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# KDCF CURRICULUM INFORMATION

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KDCF is a perfect choice for any age group to explore the forest. It's reachable easily by many communities within Klang Valley. There are many different types of trail to choose from according to the age group. For example, Petaling trail fits for all, especially young kids and family groups. The variety that offered by the forest are plenty to occupy everyone's observation eyes and mind.

This KDCF Curriculum is meant to help guides, educators, and any learning facilitators to use as some guideline to interact with the forest in different and fun ways. Activities are grouped in three main categories according to the level of activities. But it's never limited to any particular group as it's always a good challenge to try something new. For any grownup, it's also a good fun to wear children's shoes and try those basic activities.

## BASIC LEVEL

### Colourful Hike

A short activity that could be used within a longer scavenger hunt or hike. It introduces the idea of looking closely and noticing the variety of colouration in nature. Students work in small groups to carry out an inventory of colours in the out-of-doors. After presenting their findings, students discuss about the use of camouflage and warning colours as a means of adaptation, to enable species to live successfully together.

### Duplication

This is a good game for getting students interested in the subtle pieces that make up a community, whether it be a forest or a beach. Through a concentration and memory game, they learn about the various and extremely interrelationships that take place in the environment, while strengthening their memory, concentration, and observation skills. The instructor quickly reveals ten natural objects hidden beneath a handkerchief which the students will be able to find nearby. The students have five minutes to find the same 10 objects. When they return, the instructor tells interesting stories about each of the objects under the handkerchief then asks if the students were able to find the same object.

### Last Look

A short fun activity to introduce the idea of looking closely and noticing details about the things we look at. Use this activity before starting the walk to highlight about observation skills while walking in the forest.

## Leaf Rainbow

A nature art exercise: In small groups, students search for leaves of different shades and colors and create a "leaf rainbow".

## Observing the Micro-Universe

Peg out a 1 meter x 1 meter (3ft x 3ft) square in a patch of nature. Sit in the square for an hour, focusing only on what is inside the square. Observe the terrain and the myriad of natural dramas unfolding on a micro-scale.

## Scavenger Hunt

One way to run a nature scavenger hunt is to hand out an egg carton and a list of 12 items to collect - e.g., natural items which are: soft, spiky, blue, strong, beautiful, old, fragile, yummy, sharp, smooth, closed, open, wet, dry, from an animal, dead, etc. (be creative).

## Sound Map

Students create a sound map from what they hear while sitting in a natural area for 5-10 minutes.

# INTERMEDIATE LEVEL

## Interview a Tree

Students select partners and prepare a list of questions (10+) that they would like to ask a tree. Students then choose a tree from within a given area and introduce themselves to the tree. They then ask each question in turn and seek to find the answer by measuring, touching and observing the tree and its environment. At the end of the activity, the tree interviews are shared amongst the group with other students trying to identify the interviewed trees from the descriptions given

## Leaf it to me

Students explore to get to know about leaf structure and characteristics in a simple way. They choose the leaf they can find on the floor or on the tree nearby. Record, observe and draw a picture of chosen leaf and learn a bit more about this special tree.

## Planet of Plenty

Students pretend they are visitors from outer space viewing earth for the first time. By describing in minute detail, all the life they find in their plot of land, they will become more aware of the diversity of life on Earth and will better understand its importance.

## Special Spot

Students choose a spot in the forest during a break and sit down on their own. Choose something from the forest that they like i.e. a leaf, lower, ant, mushroom, etc. and create a story from its point of view. Basic information from what students can observe is a good start for the story.

## Tree Apartments

Trees provide a habitat for a host of animals and plants, from their highest leaf to their roots. This activity encourages students to discover how plants and animals depend on trees.

## Web of Life

Students will take a closer look on relationship and linkage between non-living things and living organisms in the forest. There will be a discussion on how all forms of life rely on each other and connect with each other.

# ADVANCE LEVEL

## Creature Connections

A scavenger hunt that explains and elaborates on the concepts of ecological webs, habitats and relationships in nature. A good activity to start a trip, as the examples found in this can be referred back to again and again.

## KDCF Bird Watching

Bird study and bird watching activities do not require rare birds or complete wilderness areas. The lake and the edge of the forest provide an excellent opportunity to get students aware of the diversity of bird life found along the riverine banks in and near KDCF forest as well as expose them to the consequences of human disturbance of forest which provide habitat for these birds. During this activity students will learn how to spot birds and use the Field Guide to *Birds of KDCF* to identify them and discover a new and fun activity that they can do practically anywhere.

## Rotting Condominiums

This activity allows students to investigate the organisms that live in and on rotting logs "woodland condominiums". It introduces students to the idea of decomposition, micro habitats and communities. Through observation and investigation students can begin to make connections between the logs and the life they support.

## Stream Sense

Students use their senses to observe a stream, learning there is more to flowing water than meets the eye. By making careful observations, students experience how their senses (besides sight) provide them with additional information about the environment.

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# ANATOMY OF A LESSON

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There are four main parts of a lesson for a successful experiential learning lesson.

## 1. POW

The introduction of a lesson or activity does two things:

- 1) It introduces the topic
- 2) Is the key to grabbing students' attention when their curiosity is highest and providing the energy and context to keep them engaged for the entire lesson.

Your POW can be startling or humorous, a rhetorical question or a very famous and insightful

### *Questioning*

To create the bridge for your lesson you also will want to use Focus or Recall Questions to both engage the students and relate the lesson to their experience and lives. Both types of questions require students to think, but just on the basic level of remembering past events or knowledge. These questions provide a non-threatening way for more students to participate in the lesson and gain the needed initial confidence to stay engaged and not shy away from asking or answering more questions during the lesson.

Examples of **Focus and Recall Questions**:

- a) How do birds move? Where do birds live? What do they eat?
- b) Who has ever been to a primary forest? What was your experience like then?
- c) What animals do you think live here? What animals would you like to see?
- d) How does being here in the forest of Kota Damansara Forest Park make you feel?

Clues for identifying Focus and Recall Questions:

- a) What is ...?
- b) Who has ...?
- c) Name the five ...?
- d) How many ...?

Sometimes you should ask a question in which you don't really want the students' to answer yet, but only to think about during the lesson. This is called a Rhetorical Question. Then in the conclusion, you can ask this question again but this time looking for the students to answer you using the knowledge that they acquired during this lesson. It is like planting a seed in the beginning, and then slowly helping it germinate, and finally sprout to a fully developed plant.

quotation. Your goal is provocation. You need to grab your students' attention with your first words.

## 2. BRIDGE

Bridges connect the introduction to the actual activity and to the experience of the students themselves. It is the connection between the activity and its relevance to their own lives. A good *Bridge* should answer the questions, "OK, now you have my attention, but what's your aim? Why should I care?"

## 3. BODY

This is the main part of the lesson or activity. Throughout the lesson, whenever possible, the educator should be using higher-level questions that require students to process the information that they are learning/ experiencing.

These types of questions are called Process Questions, and require that students begin putting the various facts that they are observing and learning together to get the answer.

Examples of **Process Questions**:

- a) Why do you think that the gibbons live in the canopy of the forest and not on the ground?
- b) Where do you think this deer (of the track we see) was going and what was it doing?
- c) Why would the leech be important in the food web of the Kota Damansara forest?
- d) Why would a leaf in the forest have the shape of a water spout? What advantage would this give this plant?

\* Most process questions usually are what we refer to as "open-ended" questions, meaning that they have no right or wrong answer. Sometimes this gives the students more confidence to answer as they are not as frightened of being wrong. The educator should emphasize this point in order to get more students involved in answering questions.

## 4. CONCLUSION/DEBRIEF

The conclusion and debrief is where you should summarize what the main points of the game, activity, or lesson were (i.e. lesson objectives). The conclusion/debrief is also where students really are able to synthesize and reflect on what they have learned and experience. Thus, this makes the debrief the most crucial element in the lesson as everything done to this point will have no real meaning to the lesson objectives

Examples of **Analytical Questions**:

- a) How are the forest canopy and forest floor interdependent one another?
- b) What changes might occur here in Damansara community if all the forest were destroyed.
- c) Why is this forest important to your lives, and all the peoples' lives, in Kota Damansara?

or the students themselves.

After summarizing the main points, educators should try to facilitate discussion with the group by asking pointed questions that help the students to analyze and synthesize the knowledge/experiences of the lesson into higher level thinking processes. Educators do this by asking what we call Analytical Questions.

The other important part of the conclusion/debrief is getting students to reflect on and to examine their values and beliefs. This is most important if your aim is to help them form an “ethic” that includes the environment and other living things. The best way to do this is by asking them evaluative questions.

#### **Evaluative Questions:**

Evaluative questions can be narrowly or broadly focused.

Examples of Evaluative Questions:

- a) How did you feel being here at the forest park?
- b) What was your favorite part of KD forest park?
- c) How would you feel if the forest park were destroyed or degraded?
- d) What could you do to help protect this park now and into the future?

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# ACTIVITY LIST

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# Colourful Hike

**Site:** Natural Area

**Duration:** 30 minutes

**Academic Level:** Primary / Middle School

**Author:** adapted from Johns, Liske, Evans: *Education Goes Outdoors*: ISBN 0-201-20471-1

**Activity Description:** A short activity that could be used within a longer scavenger hunt or hike. It introduces the idea of looking closely and noticing the variety of colouration in nature. Students work in small groups to carry out an inventory of colours in the out-of-doors. After presenting their findings, students discuss about the use of camouflage and warning colours as a means of adaptation, to enable species to live successfully together.

## **Learner Outcome/Participant will...**

1. Observe colouration in the natural world.
2. Report findings to the rest of the group
3. Discuss the reasons for colour in the natural world.

## **Materials:**

Journal, colour name cards, small collecting bags (optional)

## **Background Information:**

In times gone by, man used all of his senses in order to survive in the natural world. Gradually, we have allowed our senses to become dulled, to become semi-redundant. We often see a scene in front of us without really seeing what is there, what is actually occurring. We tend to miss so much. When exploring the Natural World, we need to look and see, to spot characteristics and to question why things are arranged in the way they are. Colour in the natural world is an important adaptation for the survival of species.

## **Skills:**

Observation

Reporting

Classifying

## **Curriculum Links:**

Science, environmental studies, Biology, Art

## **POW**

Give each student a card with a colour on. Students must move around and find the other member of the same colour family, and sit with that group. This then becomes the working group for this activity.

e.g. red, crimson, scarlet, pink, ruby



brown, beige, fawn, chocolate,  
blue, navy, sky blue, cobalt  
green, emerald, jade, lime

### **BRIDGE**

Discuss the colour variations in each family, e.g. crimson and scarlet. Students should give examples of things of each colour. Ask what colours are seen in nature, i.e. in the forest, desert, pond, ocean, mountain, river. What purposes do these colours have (need not be answered at this point.)

### **BODY**

Tell the students that in their groups they will have 10 minutes to go and hunt for examples of each of the colours in their journal. Set clear boundaries. Establish a signal to gather groups back together. (Adults should either accompany each group or be positioned around the playing area.) Check that each group understands the colour list in the journal or get groups to create their own list of colours to find.

Each group has about 10 minutes to find the listed colours in their journal. Students should draw or write the object that matches the colour. (If students are to collect specimens send them out with small bags.) Once everyone is back together, allow each group to talk about their most amazing find.

### **DEBRIEF**

Ask the students how they felt? Let them report back on the different colours they found. Were they surprised by the range of colours? How many shades of the same colour could they find? Was one leaf the same colour on both sides? What colour were the stones? Ask why they think there are so many colours in the natural world.

Encourage the students to think about the need for green leaves - photosynthesis, to think about insects, birds and other animals that use camouflage on the bark of trees, in grassland. Talk about insects using bright colours as a warning to other predators. Look out for these throughout the rest of the trip.

### **Variations:**

- Give each group a colour swatch of either different colours, or shades /hues of the same colour. Groups must match the swatch with natural examples.  
(Works well to show the range of greens etc.)
- Provide small boxes in the journal. Before setting out, groups colour each box a different colour, then try to match in the natural world.
- With younger students this activity could be introduced with a game of hide and seek within a small, defined safe area, and a discussion about which students it was easy to see first ( those in bright clothing) and those who were more difficult to see ( those wearing green and grey

# Creature Connection Scavenger Hunt

**Site:** forest or other wild area

**Duration:** around 1 hour

**Academic Level:** Middle - Secondary school

**Author/Source:** WWF - Windows on the Wild

**Activity Description:** A scavenger hunt that explains and elaborates on the concepts of ecological webs, habitats and relationships in nature. A good activity to start a trip, as the examples found in this can be referred back to again and again.

## **Learner Outcome/Participant Will...**

1. Explore a wild area
2. Learn about relationships in nature, and habitats
3. Think about webs, and human involvement in the natural world
4. Have fun

## **Materials:**

Cloth bags, boxes etc for collection

Enough copies of the list for one between 2 students

**Background Information:** Everything in the natural world is connected to everything else somehow. Each plant and animal needs certain other organisms in order to survive, whether it is as food, habitat, support or cleaning! Many plants and animals are also positively or negatively affected by human presence. Even a small area can give many examples of these relationships, and give an idea of the webs between all living things.

**Sources for more Information:** A journal page exists and is on file.

## **POW**

Have you ever looked at the way people interact? Who helps who in what ways? Who uses who, and in what ways? (Get funny examples.) What about animals? Have you ever looked at them?

## **BRIDGE**

Ask about the connection between e.g. a tiger and a deer. Then ask about a monkey and a piece of fruit. Does the fruit tree also benefit? (by spreading the seeds) What else might benefit? (Deer etc that eat fruit dropped by the monkeys).

## **BODY**

Explain they are going to investigate some connections, in order to get an idea of how things in the natural world interact. How will they do this? Explain that you have prepared a list of things to find.

Split them into pairs / small groups and hand out the list (appendix to this activity) and the collection bags. Go over the list and check that they understand each item. Agree boundaries and a time limit, and explain that students shouldn't damage anything, or take anything that can't be replaced, e.g. take only a leaf, a fruit or other part that won't harm the plant, and to observe rather than collect animals. Droppings can also be collected as evidence of presence.

The groups go off and search for examples of the things on the list. Anything not collectable can be named, described or drawn instead. You can move around stimulating ideas - "ooh, look at this" or, under a particularly interesting tree covered in lichens / ferns / birds' nests, "don't forget to look *up*, too"...

## **DEBRIEF**

When the students come back, ask them who found everything, all but one thing, etc. Then go through the list, asking for examples to be shown, and getting the students to explain their connections, also letting discussions develop with others contributing.

Ask students if they know about webs of life. Point out that, directly or indirectly, all the items they saw were related to each other, as is the case in all habitats around the world (ask for examples). Pick a couple of things and discuss their relationship, eg the tiger and grass are connected how? What would happen to the tiger if there was no grass? (The link is the deer, that needs the grass to eat, and is food for the tiger).

Ask if the activity has helped them to notice connections that they hadn't seen before. Also ask how humans fit into the web of connections, and what effects we can have by altering things within a habitat.

**Variations/Adaptations:** Possible extension: Have each group pick four or five items on their list and make a picture or diagram showing the way the items are connected. They should also explain why they picked those items to include.

### **Related Activities for the Classroom:**

Webbing

## Creature Connections - answers

1. A small animal that a bigger animal depends on in some way.
  - insects are food for many animals, small animals are eaten by bigger ones
2. A big animal that a smaller animal depends on in some way.
  - fleas, mosquitoes, leeches and ticks depend on mammals such as deer for food
3. A plant that grows on other plants.
  - epiphytic orchids, mosses, ferns
4. An introduced species that has caused problems for native species.
  - 'the weed'
5. A wild animal that can thrive in or around people's homes.
  - cockroaches, rats, mosquitoes - all find food in or near houses, birds that nest under eaves etc, prey animals such as deer that feel safe from predators.
6. An animal that eats dead things.
  - vultures, termites
7. An animal home that is in or on a plant.
  - birds' nests in trees, insect cocoons on leaves
8. a) A plant that benefits humans in some way.
  - trees for shade, crops for food, plants that are food for the animals we eat, medicinal plants, plants that provide fibres, e.g. cotton, reeds,b) A plant that harms humans in some way.
  - nettles, thorny plants
9. a) An animal that benefits humans because of the role it plays in its habitat.
  - bees, wasps, butterflies, moths and bats pollinate crops, geckos and spiders eat mosquitoes, earthworms aerate the soil, snakes eat rodents, herbivores cut grass!b) An animal that harms humans in some way.
  - mosquitoes, ticks and rodents can carry disease, ants and leeches bite
10. An animal that looks like a plant.
  - praying mantis, stick insects, some camouflaged moths and butterflies
11. Two species that are useful to each other in some way.
  - bees and flowers, lichens (fungi and algae)

12. An animal that spends its life in 2 different habitats.
  - migratory birds, salmon, deer (days in the forest, nights in grassland)
  
13. An animal that eats seeds / fruits and then spreads seeds by passing them as waste.
  - birds, monkeys
  
14. Something that turns into soil.
  - a rotting log, leaf litter, everything eventually!
  
15. A plant that depends on animals in some way.
  - any plant that is pollinated, or has its seeds dispersed by animals. Or in fact any plant could be said to be aided by animals in that their faeces helps to fertilise the soil and plant grows in.
  
16. A plant that is part of a food web.
  - any plant, because all plants provide food for other organisms
  
17. An animal that is part of a food web.
  - any animal, including humans, because all animals eat other animals, plants, or both

# Duplication

**Site:** Natural Area

**Duration:** 35 - 1 hr. 10 minutes

**Academic Level:** Primary School

**Author/Source:** Joseph Cornell, [Sharing Nature with Children](#)

**Activity Description:** This is a good game for getting students interested in the subtle pieces that make up a community, whether it a forest or a beach. Through a concentration and memory game, they learn about the various and extremely interrelationships that take place in the environment, while strengthening their memory, concentration, and observation skills. The instructor quickly reveals ten natural objects hidden beneath a handkerchief which the students will be able to find nearby. The students have five minutes to find the same 10 objects. When they return, the instructor tells interesting stories about each of the objects under the handkerchief then asks if the students were able to find the same object.

## Learner Outcome/Participant will:

1. Become more visually aware of their immediate environment.
2. Use concentration to memorize natural objects.
3. Strengthen short-term memory skills.

**Subject Area:** Environmental Science (Ecology), Art, Language Arts

**Activity Skills:** Observation, Short-term Memory, Synthesis, Drawing ability, Gathering Materials, Writing (Descriptions)

## Materials:

- 2 bandannas or handkerchiefs
- collecting bags
- 8-10 natural objects and one piece of trash

**Background Information:** This is a good activity to increase students' observation and concentration skills.

## Sources for More Information:

Cornell, Joseph

[Sharing Nature with Children](#)

[Sharing the Joy of Nature](#)

## POW

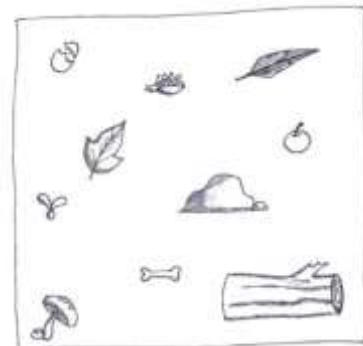
Before assembling the children to play, secretly gather from the immediate area about 10 common natural objects such as rocks, seeds, leaves, and some signs of animal activity. Lay the objects out under a handkerchief. Call the students close around you and tell them "*Under this cloth are 10 natural objects that you'll be able to find nearby. I will lift the handkerchief for 10 seconds so you can take a good look and try to remember everything you see.*"

## BRIDGE

Not necessary for this activity

## BODY

Give students time to look at the objects then have them, either individually or in pairs, spread out and collect similar items, keeping their findings to themselves. Tell the students they have five minutes to find the same ten objects.



**Activity** - (25 minutes) After five minutes of searching, call them back. When the students return, have them sit in a circle. Dramatically pull the objects from under the handkerchief, one at a time, telling stories about each one. As each object is presented, ask the children if they found one just like it.

## DEBRIEF

1. Write down the names of the ten objects in your journal and describe them generally (i.e. long (~15cm), brown, seed pod). Distribute magnifying lenses and rulers. (10 minutes)
2. Draw one object you found with as much detail as you can remember only looking at the object once, then placing it out of view. (5-10 minutes)
3. Simply sketch each of the objects. (20 minutes)
4. Now take one object and pretend you are describing it to a blind person. Either write the description down or do this with a partner who has their back to you. How does your description change? See if your partner can figure out what the object is. (5-10 minutes)
5. Have the students make an ecological web of dependence using the objects, or even a nutrient cycle (instructor may pre-plan what objects to use to facilitate both of these parts. Have them explain how they are related.

6. Use objects that are "trash" in the game. Ask students:
  - What do all of these have in common (even the trash)?
  - What doesn't belong to the forest?
  - How did it get there?
  - What eventually happens to the other objects you collected?

Decompose....weather and turn back into soil...

7. Have students pick up trash as they walk through the forest. Explain the philosophy of "Leave a place better than you found it" and the eventual result of such action/thinking.
8. Create a game of concentration with simple drawings of these objects (use blank index cards or thick, card-stock paper) and add several more natural objects. You need 2 drawings for each object. All the cards are placed face down. One student at a time can flip over two cards in trying to find a matching pair. If they correctly find a matching pair, they can go again, if not the next person tries. This game can be played with 2-4 people).

Ask these questions toward the end of the activity:

- How did you remember the objects?
- If you didn't know the name of something, how were you able to remember it?
- What might you do differently if we did this activity again?
- Do you have to memorize things or concentrate like this at other times in your life?
- How might you use the skills you practiced here in the future?

**Variations:** If you repeat the activity several times, it has a noticeable strengthening effect on the student's concentration and memory.

## Related Activities for the Classroom:

Pre-trip or Post-trip: Scavenger Hunt games on the school grounds.

# KDCF Birds Watching

**Site:** Around the edges of the Kota Damansara Forest Park

**Duration:** 1.30hr

**Academic Level:** 5th Grade up

**Author/Source:** Gonthong Lourdesamy

## **Activity Description:**

Bird study and bird watching activities do not require rare birds or complete wilderness areas. The Kota Damansara Forest Park and surrounding area provides an excellent opportunity to get students aware of the diversity of bird life found in the forest ecosystem as well as expose them to the consequences of human disturbance of forest, woodland, grassland and wetland areas that provide habitat for these birds. During this activity students will learn how to spot birds and use the Field Guide to *Birds of Malaysia* to identify them as well as discover a new and fun activity that they can do practically anywhere. The theme of bio-indicators will be introduced during the bird scavenger hunt also.

## **Learner Outcome/Participant Will...**

1. Be able to use binoculars to spot the birds properly.
2. Learn about the key identifying features of all birds and how to look them up using a bird field guide
3. Identify some of the common species in the area they observe.
4. Understand the relationship between numbers and species of birds and environment.

**Skills:** Observation, classifying, drawing, teamwork,

**Curriculum links:** biology, ecology, art, geography

## **Materials:**

- Binoculars (magnifying power: 7x35, 7x50, 8x40, or 10x50)
- Field Guide books to Birds of Malaysia, or South-east Asia
- Pens/ pencils/ coloring pencils
- Journal

\*This activity may need more items as list below:

- Day pack
- Water Bottle
- Sunscreen
- Proper outdoor clothing





**Background Information:**

Watching birds is one of the easiest ways for people to approach nature (Christine Sheppard, Wildlife Conservation Society.) Bird watching can be done by children of all ages anywhere and at almost any hour during daylight. Bird watching often becomes an engrossing life-time hobby.

What features of a bird help a young bird watcher to identify it? First is color. Black-napped Orioles or White-throated Kingfishers are easy to identify because of their coloration. A flash of red disappearing into the trees might indicate a Scarlet Minivet or a Scarlet-backed Flowerpecker. Also indicative are color patterns and field marks, such as a streaked breast or light bars on the wings. Size is important. Compare the bird with other common birds. Observe the bird's shape as well. Is it chunky, long, or slender? Tall or thin? An experienced birder will also regard the shape of the bird's beak, wings, tail, and legs, and whether the head has a crest. The bird's behavior is also significant. Does it hop or walk? How does it fly? Does it sing or call? Habitat is another consideration, for, like all animals, different species of birds have their preferred habitats.

Birds also tell us a lot about what is happening in an environment, bio-indicator. Declining bird populations today are sending us urgent messages about the health of our planet. From this reason, students can learn this fact by observing life along the river as how it affects number and species of birds we see.

**Sources for more Information:**

Jenner, Janann V., 1996. Birdwatching: tips, techniques, and equipment for understanding and observing birds. Friedman/Fairfax. 128pp.

Jeyarajasingam, Allen and Alan Pearson. 1999. A Field Guide to Birds of West Malaysia and Singapore.

Sisson, Edith A., 1982. Nature With Children of All Ages. Massachusetts Audubon Society. 195pp.

**POW**

Have students sit in front of you in a U-shape on the barge deck, and have them close their eyes. Pull out the "Bird cut-outs." Pick one to start with and move it (fly) from side to side when you tell them to open their eyes. Ask the students questions about what they have seen: colors, size, beak shape, wing size. Do this with about 2-3 bird samples before you show them what they just saw. After this section, ask the students these questions:

- How many of you have done bird watching before? Where?
- What was the most challenging thing for bird watching in the forest (if the previous answer was forest)?
- What type of environment they have been in when they did bird watching?

**BRIDGE**

Have everyone look around and describe the environment around there. Looking for the answer about more or less trees, houses, noises, pollution, etc., then ask the students these questions:

- What is their prediction for the number of bird species we will see today? What is their reason to say so?
- Where will be the best place to spot the birds? (On the wire, on top of the pole, dead branch, near water, on top of the tree, etc.) Why?

## **BODY**

Introduce equipment and materials needed for looking for the birds in the wild. Refer to the *Bird anatomy page* in journal and using the bird anatomy poster, go through some specific terminology using to describe bird's parts. This is very important for student who speaks English as their secondary language. Show the students how to use the Bird Guide by introducing some techniques:

- once the student sees a bird, have them open to inner cover on the front page to identify which one is the most similar to what he/she sees.
- then go to page number that labeled below the picture of the bird, and find the more detail about it.
- explain the meaning of Thailand map and color that shows the distribution and season that we can see that species.
- refer to *Checklist* in journal and the best way to record what they see (i.e. marks number of each species, note weather condition and date, etc.)

At this point, binoculars should be ready to use by having other staff help in getting them organized. Show them the proper way to use and adjust them by using the following guidelines:

- Use both hands to carry binoculars.
- Hang your binoculars around your neck and carry them slightly raised or "at the ready."
- Once the students spot the bird, keep eyes on it. If it flies to another nearby site, follow it with your eyes to a better vantage point. Then, without transferring your gaze from the bird, lift your binoculars to your eyes.
- When you focus your glasses, the bird should be in the center of your field of view.

\* Remember to remind the students to always hang binoculars around their necks.

Leading instructor (and other instructors) should keep the group energy up as much as possible by pointing out some birds you see, rotating yourself to each group, and complimenting some students that really put a lot of his/her energy to draw or identify. Make sure that students rotate the use of binoculars, and guide books.

## **DEBRIEF**

With the younger group, competition seems to be a good start for this section as you should ask who found the most species of today, or who found new species. Make sure you acknowledge most of their data of what they have found. Some questions you might ask in this part:

- Where did we find birds the most?
- Why did we find birds at different places? What does it relate to?
- Why do they think we find more birds here than in the housing area? What are their reasons?

**Variations:**

For less English-literate students, instructors need to help them find more detail from the guidebook. Checklist also needs to change into picture list rather than information checklist.

Another variation with older students is to have them figure out a species diversity index for different areas of the river and compare this data with land-use and disturbance (i.e. using Spearman's Ranking).

**Related Activities for the Classroom:****Pre-trip:**

- List the common birds they find in city or nearby school.
- Study type of bird food: worm, insect, fruit, fish, snail, nectar, etc. that relate to their habitat and beak adaptation.

**Post-trip:**

- Bird Watching in different environment nearby school
- School yard bird survey
- Bird behavior scavenger hunt

**STUDENT JOURNAL PAGE**

**Kota Damansara Bird Checklist**

<b>Common Name</b>	<b>Brief characteristics</b>	<b>Habitat Found/Habit</b>	<b>Date/time found</b>
White-throated Kingfisher	Red bill, white throated and breast with bright chocolate brown head. Wings bright blue	Scrub, mangrove and forest edges. Use bare branches, post, telephone wires as vantage point.	
Stork-billed Kingfisher	Largest local kingfisher. Huge red bill with dark tip and pale brown head.	Found near water body in open country, forested river course. Sits on open branches.	
Blue-eared Kingfisher	Dark blue upperparts and ear coverts, darker rufous underparts and all black bills.	Forested streams. Sit on low perches over looking forest streams. Catch small fish by diving	
Peaceful Dove	Small and slender build with long slender tail distinctive. Grey head and forecrown and brown hindcrown together with pale brown upperparts, marked with fine black and white barrings on neck	Open country, plantation, garden. Solitary or in small loose group. Forages largely on ground, but also perch in low trees.	
Philippine Glossy Starling	Glossy dark green plumage with red iris diagnostic. Appear all black in poor light.	Forest edge, plantations, cities	
Common Golden-backed Woodpecker	Golden mantel and wings, red lower black and rump. White face with two black malar stripes and largely black hindneck.	Forest edge, peat swamp forest. Usually in pairs. Forages largely on tree trunks and stems. Very vocal.	
Baya Weaver	Male: distinct breeding plumages, forehead, crown and nape bright yellow, bill and facial mask black, throat brownish. Female: upperparts dark with buff streaks.	Nests elaborately woven structures with lateral openings. Associates in compact flocks of up to forty. Flight swift, direct, and co-ordinate with the whole flock.	
Brown Shrike	Broad black eyeline, whitish supercilium, and forehead distinctive. Upperpart colour varies from white to buff.	Found on forest edge. Use fence post, wire as vantage point to look for prey.	
White-headed Munia	White head and upper breast contrasting sharply with brown iris, bluish grey bill and dark chestnut plumage diagnostic.	Open grassland, scrubs, gardens. Gather in large flocks.	
Pink-necked Pigeon	Grey tail with broad subterminal black band and very narrow grey tip. Male: grey head, green mantle. Female:dull green with mild yellowish on underparts.	Mangrove, forest edge, plantations, etc. Found in canopy and crowns of smaller trees in pairs or moderate to large flocks.	
Long-tailed Parakeet	Male: green crown, reddish side of head and nape, broad black malar stripe diagnostic. Wing blue, mantle tinged bluish Female: has shorter tail and lack bluish tinge on mantle.	Mangrove, forest edge, forest, palm plantations. Habits the canopy and crowns of tall trees in noisy flocks. Frequently perch on dead tree.	

# Rotting Condominium

**Site:** Rotten wood or log in the forest

**Duration:** 1 hour - 1 1/4 hours

**Academic Level:** Primary / Middle School

**Author:** adapted from Project Learning Tree

**Activity Description:** This activity allows students to investigate the organisms that live in and on rotting logs "woodland condominiums". It introduces students to the idea of decomposition, micro habitats and communities. Through observation and investigation students can begin to make connections between the logs and the life they support.

## **Learner Outcome/Participant will...**

1. Observe closely
2. Identify some of the organisms that live in, on, and under fallen logs.
3. Be able to suggest how the dead wood supports the survival of organisms.
4. Describe the process of decomposition.

## **Materials:**

Magnifying glass, reference material, journal page for observation notes, containers to collect (optional), journal questions, observation guide

## **Background Information:**

Throughout their lives, trees collect nutrients from the ground and use them to build new bark, leaves, branches etc. when a tree dies, its nutrients are recycled back into the environment through decomposition. Animals such as bark beetles move into the trees and start the process of decomposition even before a tree has died. These creatures may hasten the death of a tree. Wood eating insects as well as fungi and bacteria invade a dead or dying tree, paving the way for other invaders.

## **Things growing on Dead Wood**

Any decaying wood is sure to have fungi, moss, lichens and other plants growing on it. Wildflowers, grasses, trees and other plants seeds land on the soft wood of a decomposing log and begin to sprout and grow. Plants and fungi absorb nutrients from the decaying wood and as they grow, they penetrate the wood and break it apart. Lichens as they grow release a weak acid that breaks down the wood. Moss keeps the log moist, making it suitable for other plants and animals to live.

## **Wood Munchers**

Termites, ants and wood roaches all eat or tunnel through wood. Many of those animals also eat other vegetable matter, such as dead leaves. All of them chew their way through the wood and help to break down the log. Bark beetles eat through living tissue just under the bark. Evidence of their work is easy to see on many dead logs. The tunnels create intricate patterns just under the bark.

### **Predators on the Prowl**

Some animals such as centipedes and spiders feed on the other scavengers that feed on the decaying log. The predators and then the scavengers in turn become the food for birds that come to the log to feed, resulting in the diversity of life seen in the forest.

### **Hideouts and Nurseries**

Many creatures depend on decaying logs as places to hide from predators or to find shelter from the elements. Some beetles may hide in the decaying matter during the cool season, some laying their eggs in the decomposing wood. Skinks and geckos wait in the relative coolness of the log and then hunt for food. As these animals burrow into the log they also help to break it down.

### **Skills:**

observation  
organising information  
identification

### **Curriculum Links:**

science, environmental studies, biology, Visual arts, ecology

### **POW**

Ask the students who has been into a forest before. What did they see? Did they see any condominiums? Sound surprised when they say they didn't!

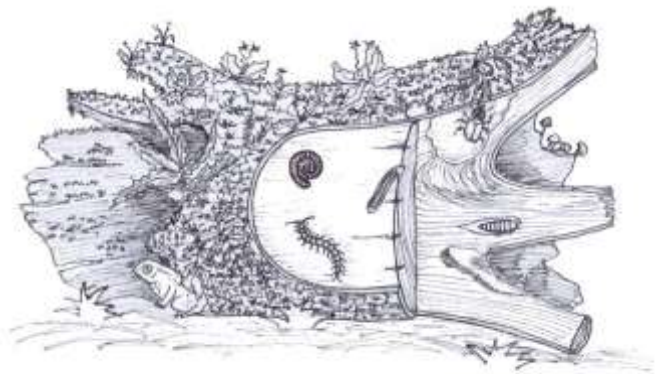
### **BRIDGE**

Ask the students why they think the forest wasn't piled high with leaves. What happens to trees when they die?

### **BODY**

Tell the students that they are going to be scientists exploring rotting condominiums to find the answers to these questions. Question what a condominium is.... ask what might be a forest condominium. Lead the students on to knowing that they are going to look at life on rotting logs! Ask them to predict the life they might see on a log. Check through the guided discovery questions in the journal.

Small groups of students investigate a log. Magnifying glasses are used to look carefully at everything. Students work to answer the guided observation questions in their journal. Once the log has been investigated, observe the area around the log. What does it tell us?



## **DEBRIEF**

Ask students to tell you of any special things they found? Was the same life found on all wood types?  
In which conditions were the most plants found?

Encourage the students to think about the role the small insects and the plants that they have seen fit into the food chains and habitat ecosystem.

### **Variations:**

- Students make sketches of the life they find on the log
- Students devise their own questions / observations

### **Classroom Follow Up**

- Study the food chains that the things identified on the log
- Make drawings of the things seen on the log
- Creative writing about life in the rotting condominium

## STUDENT JOURNAL PAGE

1) Describe the bark on the log. Is there bark? What colour, texture is it? How thick is it?

2) What kinds of plants are growing on the log? What are their roots like? What colour are the plants?

3) What kinds of animals are on the bark? Under the bark? Inside the log? Under the log?

4) What are the animals doing? What do you think each one eats? Why do you think this?

5) What evidence of animal activity is around the log?

6) Why do you think this log died? How long do you think this log has been dead? Why do you think this?

7) How valuable is this log to the forest ecosystem? Describe.



# Tree Apartments

**Site:** Forest or Classroom

**Duration:** 60 minutes

**Academic Level:** Primary-Middle School

**Author/Source:** Project Learning Tree

**Activity Description:** Trees provide a habitat for a host of animals and plants, from their highest leaf to their roots. This activity encourages students to discover how plants and animals depend on trees.

## **Learner Outcome/Participant will:**

1. Collect data about the plants and animals that live in and around trees
2. Identify ways in which those animals and plants depend upon the tree, and the tree in turn on the plant or animal
3. Consider the role of buildings in an "urban forest."

## **Materials:**

- Pencils
- Paper (journal page with tree outline)
- Magnifying glass
- Identification material (optional)

## **Background Information:**

A *habitat* is a place where a plant or animal gets all the things it needs for survival, such as food, water, shelter, and space for living off and for raising its young. A habitat may be 259 km sq. of grassland for a lion or a single plant for an insect. A tree may serve as part of an organism's habitat or it may be the organism's entire habitat. E.g. An Indian rain tree might provide food for one bird and nesting space for the Asian Open Billed Stork, but lichen can get everything it need just from that tree.

## **Sources for more Information:**

Nebel, Bernard J. and Richard T. Wright [Environmental Science](#)

Ricklefs, Robert E. [Ecology](#)

## **POW**

Ask "have you ever looked closely at a tree? What did you see? What was living on / near the tree?"

## **BRIDGE**

Show a picture of a tree. Brainstorm with the children what they think may be living on the tree. Ask " why do you think .... would live on the tree? " establish that animals and some plants *depend* on the tree for one of their habitat needs ( shelter, food, water, space).

They are going to study a tree (or shrub) very closely, like a detective, to notice everything that is depending on that tree / using it in some way. They will record on an outline of their tree where they found the evidence.

Brainstorm the types of things they should look out for (eaten fruit, droppings, claw marks, tracks, chewed leaves etc.). Set the boundary limits and establish a "come back" time and signal.

## **BODY**

Students observe and record in drawing the things they find on each tree. (Depending on age and location, more than one tree could be studied by each child / pair)

## **DEBRIEF**

Students share the things that they have found out. Create a white board list of insects, birds, mammals, plants that were observed and where they were found on each tree (or make headings bark, roots, leaves and write the things found underneath)

Ask the students "why do you think .... was found on the tree?" Discuss how each animal / plant affects the tree. Discuss how they benefit the tree. ask: "Which of these organisms seemed to harm the tree? What was happening? What did you see to make you think this way?"

Discuss what the students think would happen if the tree was

- a) cut down to build a new road
- b) killed in a drought.

### **Variations: Younger Students**

- Provide a collection of leaves, fruits and seed. egg shells , bark with lichen...( perhaps collected during a walk) and ask the students to look closely and tell each other what they noticed.
- Ask "What do you think chewed that leaf? Why is there egg shell under the tree?"
- Go outside and look at a tree together for signs of animal life.
- Make a large group collage of a tree and all the birds and animals that live in and around it.

### **Urban Environment**

- Brainstorm plants and animals that live on the inside and outside of a building
- Discuss how the plants / animals depend on the building?
- How do they affect the building and the people living there?
- Survey the school / home to find the plants and animals living there and the conditions that make this habitat a suitable one.

### **Related Activities for the Classroom:**

- *Webbing*
- *Interview a Tre*

# Web of Life

**Site:** Anywhere

**Duration:** 1 hour

**Academic Level:** Primary-Middle School

**Author/Source:** Adapted from Joseph Cornell, [Sharing Nature with Children](#)

**Activity Description:** In this activity, students will take a close look at a forest ecosystem by discovering the invisible linkages between the non-living things (abiotic) and living things (biotic) found there. The students will create a “web of life” to depict the relationships among members of a forest ecosystem. This web includes eating relationships (as in the food web), but also show the various other kinds of relationships found in a forest (e.g. shelter, light, reproduction). After the initial part of the activity there will be a short discussion about how all forms of life rely on each other and are connected to each other.

**Learner Outcomes / Participants will:**

1. Create an ecological web of living and non-living things.
2. Understand the interconnections between abiotic and biotic components of an ecosystem.
3. Review the habitat needs of different forest species.
4. Demonstrate how each member of the ecological community is important and interdependent on the other members.

**Skills:**

Communication, team work, classifying, synthesis

**Curriculum Links:**

Ecology, biology, environmental science, art

**Materials:**

- Laminated ecosystem role cards (attached with string)
- Rope or string wrapped around a throwing ball or another object

**Background Information:**

This game makes very clear the essential interrelationships among all the members of nature's community. Webbing vividly portrays how air, rocks, plants, and animals function together in a balanced web of life.

**Sources for more Information:**

Western Regional Environmental Education Council, [Project WILD](#) and [Aquatic Project WILD](#)

**POW** (5 minutes)

What are the four things that make up a habitat for an animal? Food, water, shelter and air. Ask students to choose an animal, plant, or non-living thing found in an animal's habitat and act out that character or thing for one minute. Encourage them to fully get into their role by making sounds, body movements, and interacting with the other species.

**BRIDGE** (5 minutes)

**Set-up:** Have all the students sit in a large circle on the ground

Start out by asking the students "who has ever been in a natural forest like this before?" What things live in the forest? Do they know what an ecosystem is? If not, briefly explain what an ecosystem is. How about a Community? Can anyone define what a community is and what it consists of? Do you live in a community? Who and what else lives or is found in your own community? Can people live in a community without interacting with other people, other organisms, and other non-living things? No, they are both dependent on other people and things as well as all other people are interdependent on hosts of other organisms and things and visa versa. Explain the difference between "abiotic" (non-living) and "biotic" (living) things?

**BODY****Activity 1: Who Am I?** (10-15 minutes)

1. Explain to the students that you will be placing role-cards on their backs, and they are not to peek to see what it is. Place the string over their heads so that the picture of the hangs down and is visible on the child's back.
2. When all the cards have been distributed, ask for a volunteer to be first. The child walks around the inside of the circle to that all the other can see what animal he/she is.
3. Then the questioning begins. This phase may be done in several ways.

a. If the children are older, and knowledgeable about animals, then they may ask questions like: "Am I a mammal?" "Do I live in the water?" "Do I have six legs?" Like "20 Questions," with only yes or no answers possible. They should walk around to different people to ask questions.

b. For younger children, children in the circle can provide clue, one at a time until the one who is "It" realizes what animal is depicted. Example: "You have a big trunk " "You spin a web "

The problem with this way of playing is that the participants make the clues too obvious and the person gets it too quickly, and the game loses its excitement. You may have to direct the clue giving by providing the first few, less obvious clues. Example: For an elephant, rather than saying "you have a long trunk " a less obvious, more subtle cues might be "you are the largest land mammal." After you have given a few, let the students take over so that the game isn't too difficult.

Once all the students have found out "who they are," proceed to the webbing part of the lesson.

**Activity 2: Webbing**

**Explain** - (2 minutes) Have the students form another circle. They will be creating a web using rope or string to represent the interactions among the living and non-living things found in the local ecosystem.

**Activity** - (25 minutes) The instructor stands inside the circle near the edge, with a ball of string and says: "Who can name a plant that grows in the area?...*Tree....good. Here Tree, you hold the end of the string. Is there an animal around here that might eat or depend on the tree for its*

*survival?...Kingfisher?...Ah, a lovely home for the . Mr. Kingfisher. Kingfisher, you take hold of the string here; you are connected to the tree by your dependence on her branches for your nesting grounds. Now, who has a relationship with the Kingfisher?*

*Note: This is just an example. Start with any abiotic or biotic organism to get the game going.*

Continue connecting the students with string as their relationships to the rest of the group emerge. Bring in new elements and considerations, such as other animals, soil, water, sun and so on, until the entire circle of students is strung together in a symbol of the web of life. You have created your own ecosystem.

To demonstrate how each individual is important to the whole community, take away by some plausible means one member of the web. For example, a fire or a logger kills a tree. When the tree falls, it tugs on the strings it holds; anyone who feels a tug in his string, is in some way affected by the death of the tree. Now everyone who felt a tug from the tree gives a tug. The process continues until every individual is shown to be affected by the destruction of the tree. Introduce several realistic scenarios that might affect the web.

## **DEBRIEF**

After everyone has found out who or what he or she is in the ecosystem. Ask the students questions such as:

- Did you learn anything new about what you were or what other people were by asking the questions? Have some of the students explain what they learned.
- Is there anything that a11 the different things have in common? What?
- If one of your community members were to disappear (i. e. go extinct) how would you feel? Would their disappearance from your community/ecosystem affect you in any way? How?
- What does this game tell us about a11 the members (living & non-living) of a community or ecosystem?

### **Variation**

Get the students to sit in groups and draw the web they have physically created using arrows to show relationships between species. Label the producers (P), primary consumers, (1C) secondary consumers (2C), and non-living (NL) members of the web.

