

NATURE EXPLORERS

Objectives:

1. To observe the morphological characteristics of plants.
2. To group plants according to their characteristics.

Learning Skills:

Observation, discovery, classification, and grouping

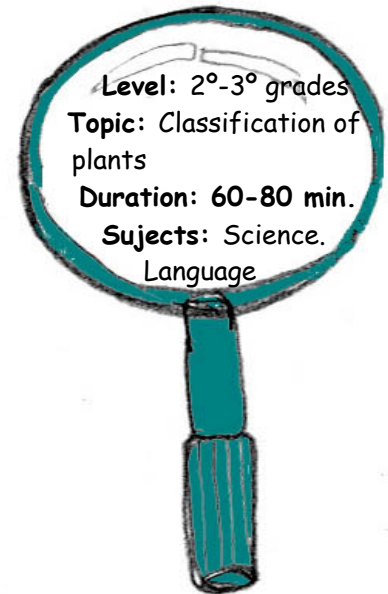
Information Base:

The parts of the plant (flowering) that are the most familiar to us are: roots, stem, leaves, flower, and fruit. The roots hold the plant into place and transports water and minerals to the plant from the ground. The stem transports water and minerals from the roots to the leaves and returns the sugars that are made in the leaves to the rest of the plant. The leaves make sugars through a process called "photosynthesis". The leaves also function in respiration whereby oxygen from the air is used and carbon dioxide is released. However, not all flowering plants are the same. Roots, stems, leaves and flowers vary in shape, size and duration.

There are woody plants with hard stems called "**trunks**". These woody plants may have stems and/or branches that begin to branch out low and we can climb them (**bushes**), or branch out high (**trees**). The majority of these bushes and trees live for many years and are called "**perennials**".

There are plants with **fleshy stems**, like the cactus and others that are found in deserts. There are also plants with soft stems or without stems at all! These are called "**herbaceous**" plants which do not live for more than one or two years (**annuals** or **biennals**). Many herbaceous grasses have underground roots called "**rhizomes**" which are only visible when we dig them up.

The leaves of plants can have many forms and last for a long time (**perennial leaves**) or they may all fall off simultaneously each dry season (**deciduous leaves**). Some leaves may specialize and change into **spines**. In these plants, the stem remains green and carries out the photosynthesis.



Vocabulary: Annual plants, perennials, woody, herbaceous, tree, trunk, branch, fleshy, spines, aquatic, terrestrial, Classify = to make groups.

Materials: Cards with photos or drawings of plants to look for (20 with trees and 20 with grasses), 40 observation sheets, one (1) clipboard, one (1) pencil and one (1) magnifying glass for each group of 2 students (explorer outfit), for a total of 20 clip boards, pencils, and magnifying glasses.

Note: Possible plants are: coconut palms, jobo, corotu, cercropia; the herbaceous plants/grasses are: cactus, Graminea (saw grass), inpatients, cat tails, Spanish bayonet. Three (3) trees and three (3) herbaceous plants will be chosen depending on the season.

Procedure:

1. Meet the children at the entrance of the dry forest in front of the sign, or in front of the classrooms. After welcoming the children and introducing the docents, ask them if they believe all plants are alike. "How are they different?" Let them talk about size, colors, and smells. Try to determine if they know what are leaves, flowers, stems, trunks and roots. Be sure to introduce these terms. (5 minutes).
2. Today we will learn how plants can be different by playing a game called "Nature Explorer". Ask them if they know what it is to be an "explorer". Explain: After the arrival of Columbus and Balboa in Panama special scientific expeditions came which would return to Europe with tales of exotic plants and animals. Most of the time these expeditions were accompanied by an indigenous guide who would show them plants and teach them their names. For emphasis, the descriptive text can be read using a Spanish accent (possible text attached). This is a good icebreaker in that we can establish a comical personality in Don Diego Casco de Grama, which will heighten their interest in being explorers (5 minutes).
3. Explain how the children will be placed in groups of 2-3 and will receive help from an indigenous inhabitant of Punta Culebra. Diguarsapi left us drawings of some of the plants and recorded their names. Each group of 2-3 children will have a pair of plants (one herbaceous and one woody, **do not point them out**) and two observation sheets.
4. Fill out a sample sheet together (so each may have a copy on 11"x17" paper). For this example we can use the bean plant surrounded by ornamentals and a cactus that can be found at the entrance rotunda or next to the bench that faces Perico and Flamenco. Help them answer each

question with different options; a tree, a cactus, a grass, etc. This will help them become familiar with the observation sheet and will clarify any questions about the activity. Invite them to draw or write any notes that may help them as good scientists (10 minutes).

5. Divide the children into groups of 2-3 and provide each with a card and observation sheet. We can now go search for our plants. Help by providing them with simple clues. The plants used will be examples that are near the two work areas: under the corotu and jobo trees at the center of the forest, and by the palms and ornamentals beneath them. This will enable us to divide the guides and the teachers among the children for assistance and control their dispersal. We will spend 10-15 minutes per plant and arrange to meet under the corotu or jobo tree.

Examples of pairs: corotu-cactus, cercropia-saw grass, jobo-cactus, coconut palm-cat tail, Spanish bayonet-palm, cercropia-Spanish bayonet, palms-inpatients.

6. The cards will contain only 3 types of trees and herbaceous plants. We will later share and compare each "explorers" observation with the entire group. Talk about each plant. A volunteer can read the children's responses while the remaining children, with the same plant, can compare their findings. If there are drawings, share them with the group.

7. "What do all the plants described have in common?" "What are their differences?" "If we wanted to divide them into two groups, who would you put with whom?" Use volunteers to make groups representing each plant group. "Are there other ways of grouping the plants?" "Do you know of any other plants that can be added to the groups?" **Allow them to make groups of their choosing** (with or without flowers, big or small, green or brown, etc.). **The idea is that they practice grouping skills.**

8. In conclusion, we leave the plant kingdom for the aquariums leaving them with a question for the end: "Are there plants in the aquariums?"

Suggestions for the Docent: If time permits, introduce to the group the concept of aquatic plants and flowerless plants like the algae.

Suggested Classroom Activities: A good complementary activity integrating both English and writing skills: have the children compose a descriptive paragraph of their plant. The children will need to take with them their observation sheets and a photocopy of the description of each plant which was given to the teacher.

Another activity is to build a mural with the plants that describe their characteristics.

Evaluation: The classification of plants in proper groups shall be our evaluation since grouping requires observation analysis.

References: Editorial Santillana, 1997. Ciencias Naturales 3. Panama: hacia el siglo XXI/ direccion de Elsa Morales Cordero with the collaboration of Rolando Checa Campos. 1st Edition. San Jose, Costa Rica.

Text to Read (Fictional):

Don Diego Casco de Grama was a naturalist who accompanied Balboa on his explorations through the Darien, and described the tagua palm as follows: "Description of a plant whose seeds look like ivory: This is a tree without branches which barely reaches a height of a Spaniard standing on the shoulders of another. Its leaves are huge and joined at the top of the palm. They are as long as a man lying down. The fruits are spiny and grouped by fours. The Indians use the seeds that resemble ivory from elephant tusks to carve ornaments."

Another description can be done in front of the jagua tree that is on our grounds:

"A description of the tree that bears fruit which the Indians use to paint and adorn their body: This tree is not pretty yet it reaches a height of three Spaniards standing on each others shoulders. All the leaves on the tree fall off during the season that it does not rain. Indians eat the stinky fruit that look like chocolate apples whose pulp smells fermented. They grate the pulp with wood ashes and cook it to paint their bodies with special ceremonial designs. The naked Indian maidens (God save us from temptation!) are experts at creating these designs."

NATURE EXPLORERS
Observation Sheet



Hi! I'm Diguarsapi; I hope my drawing will help you so you can tell your friends about the plants of Punta Culebra. The name of this plant is



This plant is
Big ___
Medium ___
Small ___

Is it supported by the ground ___ or by another plant ___?

Can you see its roots? Yes ___ No ___
Are they in the ground? Yes ___ No ___

Do you see its stem?
Yes ___ No ___
What color is it? _____
Is it soft or hard

¿ Does it have leaves? Yes ___
No ___
Where do they grow?
On branches ___
On the floor ___
At the tree top

Does it have fruit?

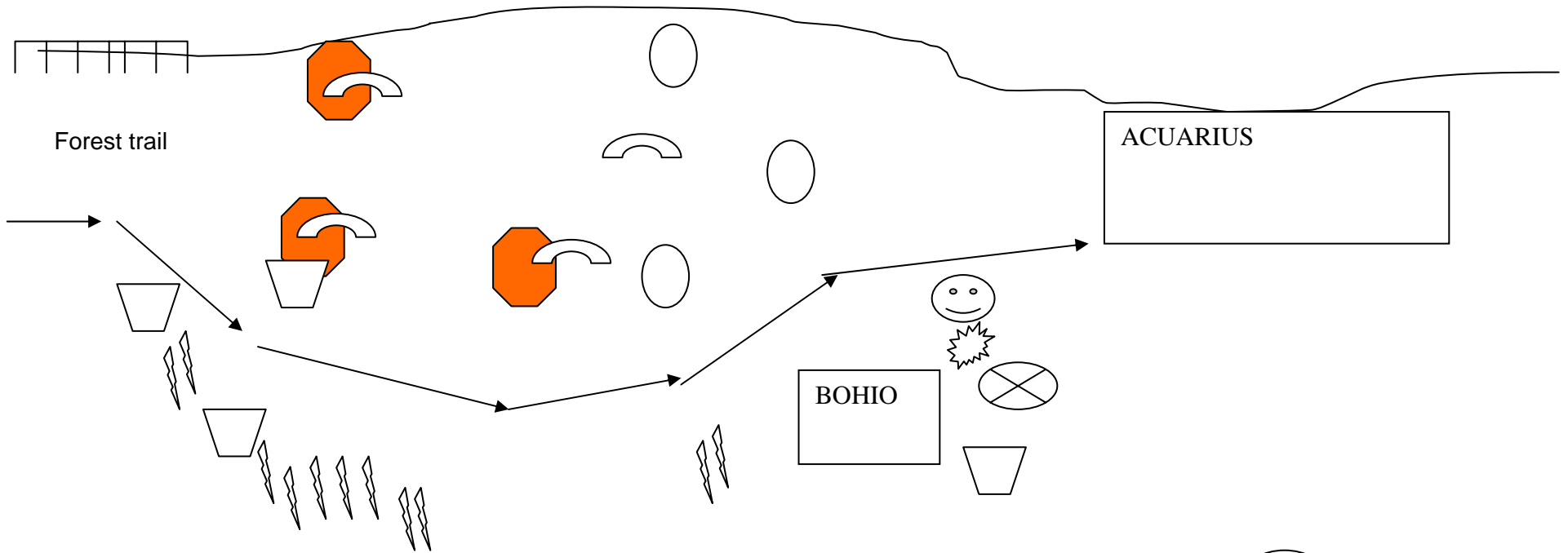
Does it have spines?
Yes ___ No ___

Does it have flowers?

Does it have a trunk? Yes ___ No ___
Thin ___ Thick ___
Does it have Branches? Yes ___ No ___
Can you climb it?

DIAGRAM OF PLANTS WE CAN EXPLORE

Strategy for the distribution of the groups with the supervision of the CEM docents



	COROTU		CACTUS		RABO DE GATO
	GUARUMO		HIERBA GRANDE		NOVIOS
	JOBO		ENREDADERA		COCO

POSIBLES PAREJAS DE