



RECONNECTING URBAN CHILDREN TO THEIR NATURAL ENVIRONMENT

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Project II | Guide: Raja Mohanty

Approval Sheet

The Industrial Design Center Project II titled "Reconnecting Urban Children with their Natural Environment" by Shubhangi Salinkar (136250009) is approved, in partial fulfillment of the requirements for Master of Design Degree in Visual Communication at the Industrial Design Centre, Indian Institute of Technology, Bombay.

Guide

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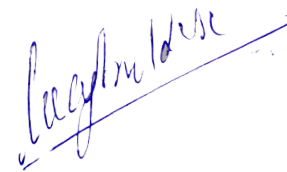
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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misinterpreted or fabricated or falsified any idea/data/fact/source in my submission. I understand that the violation of the above will be cause for disciplinary action by the institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Shubhangi Salinkar

136250009

Industrial Design Center, Visual Communication

November 14th, 2014







Acknowledgements

Nature has always been very close to my heart. It is a source of endless joy, wonder, and respite for me. So I must, first and foremost, thank nature for the wonderful gifts that it gives us so graciously.

My sincere thanks to my guide, Professor Raja Mohanty, who always encouraged me to go a level deeper with my thoughts, words, and work.

Mr. Raghuram and Prashant Gokarankar, nature enthusiasts and trail-guides, who got me an entry into various nature organizations and private nature trails. The people at Bombay Natural History Society's Conservation Education Center (BNHS CEC), for their valuable support.

I owe this project to a dear friend who passed away, who brought me closer to nature, as no being ever could.

The IIT-B campus, with all its beauty and tranquility. The Central Library.

Prashant, Rekha, Upasana and Gauri for their valuable inputs.

The mongoose on the lakeside who looked at me squarely in the eye, before shuffling away. The black kite who posed for my camera. The Blue Cerulean butterfly Who settled on the flower in my hair. The trees, for being there. And everybody else who helped me along the way.

Thank you.

Abstract:

Nature is fast losing its place in the lives of urban children. The urban child's exposure to nature is largely virtual, through television, the internet, movies and books. Spending time in nature has been documented to improve a child's life and learning in many ways. Out of the few situations in which urban children do spend time in nature, conducted nature trails were found to be fairly prevalent.

After extensive field study, accompanying children on these nature trails, and spending time with them, it was found that the trails were too structured and information-heavy to give the children an enjoyable and memorable nature experience. Moreover, they were conducted by Trail-Guides, who are field experts, and thus took place only with the trail guide's presence, under a banner of a certain organization.

This project aims to create a set of resources to give children a less structured, more enjoyable, yet an informative nature experience, without a field expert's presence. A Self Guided Nature Trail is conceptualized. Anybody with these set of resources, may initiate their own nature trail. The area selected for the sample nature trail and resources, is the IIT-Bombay Lakeside.

This set of resources, forms a kit for children, termed as The Little Explorer Bag. It consists of the following items, specifically designed for use by children. A Field Guide for specie identification, an Activity Book, which contains a set of thoughtfully designed, trail-specific activities and information nuggets, a Trail Map of the IIT-B Lakeside Area, and other resources to enable the group to plan and create their own nature trail. It is recommended for an adult to accompany the group of children on the Nature Trail.

The use of the kit will enable the children to have an informative as well as an enjoyable nature-immersion experience, and might act as a trigger to generate sensitivity towards nature in children.





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Introduction

Ever since I was a child, I have had a very close association with nature. Though a city-bred child, I was lucky enough to have had a patch of green in my building compound, in which we spent all our time! We chased butterflies, climbed trees, built mud cakes and looked at earthworms. Opportunities for such kind of play are disappearing, in today's urban scenario. Children are getting increasingly disconnected from nature, and their encounters with nature or anything nature-related are becoming more and more virtual. Moreover, the need for this is not felt anymore, and is lost from the collective method in which children play.

My project started out with the aim of familiarizing urban children with Nature. Two things, I knew at the onset:

I wanted the project outcome to be such that it would directly facilitate children spending time outdoors, in a natural environment.

I couldn't claim to 'connect' a child to nature- It is a process that happens organically, it is a process of the heart and mind and not one with measurable outcomes. But I could try to act as a catalyst to create an empathy, sensitivity, and love for nature in children, and provide them with a well thought out and effective natural experience.

How could this be achieved in an urban scenario? Children could be given an opportunity to go to the natural pockets in the city, on a regular basis. Nature trails and walks do happen in some of these areas, and they serve the purpose quite well. I then set out on an extensive study and observation of Nature Trails in Mumbai. After looking at the children's experience during the trail, I decided to find ways I could integrate interesting activities, a little unstructured play, and some learning, into a nature trail.

Process followed:

Field Study:

Field Study was carried out by visiting various organizations working with nature, in Mumbai. Various nature trails with children, parents and teachers were observed, passively. The children's and parent's reactions were closely noted at each juncture. Also, the role of the Trail Guide was identified, and noted.

Engaging with Children:

Children were taken on nature trails by me, in the IIT Campus. The one-to-one interactions with them also helped me gather valuable insights.

Problem Identification

Based on insights from the Field Study and interactions with children, problems were identified in the existing model of the Nature Trails.

Ideation and Conceptualization

Based on the interactions with children, and background reading on the subject of children and nature, and the problems identified, a new concept of a Self Guided Nature Trail was formulated.





Prelude

Long, long ago, before the advent of smart phones, computer video games, and glitzy child-friendly programs on television, children spent all their free time in nature. After school, in between classes, and in long vacations that stretched indefinitely, they most likely ran off to the nearest 'wild place', which could be a nearby stream, a forest, field, park, or just a vacant lot where nature had taken over.

And they made their own games. They climbed trees, raced each other through the fields, made whistles out of leaves, chased butterflies, and tossed pebbles into streams. There was little restriction or supervision, but they were still mostly safe, happy, and fun-loving - As kids through the ages are.

And in this process, something beautiful happened. They grew up in close contact with, and surrounded by mother nature. They grew up knowing who they really are.





Children and Nature

Humans, through their 120,000 year history, have evolved in close contact with nature. In the last four decades or so, with the advent of urbanization and growth of modern technology, urban lifestyles have changed.

The lives of children today are much different. They have few opportunities for outdoor free play and regular contact with the natural world. Fear of insects, stray animals, reptiles, and various forms of pollution are also leading adults to keep children indoors.

Furthermore, children's lives have become structured and scheduled by adults, who hold the mistaken belief that this sport or that lesson will make their young children more successful as adults. (1)

The culture of childhood that played outside is gone and children's everyday life has shifted to the indoors. As a result, children's opportunity for direct and spontaneous contact with nature is a vanishing experience.





Life of Urban Children Today

Television, nature documentaries, EVS Textbooks, National Geographic and other nature TV channels, and even visits to Zoos are conditioning children to think that nature is an exotic, awe-inspiring and in far, far away, places they will never experience. Children are losing the understanding that nature exists in their own neighborhoods, which further disconnects them from knowledge and appreciation of the natural world.(1)

An average child today knows the names of various plants and also concepts of science related to nature- but he/she might rarely have touched that plant, or even seen it for real. These sensory and kinesthetic experiences within nature are completely absent from modern children's lives.





Dissociation

The textbooks used by children and the media are filled with issues like deforestation, acid rain, ozone holes and global warming. One result of trying to teach children at too early of an age about such negative and abstract concepts can be **dissociation**. When we ask children to deal with problems beyond their cognitive abilities, understanding and control, they can become anxious, tune out and develop a phobia to the issues. In the case of environmental issues, bio-phobia—a fear of the natural world and ecological problems—a fear of just being outside—can develop.(2)(3)(4)

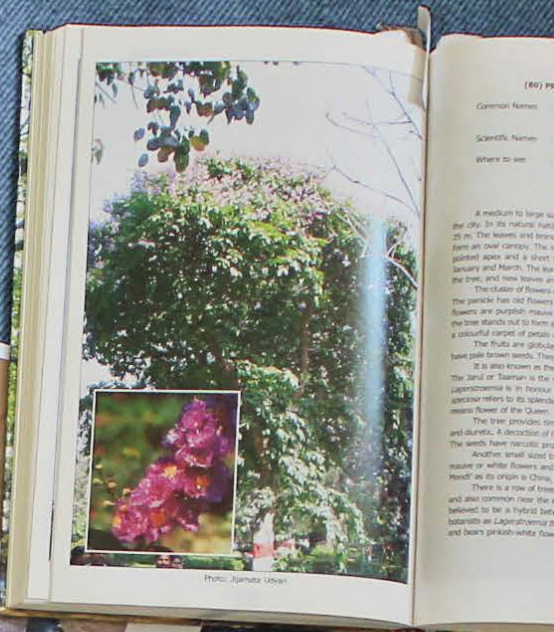
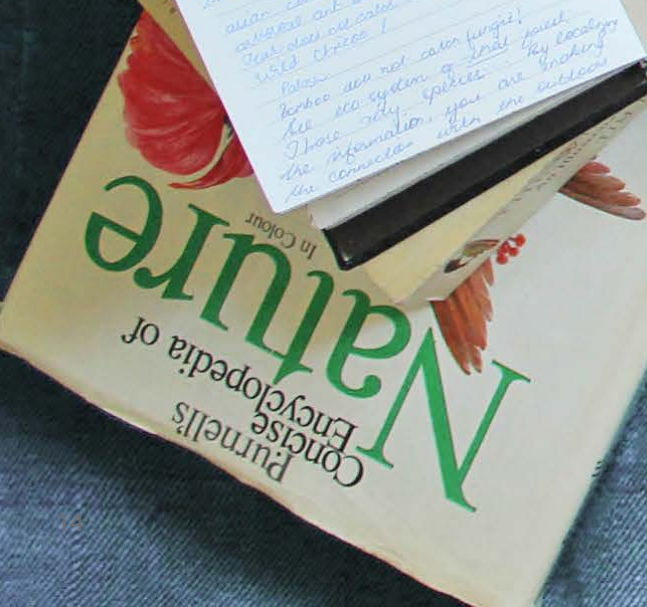






Love

The lack of contact with a natural environment also sets the stage for a continuing destruction of the natural environment. Affinity to nature, along with a positive environmental ethic, grow out of children's regular contact with the natural world. In today's world, results of the lack of sensitivity towards environmental concerns are evident. Positive natural experiences are essential to children for developing an attitude towards conservation, from an early age. John Burroughs cautioned that, "Knowledge without love will not stick. But if love comes first, knowledge is sure to follow." The problem with most environmental education programs is that they try to impart knowledge and responsibility before children have been allowed to develop a loving relationship with the earth (3).

Children whose development occurs with very little contact with the natural world come to see themselves as separate and not a part of the natural world. If children's developing sense of self becomes disconnected from the natural world, then nature comes to be seen as something to be controlled and dominated rather than loved and preserved.



Polosh - Buteo M
 Pangara - Erythrina
 Gliricidia sepium -
 Neem
 Tamok (purple flower)
 araria Australian Acacia
 Khair
 Babul
 Sakobul ()
 Vagiti Chind
 * Rain Tree (pink flower)
 Umber Tree (Wild Fig) - Ficus Glomerata
 Kala Umber
 Jengli Bodan
 * Sandpaper Tree  those large-leaved
 Nilgiri Ficus hispida
 Jamun
 Parijat
 Bor -
 Bartonsi - Foot ball Tree
 Kadamb (few)
 Bakul (few)
 Wavla
 * Charcoal
 Teak Tree
 Banyan
 Ghost Tree -
 * Pipal
 Bahava (Bahur)
 Kuda



Field Study - Observing and Learning

Based on interviews conducted with 10 urban parents from Mumbai, it was observed that their children had had direct natural experiences in the following situations:

- Summer camps
- Holiday outings to wildlife sanctuaries
- Nature trails by organizations

Various organizations like BNHS(Bombay Natural History Society), WWF India (World Wildlife Fund), MNP(Maharashtra Nature Park), and others are working in this field. They conduct nature camps and trails, distribute educational material to schools, and hold various programs and workshops, to spread awareness about the natural environment.

Nature trails are basically planned walks, through a natural area. The trail generally lasts for 1-2 hours. There are a fixed number of children, and an adult trail-guide. The children may/may not be accompanied by their parents. The trails are planned, and information about what's around is given by the trail guide, in most cases.

7 Sept 2014



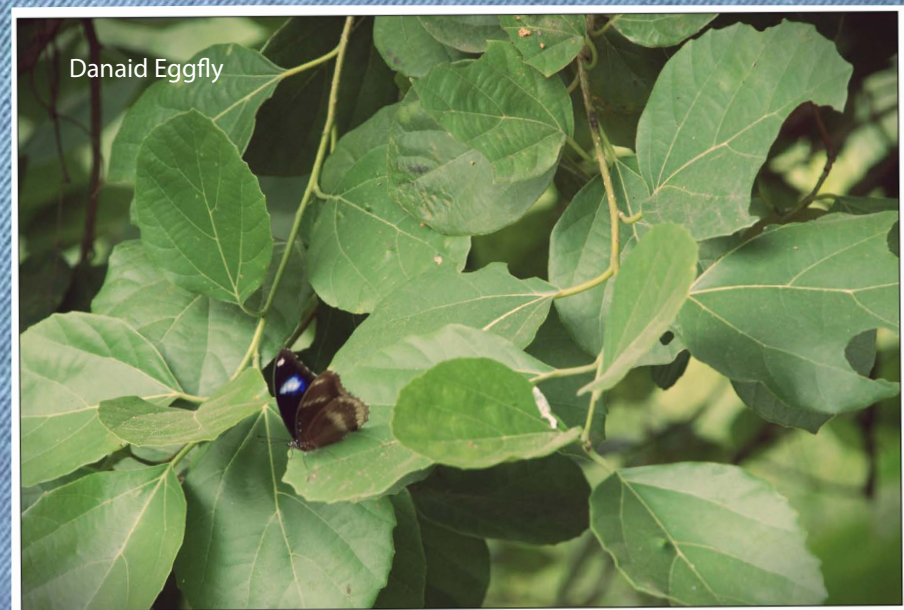
Where: *Bombay Natural History Society*
Conservation Education Center (CEC), Goregaon

Who: A Trail of College Students

My Role: A participant in
the nature trail.



Jamaican Spike



Danaid Eggfly



The green around me was not just a faceless body of trees and shrubs anymore- they were beings who had names, identities, and a specific purpose in the wild.



My Trail Experience

Crabs scuttled about on the wet, slippery trail. Above me, was a wide, dense canopy of trees, and all around, shrubs, mosses, fungi and ferns blossomed in profusion. But I kept on, striding confidently with my shoes. As we moved further and further ahead, leaving the trail in some areas, and trekking into the wild, I lost my reservations, and automatically, my senses opened up to everything around me-Sights, sounds, and the smells of the forest. We trekked up a wide, flowing stream. I could feel the cold water and the sharp pebbles underfoot, between my toes.

The trail-guide pointed out various species of plants and animals on the way. It was wonderful to know their names, to know where they stood in this cycle of the ecosystem. We encounter so many local plants every day, specific only to our area and our forests, and fail to know their names. I realized, that once the love of nature is instilled deep within us, we automatically want to know more about it. And knowing the names of the species made me feel that they were my friends, and I felt glad when I recognized them from afar.

19 Sept 2014



Where: *Bombay Natural History Society*
Conservation Education Center (CEC), Goregaon

Who: A trail of ten 3-5 year olds, accompanied by their parents.

My Role: Trail Observer.





BNHS Conservation Education Center

Observations

Children have a strange affinity to animals. They really connect with them, especially the younger ones.

Initially, the children are very interested in nature facts. But they do not want to listen to the volunteer after sometime. They prefer to wander about, look around, and be free.

They lose their inhibitions after sometime. Are less inhibited when parents are not around.

Some younger children, surprisingly, come up to hold strange creatures like grasshoppers, spiders, etc, when urged by the volunteer.

Children of ages 7 and up used smart-phones to take pictures.

They listened keenly to the safety guidelines at the start of the trail. They felt it was important for them to know them. And being children who are constantly being instructed about what to do, they absorbed it well as they were excited to start with the trail.

Insights:

Natural curiosity and affinity to nature is present, in children. It needs to be tapped and real life experiences need to be had at an early age.

Parents are unknowingly limit their children's experiences, and have a major role to play in curbing their children's curiosity and enthusiasm to explore.

Technology is very much here to stay, at least for the older children. They use it on the trail to document what is being said, so that they can re-visit it later. But it does take away some of the real experience.

8 Oct 2014

10 am-3pm

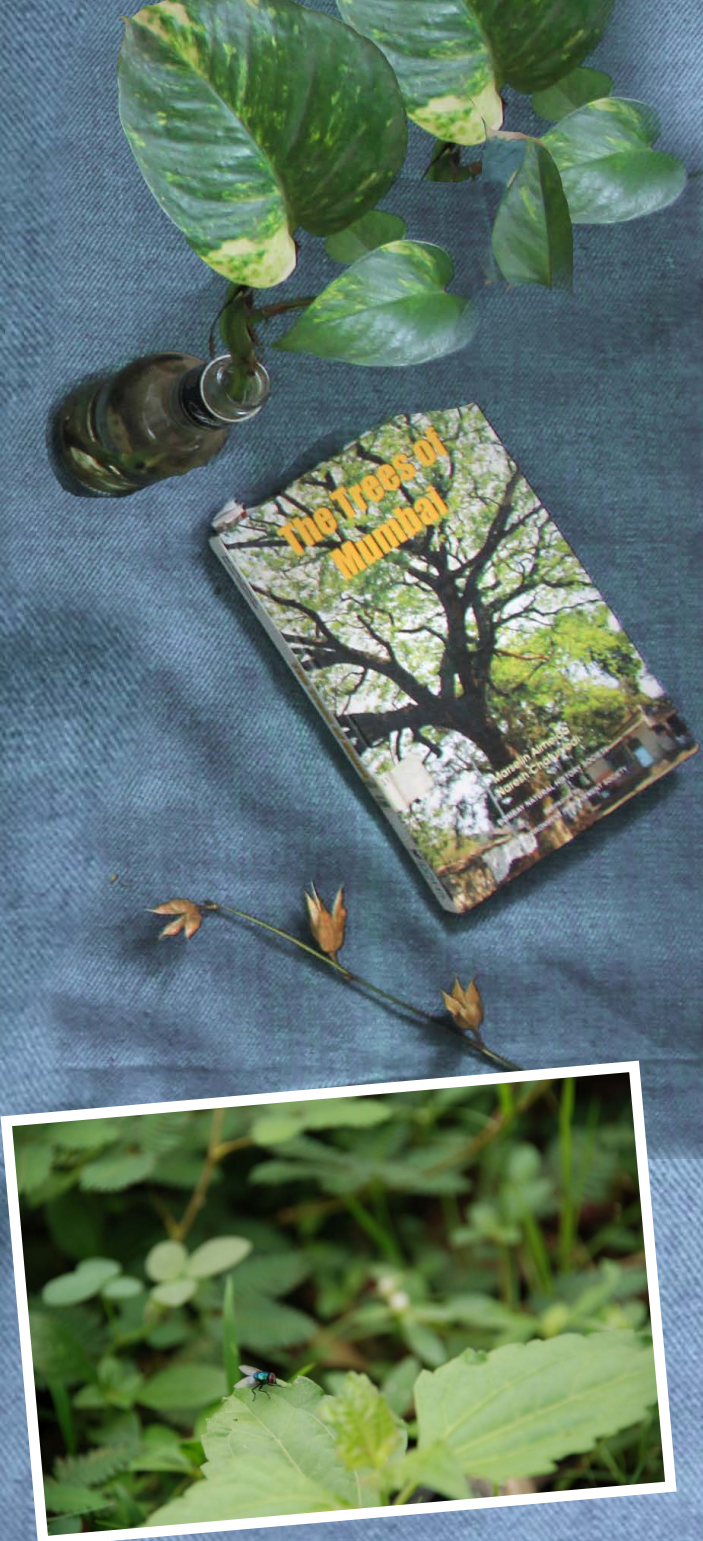
Where: *Bhavan's Nature and Adventure Center*
Versova

Who: A group of 60 international school students, accompanied by their teachers.

My Role: Trail Observer.

images from : wild-holidays.com





Bhavan's Nature and Adventure Center

What they do:

They attempt to provide a wholesome, guided, packaged, and large scale natural experience for children. They have four activity sessions:

Nature trail | Planting session | Pet care | Vermicompost(Earth Care)

Observations

Manmade forest ecosystem, with features like a butterfly garden, and provisions to exhibit to the children every domain of nature.

Worksheets provided at the end of the trip.

They have managed to get a total of 25000 children from various schools across mumbai, to their park, and are located centrally, and enjoy immense popularity with all categories of schools.

Large scale, scalable solution. Right from dividing the children into groups with different band colours to abiding by the fixed time slots for each activity, they are very organized.

Children seem to enjoy themselves fairly well, but it's just like a classroom, or a lab session.

The man-made eco-system is quite inadequate to give a lovely nature immersion experience.

Their volunteers and employees are knowledgeable, genuine nature lovers, and are committed to their job.

Insights:

Too much structure is good for imparting knowledge, but the environment is not conducive to enjoyment and appreciation of beauty.

There is no element of exploration and finding out for yourself, when everything is demonstrated and told .

9 Oct 2014

2pm-5pm

Where: *Maharashtra Nature Park*, Mahim

Who: A huge group of 200 school students from the Dhirubhai foundation Program, accompanied by their teachers, from all over India.

My Role: Trail Observer, Helper.





Maharashtra Nature Park

What they do:

Maharashtra Nature Park is a 37 acre reclaimed grabage dump, now converted into a lush man-made forest eco-system. It is surrounded by Dharavi and the Mithi River.

It is a superb initiative by the Government, and it has conducted nature trails, an auditorium for AV shows, an extensive library, and various nature programmes.

Observations:

The heat of the afternoon, and the huge group-size, took away all the joy of the trail. Most children were fatigued, and distracted.

Insights:

Time of the Trail is crucial.

Large group sizes are undesirable.

Insights were in the form of personal learnings, where I paid close attention to the information being told.





Interactions with Children

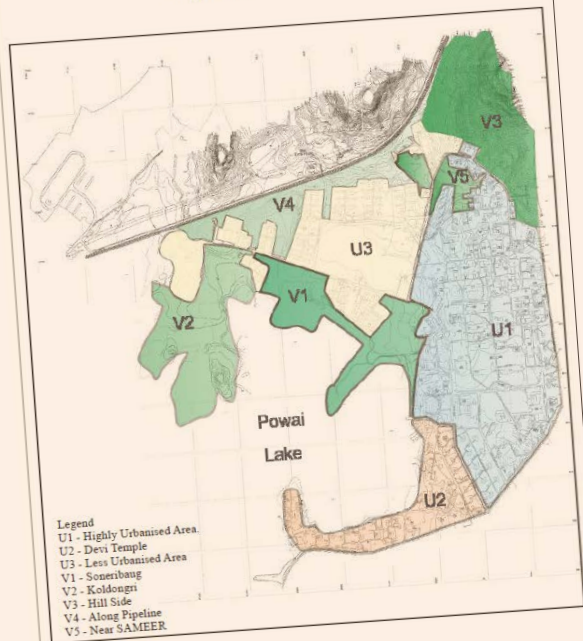
After considerable study, and burrowing through Field Guides and Biodiversity surveys; daily walks at the IIT Bombay lakeside and hill side, learning, experiencing and understanding what was around me- I wanted to conduct my own trail. I wanted to be with children, see their reactions, feel their enjoyment, and explore with them.

Luckily, I met a group of enthusiastic young children living in the IIT Campus, who were very excited to go on a nature trail with me!

We went on two trails, where I let them explore by themselves. There were no structured activities, and the intention was to learn and explore together.



Map 1: Study Area of IIT-Bombay



17 Oct 2014

7 am-9:30 am

Where: *11T Bombay Sameer Hill*

Who: A group of 11 children from 3-9 years.

My Role: Trail-Guide

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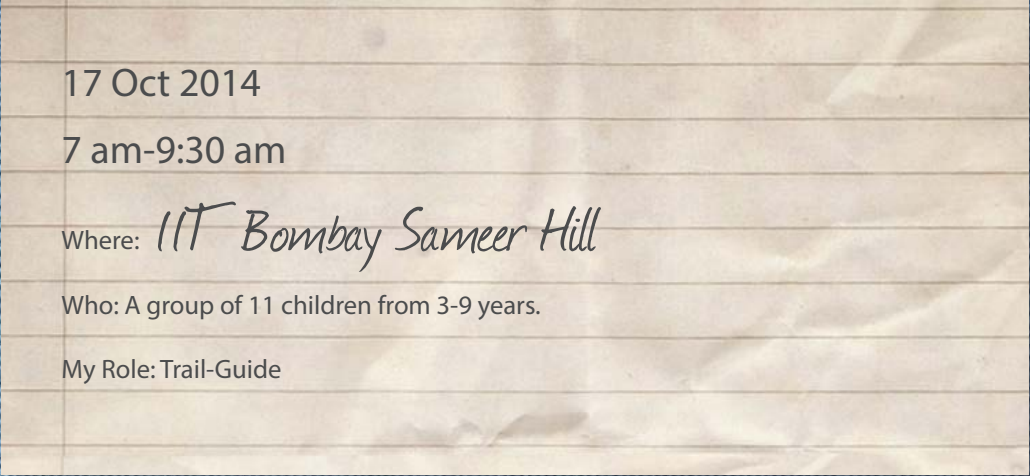
17 Oct 2014

7 am-9:30 am

Where: *11T Bombay Sameer Hill*

Who: A group of 11 children from 3-9 years.

My Role: Trail-Guide





A Trek Up the Hill

Observations

Children are highly curious. They keep asking names of plants and animals. Wanted to know the names of wild plants. Even scientific names.

Loved plucking and collecting, it became like a competition with them.

Love butterflies, scared but fascinated with worms and caterpillars. Scared of snakes. Younger ones are quite sure footed.

They already knew Marathi names of some wild plants .

Love to smell leaves. Sometimes asked if they can eat them, to taste.

Loved the view on top, it mesmerized them for quite some time.

Wanted to grow plants. they already had, on the hill, during Van Mahotsav.

Got out out their papers and pencils, on the hilltop, and started drawing. Loved doing the activity out-doors, everyone wanted to do it. They all (almost) ended up drawing a mountain and a rising sun. The elder ones, and some young ones, drew what they saw (the landscape) and the nearby tree. They asked me to grade them too!

Insights

The excitement of children to go to such a place is immense. They like to be prepared, like to carry their own stuff from water bottles to eatables to notebooks.

Children want information, it helps them appreciate what's around them more.

Besides wandering off and exploring on their own, they love doing certain planned activities, like drawing or craft.

Plucking should not be allowed on a nature trail. Though it limits the experience, it is essential because the children don't have the necessary sensitivity to know when to stop.

Children want to take their own time to observe and explore. It gives them a better experience than a planned and highly structured trail with fixed number of stops and stringent timings.

A larger group of children need to be reminded to stay silent, and concentrate on what's around them.

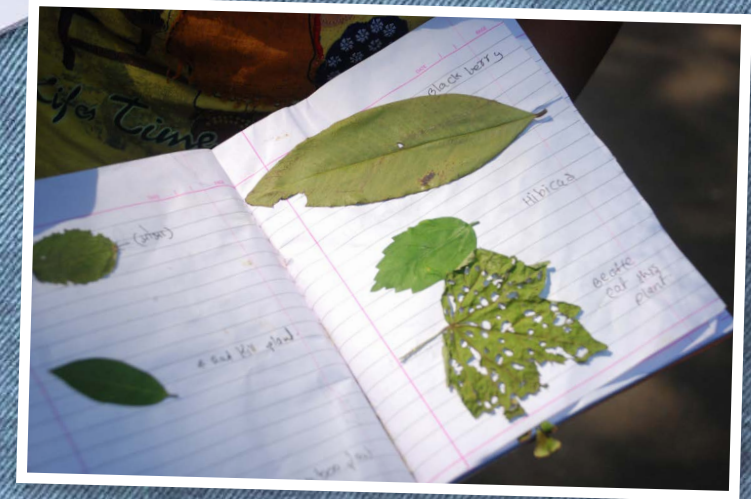
18 Oct 2014

8 am-11 am.

Where: IIT Bombay Lakeside

Who: A group of 6 children from 5-6 years.

My Role: Trail-Guide





A Trail by the Lake

Observations

Shambhavi had stuck leaves and labeled them neatly from the previous day's trail.

They wanted to see the ducks, geese and rabbits at Guest House.

Were curious about trees, wild flowers and wild plants, wanted to know their names.

They pointed out damsel flies, how they are different from dragon flies.

Had named various species of butterflies by themselves. Were very quick in spotting them, and were enthralled when they saw something new.

As the forest got thicker, and we saw a strange bird (later recognized as a Heron) , their voices got hushed, and they took on the mode of explorers.

Were morbidly excited/scared/interested when we witnessed two fishermen catching Tilapia fish, using a hook. Namoh wanted to return the caught fish into the pond at guest house, though he hit them with a stick to stop them from squirming and hopping on the ground.

Found shapes in dense thickets. Looked for patterns in twined woody climbers and creepers.

They had a lovely time feeding the ducks, the black swan, and rabbits at guesthouse. Had brought bread especially for that.

Were very interested when I told them about the Cascuta parasite.

Loved to play, so made me join them for a game of catch at the Boathouse.

Their attention in the trail waned, after 2 hours, as they were tired and the heat increased.

Insights

The concept of outdoor picnics excite children.

Trails must not last longer than 2 hours.

They love to play 'explorers' or 'scientists'.

Children are very keen observers.





Analyzing Nature Trails

Parents:

Most of the parents observed had a considerable role in the children's disconnect. The use of natural elements to scare children into doing something or behaving a certain way also causes major disassociation and unfounded fear in children. Parents are naturally scared for the safety of the children. However, their constant warnings negatively affect the child's experience. There must be a way to ensure that the child remains safe mostly, and this can be achieved by giving adequate safety guidelines at the start of the trail. Parents also, must be reassured in some way that their child will stay safe, because he/she has been told the guidelines effectively . They do like it that their child is having a novel experience on the trail, and realize that it is a significant one in their lives, and would possibly like their child to experience it again.

Children

Children are mostly excited at the prospect. Children with different levels of exposure react differently. But the common underlying fact remains that they are excited, curious, and happy in nature.





Nature Trails - Physical Aspects

Trail Guide:

The Trail Guide supervises and leads the trail. He/ She is knowledgeable about the local flora and fauna, and the species one might encounter on the trail. He/She is well versed with safety instructions, and must be able to handle children well and keep them pleasant company. The trail guide may play specific games or conduct specific pre-planned activities with the children, for their learning and enjoyment. The trail-guide is responsible for the children and their safety, while on the trail.

Trail Guides that I observed, had one thing in common- They were nature lovers! Their love for nature had made them take up this work, either full time or as volunteers, and the knowledge that they had about the flora and fauna was cultivated, along the way. They constantly encouraged children who were too scared to go ahead, but also curbed the over-enthusiasm of the bold ones.

They combined natural species names and facts with things from the children's interests. Eg: they associated woody climbers with Tarzan, and pointed out to trees with interesting names, like the Soccer-ball tree and the Dinner-Plate Tree.

Trail Location

Trail Location is an integral part of the Nature Trail, as it completely defines what the trail would be like. It defines the flora and fauna the children would get to see, the level of difficulty of the terrain, the specific instructions given, the activities done, the trail route, and other logistics of the trail.



Wandering Rose Tree

Red & white - small pink

The leaves are very big

I found

from the tree

the tree

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves

leaves



Essential components of any nature trail:

Trail Planning: Logistics of the trail

Trail location and route

Understanding of What's Around: Biodiversity

Instructions (Pre-trail & On Trail)

Activities





Problems Identified:

It is important to allow children should be allowed to just 'be' in nature. There is no need of creating deliberate situations and teaching them, and with time, they would, by method of play, exploration and experience, develop a life-long love and empathy with the natural world. Trying to find a mid-way between this thought, and the conducted nature trails that were observed, the following **drawbacks** of conducted trails were identified:

- The trails are too structured.
- Strict time limits are observed.
- Very few, or no activities where the children play and learn in nature.
- Fixed, planned routes.
- Flow of information is one way, i.e, from the Trail Guide to the children.The children lose interest after a while.
- There is no learning by way of exploration and finding.

Another drawback with the Nature Trails that was observed:

- They are conducted trails, by certain organizations, and the chances that a child would get to go on such a trail are few.
- The trail-guides, who are the nature experts, would be available only on conducted trails, by organizations like BNHS, WWF, MNP, etc.
- If teachers, parents or care-givers want their children to have a nature experience, to a nearby natural area, they might lack the expertise or the resources to do it themselves.





Revised Project Goals

Out of this problem identification, were born the following two goals, Keeping the initial essence of the project and goals intact.

- 1. To make a natural experience for children which is less structured, more exploratory, and yet, informative.**
- 2. To minimize the role of a trail guide.**

Responsibilities of a Trail Guide

Trail planning: Logistics of the trail

Trail location and route

Understanding of what's around: Biodiversity

Instructions (pre-trail & On Trail)

Activities



Trail Guide

1. How to Minimize the Role of the Trail Guide?

The responsibilities of the trail guide, in terms of the field expertise, may be shifted to information-resources. The Planning, Safety and Supervision can be handled by any adult accompanying the children, provided the required resources to be able to do so.

Trail planning: Logistics of the trail	An Accompanying Adult
Trail location and route	Trail Map
Understanding of Biodiversity	Field Guide
Instructions (pre-trail & On Trail)	Instructional Document
Activities	Activity Suggestions

2. How to make a nature experience less structured?

- The Trail must be self-motivated
- No fixed timings need to be observed.
- The element of learning through exploration must come in.
- More empathy-oriented activities than information-oriented activities.
- The trail experience must be more like play, than learning.





Concept

A set of resources which would make the nature trail exciting, informative and reduce the dependence on the expertise of the Trail Guide.

A **kit**, to enhance the experience of a nature trail consisting of

1. Field guide
2. Activity Book (With Activities, Instructions, & Worksheets)
3. Map

And certain additional resources.

All, specially designed for children Ages 7 and Above.

Closely connected to this location, the IIT-B Lakeside trail. as near to the real world as possible.

The kit should be such that it should perfectly complement the experience of that particular trail.

The kit by itself, would be incomplete without the actual outdoor nature experience.

The kit should enable the user (a child, a group of children, parent and child/ children, teacher and children) to take a self guided trail, also.

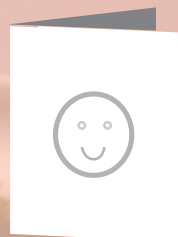
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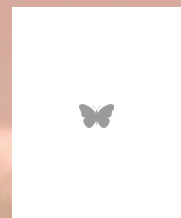
FIELD GUIDE



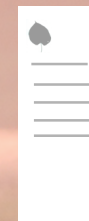
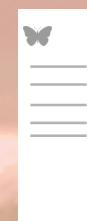
TRAIL MAP



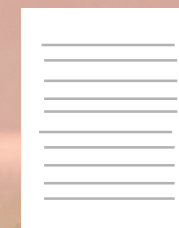
ACTIVITY BOOK



NATURE JOURNAL



TRAIL SUGGESTION CARDS



A NOTE TO PARENTS

FOR CHILDREN

FOR ACCOMPANYING ADULT



Outcome

Little Explorer Bag- A functional and attractive kit for children ages 7 and above, which contains 6 different resources to complement the experience of a nature trail.

The outcome could have been generalized enough to be used in a wide variety of geographical areas. But a connection to and understanding of the greater whole of the environment, can be understood by children better, if they understand first what is immediately around them. Hence, a particular location needed to be chosen, and the contents of the Little Explorer Bag would be tailored to contain all the aspects of natural biodiversity of that area.

In order to connect and come closer to the real environment, from the virtual environment, a child must be familiar with what is immediately around him/her. This would further lead to enhanced awareness of being a part of a greater whole.

Nature Trails with the Little Explorer Bag:

Children can be from 2-30 in number. Each child may have his/her own kit, or they may even share a kit. It is recommended that children don't go on nature trails unaccompanied.





Selecting the Trail Location

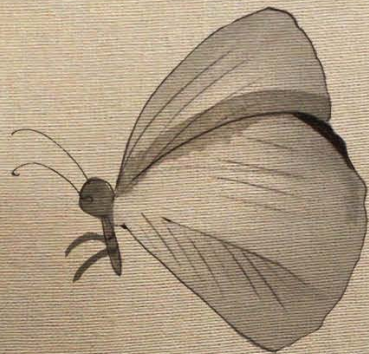
Based on field study of the Biodiversity at various natural locations in Mumbai, it was observed that it is quite different from location to location.

The trail location is an integral part of the nature trail, as it completely defines what the trail would be like. It defines the flora and fauna the children would get to see, the level of difficulty of the terrain, the specific instructions given, the activities done, the trail route, and other logistics of the trail.

IIT-B Lakeside is a lovely natural area, relatively clean and untouched. It has a tiled pathway, which leads to a small shed called as the 'Boathouse'. This area is a hot-bed for biodiversity, especially for various bird species. The trees here are thick, with a beautiful tangle of vines, woody climbers and epiphytes on them. Palmyra Palms stand stately and tall, and through clearings in the dense trees, you can see the lake, and the endless green marsh grass stretched out.

This location was chosen for the Nature Experience, because of its proximity, security, and also the rich biodiversity.

Little Explorer Bag





The Little Explorer Bag is an attempt to make nature accessible and interesting to urban children. It might spark a lifelong love and a feeling of belonging with nature. Or else, it might just get a few smiles and some well spent time amidst nature for children.



Common Castor



Common Bushbrown



Common Cerulean



2 Common Banded Awl

It is found flying around bushes in bright sunshine. It can be seen visiting flowers early in the day and sometimes basks on leaves, with its wings slightly parted. It rests with wings closed.

<http://butterflycircle.blogspot.in/>



Paradise Flycatcher



Kanchan



Golden Oriole



Almond



Common Banded Awl



Rain Tree



Smith's Barbet

4



Common Castor

It is an orange butterfly with brown lines whose larvae feed almost exclusively on the Castor Plant.

thru-eye-of-lens.blogspot.com

1. Field Guide

What: 5 sets of cards. Do the work of a Field Guide, ie, a Specie Identification Guide. Birds | Butterflies | Reptiles, Mammals and other | Shrubs and Herbs | Trees Each set held together by a detachable ring. Will include all the species on Lakeside, with photographs.

Who: Children

Where: During the Trail

Purpose: To connect the virtual with the real.
Knowing about the natural world starts with knowing the name of specie.
Easy Specie Identification| No instructor needed.
Condensed content. Child friendly. Can be used for various games and activities, according to the Trail Suggestion Cards.



Design Decisions for the Field Guide

Content: Based on what had been seen and observed on the lakeside trail, the number of species were drilled down from the WWF Biodiversity Survey of IIT Bombay. Comprehensiveness and rigour are not the aim of this field guide. (12) (9) (6)

Testing of Content: This drilled-down content was tested on the trail, to see if it is satisfactory as a fairly comprehensive information guide. Most of the species seen must be covered in the field guide, without making it too information heavy.

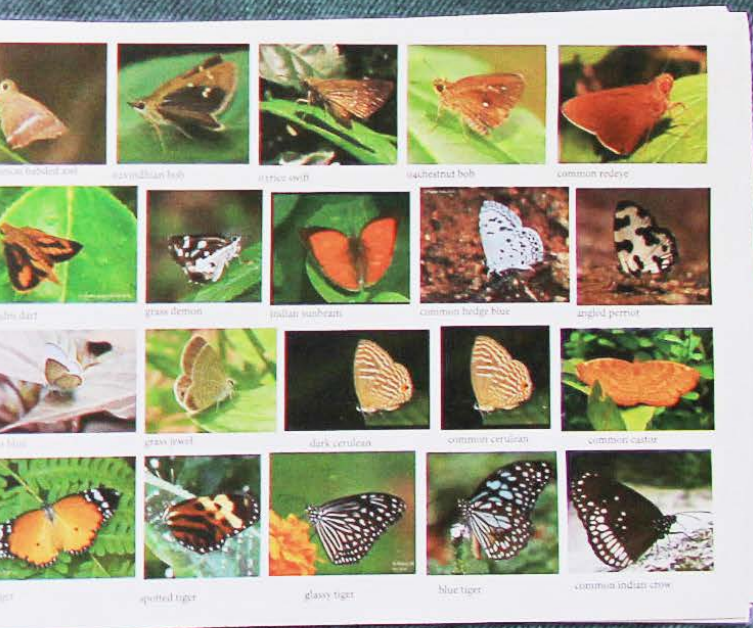
Cut Out Photographs: The foreground was isolated for clarity and focus on the content.

Access: Quickly finding a particular specie in the field guide is important to the functionality of the field guide. Butterflies, for instance, or birds, pass by in a flash, and the quicker and more immediately you look them up in the field guide, the more likely it is that you remember their appearance.

Flora: For trees, especially, identification by the leaf, the positioning of the leaves, and the overall appearance of a branch are most important pointers for identification, in that order. Flowers and fruits are seasonal, so they are add-ons as identification markers. Distinctive bark or trunks are also good markers.

Information: Basic information about the specie, along with the scientific name, which they can use to look up the specie further, if they so wish.

Child Friendly Design: Field Guides are mostly designed for adults, because of the detail of the content and the type of subject matter. But the use of a flash-card like layout, large picture, and the ring binder, make this field guide child friendly. The ring is detachable. There would be 4 such rings, for Birds, Butterflies, Mammals & Reptiles, and Trees.



Final List of Species Identified

Trees

Taad
Mango
Jamun
Sandpaper
Charcoal
Umber
Kala umber
Peepul
Banyan
Red Silk Cotton
Undi
Copperpod
Gulmohur
Rain Tree
Siamese Cassia
Fishtail Palm
Tamarind
Foxtail Palm
Coconut
Bottle Palm
Bamboo
Eucalyptus
Blackboard
Palash
Pangara
Kadamb
Australasian Accasia
Bor
Kanchan
Ghost Tree
Teak

Fungii

Bracket
Toadstools

Ferns

Sword Fern
Mermaids Hair

Shrubs

Crown Flower
Lantana Camara
Castor
Raan Bhendi
Ixora
Hibiscus
Trumifelta Rhombodea
Parvel Cocculus Hiristus
Kaarvi

Herbs

Tridax Procumbens Daisy
Coat Buttons
Vernonia Cinera
Urena Lobata Ceasers
Weed
Tora Takla
Mimosa Pudica
Syndrella Nodiflora
Spiral Ginger
Sida Rhombifolia
Aerva Lantana
Blumea Oxyodonta
Cocks Comb
Alloccasia

Creepers

Gunj
Elephant Creeper
Ipomoea
Madhumati

Wild Grapes
Gokarna
Khaj Khujli
Bandgul
Liana

Mammals

Cattle
Mongoose
Rhesus Macque
Hanuman Langoor
Rat
Three Striped Palm
Squirrel
Indian Flying Fox Bat
Civet Cat
Leopard
Cat
Dog

Insects

Assassin bug
Blue Bottle Fly
Bush Cricket Katydid
Honey Bee
Carpenter Bee
Cricket
Grasshopper
Leaf Hopper
Leaf Bug
Damsel Fly
Dragon Fly
Earwig
Long Horned Beetle
Paper Wasp
Yellow Potter Wasp
Praying Mantis
Red Silk Cotton Bug
Shield Bug
Spittle Bug

Stick Insect

Spiders

Dome Spider
Signature Spider

Reptiles & Amphibians

Toads
Frogs
Brahminy Skink
Calotes Garden Lizard
Gecko
Marsh Crocodile
Vine Snake
Rat Snake
Checkered Keelback
Russels Viper

Birds

Cattle Egret
Black Drongo
Blue Rock Pigeon
Spotted Dove
Alexanderine Parakeet
Rose Ring Parakeet
Jungle Babbler
Crow
Jungle Crow
Greater Coucal
House Sparrow
Kite
Koel
Myna
Oriental Magpie Robin
Palm Swift
Ashy Prinia
Asian Palm Swift
Black Drongo
Asian Paradise Flycatcher
Red Vented Bulbul

Red Whiskered Bulbul
Indian Pond Heron
Booted Warbler
Common Tailorbird
Coppersmith Barbet
Dusky Craig Martin
Golden Oriole
Goose
Green Bee Eater
Kingfisher
Pheasant Tailed Jacana
Purple Rumped Swallow
Scaly Breasted Munia
Red Rumped Swallow

Butterflies

Angled Perriot
Blue Tiger
Chestnut Bob
Chocolate Pansy
Common Banded Awl
Common Bushbrown
Common Castor
Common Cerulean
Common Crow
Common Emigrant
Common Four Ring
Common Gull
Common Hedge Brown
Common Jezbel
Common Leopard
Common Palmfly
Common Redeye
Common Wanderrerr
Dainid Eggfly
Dark Palm Dart
Glassy Tiger
Gram Blue
Grass Demon
Grass Jewel

Grass Yellow
Great Eggfly
Great Orange Tip
Peacock Pansy
Plain Tiger
Psyche
Rice Swift
Short Banded Sailor
Tailed Green Jay
Tawny Coaster



*Knowing the names of the weeds you tread on
everyday, the odd insect that visits your room in the
middle of the night, or that bird soaring high up in
the sky - Gives you a new sense of understanding of
the world around you, a sense of familiarity, and a
sense of caring.*

12. Listen.

When you are on the trail, stop for a while.
Stand still, close your eyes, breathe in deeply,
and listen..

What do you hear?

How many sounds do you hear?



12. Look out for: Woodland Flowers!

The woods are full of flowers of wild plants,
full of a delicate beauty.

Take a look at them and remember them,
even if you don't know their names..



Build your own Nest!

Gather some twigs and leaves and try and
build a nest...

How do birds do it? With their beak and
claws?

Is it as easy as you thought?





2. Activity Book

What: A book of about 30 activities, and instructions for the trail.

Who: A Child, A group of Children.

Where: On the trail, at the boathouse. Or wherever else the child wants to stop and read; Else, before setting out for the trail.

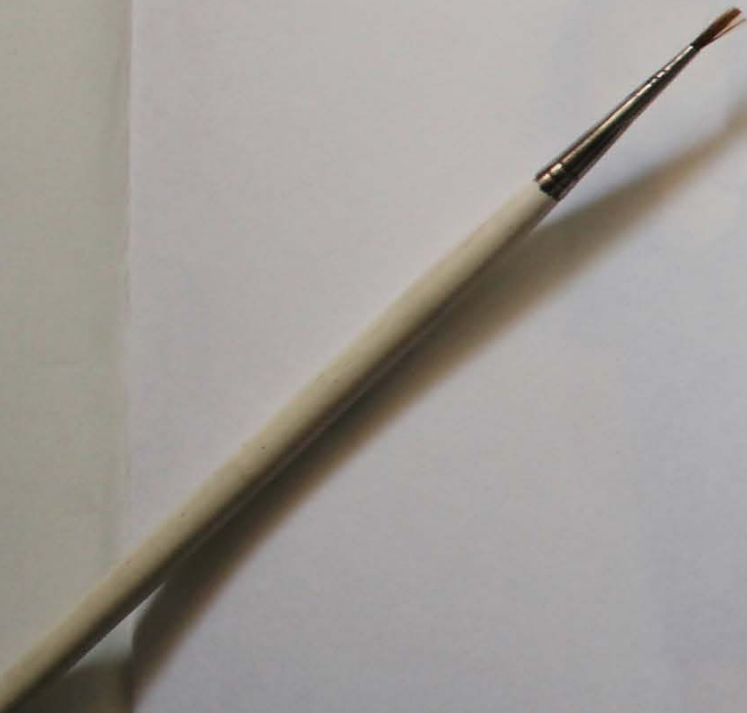
Aim of Activity Design:

- To trigger empathy and love towards nature.
- To ask children to note various features of interest, specifically at the lakeside trail.
- To evoke a sense of belonging with nature.
- To involve them in hands-on activities, which can be fun as well as instructional.
- To take nature activities outside of the trail as well, to their surroundings and their homes.

Activities designed under the following categories:

- Observational Activities
- Make and Do Activities
- Engaging Activities

Activities are designed as individual activities. Can be performed by a group by multiplying the numbers.





Activity Design : Methodology Used

Activities were designed after **careful observation** and **daily visits** to the IIT-B Lakeside, and the **responses of children** on the trail.

Points were referred from David Sobel's Nature Principles (11), on how children interact with nature.

- Making forts and special places;
- Playing hunting and gathering games;
- Shaping small worlds;
- Developing friendships with animals;
- Constructing adventures;
- Descending into fantasies;
- Following paths and figuring out shortcuts.

Sample Activities:

Look out for: (Observational Tone)

Beatle and Caterpillar eaten leaves
Dragon Flies and Damsel Flies
Strangler Trees

Make and Do:

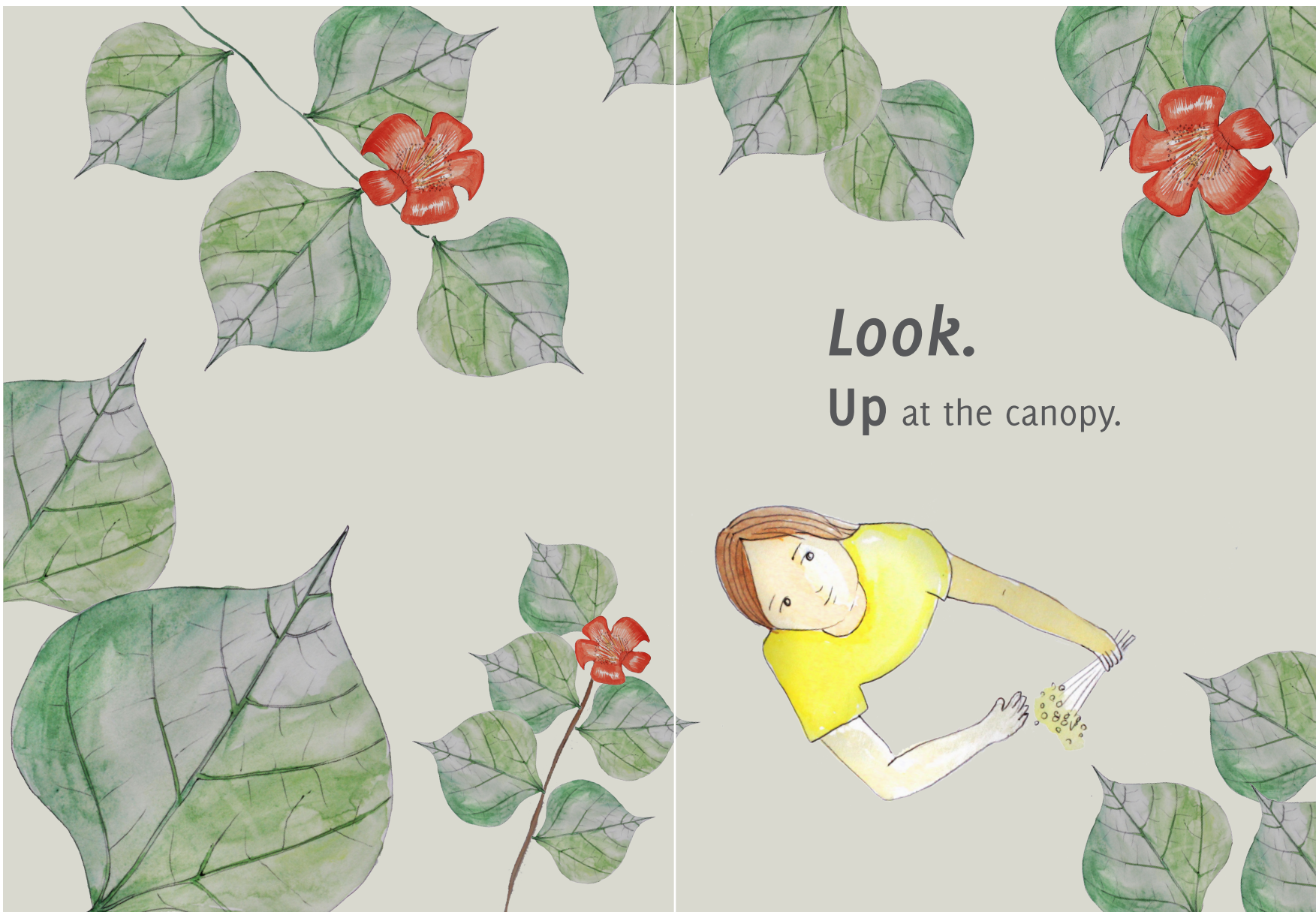
Tree-Bark Rubbings
Seed Packets
Draw a picture with Rain

Engage:

Hug a tree-measure its girth
Have a picnic under your favorite tree
Look at the world through your magnifying glass

The illustration style was **watercolour**, as it lends itself well to natural drawings.

Each illustration is inspired by what is seen on the trail, be it the colours, the feel, and the flora and fauna.



Look.
Up at the canopy.

Final Activity List

Make and Do

Make Seed Packets
Sow some seeds
Branches in a bottle
Make Rain Pictures
Scrapbook for Dry Leaves
Things to do with: Dry Leaves
 Leaf Prints on Tee Shirts
 Leaf Stencils
 Leaf Rubbings
Greeting Card with Cocks Comb
Draw a Plan for Tree House
Make a mask of an animal, bird, or plant from your Field Guide.
Find out more about it, and write a story about it. Tell it to your friends during the trail!

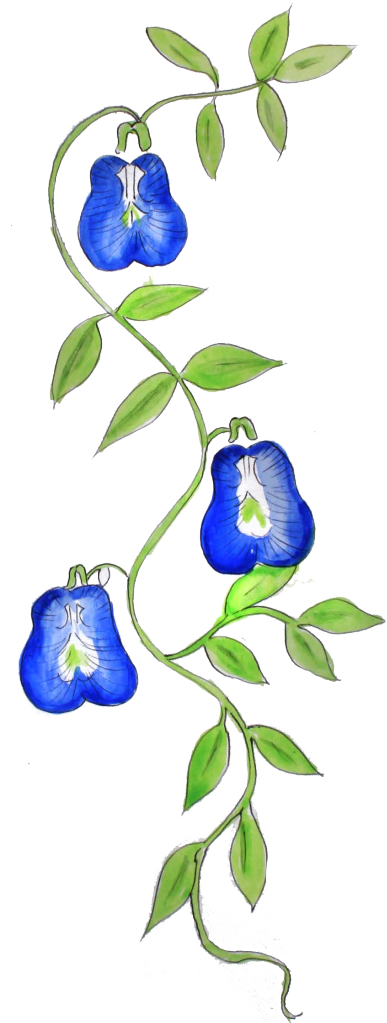
No Materials

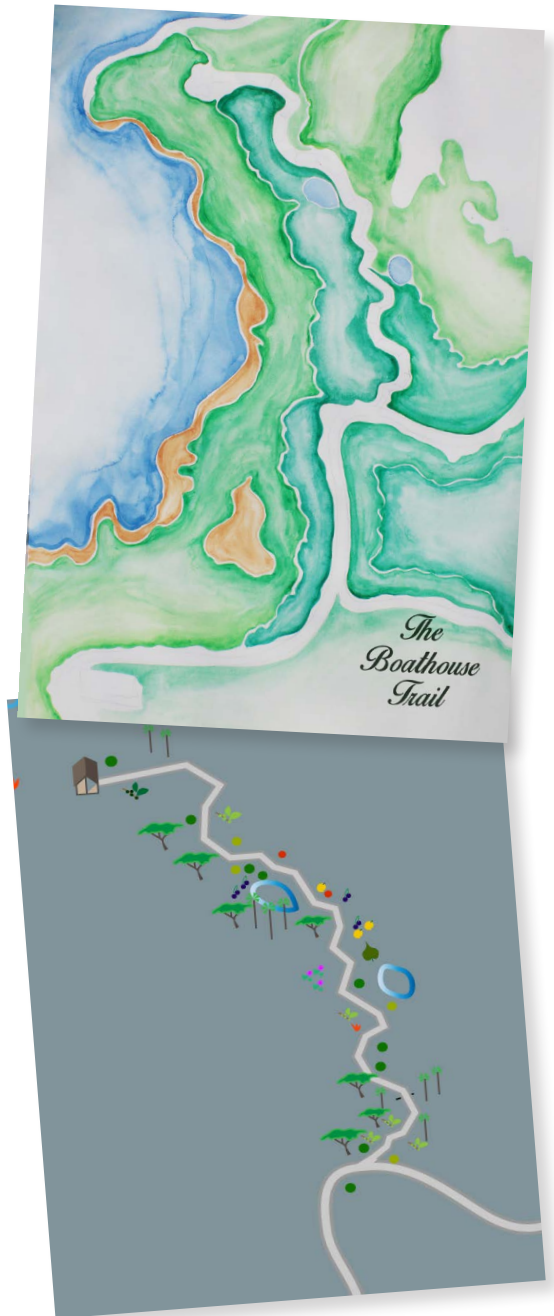
Sound Map
Hug a Tree-measure its girth (P)
Lie under the canopy of a tree (P)
Learn and imitate bird calls (B)
take a walk in the rain
Have a picnic-do not litter!
Look through your magnifying glass
Natural object that represents you.
Give a name to a new friend in the wild.
Try to know more about your friend.

Look for:

Beetle eaten and Caterpillar Eaten Leaves (I/P)
Dragon Flies and Damsel Flies (I)
Crab Holes
Kites (B)
Bamboo(P)
Mushrooms(P)
Sandpaper Leaves (P)
Dinnerplate Tree (P)
Palmyra Palms (P)
Woodland Flowers (P)
Thorny Tree Bark (P)
Bird Feathers (B)
How does the Rain Tree Sleep? (P)
Spittle Bug Nests (I)
Spider Webs (I)
Strangler Trees (P)
Cascuta (P)
Peepul Tree (P)
Tree Flowering Seasons -mention them!(P)
Water Birds! (B)
Creeper Layers (P)
Ferns (P)
Where do Kingfishers make their nests! (B)
Bubbles of Breathing Frogs (A)
Castor Butterfly on Castor Plant (BB)
Common Crow on Camara Lantana(BB)
LeafHoppers and Grasshoppers (I)
Asian Palm Swift (B) Evenings
Unusual Fruits (P)
Earthworms! (I) Rainy Season

P-Plant
BB-Butterfly
B-Birds
I-Insect





3. Trail Map

What: A trail-map, of the IIT-B Lakeside area. Trail marked from Jalvihar Guest House to Boathouse.

Who: Children , Accompanying Adult

Where: Before, After, but mostly ON the Trail.

Purpose: To provide a specified path to take for the trail.
Trees act as markers along the way.
To connect the Little Explorer Bag to a real world location.
To provide some tips on what to see, where to see it, and how.

4. Trail Suggestion Cards:

What: A set of three suggestion cards, containing group activities.

Who: The Accompanying Adult

Where: The cards can be referred to before the start of the trail.

Purpose: Activities to increase collaboration and interaction among the children on the trail.

To add the Element of competition, fun, and games

To add a new dimension to the use of the field guide rings.

Three types of trails can be conducted, based on the types of activities.

- Butterfly and Insect Trail
- Bird Trail
- Plant Trail

Each will contain:

- Activities that can be conducted on each trail.
- Best time to conduct each trail
- Trail-specific Instructions.
- Links to related activities from the activity book.

The Accompanying Adult (AA) can decide which trail to conduct, when to conduct it, and may even decide to mix activities from two or more trails.

These group activities will be conducted and coordinated by the Accompanying Adult. The AA might decide NOT to use the suggestion cards at all, and let the children explore and learn by themselves.

5. A Nature Journal, 6. A Word to Parents are additionally a part of the Little Explorer Bag.





The Road Ahead

This concept can be applied to various natural pockets in urban areas.

A similar solution can be developed for different natural areas, within cities.

Eg: An Explorer Kit for Sanjay Gandhi National Park will contain trail-specific resources for the habitat and biodiversity that occurs there. Activities will be tailored to what can be done there.

These kits may be retailed, may be issued in school libraries, and libraries of nature organizations.

They can be incorporated into nature excursions initiated by schools or nature organizations.

In future, the resources in the kit can be made comprehensive enough to enable its usage in a wide variety of habitats. A more detailed field guide, and other resources, would enable the kit to be generalized enough to be used within a wider geographical area, eg: Maharashtra Region.

Conclusion

My learning in this project has been immense. Though a nature lover from childhood, I was unaware of so many facets of nature. Going on regular conducted nature trails in various areas in Mumbai, and excursions to the IIT-B lakeside and hillside, brought me back into a regular contact with nature, which had been lost. A lot of learning went into the developing the Field Guide. I was unfamiliar with so many plant and animal names - specially the herbs, butterflies and birds! Learning to identify them in the wild was truly enjoyable for me! I found myself looking upwards and sideways, trying to identify them, whenever I was outdoors. And most of all, this project gave me an opportunity to interact with children. To share their joy, wonder, and get infected by it myself.

In terms of skill-based learning, this was the first time I used watercolour after my school days, and it was a good and patient exercise. I looked at children's book layouts, and maps. I tried to implement the project in such a way that the children could use the Little Explorer Bag and all its contents with ease.

I captured several photographs in the course of my project, some of which are in this report. Though not a part of the final outcome, they served as references for me and inspired me along the way.



Look.
Up at the canopy.

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