the pond
Reason: The small aquatic animals need clean water source. They would not be able to survive if the water was polluted. It is also very dangerous for children to play in the pond as they may get drowned.
 - ▶ Please inform the staff for cleaning if any rubbish is found in the water
 - Children start looking for Dow's friends freely after understanding the codes.
 - During the exploration, if children cannot see the small aquatic animals clearly, teacher should ask for the reason and then asks them, "Some small animals are very tiny that we may not be able to see them clearly with our eyes. Children, can you guess how we can see clearly?" (Children discuss freely)
 - Dow shows an underwater scope and demonstrates how to use it to observe the form of small aquatic animals in the water. Teacher should remind children to use the underwater scope properly to avoid harm to the small aquatic animals.
 - Dow says, "I would like to invite each group to find one of my aquatic friends, remember its appearance and how it swims. Later you can share with other children to see how they are different from one another."
- For instance,
- ▶ It is the smallest but it swims the fastest
 - ▶ It is the biggest but it swims the slowest
 - ▶ It is a small long fish with an upturned mouth
 - ▶ It has a big shell and moves very slowly
 - ▶ It has 4 long legs which can jump on the water surface
 - ▶ It has a big head with a black tail and it swims very fast

Proposed Activity Plan
(Procedures)

- Based on the children's responses, teacher can make use of the "Reference Questions for Teachers" in this activity to encourage children to find various small aquatic animals in the Life Zone and observe their characteristics and habitats. Meanwhile, teacher can also encourage them to proactively share their observation findings and feelings, and raise questions.

Conclusion (Discussion and Sharing)

- Teacher leads children to the pavilion and let them share their findings, so as to get to know the appearances, characteristics and habitats of Dow's friends, as well as how they're related to our daily lives.
- Compare and contrast the living environments of small aquatic animals and human beings, then predict how different environments affect the small aquatic animals, so as to bring out how to protect water resources. "You have just observed the living environments of small aquatic animals, how are they different from those of human beings?" (Children answer freely)

The living environment of small aquatic animals are as follows:

- ▶ In the water
- ▶ With various aquatic plants
- ▶ Aquatic plants provide food and habitats, etc. to small aquatic animals
- ▶ Subject to constraints like air, sunlight, water temperature, water quality, etc.

The living environment of human beings are as follows:

- ▶ Houses on land
- ▶ With air, water and food

"What would happen to small aquatic animals and plants if the pond was empty, or the water was very dirty, or there was no soil in the pond one day?" (Children answer freely)

"Can you share about how to protect nature?" (Children answer freely)

- ▶ Do not throw rubbish into water
- ▶ Do not play in the water pond, fish pond and wetland
- ▶ Do not pick the aquatic plants (because they provide food, shelter, and oxygen to the small aquatic animals)
- Lastly, teacher invites children to talk about how they protected the small aquatic animals and kept the pond water clean during the activity. (Children answer freely) Teacher praises them.

Possible Adjustments

Teachers can provide assistance if children are unable to use the underwater scope.

Reference Questions for Teachers

(Select questions according to circumstances and in line with the proposed learning objectives)

According to children's prior knowledge and skills on the activity, teacher guides them in thinking and questioning gradually and progressively.

Before the Activity

- Do you know what insects and small aquatic animals are?
- Have you seen insects that live in water? Where did you see them?
- What colours are the insects/small aquatic animals?

During the Activity

- Do you see anything moving/swimming?
- What are they doing? Are they eating?
- Where do they live?
- How do they move?
- How do they eat?
- Why are their bodies so small/ big?
- Why can they only live in water?

After the Activity

- Who can help us clean up the rubbish in the pond?

Extended Activities

Based on the rationale of this activity, teachers may develop other extended activities to fit into the themes of the school-based curriculum, for example:

- Children can circle the small animals/plants that they saw today, draw their favourite ones in the Children Activity Booklet and briefly describe them.
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Proposed Class Level	K3
Name of Area	Life Zone
Proposed Number of Participants	8 people in a group
Duration	Around 30 minutes
Teaching Aids/ Materials	<p>Free loan from Hong Kong Wetland Park through advance registration:</p> <ul style="list-style-type: none"> • A magnifying glass per group • An underwater scope <p>Prepared by teachers:</p> <ul style="list-style-type: none"> • Paper Puppet “Dragonfly Dow” (Appendix 1) • Pictures of Aquatic Animals (Appendix 4) • Picture of Food Web in a Pond (Appendix 5) • Picture of Mosquito fish (Appendix 6)
Children’s Developmental Characteristics 5-6 years old	<ul style="list-style-type: none"> • Able to use different adjectives to describe the characteristics of objects • Enjoy cooperative play • Able to recite what happened in a systematic manner
Proposed Learning Objectives	<p>[Knowledge] Children are able to understand the habitats and living conditions of small aquatic animals</p> <p>[Skill] Children are able to share with their peers about the importance of environment to small aquatic animals based on their prediction</p> <p>[Attitude] Children are able to care for and appreciate nature</p>
Focus of Activity	Enable children to explore the relationship between small aquatic animals and their habitats through sense of sight and different tools, share their views with their peers so as to nurture their awareness of care for and appreciate nature.
Proposed Activity Plan (Procedures)	<p>Introduction</p> <ul style="list-style-type: none"> • Teacher continues to use the Paper Puppet “Dragonfly Dow” to accompany children to visit other friends in the Life Zone. • After arriving at the pavilion for a while, Dow asks children questions as lead-in, “Oh, where are my friends? They really love to play the game hide-and-seek with me in the Life Zone. Some of them are very close but some of them far away. Now let me show you what they look like (Dow chooses suitable pictures from Appendix 4 (only one part of the animals is shown in the pictures)), today’s small task is to help me find them out. As each picture only shows a part of my friend, please find them out. After finding them, you can borrow a magnifying glass from the teacher if you can’t see clearly. You also need to see what their living environments are like.”

Proposed Activity Plan
(Procedures)

Process

- Before the exploration, teachers should remind children of the following codes to help them understand the methods of protecting aquatic animals and pay attention to safety:
 - ▶ Speak softly
Reason: Small aquatic animals will be disturbed.
 - ▶ Do not put your hands into the water
 - ▶ Do not touch or capture the small aquatic animals
Reason: That will cause harm to small aquatic animals.
 - ▶ Keep your mouth away from pond water
Reason: Pond water may contain a lot of germs.
 - ▶ Do not go into the pond
Reason: The small aquatic animals need clean water source. They would not be able to survive if the water was polluted. It is also very dangerous for children to play in the pond as they may get drowned.
 - ▶ Please inform the staff for cleaning if any rubbish is found in the water
 - ▶ Do not casually put any objects into the pond
Reason: The water will be polluted.
- During the exploration, Dow leads the children to get near the pond and asks, "Do you see them? It is alright if you don't. You can borrow an underwater scope from the teacher to find them out. After finding them, please also see what their living environments are like."
- Teacher shows them an underwater scope and demonstrates how to use it to observe the small aquatic animals. Teacher should remind children to use the underwater scope properly to avoid harm to the small aquatic animals.
- Based on the children's responses, teacher can make use of the "Reference Questions for Teachers" in this activity to encourage children to find out the appearances, characteristics, body structures and habitats of interesting small aquatic animals in the Life Zone. Meanwhile, teacher can also encourage them to proactively share their observation findings and feelings, and raise questions.
- Dow says, "Children, you need to care for my aquatic friends. Children, do you know how we should care for them? Do you know what the most important element to their living environment is?" (Children answer freely)

Conclusion (Discussion and Sharing)

- Teacher leads children to the pavilion and let them share their findings.
- Teacher shows children the Picture of Food Web in a Pond (Appendix 5) and invites them to guess the relationship among the aquatic plants, small aquatic animals, water and soil. (Children answer freely)
- Wetlands are very useful to human beings and nature. What could we do if the sky stopped raining and there was less water on the earth?

Proposed Activity Plan

(Procedures)

- Teacher discusses with children on how to protect and treasure water resources in our daily lives.

On a Personal Level

- ▶ Do not throw rubbish into water ponds, fish ponds and wetlands
- ▶ Take showers instead of baths and shorten the bathing time
- ▶ Drink up all the water you poured out
- ▶ Treasure the drinking water, do not keep the tap running (especially when brushing teeth)
- ▶ Don't play with water to avoid water wastage

At the Family/School Level

- ▶ Clean with homemade natural detergents
- ▶ Recommend family members to keep water after washing rice, vegetables or fruits for watering plants
- ▶ Turn on washing machines only when a considerable amount of clothing is collected
- ▶ Reduce water consumption by using dual flush toilets
- ▶ Treasure the drinking water, do not keep the tap running (especially when brushing teeth, washing rice, fruits and vegetables, and dishes)
- Finally, teacher invites children to talk about how they protected the small aquatic animals and kept the pond water clean during the activity. Teacher praises them.

Possible Adjustments

- During the sharing sessions, children may not be able to fully express their ideas. Teachers can give hints to help children express themselves.
- Guide children to observe, as well as to observe and think at the same time by optimal use of their eyes for seeing, ears for hearing, noses for smelling and mouths for asking questions. After conducting observation and exploration, invite children to consider what to share about their observations. Children's sharing can also help teacher understand their ideas.

Reference Questions for Teachers

(Select questions according to circumstances and in line with the proposed learning objectives)

According to children's prior knowledge and skills on the activity, teacher guides them in thinking and questioning gradually and progressively.

Before the Activity

- What insects do you know?
- Do you know any small animals that live in water? Which are they?

During the Activity

- What kind of interesting things have you found?
- Is there anything moving/swimming?
- Can you guess/think about where these small animals come from?
- Have you noticed if they have hands? Can you guess how they greet their good friends? Can you demonstrate?
- What were they like when they were babies? Would they be the same as human babies?
- How would you protect their living environments?

Reference**Questions for Teachers**

(Select questions according to circumstances and in line with the proposed learning objectives)

After the Activity

- This is a Mosquito fish (Appendix 6). Can you guess what it eats? How is it beneficial to us?
- Do you know that they are alien species? What are their impacts on native species?
- Are they living happily here? Why?
- Can we bring them home as pets? Why?
- How would you and your family protect and treasure water resources together?
- How would you protect and treasure water resources?

Extended Activities

Based on the rationale of this activity, teachers may develop other extended activities to fit into the themes of the school based curriculum, for example:

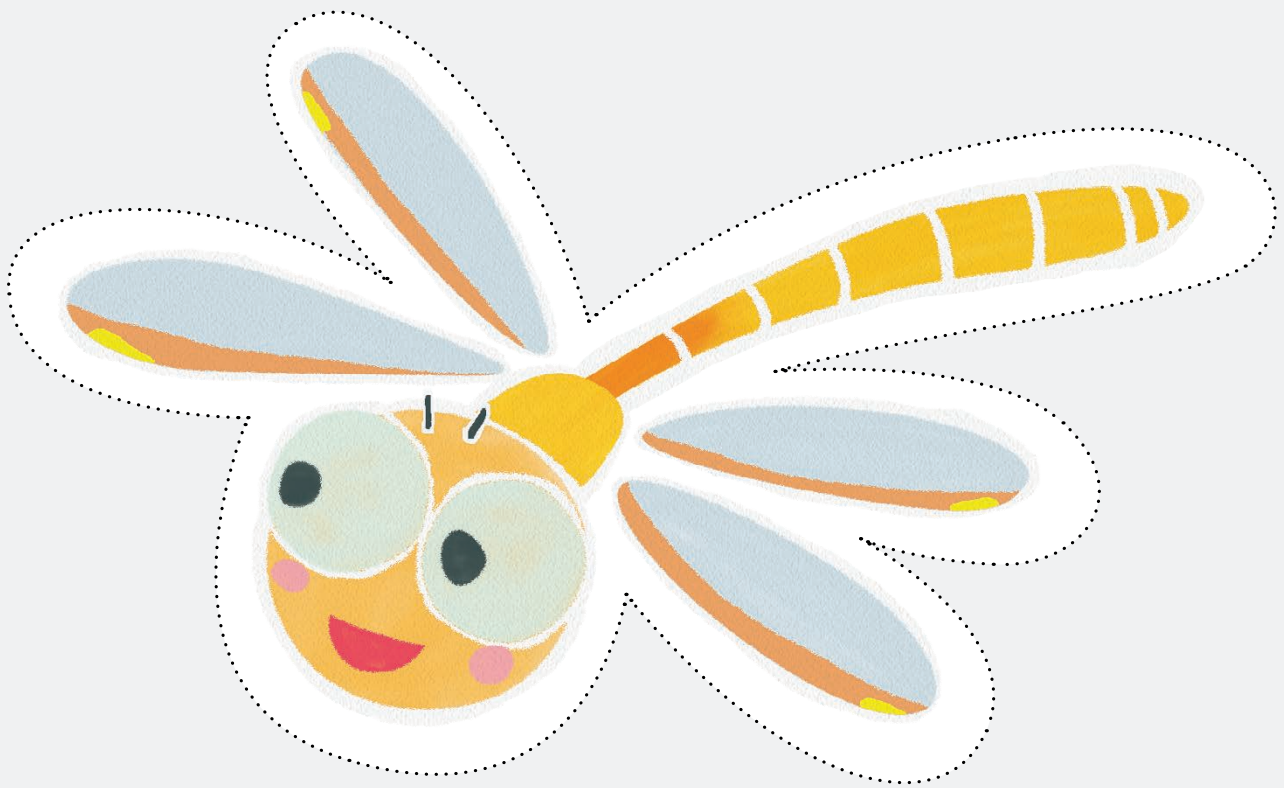
- Children can circle the small animals/plants that they saw today, draw their favourite ones in the Children Activity Booklet and make brief description and review to adults.
- At school, teacher can organise some activities for conveying the related message, such as poster design or slogan design on environmental protection to spread the message.

Referring to picture of 'Food Web in a Pond' in Appendix 5, the following information is prepared for teacher's reference and the information can be adapted into extended learning materials:

- ▶ *Wetlands can store water*
- ▶ *Wetlands provide food to humans and small animals*
- ▶ *Aquatic plants and small animals provide food to the insects*

(Some plants grow in water while some plants thrive in wet soil. Those plants produce food and nutrients for aquatic animals using sunlight. Some aquatic plants can remove the impurities in the water, and some fish can eat up the rotten food in the pond. The process helps keep the pond water clean, which allows plants and animals to prosper and reproduce. The most interesting feature of wetlands is that it serves as a giant sponge that retains water and allows different aquatic animals and plants to live in it.)

Appendix 1: Paper Puppet “Dragonfly Dow”



Appendix 4: Pictures of Aquatic Animals

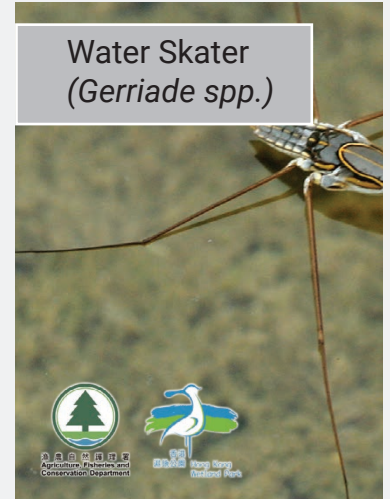
Golden Apple Snail
(*Pomacea canaliculata*)



Damselfly



Water Skater
(*Gerriade spp.*)



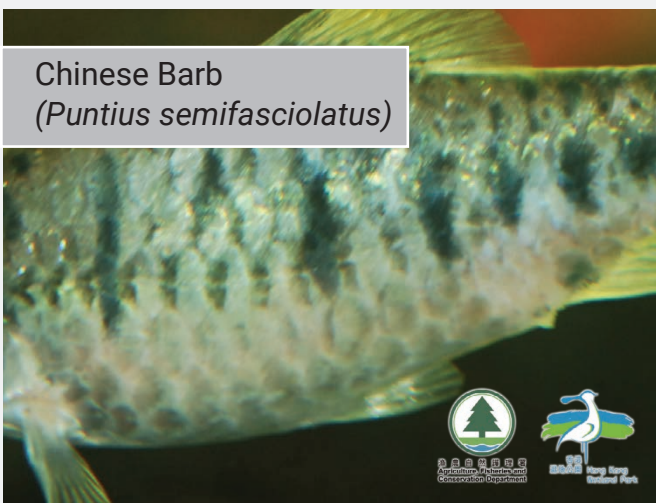
Dragonfly



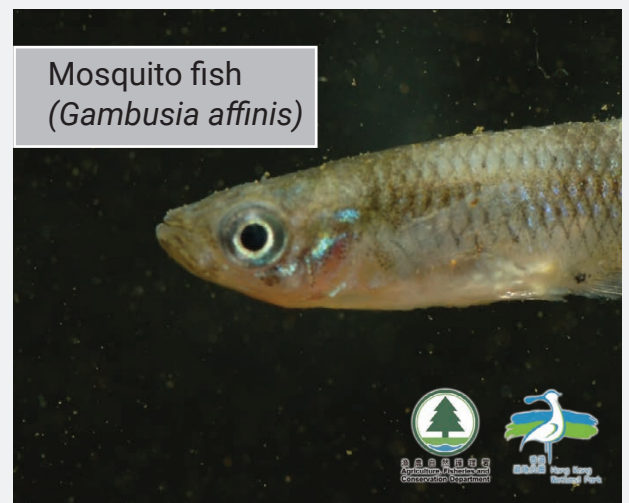
Tadpole



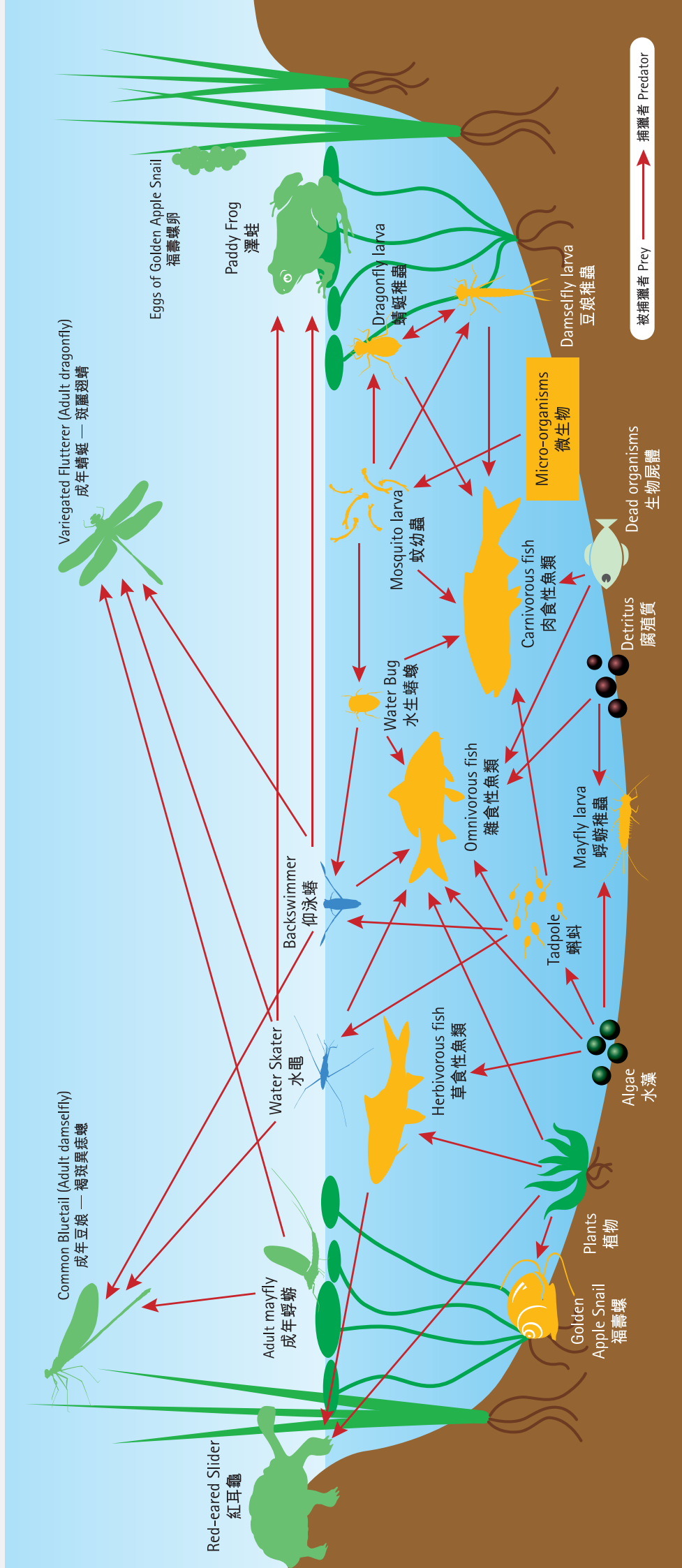
Chinese Barb
(*Puntius semifasciolatus*)



Mosquito fish
(*Gambusia affinis*)



Appendix 5: Food Web in a Pond



Hong Kong Wetland Park - Life in a Pond. Retrieved from:

https://www.wetlandpark.gov.hk/filemanager/files/public/Download/pamphlets/20130903_Pond_Life_Leaflet.pdf

Appendix 6: Picture of Mosquito fish



Some information and pictures are provided by Hong Kong Wetland Park under AFCD.